

DEPARTMENT OF BUSINESS ADMINISTRATION (BBA)



OUTCOME BASED EDUCATION SYLLABUS

Effective from Batch 2021



DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE (AUTONOMOUS)

College with Potential for Excellence

Linguistic Minority Institution Affiliated to University of Madras

E.V.R. Periyar High Road, Arumbakkam, Chennai – 600106, Tamilnadu.

CONTENTS:

1. Vision, Mission and Program Educational Objectives (PEO)
2. Program Outcomes (PO) with Graduate Attributes
3. Mapping of POs with PEOs
4. Scheme & Syllabus of the programme. (Semester I – VI)

Institution

Vision

To impart value-based quality academia; to empower students with wisdom and to charge them with rich Indian traditions and culture; to invoke the self, to broaden the same towards nation building, harmony and Universal brotherhood.

Mission

To ensure sustained progress and development in imparting quality education, to pioneer new avenues of teaching and research and to emerge as an institution with potential for excellence.

DEPARTMENT OF BUSINESS ADMINISTRATION

VISION

To evolve as an institution providing wholesome quality education in the field of management for building and developing entrepreneurship.

MISSION

| | |
|----|--|
| M1 | To provide sustained comprehensive quality management education inculcating social and ethical values. |
| M2 | To spearhead new teaching practices for course delivery for management education. |
| M3 | To stay abreast and constantly strive to provide students with the latest developments in the field of education and integrating with ICT. |

PROGRAM EDUCATION OBJECTIVES (PEOs)

| | |
|-------------|--|
| PEO1 | Raise a career in the field of management and contribute to the growth of the company and nation. |
| PEO2 | Kindles the entrepreneurship spirit and start their own business and/or develop their existing business. |
| PEO3 | To pursue higher studies and research in the specialized areas of management of their interest. |
| PEO4 | Build and/or develop organisations adherence to legal, social, ethical regulations of the nation. |

PEO TO MISSION STATEMENT MAPPING

| MISSION STATEMENTS | PEO1 | PEO2 | PEO3 | PEO4 |
|--------------------|------|------|------|------|
| M1 | 3 | 3 | 3 | 3 |
| M2 | 1 | 1 | 1 | 2 |
| M3 | 2 | 2 | 1 | 3 |

CORRELATION: 3- STRONG 2- MEDIUM 1- LOW

PROGRAM OUTCOMES (PO) IN RELATION TO GRADUATE ATTRIBUTES

| | | |
|----|-------------|--|
| 1 | PO1 | Disciplinary knowledge: Provides a comprehensive knowledge and capable of demonstrating it the field of management and apply the in-depth knowledge in their field of specialization Marketing or Human resources. |
| 2 | PO2 | Problem analysis: Identify, review, formulate and analyse the problem or reformation to provide conclusions applying analytic thought to body of knowledge. |
| 3 | PO3 | Design/Development of solutions: Design solutions for social and economic needs applying their core management competencies to solve the problem integrated with real life learning. |
| 4 | PO4 | Conduct investigations of complex problems: Ability to inquire, identifying problems, logical flaws, analyse data from various sources, interpret and draw valid conclusions. |
| 5 | PO5 | Modern tool usage: Identify and access, evaluate appropriate software and integrating management competencies. Gain skills to use ICT for learning. |
| 6 | PO6 | With society: To apply rational thinking with contextual knowledge and evaluate the subsequent responsibilities of the professional management to the society. |
| 7 | PO7 | Environment & sustainability: Analyze the impact of professional management in the society and plan for sustainable development. |
| 8 | PO8 | Ethics: Demonstrate moral/ethical values in carrying out his duties in his profession and identify unethical work. |
| 9 | PO9 | Individual and teamwork: Demonstrate ability to work effectively individually, within the group and with other groups. |
| 10 | PO10 | Communications: Effectively communicate thoughts, ideas or any complex information orally or written using appropriate media clearly and concisely. |
| 11 | PO11 | Project management: Demonstrate knowledge and understanding of core management concepts applying to real scenarios in the work environment. |
| 12 | PO12 | Lifelong learning: Gain skills and knowledge through self-paced and self-directed learning and use to develop them personally and to be abreast with changing environment. |

Mapping of POs TO PEOs

| <u>PEO/ PO</u> | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO8 | PO9 | PO 10 | PO 11 | PO12 |
|----------------|------|------|------|------|------|------|------|-----|-----|-------|-------|------|
| PEO 1 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 |
| PEO 2 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 2 | 1 |
| PEO 3 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 3 |
| PEO 4 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

PROGRAM SPECIFIC OUTCOMES

PSO 1: Students will be able to apply the knowledge of management concepts in business environment and describe the recent trends.

PSO2: Students will build proficiency in their area of specialization (Marketing or Human Resource Management or Family Business Management or Media Management).

PSO3: Students undergo co-curricular activities to demonstrate practical knowledge in their domain area.

PSO4: Students acquire practical skills to identify & solve a problem/area of improvement.

PSO5: Students gain knowledge & skills to start their own enterprises, effectively contribute to the growth of the organization and/or pursue higher studies in management.

PSO6: Students will be able to identify the technology trends and its impact on business.

**DWARAKA DOSS GOVERDHAN DOSS VAISHNAV
COLLEGE
(AUTONOMOUS)
DEPARTMENT OF BUSINESS ADMINISTRATION (BBA)**

DEPARTMENT PROFILE:

With the blessing of Lord Almighty, the Department of Business Administration, (BBA) D.G. Vaishnav College had a modest beginning in the year 1991 with 1 section. Presently, the Department has 3 sections with around 650 students and 16 faculty members. One additional section is to be introduced in the academic year 2021-22.

The Department provides conducive ambience for learning Management & Career oriented subjects, keeping in view the changing trends in education. In the year 2009 the college attained autonomous status which helped the department to design its own syllabus and came out with innovative papers to meet the current requirement of the industry. The Department has been revising the syllabus regularly under the choice-based system. The Department offers specialization in Marketing, Human Resources & Family Business Management. Institutional training & Industrial visit are part of the academics which student undergoes every year to get exposure of the corporate world. The Department has signed MoUs with National Council for Vocational Training & Education (MHRD) and National Foundation for Entrepreneurship Development. The Department in collaboration with institutes offers certificate courses on E-entrepreneurship, Supply Chain & Logistics Management, GST Filing. The Department hosts Markutsav & Synergy – two inter college events every year and publishes EPITOME – Annual Magazine. The Department takes pride in its Student Social Responsibility (SSR) activities. The recent ones include Ne Ne Programmes, CareNimals. The Department was listed as Top BBA Institutes by Times Ranking 2017 & 2018.

REGULATIONS

1. Eligibility for admission:

Candidates for admission to the first years of Bachelor of Business Administration (BBA) course shall be required to have passed Higher Secondary examinations conducted by the Government of Tamil Nadu, or an examination accepted as equivalent thereto by the syndicate of the University of Madras.

Aggregate marks obtained in Commerce/Business studies, Accountancy, Mathematics / Business Mathematics/Economics/ Computer science will be considered for admission.

2. Eligibility of award of Degree:

A candidate shall be eligible for the award of Degree only if he or she has undergone the prescribed course for a period of not less than three academic years, passed the examinations of all Six Semesters prescribed.

3. Course of Study

:

The main subject of study for Bachelor's degree shall consist of the following: Part 1: Foundation course exclusive for language.

Part 2: English

Part 3: Core courses / Allied subjects I and II – Job and skill-oriented entrepreneurship components.

Part 4: Non-major Elective and Skill based subjects.

Part 5: Extension Activities / Sports/NCC

4. Passing Minimum:

A candidate shall be declared to have passed in each paper/practical of the main subject of study wherever prescribed, if he/she secured not less than 40% of the marks prescribed for the examination.

5. Classification of successful candidates:

PART I, II, III &IV

Successful candidates passing the examination and securing the marks (i) 60% and above and (ii) 50% and above but below 60% in the aggregate shall be declared to have passed the examination in the FIRST and SECOND class respectively. All other successful candidates shall be declared to have passed the examination in the THIRD class.

Candidates who passed all the examination (Part I,II, III &IV) prescribed for the courses in the FIRST APPEARANCE ITSELF ALONE are eligible for ranking.

CERTIFICATE COURSE

One certificate programme (for all III years) is offered during the academic year other than undergoing Swayam / MOOCs Online Courses(s). On completion of every certificate programme, 2 credits will be allotted for every certificate programme for the student.

| Certificate Course Programme | Year |
|--|--------------|
| E-entrepreneurship or Innovation & Creativity for Business (Any one) | For I year |
| Supply Chain & Logistics Management | For II year |
| GST Filing | For III year |

CERTIFICATE COURSE SYLLABUS

E-Entrepreneurship

Unit 1 – Introduction to E-Business

E-Business – Genesis – Concept & Definitions – History of Internet – Opportunities & Challenges – Working of E-Business – Advantages & Disadvantages – Fundamental Goals & E-Business Prospects – Illustrations – Success Stories of Entrepreneurs – Ideas & Opportunities – Types of Entrepreneurship & Skills – Difference between E-Commerce & E-Business – Challenges faced by Entrepreneurs – Scenarios.

Unit 2 – Devising Successful Business Model

Business Models & Emerging Trends in E-Commerce – Internet & Web Change Business: Structure – Strategy & Process – Internet of Things (IoT): Internet Today & Next Gen – World Wide Web: Features & Growth – Comparison of Traditional Commerce & E-Commerce – Overview Software Applications & Hardware Requirements – Cloud & On Premises.

Unit 3 – Business Operations & Strategy

Business Models in E-Commerce – Business to Business (B2B) Model – Business to Consumer (B2C) Model – Consumer-to-Consumer (C2C) Model – Consumer-to-Business (C2B) Model – Peer-

to-Peer (P2P) Model – Strategic Planning of Business – Cases – Content Strategy – Goal Setting – Resource Allocation & Management.

Unit 4 – Business Plan Inception

Business Plan Overview – Feasibility Study & Assessment Strategies – Decision Making & Problem Solving – Significant Components – Breakeven Ratio – Preparation & Submission – Business Development Plan for E-Entrepreneurship - SWOT Analysis & FMEA Overview.

Unit 5 – Business Types & Compliances

Types of Enterprises – Creativity & Innovation – Registration Modalities & Approvals –Investor Choice & Relations – Art of Negotiation – Legal & Ethical Policy Issues: Protection of Privacy – Copyright – Trademark & Intellectual Property Rights – Internet Marketing- Advertisement & Display Strategies on Internet – E-Business for Service Industry – Ethical & Legal Issues.

Unit 6 – MSME Schemes, Procedures & Policies

Enterprise Promotion – Understanding & Differences in MSMEs – Role of Financial Institutions – MSME Start-up Procedures & Policies – Governmental Support – Schemes & Modalities for Start-ups – Risk Assessment & Crisis Management.

Unit 7 – Business Transformation

Sales & Marketing – Concepts & Comparison - Challenges of Traditional Marketing – Business Digitalization – Branding & Promotion for Retailing Growth in E-Business Space – Enhancement of Business Prospects.

Unit 8 – Digital Marketing Overview

SEO & SEM Concepts – Social Media Marketing – Google Ads – E-Payment Systems: B2B Electronic Payments – Third-Party Payment Processing – Electronic Payment Gateway – Online Payment Technologies, e-Transactions & Security – Digital Signature & QR Code.

Innovation & Creativity for Business

Unit 1 – Innovation & Ideation

Innovation – Concept – Principles – Characteristic Features – Qualities of Innovation – Ideation Concepts – Idea Mobilization – Areas of Innovation & Processes – Continuous Improvement – Problem Solving – Game Changer – Types of Innovation – Self-Recognition & Continuity – Success Cases.

Unit 2 – Creativity for Business Development

Creativity – Meaning & Concept – Stages – Source & Process – Nature & Characteristics – Factors – Views – Components – Motivation & Support – Innovation Vs Creativity – Divergent Thinking – Case Studies – Creative & Innovative Business Personalities.

Unit 3 – Self-Management & Skill Acquisition

Self-Realization & Understanding Psyche – Self-Management – Concepts & Practices – Psychological Aspects – Self-Learning & Social Learning – Achievement Motivation & Reinforcement Theories – Time Management – Skill Acquisition Techniques – Upskilling – Adoption & Rejuvenation.

Unit 4 – Design Thinking

Design Thinking – Process – Phases & Steps – Source – Types of Thinking – Creative & Analytical – Brain Functions – Mindsets – Modes – Dimensions – Case Studies.

Unit 5 – Managing Innovation

Importance of Innovation – Understanding Differences – Invention & Creativity – Case Studies – Successful Innovation – Methods & Techniques – Assessment & Effectiveness – Organizational Factors – Legal Aspects – Trademark – Copyright – IPR – Patent – Examples.

Unit 6 – Understanding Business Start-ups

Start-up – Concept & Process – Types & Models – Barriers & Influences – Registration Formalities – Business Plan & Feasibility – Working Capital Management – Break Even Point – Promotion – Strategies – Instructional Design – Training Needs & Evaluation – Cases.

Unit 7 – Role of EDIs & TBIs

EDIs & TBIs – Overview – Roles & Functions – Incubation Process – Technical Guidance – Promotional Schemes – Start-up & Enterprise Development – Training Modalities – Assessment.

Unit 8 – Innovative Ventures & Investors Behaviour

Innovative Ventures – Branding – Digital Transformation – Social Media Marketing – Investor Types – Role of Investors – Investors Behaviour – Funding Sources – Features & Patterns – Types of Funding – Case Studies.

SUPPLY CHAIN AND LOGISTICS MANAGEMENT

Unit 1: Concept of Logistics: Introduction, Objectives, Concept of Logistics, Objectives of logistics, Types of logistics, Concept of Logistics Management, Evolution of Logistics, Role of Logistics in an Economy, Difference between Logistics and Supply Chain Management, Logistics and Competitive Advantage, Logistics Mix, Logistics in Organised Retail in India.

Unit 2: Integrated Logistics: Introduction, Objectives, Concept of Integrated Logistics, Inventory flow, Information flow, Operational Objectives of Integrated Logistics, Barriers to Integration, Organisation structure, Measurement system, Inventory ownership, Information technology, Knowledge transfer capability, Logistical Performance Cycle, Logistics performance cycle, Manufacturing support performance cycle, Procurement performance cycle.

Unit 3: Supply Chain Management: Introduction, Objectives, Defining Value Chain, Organisation level, Activities, Industry level, Value reference model, Concept of Supply Chain Management (SCM), Functions and Contribution of Supply Chain Management, Creating value, Enlisting suppliers to innovate, Leveraging value chain partners, Supply Chain Effectiveness and Indian Infrastructure, Framework for Supply Chain Solution, Supply Chain Relationships, Building a long-term relationship with vendors, Supplier relationship management (SRM).

Unit 4: Demand Forecasting: Introduction, Objectives, Concept of Demand Forecasting, Impact of Forecasts on Logistics and Supply Chain Management, Forecasting Process, Forecasting Techniques, Selecting the Appropriate Forecasting Technique, Operating Principles of Forecasting.

Unit 5: Inventory Management: Introduction, Objectives, Concept of Inventory, Types of Inventory, Concept of Inventory Management, Importance of inventory management, Objectives of inventory management, Different Types of Inventory Costs, Inventory Performance Measures, Inventory turnover ratio (ITR), Framework of performance indicators, Inventory Planning Measures, Economic order quantity (EOQ), Reorder point, Safety stock, Supplier-managed inventory.

Unit 6: Material Handling: Introduction, Objectives, Concept of Material Handling, Objectives of material handling, Principles of material handling, Equipment Used for Material Handling, Points to be Considered While Handling Materials, Role of Material Handling in Logistics

Unit 7: Material Storage System: Introduction, Objectives, Concept of Material Storage System, Unit Load Storage, Storage principles, Storage design and its benefits, Storage Methods.

Unit 8: Warehousing: Introduction, Objectives, Concept of Warehousing, Need for warehousing management, Evolution of warehousing, Functions of Warehouses, Types of Warehouses, Warehousing Cost, Warehousing Strategies, Significance of Warehousing in Logistics, Warehousing Management System (WMS).

Unit 9: Storehouse Operations and Control: Introduction, Objectives, Storehouse Operations and its Objectives, Daily Activities of Stores, Organising a Store, Store Location and Layout, Selecting appropriate storage system, Centralisation, Decentralization and variety reduction of stores, Store Housekeeping, Stores Accounting.

Unit 10: Logistical Packaging: Introduction, Objectives, Concept of Logistical Packaging, Design Consideration in Packaging, Types of Packaging Material, Packaging Costs

Unit 11: Transportation: Introduction, Objectives, Transportation System, Transportation Infrastructure, Different Modes of Transportation, Freight Management, Factors Affecting Freight Cost, Transportation Network, Containerisation.

Unit 12: Customer Service: Key Element of Logistics: Introduction, Objectives, Concept of Customer Service, Attributes of customer service, Different phases of customer services, Customer Service for Competitiveness, Value-Added Logistical Service.

Unit 13: Logistics Outsourcing: Introduction, Objectives, Concept of Logistics Outsourcing, Catalyst for logistics outsourcing, Benefits of logistics outsourcing, Issues in logistics outsourcing, Third-Party Logistics, Fourth-Party Logistics, Selection of Logistics Service Provider, Logistics Service Contract, Outsourcing-Value Proposition.

Unit 14: Logistics Information System: Introduction, Objectives, Concept of Logistics Information System (LIS), Importance of LIS, Principles of designing LIS, Logistics Information Architecture, Application of Information Technology in Logistics and Supply Chain Management

Unit 15: E-Commerce Logistics: Introduction, Objectives, Concept of E-Commerce, Requirements of Logistics in E-Commerce, E-Logistics Structure and Operation, Logistic Resource Management.

GST FILING

UNIT -1 OVERVIEW OF GST AND MODEL GST LAW (CGST & SGST)

Constitutional Provisions-Taxable Event – Supply- Destination Principle-Concurrent Dual GST IGST Model (Introduction)- Composition Levy-Taxable Persons-Casual Taxable Person Non-resident Taxable Persons.

UNIT -2 MEANING/SCOPE OF SUPPLY OF GOODS & SERVICES

Definition-Intra-State and Inter-State Supply-Exempted & Zero-rated Supply- Mixed and Composite Supply.

UNIT- 3 GST BUSINESS PROCESS – REGISTRATION

Legal Provisions, Schedule V- Migration of existing dealers/assesses- Fresh Registration, Amendment, Cancellation and Surrender & Revocation-Transitional Provisions relating to Registration.

UNIT -4 TIME OF SUPPLY & VALUATION OF SUPPLY OF GOODS AND SERVICES; CHANGE IN RATE OF TAX, GST BUSINESS PROCESS - RETURNS

Filing of Returns-Types of Returns and Formats- Input Tax Credit and its matching - Tax Return Preparers Accounts and Records Tax Invoice, Credit / Debit Notes & Payments.

UNIT- 5 PLACE OF SUPPLY OF GOODS AND SERVICES AND OVERVIEW OF IGST ACT

Domestic Supplies-International Supplies.

PATTERNS FOR CONTINUOUS ASSESSMENT

Theory Papers: Internal Marks 40

| | |
|--|----------|
| Class Test (Two Tests) | 25 Marks |
| Attendance | 05 Marks |
| III Component CIA (Assignment/Seminar) | 10 Marks |

External Marks: 100 Marks

End semester examination will be for 100 Marks and the mark scored will be converted to 60.

Project Evaluation:

| | |
|-----------------------|-----------------|
| Project Report | 60 Marks |
| Viva Voce | 40 Marks |
| Total | 100 Marks |

Note: For Accounting for Managers (I year – I & II semesters) and Financial Management (II year – III Semester), the question paper is to be set in the ratio of 80:20 (80% problems and 20% theory)

Question Paper Pattern:

DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE (AUTONOMOUS)
CHENNAI – 106.

Office of the Controller of Examinations

Time: 3 hours

Max.marks: 100

PATTERN OF THE QUESTION PAPER

Section – A (10x2 = 20 Marks)

Answer all the Questions

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)
- 10)

Section – B (5x7 = 35 Marks)

Answer all the Questions

11) a)*****

Or

b)*****

12) a)*****

Or

b)*****

13) a)*****

Or

b)*****

14) a)*****

Or

b)*****

15) a)*****

Or

b)*****

Section – C (3x15 = 45 Marks)

Answer all the Questions (Qn.no:16 is compulsory)

16)*****

17) a)*****

Or

b)*****

18) a)*****

Or

b)*****

DEPARTMENT OF BBA

SCHEME OF I SEMESTER BBA PROGRAM

| Sl. NO | Course Category | Course Code | Course | Over all Credits | Total Contact Hours/ Week | Marks | | |
|--------------|-----------------|-------------|---------------------------|------------------|---------------------------|-------|-----|-------|
| | | | | | | CIA | ESE | Total |
| 1 | Foundation | | Language –I | 3 | 4 | 40 | 60 | 100 |
| 2 | Foundation | | English – I | 3 | 4 | 40 | 60 | 100 |
| 3 | Core I | 03101 | Accounting for managers-I | 4 | 6 | 40 | 60 | 100 |
| 4 | Core II | 03102 | Principles of Management | 4 | 6 | 40 | 60 | 100 |
| 5 | Allied I | 03103 | Managerial Economics | 4 | 6 | 40 | 60 | 100 |
| 6 | Non-Major | 03104 | Consumer Behavior | 2 | 2 | 40 | 60 | 100 |
| 7 | | | Soft skills | 2 | 1 | 40 | 60 | 100 |
| Total | | | | 22 | 30 | | | |

SCHEME OF II SEMESTER BBA PROGRAM

| Sl. | Course category | Course | Course | Overall Credits | Total Contact Hours/Week | Marks | | |
|--------------|-----------------|--------|-----------------------------------|-----------------|--------------------------|-------|-----|-------|
| | | | | | | CIA | ESE | Total |
| 1 | Foundation | | Language –II | 3 | 4 | 40 | 60 | 100 |
| 2 | Foundation | | English – II | 3 | 4 | 40 | 60 | 100 |
| 3 | Core III | 03205 | Accounting for managers -II | 4 | 6 | 40 | 60 | 100 |
| 4 | Core IV | 03207 | *Computer Application In Business | 4 | 6 | 40 | 60 | 100 |
| 5 | Allied I | 03206 | Corporate Communication | 4 | 6 | 40 | 60 | 100 |
| 6 | Non-major | 03208 | Personality Development | 2 | 2 | 40 | 60 | 100 |
| 7 | | | Soft skills | 2 | 2 | 40 | 60 | 100 |
| Total | | | | 22 | 30 | | | |

SEMESTER I

| Sl. NO | Course Category | Course Code | Course | Over all Credits | Total Contact Hours/ Week | Marks | | |
|--------------|-----------------|-------------|---------------------------|------------------|---------------------------|-------|-----|-------|
| | | | | | | CIA | ESE | Total |
| 1 | Foundation | | Language –I | 3 | 4 | 40 | 60 | 100 |
| 2 | Foundation | | English – I | 3 | 4 | 40 | 60 | 100 |
| 3 | Core I | 03101 | Accounting for managers-I | 4 | 6 | 40 | 60 | 100 |
| 4 | Core II | 03102 | Principles of management | 4 | 6 | 40 | 60 | 100 |
| 5 | Allied I | 03103 | Managerial Economics | 4 | 6 | 40 | 60 | 100 |
| 6 | Non-Major | 03104 | Consumer Behavior | 2 | 2 | 40 | 60 | 100 |
| 7 | | | Soft skills | 2 | 1 | 40 | 60 | 100 |
| Total | | | | 22 | 30 | | | |

ACCOUNTING FOR MANAGERS – I

| | |
|----------------------------|------------------------------|
| Course Code : 03101 | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA/ESE Marks: 40 /60 |
| Exam Hours : 03 | Teaching hours: 90 |

Learning Objectives:

- To impart knowledge about basic concepts of Accounting its applications
- To analyze and interpret financial reports of a company

Unit I:

Meaning And Scope Of Accounting – Basic Accounting Concepts And Conventions – Objectives Of Accounting – Accounting Transactions – Double Entry Book Keeping – Journal, Ledger, Preparation Of Trial Balance – Preparation Of Cash Book.(18 Hours)

Unit II:

Preparation Of Final Accounts Of A Sole Trading Concern – Adjustments – Closing Stock, Outstanding And Prepaid Items - Depreciation, Provision For Bad Debts, Provision For Discount On Debtors – Interest On Capital And Drawings (Inclusive Of All Adjustment(18 Hours).

Unit III:

Classification of Errors – Rectification of Errors – Preparation of Suspense Account.Bank Reconciliation Statement (Only Simple Problems).(18Hours).

Unit IV:

Depreciation – Meaning, Causes, Types – Straight Line Method – Written Down Value Method (Change In Method Excluded).(16 Hours).

Unit V:

Single Entry System – Meaning, Features, Defects. Difference between Single Entry and Double Entry System – Statement of Affairs Method – Conversion Method (Only Simple Problems). (20 Hours).

RECOMMENDED TEXT BOOKS:

1. TS Reddy & amp; A.Murthy; Financial Accounting -Margham Publications , 6th Edition, 2019.
2. David Kolitz; Financial Accounting – Taylor and Francis group, USA 2017.

REFERENCE BOOKS:

1. M N Arora; Accounting for Management- Himalaya Publications House 2019.
2. SN Maheswari; Financial Accounting - Vikas Publishing House, Jan 2018.
3. T. Horngren Charles , L. Sundern Gary , A. Elliott John; Introduction to Financial Accounting, Pearson Publications Oct 2017.

ONLINE REFERENCES:

1. <https://open.umn.edu/opentextbooks/textbooks/introduction-to-financial-accounting>
2. <https://corporatefinanceinstitute.com/resources/ebooks/principles-accounting-book-pdf/>
3. https://www.barnesandnoble.com/b/free-ebooks/nook-books/accounting/financial-accounting/_/N-ry0Z8qaZtsg
4. <https://www.profitbooks.net/what-is-depreciation/>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Prepare Journal, ledger, trial balance and cash book |
| CO2 | Prepare final accounts with adjustments |
| CO3 | Classify errors and making rectification entries |
| CO4 | Pass depreciation entries and prepare depreciation accounts |
| CO5 | Prepare single and double entry system of accounting. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | | 3 | 2 | | | |
| CO2 | | | 3 | 3 | | | |
| CO3 | | | 3 | 3 | | | |
| CO4 | | | 2 | 3 | | | |
| CO5 | | | 2 | 3 | | | |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | | | 2 | 2 | |
| CO2 | 3 | | | 3 | 3 | |
| CO3 | 3 | | | 2 | 2 | |
| CO4 | 3 | | | | 2 | |
| CO5 | 3 | | | | 2 | |

Correlation levels: 1- Weak 2-Medium 3-High

| SI NO | CONTENTS OF MODULE/UNITS | Hrs | Cos |
|-------|--|-----|-----|
| 1 | Meaning And Scope Of Accounting – Basic Accounting Concepts And Conventions – Objectives Of Accounting – Accounting Transactions – Double Entry Book Keeping – Journal, Ledger, Preparation Of Trial Balance – Preparation Of Cash Book. | 18 | CO1 |
| 2 | Preparation Of Final Accounts Of A Sole Trading Concern – Adjustments – Closing Stock, Outstanding And Prepaid Items - Depreciation, Provision For Bad Debts, Provision For Discount On Debtors – Interest On Capital And Drawings | 18 | CO2 |
| 3 | Classification of Errors – Rectification of Errors – Preparation of Suspense Account. Bank Reconciliation Statement | 12 | CO3 |
| 4 | Depreciation – Meaning, Causes, Types – Straight Line Method – Written Down Value Method (Change In Method Excluded) | 10 | CO4 |
| 5 | Single Entry System – Meaning, Features, Defects. Difference between Single Entry and Double Entry System – Statement of Affairs Method – Conversion Method (Only Simple Problems) | 14 | CO5 |

PRINCIPLES OF MANAGEMENT

| | |
|----------------------------|-------------------------------|
| Course Code : 03102 | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA/ESE Marks : 40 /60 |
| Exam Hours : 03 | Teaching hours: 90 |

Learning Objectives:

1. To impart knowledge about basic functions of management – planning, organizing, leading and controlling.
2. To provide understanding about historical evolution of management theories.
3. To provide an overview of Strategic management concepts & decision making.

Unit I:

Management: Importance – Definition – Nature and Scope Of Management Process – Role And Functions Of A Manager – Levels Of Management – Development of Scientific Management And Other Schools Of Thought And Approaches. (18 Hours)

Unit II:

Planning: Nature – Importance – Forms – Types – Steps in Planning – Objectives – Policies – Procedures and Methods – Natures and Types of Policies – Decision – Making Process of Decision – Making – Types of Decision. (18 Hours)

Unit III:

Organizing: Types of Organizations' – Organization Structure – Span Of Control and Committees – Departmentalization – Informal Organization. (18 Hours)

Unit IV:

Authority – Delegation – Decentralization – Difference between Authority and Power – Responsibility – Direction – Nature and Purpose. Co-Ordination – Need, Type and Techniques and Requisites for Excellent Co-Ordination – Controlling – Meaning and Importance – Control Process. (22 Hours)

Unit V:

Strategic Management – Introduction – Roles and Importance – Process – Strategic Decision-Making in Current Scenario (14 Hours).

RECOMMENDED TEXT BOOKS:

1. P.C. Tripathi & P.N Reddy; Principles of Management, Sultan Chand & Sons, 6th Edition, 2017.
2. L.M.Prasad; Principles & Practice of Management, Sultan Chand & Sons, 8th Edition.
3. Stephen P. Robbins & Mary Coulter; Management, Pearson Education, 13th Edition, 2017

REFERENCE BOOKS:

1. Dr.C.B.Gupta; Principles of Management, Sultan Chand & Sons, 3rd Edition.
2. J.Jayashankar; Business Management, Margham Publication, 2019.
3. Harold Koontz, Hienz Weihrich, A Ramachandra Aryasri; Principles of Management, McGraw Hill, 2nd edition, 2015
4. Azhar Kazmi; Strategic Management, McGraw Hill, 5th Edition, 2020.

ONLINE REFERENCES:

1. <https://courses.lumenlearning.com/principlesmanagement/>
2. <http://www.maciejczak.pl/download/pmgt-w2.pdf>
3. <https://rlshumancare.com/modern-management-thoughts-recent-trends/>
4. <https://www.business.com/articles/popular-management-theories-decoded/>
5. <https://toggl.com/blog/?s=principles+of+management>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Describe nature, scope, role, levels, functions and approaches of management |
| CO2 | Apply planning and decision making in management |
| CO3 | Identify types of organization and its structure |
| CO4 | Explain authority, delegation, co-ordination and control mechanisms in organisation |
| CO5 | Understand strategic management concepts |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | 2 | 2 | 2 | 1 | | |
| CO2 | 3 | 2 | 2 | 3 | | 2 | 2 |
| CO3 | 3 | 3 | 2 | 3 | | 3 | 3 |
| CO4 | | | 2 | 3 | | 2 | 2 |
| CO5 | 3 | | 2 | 1 | | | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 2 | | 3 | 2 | 3 |
| CO2 | 3 | 3 | | 2 | | |
| CO3 | 3 | | | 2 | 3 | |
| CO4 | | 3 | | | | 2 |
| CO5 | 3 | 2 | | | 2 | |

Correlation levels: 1- Weak 2-Medium 3-High

| Sl. No | CONTENTS OF MODULE/UNITS | Hrs | Cos |
|--------|--|-----|-----|
| 1 | Management: Importance – Definition – Nature and Scope of Management Process – Role and Functions Of A Manager – Levels of Management – Development of Scientific Management And Other Schools Of Thought And Approaches. | 18 | CO1 |
| 2 | Planning: Nature – Importance – Forms – Types – Steps in Planning – Objectives – Policies – Procedures and Methods – Natures and Types of Policies – Decision –Making Process of Decision – Making – Types of Decision. | 18 | CO2 |
| 3 | Organizing: Types of Organizations’ – Organization Structure – Span of Control and Committees – Departmentalization – Informal Organization | 18 | CO3 |
| 4 | Authority – Delegation – Decentralization – Difference Between Authority and Power – Responsibility. Direction – Nature and Purpose. Co-Ordination – Need, Type and Techniques and Requisites for Excellent Co-Ordination. Controlling – Meaning and Importance – Control Process. | 22 | CO4 |
| 5 | Strategic Management – Introduction – Roles and Importance – Process – Strategic Decision-Making in Current Scenario. | 14 | CO5 |

MANAGERIAL ECONOMICS

| | |
|----------------------------|------------------------------|
| Course Code : 03103 | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA/ESE Marks: 40 /60 |
| Exam Hours : 03 | Teaching hours: 90 |

Learning Objectives:

1. To familiarize students with concepts of economics and its relevant in business scenario.
2. To understand the applications & implications of economics in business aspects.

Unit I:

Nature and Scope of Managerial Economics – Definition of Economics – Important Concepts Of Economics – Relationship Between Micro And Macro And Managerial Economics – Objectives Of The Firm. (18 Hours)

Unit II:

Demand Analysis – Theory of Consumer Behavior – Marginal Utility Analysis – Indifference Curve Analysis. Meaning of Demand – Law of Demand – Types of Demand – Determinants Of Demand- Elasticity Of Demand – Demand Forecasting. (18 Hours)

Unit III:

Production And Cost Analysis – Concept of Law Of Variable Proportion – Law Of Return To Scale And Economies Of Scale – Cost Analysis; Different Cost Concepts – Cost Output Relationships, Short Run And Long Run – Revenue Curves Of Firms – Supply Analysis. (20 Hours)

Unit IV:

Pricing Methods And Strategies – Objectives – Factors – General Consideration Of Pricing – Methods Of Pricing – Dual Pricing – Price Discrimination. (18 Hours)

Unit V:

Market Classification – Perfect Competition – Monopoly – Monopolistic Competition – Duopoly – Oligopoly (16 Hours).

RECOMMENDED TEXT BOOKS:

1. Dr. S.Sankaran; Managerial Economics; Margham Publication, Chennai, 2019.
2. Thomas and Maurice; Managerial Economics: Foundations of Business Analysis and Strategy, McGraw Hill Education, 10 edition, 2017.

REFERENCE BOOKS:

1. D N Dwivedi; Managerial Economics: Vikas Publishing House, 8th edition, 2015.

2. H L Ahuja; Managerial Economics, S.Chand, 9th Edition,2017.
3. Dominick Salvatore ; Managerial Economics: Principles and Worldwide Applications, Oxford University Press, Eighth edition, 2016.

ONLINE REFERENCES:

1. <http://www.economicdiscussion.net/managerial-economics/notes-on-managerial-economics/19271>
2. http://home.cerge-ei.cz/pstankov/Teaching/UNVA/Econ_510_F09/Ch05.pdf
3. <https://www.toppr.com/guides/business-economics/determination-of-prices/intro-to-determination-of-prices/>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Analyse & apply the various economic concepts in individual & business decisions |
| CO2 | Explain demand concepts, underlying theories and identify demand forecasting techniques. |
| CO3 | Employ production, cost and supply analysis for business decision making |
| CO4 | Identify pricing strategies |
| CO5 | Classify market under competitive scenarios. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | 2 | 3 | 1 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 | | 2 | 2 |
| CO3 | 2 | 2 | 2 | 3 | | 2 | 2 |
| CO4 | | 2 | 3 | | | 3 | 2 |
| CO5 | | | 2 | 1 | | | 1 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | | | 3 | |
| CO2 | 2 | 2 | | | 2 | |
| CO3 | 2 | 3 | | | | |
| CO4 | 3 | 2 | | | 3 | |
| CO5 | 2 | | | | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

| Sl NO | CONTENTS OF MODULE/UNITS | Hrs | Cos |
|--------------|--|------------|-------------|
| 1 | Nature and scope of managerial economics - Definition of economics - Important concept of economics - Relationship between Micro, Macro and Managerial economics - Objectives of the firm. | 18 | CO1 CO2 |
| 2 | Demand analysis - Theory of consumer behaviour - Marginal Utility analysis - Indifference curve analysis - Meaning of Demand - Law of Demand - Types of Demand - Determinants of Demand - Elasticity of demand - Demand forecasting | 24 | CO2 CO3 |
| 3 | Production and cost analysis - Concept of Law of Variable Proportion - Law of return to scale and economics of scale - Cost Analysis - Different cost concepts - Cost Output relationship - Short run and Long Run - Revenue curves of firms - Supply Analysis | 32 | CO3, CO4 |
| 4 | Pricing Methods and Strategies Objectives - Factors - General Consideration of Pricing - Methods of Pricing - Dual Pricing - Price Discrimination | 18 | CO4, CO5 |
| 5 | Market Classification - Perfect Competition - Monopoly - Monopolistic competition - Duopoly – Oligopoly | 16 | CO5 CO6 |

CONSUMER BEHAVIOUR

| | |
|----------------------------|------------------------------|
| Course Code : 03104 | Credits : 02 |
| L:T:P:S : 2:0:0:0 | CIA/ESE Marks: 40 /60 |
| Exam Hours : 03 | Teaching hours: 36 |

Learning Objectives:

1. To study the various theoretical models and factors influencing consumer behaviour.
2. To know the implications of personality, motivation and attitude on consumer behaviour.

UNIT I: Meaning and nature of consumer behavior, factors affecting consumer behavior, models of consumer behavior - consumer involvement and decision making - types of involvement- model of consumer involvement (12 hours)

UNIT II: Personality and consumer behavior – nature and characteristics of personality-theories of personality- influence of personality on consumer behavior- consumer motivation-concepts-needs, goals and motives-themes in consumer motivation (12 hours)

UNIT-III: Attitude – characteristics – components – functions of attitude – factors influencing attitude – themes of attitude – factors influencing purchase decision of a consumer – culture, social class, reference group (12 hours).

RECOMMENDED TEXT BOOKS:

1. Dr. L Natarajan; Consumer Behavior, Margham Publication, 2019
2. Ms. Suja and R. Nair; Consumer Behavior, Himalaya Publishing house Pvt Ltd, 2009

REFERENCE BOOKS:

1. Michael R Solomon; Consumer Behaviour: Buying, Having and Being. Pearson Education, 2014
2. Leon G Schiffman, Joseph Wesen Blit, S. Ramesh Kumar; Consumer Behavior, Pearson Publication, 11th Edition, 2015

ONLINE REFERENCES:

1. http://cbsmohali.org/img/Journal_1-50-53.pdf
2. www.mintel.com/global-consumer-trends?gclid=EAIaIQobChMIrfCI5e_75wIV2Q0rCh36ZACdEAAYASAAEgL93vD_BwE
3. <https://www.intelligenenode.com/blog/category/consumer-behavior/>
4. <https://www.omniconvert.com/blog/>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Describe concepts underlying consumer behavior and relate consumer involvement & decision making. |
| CO2 | Identify & outline the significance of motivation & personality with consumer behavior |
| CO3 | Identify & outline the significance of Attitude, Culture with consumer behavior. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | 2 | 3 | 1 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 | | 2 | 2 |
| CO3 | 2 | 2 | 2 | 3 | | 2 | 2 |
| CO4 | | 2 | 3 | | | 3 | 2 |
| CO5 | | | 2 | 1 | | | 1 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | | | 3 | |
| CO2 | 2 | 2 | | | 2 | |
| CO3 | 2 | 3 | | | | |
| CO4 | 3 | 2 | | | 3 | |
| CO5 | 2 | | | | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

| Sl NO | CONTENTS OF MODULE/UNITS | Hrs | Cos |
|------------------|--|------------|---------------------|
| 1 | Meaning and nature of consumer behavior, factors affecting consumer behavior, models of consumer behavior - consumer involvement and decision making - types of involvement- model of consumer involvement | 12 | CO1, CO2 |
| 2 | Personality and consumer behavior – nature and characteristics of personality-theories of personality- influence of personality on consumer behavior- consumer motivation-concepts-needs, goals and motives-themes in consumer motivation (12 hours) | 12 | CO2, CO3 |
| 3 | Attitude – characteristics – components – functions of attitude – factors influencing attitude – themes of attitude – factors influencing purchase decision of a consumer – culture, social class, reference group | 12 | CO2, CO3 |

SEMESTER II

| Sl. | Course category | Course | Course | Overall Credits | Total Contact Hours/Week | Marks | | |
|--------------|-----------------|--------|-----------------------------------|-----------------|--------------------------|-------|-----|-------|
| | | | | | | CIA | ESE | Total |
| 1 | Foundation | | Language –II | 3 | 4 | 40 | 60 | 100 |
| 2 | Foundation | | English – II | 3 | 4 | 40 | 60 | 100 |
| 3 | Core III | 03205 | Accounting for managers -II | 4 | 6 | 40 | 60 | 100 |
| 4 | Core IV | 03207 | *Computer Application In Business | 4 | 6 | 40 | 60 | 100 |
| 5 | Allied I | 03206 | Corporate Communication | 4 | 6 | 40 | 60 | 100 |
| 6 | Non-major | 03208 | Personality Development | 2 | 2 | 40 | 60 | 100 |
| 7 | | | Soft skills | 2 | 2 | 40 | 60 | 100 |
| Total | | | | 22 | 30 | | | |

ACCOUNTING FOR MANAGERS –II

| | |
|---------------------------|------------------------------|
| Course Code : 3205 | Credits : 04 |
| L:T:P:S : 6 :0:0:0 | CIA/ESE Marks: 40 /60 |
| Exam Hours : 03 | Teaching hours: 90 |

Learning Objectives:

1. To provide basic understanding of cost concepts and classification.
2. To develop skills in tools & techniques and critically evaluate decision making in business.

Unit-I:

Cost Accounting - Nature And Scope- Cost Analysis – Concepts And Classification – Installation Of Costing System – Cost Sheet-Tender – Reconciliation Of Cost And Financial Accounts (Theory And Problems) (14 Hours)

Unit-II:

Management Accounting – Meaning, Nature, Scope and Functions, Need, Importance and Limitations – Management Accounting Vs Cost Accounting – Management Accounting Vs Financial Accounting (Theory Only), (12 Hours)

Unit-III:

Fund Flow and Cash Flow Analysis – Budgets And Budgetary Control – Meaning, Objectives, Merits And Demerits (Simple Problems) (24 Hours)

Unit-IV:

Marginal Costing (Excluding Decision Making) – Absorption Costing and CVP Analysis (Simple Problems)(20Hours)

Unit-V:

Ratio Analysis –Interpretation – Benefits and Limitations – Classification Of Ratios – Liquidity – Profitability – Turnover – Capital Structure (Simple Problems) (20 Hours)

RECOMMENDED TEXT BOOKS:

1. T. S. Reddy and Hari Prasad Reddy- Management Accounting, Margham Publication, 2016.
2. Antony Atkinson, Rebert S Kalpan, Advance Management Accounting, Pearson Publications,2015.

REFERENCE BOOKS:

1. Horngren Sunderu Stratton, Introduction to Management Accounting, Pearson Education,2013.
2. Rajiv Kumar Goel & Ishaan Goel, Concept Building Approach to Management Accounting ,2019.
3. Colin Drury, Management and Cost Accounting (with CourseMate and eBook Access), Cengage, 2015.

ONLINE REFERENCES:

1. <https://www.freebookcentre.net/business-books-download/Accounting-for-Managers-by-Vardhaman-Mahaveer-Open-University.html>
2. http://ebooks.lpude.in/commerce/mcom/term_1/DCOM302_DCOM403_MANAGEMENT_ACCOUNTING.pdf
3. <http://213.55.83.214:8181/Bussiness%20Ebook/mang%20end%20accounting/Advanced%20Management%20Accounting.pdf>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Interpret cost sheet & write comments |
| CO2 | Compare cost, management & financial accounting |
| CO3 | Calculate fund flow and cash flow statements |
| CO4 | Evaluate marginal costing and its components |
| CO5 | Analyse the various ratio and compare it with standards to assess deviations |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | | 3 | 2 | | | |
| CO2 | | | 3 | 2 | | | |
| CO3 | | | 3 | 2 | | | |
| CO4 | | | 3 | 3 | | | |
| CO5 | | | 3 | 3 | | | |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | | 2 | 3 | | |
| CO2 | 3 | | 2 | 2 | | |
| CO3 | 3 | | 3 | | | |
| CO4 | 3 | | 3 | 3 | | |
| CO5 | 3 | | 3 | 3 | | |

Correlation levels: 1- Weak 2-Medium 3-High

| Sl NO | CONTENTS OF MODULE/UNITS | Hrs | Cos |
|------------------|---|------------|------------|
| 1 | Cost Accounting - Nature And Scope- Cost Analysis – Concepts And Classification –Installation Of Costing System – Cost Sheet-Tender – Reconciliation Of Cost And Financial Accounts (Theory And Problems)(| 14 | CO1 |
| 2 | Management Accounting – Meaning, Nature, Scope and Functions, Need, Importance and Limitations – Management Accounting Vs Cost Accounting – Management Accounting Vs Financial Accounting (Theory Only), | 06 | CO2 |
| 3 | Fund Flow and Cash Flow Analysis – Budgets And Budgetary Control – Meaning, Objectives, Merits And Demerits (Simple Problems) | 24 | CO3 |
| 4 | Marginal Costing (Excluding Decision Making) – Absorption Costing and CVP Analysis (Simple Problems) | 14 | CO4 |
| 5 | Ratio Analysis –Interpretation – Benefits and Limitations – Classification Of Ratios – Liquidity – Profitability – Turnover – Capital Structure (Simple Problems) | 14 | CO5 |

COMPUTER APPLICATIONS IN BUSINESS

| | |
|----------------------------|------------------------------|
| Course Code : 03207 | Credits : 04 |
| L:T:P:S : 6 :0:0:0 | CIA/ESE Marks: 40 /60 |
| Exam Hours : 03 | Teaching hours: 90 |

Learning Objectives:

1. To build skills in Ms-Word, Ms-Excel, Ms-Power point, Tally and Google Forms for students with relevance in business scenario and its applications.

Unit-I: MS-Word

Introduction, Menus, Shortcuts, Document types, working with Documents-Opening, Saving, Closing, Editing Document, Using Toolbars, Rulers, Help, Formatting Documents-Setting font, paragraph, Page Style-Setting foot notes, page break, Line break, creating sections and frames, Inserting clip arts, pictures, Setting document styles, Creating Tables-Settings, borders, alignments, Merging, splitting, sorting rows and columns, Drawing-Inserting, drawing, formatting, grouping, ordering, rotating pictures, Tools-Word completion, Spell check, Macros, Mail merge, Tracking Changes, Security, Printing Documents .(20 HOURS)

Unit-II: MS-Excel

Introduction, Spread sheet application, Menus, Tool bars and icons, Spreadsheet-Opening, saving, closing, printing file, setting margins, Converting file to different formats, spread sheet addressing, Entering And Editing Data- Copy, cut, paste, undo, redo, find, search, replace, filling continuous rows and columns, inserting data cells, columns, rows and sheet, Computation Data-Setting formula, finding total in rows and columns, Functions Types- Mathematical, Group, string, date and time, Formatting Spread Sheet- Alignment, font, border, hiding, locking, cells, Highlighting values, background color, bordering and shading, Working With Sheet-Sorting, filtering, validation, consolidation, subtotals, Charts-Selecting, formatting, labeling, scaling, Tools- Error checking, spell check, formula auditing, tracking changes, customization (20 HOURS).

Unit-III: MS-Power Point

Introduction, Opening new presentation, Presentation templates, presentation layout, Creating Presentation- Setting presentation style, adding text, Formatting- Adding style, color, gradient fills, arranging objects, adding header and footer, slide background, slide layout, Slide Show, Adding Graphics-Inserting pictures, movies, tables, Adding Effects-Setting animation and transition effects, audio and video, Printing handouts. (15 HOURS)

Unit-IV: Introduction to Tally

Introduction to Tally - Features of tally, creation of company, Accounts only andAccounts with, Get way of Tally, Accounts confiscation, Groups and Ledgers, Voucher entry with Bill wise details Interest computation, order processing. Reports - Profit and Loss A/C, Balance Sheet (25 HOURS)

Unit -V: Google Forms

Use Google forms to develop & share questionnaire. (10HOURS)

RECOMMENDED TEXT BOOKS:

1. P.Rizwan Ahmed; Computer Application in Business, Margham Publications, 2019.
2. P.Rizwan Ahmed; Computer Application in Business & Management, Margham Publications, 2020.

REFERENCE BOOKS:

1. Bittu Kumar; Mastering Ms-Office, V&S Publishers, 2017.
2. Lisa A. Bucki, John Walkenbach, Faithe Wempen, & Michael Alexander; Microsoft Office 2013 BIBLE, Wiley, 2013.
3. S.S. Shrivatsava; Ms-Office, First Edition, Laxmi Publications, 2015.

ONLINE REFERENCES:

1. <https://www.microsoft.com/en-us/microsoft-365/blog/>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Demonstrate hands on experience with Ms-word for business activities |
| CO2 | Demonstrate hands on experience with Ms-Excel for business activities |
| CO3 | Demonstrate hands on experience with Ms-power point for business activities |
| CO4 | Demonstrate hands on experience with Tally for business activities |
| CO5 | Demonstrate hands on experience with Tally for reporting in business |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | 3 | 2 | | 3 |
| CO2 | 3 | 3 | 2 | 3 | 1 | 3 | 3 |
| CO3 | 3 | 3 | 1 | 3 | 3 | | 3 |
| CO4 | 2 | 3 | 2 | 3 | 1 | 2 | 3 |
| CO5 | 2 | 3 | 2 | 3 | 1 | 2 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 3 | 1 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 1 |
| CO3 | 2 | 2 | 1 | 3 | 3 | 2 |
| CO4 | 3 | | | 1 | 2 | |
| CO5 | 3 | | | | 2 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

| SI NO | CONTENTS OF MODULE/UNITS | Hrs | Cos |
|----------|--|-----|----------------------------------|
| 1 | Introduction, Menus, Shortcuts, Document types, working with Documents-Opening, Saving, Closing, Editing Document, Using Toolbars, Rulers, Help, Formatting Documents-Setting font, paragraph, Page Style-Setting foot notes, page break, Line break, creating sections and frames, Inserting clip arts, pictures, Setting document styles, Creating Tables-Settings, borders, alignments, Merging, splitting, sorting rows and columns, Drawing-Inserting, drawing, formatting, grouping, ordering, rotating pictures, Tools-Word completion, Spell check, Macros, Mail merge, Tracking Changes, Security, Printing Documents . | 20 | CO1, CO4, CO5, CO6 |
| 2 | Introduction, Spread sheet application, Menus, Tool bars and icons, Spreadsheet-Opening, saving, closing, printing file, setting margins, Converting file to different formats, spread sheet addressing, Entering And Editing Data- Copy, cut, paste, undo, redo, find, search, replace, filling continuous rows and columns, inserting data cells, columns, rows and sheet, Computation Data-Setting formula, finding total in rows and columns, Functions Types- Mathematical, Group, string, date and time, Formatting Spread Sheet- Alignment, font, border, hiding, locking, cells, Highlighting values, background color, bordering and shading, Working With Sheet-Sorting, filtering, validation, consolidation, subtotals, Charts-Selecting, formatting, labeling, scaling, Tools- Error checking, spell check, formula auditing, tracking changes, customization | 20 | CO1, CO3, CO4, CO5, C06 |
| 3 | Introduction, Opening new presentation, Presentation templates, presentation layout, Creating Presentation- Setting presentation style, adding text, Formatting- Adding style, color, gradient fills, arranging objects, adding header and footer, slide background, slide layout, Slide Show, Adding Graphics-Inserting pictures, movies, tables, Adding Effects-Setting animation and transition effects, audio and video, Printing handouts. | 15 | C01, CO2, CO5, CO5 |

| | | | |
|---|---|----|---|
| 4 | Introduction to Tally - Features of tally, creation of company, Accounts only and Accounts with, Get way of Tally, Accounts confiscation, Groups and Ledgers, Voucher entry with Bill wise details Interest computation, order processing. Reports - Profit and Loss A/C, Balance Sheet | 25 | CO1, CO2, CO3, CO4, CO5 |
| 5 | Use Google forms to develop & share questionnaire | 10 | CO1, CO2, CO3, CO4, CO5, CO6 |

CORPORATE COMMUNICATION

| | |
|----------------------------|------------------------------|
| Course Code : 03206 | Credits : 04 |
| L:T:P:S : 6 :0:0:0 | CIA/ESE Marks: 40 /60 |
| Exam Hours : 03 | Teaching hours: 90 |

Learning Objectives:

1. To educate students role & importance of communication skills.
2. To build their listening, reading, writing & speaking communication skills.
3. To gain a knowledge about corporate communication, corporate reputation and identity.

Unit -I:

INTRODUCTION TO MANAGERIAL COMMUNICATION

Meaning, importance, objectives – Principles of communication- Forms of communication – Communication process –Barriers to communication- Techniques of effective communication. (20 hours)

Unit – II:

INTERVIEW TECHNIQUES

Mastering the art of conducting interviews, placement interviews – Exit interviews, Group discussions- Meetings – Group discussions, video conferencing- Appointment. Developing oral communication skills, SQ3R reading technique. (20 hours)

Unit– III:

INTRODUCTION TO MANAGERIAL WRITING

Business letters: Enquiries, circulars, orders, acknowledgement, sales, circulars, complaints, correspondence with shareholders, Agenda – Minutes of meeting – Memorandum – Notes.

MODERN COMMUNICATION FOR MANAGERS

Facebook, Whats APP, LinkedIn, Twitter, Internet, E-mail, YouTube and their uses in business. E- communication etiquettes (20 hours)

Unit – IV:

CORPORATE COMMUNICATION

Introduction-Meaning –Types of corporate Communication-Importance of corporate communication.

Unit – V:

CORPORATE REPUTATIONS AND IDENTITY

Meaning - The value of good Reputation - Linking corporate communication to Reputation - Defining Corporate Identity - The Identity Mix – Employer Branding

RECOMMENDED TEXT BOOKS:

1. N.S. Raghunathan and B.Sumathi; Business Communication, Margham Publications, Reprint 2019.
2. Herta A Murthy, Herbert W.Hildebrand and Jana R. Thomas; Effective Business Communication, 7th Edition, Mc Graw Hill Education.
3. Cees B.M. Van Riel, Charles J .Fombrun ; Essentials of corporate communication ,Taylor and Francis Group,2007.
4. Sandra M. Oliver; Handbook of Corporate Communication and Public Relation; Routledge ,Taylor and Francis Group,2004.

REFERENCE BOOKS:

1. Hory Sankar Mukerjee; Business Communication: Connecting at Work; 2nd Edition, Oxford University Press, 2016.
2. Payal R. Mehra; Business Communication for Managers, 2nd Edition, Pearson Education India, 2016.
3. Raymond V. Lesikar; Business Communication (SIE): Connecting in a Digital World; 13th Edition, McGraw Hill Publication, 2017.
4. Urmilarai; Business Communication, Himalaya Publication, 2015.

ONLINE REFERENCES:

1. <http://www.edukart.com/blog/importance-of-effective-communication-in-an-organization/>
2. <https://www.educationobserver.com/forum/showthread.php?tid=14538>
3. <http://www.careerlauncher.com/banking/correspondence/>
4. <https://thebusinesscommunication.com/what-is-circular-letter-importance-or-advantages- of-circular-letter/>
5. <https://study.com/academy/lesson/internal-communication-in-an-organization-definition- strategies-examples.html>
6. <https://asue.am/upload/files/asue/Essentials-of-Corporate-Communication-PDFDrive.com-.pdf>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Understand communication process and its barriers |
| CO2 | Develop oral communication skills & conducting interviews |
| CO3 | Use managerial writing for business communication |
| CO4 | Aware about corporate communication and its importance |
| CO5 | Know about corporate reputation and identity |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | | | | | | 1 |
| CO2 | 3 | | | | | | |
| CO3 | 3 | | | | 3 | | |
| CO4 | 3 | | 1 | | | | |
| CO5 | 3 | | 2 | | | | |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 2 | | | | |
| CO2 | 3 | 2 | | | 2 | |
| CO3 | 2 | 2 | | | 2 | 3 |
| CO4 | 3 | 2 | | | | 2 |
| CO5 | 3 | | | 1 | 3 | |

Correlation levels: 1- Weak 2-Medium 3-High

| SI NO | CONTENTS OF MODULE/UNITS | Hrs | Cos |
|-------|--|-----|-----|
| 1 | <p>INTRODUCTION TO MANAGERIAL COMMUNICATION</p> <p>Meaning, importance, objectives – Principles of communication- Forms of communication – Communication process – Barriers to communication- Techniques of effective communication.</p> | 20 | CO1 |
| 2 | <p>INTERVIEW TECHNIQUES</p> <p>Mastering the art of conducting interviews, placement interviews – Exit interviews, Group discussions- Meetings – Group discussions, video conferencing- Appointment. Developing oral communication skills, SQ3R reading technique.</p> | 20 | CO2 |
| 3 | <p>INTRODUCTION TO MANAGERIAL WRITING</p> <p>Business letters: Enquiries, circulars, orders, acknowledgement, sales, circulars, complaints, correspondence with shareholders, Agenda – Minutes of meeting – Memorandum – Notes.</p> <p>MODERN COMMUNICATION FOR MANAGERS</p> <p>Facebook, Whats APP, LinkedIn, Twitter, Internet, E-mail, YouTube and their uses in business. E-communication etiquettes</p> | 20 | CO3 |
| 4 | <p>CORORATE COMMUNICATION</p> <p>Introduction-Meaning –Types of corporate Communication-Importance of corporate communication.</p> | 18 | CO4 |
| 5 | <p>CORPORATE REPUTATIONS AND IDENTITY</p> <p>Meaning-The value of good Reputation-Linking corporate communication to Reputation-Defining Corporate Identity-The Identity Mix - Employer Branding</p> | 12 | CO5 |

PERSONALITY DEVELOPMENT

| | |
|----------------------------|--------------------------------|
| Course Code : 03208 | Credits : 02 |
| L:T:P:S : 6 :0:0:0 | CIA /ESE Marks: 40 / 60 |
| Exam Hours : 03 | Teaching hours: 36 |

Learning Objective:

1. To groom students with proper behaviour, socially and professionally
2. To improve overall personality of the students.
3. To know techniques to overcome and manage stress levels experienced.

Unit I

Personality definition Elements of personality Determinants of personality SWOT analysis. (8 Hours)

Unit II:

Self Esteem, Advantages of high self-esteem, Characteristics of people with high and low self-esteem, Steps to building positive self-esteem.

Attitude- Factors that determine our attitude Benefits of a positive attitude-Consequences of a Negative attitude.

Motivation-The difference between inspiration and motivation (14 Hours)

Unit III:

Success- Defining success- Real or imagined obstacles to success- Qualities that make a person successful- Reasons for failure- Steps for building a positive personality- Body language - Projecting positive body language

Stress management -Causes of stress handling stress - Stress management techniques. (14 hours)

RECOMMENDED BOOKS

1. Wallace (Harold R) and masters Ann., Personality Development, south-western publishers, edition 2006.
2. Swami Srikantananda, Personality Development through Human Excellence, Adhyaksha Publications, Edition 2010.
3. Dr. K. Rao Prashant Jyoty, Handbook for Personality Development, BBA, DGVC.

REFERENCE BOOKS:

1. Elizabeth B. Hurlock, Personality Development, Tata McGraw-Hill, edition 2010
2. Mithrabarum. k. Personality Development and Soft Skills, Oxford University Press, edition 2012.
3. Swami Vivekananda, Personality Development, Ramakrishna mission institute, edition 2011.
4. Arnavanand, Personality Development, veekumar Publication Pvt Ltd, New Delhi 2012.
5. D.P.Sabharwal, Personality Development Handbook, Prakash Books, India pvt ltd, edition 2011.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=jD_hP080U00<https://www.artofliving.org/in-en/personality-development>
2. <https://books.google.co.in/books?id=qfXrwgEACAAJ&dq=7+Habits+Of+Highly+Effective+People&hl=en&sa=X&ved=0ahUKEwjUyKGmwPHIAhXBYo8KHSS-D1MQ6AEIKTAA>
3. <https://books.google.co.in/books?id=ZU04cwk7hIEC&printsec=frontcover&dq=stress+management&hl=en&sa=X&ved=0ahUKEwjElIODBwPHIAhUW5o8KHQcbBkEQ6AEIKTAA>

4. <https://books.google.co.in/books?id=RzP-VLndJgMC&pg=PT14&dq=RECRUITERS+EXPECTATIONS&hl=en&sa=X&ved=0ahUKEwjJjOzWwPHIAhXBso8KHX-mAgUQ6AEIPjAD>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Explore the elements of Personality and SWOT |
| CO2 | Understand Self Esteem, Attitude and Motivation |
| CO3 | Achieve success and manage stress |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | | 3 | | | | |
| CO2 | 3 | | | | | | |
| CO3 | 2 | | 3 | 3 | | | |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | | | | |
| CO2 | 3 | 2 | | | | |
| CO3 | 3 | 3 | | 3 | | |

Correlation levels: 1- Weak 2-Medium 3-High

| SI NO | CONTENTS OF MODULE/UNITS | Hrs | Cos |
|----------|--|-----|------|
| 1 | Unit I: Personality definition Elements of personality Determinants of personality SWOT analysis. (8 Hours) | 8 | CO 1 |
| 2 | Unit II: Self Esteem, Advantages of high self-esteem, Characteristics of people with high and low self-esteem, Steps to building positive self esteem Attitude- Factors that determine our attitude Benefits of a positive attitude-Consequences of a Negative attitude. Motivation-The difference between inspiration and motivation (14 Hours) | 14 | CO 2 |
| 3 | Unit III: Success- Defining success- Real or imagined obstacles to success- Qualities that make a person successful- Reasons for failure- Steps for building a positive personality- Body language, - Projecting positive body language Stress management -Causes of stress Handling stress - Stress management techniques. (14 hours) | 14 | CO 3 |

SEMESTER III

| Subject Category | Sem | Subject Name | Hours per week | Credits | Marks | | |
|------------------|-----|---------------------------|----------------|---------|----------|----------|-------|
| | | | | | Internal | External | Total |
| Core V | III | Financial Management | 6 | 4 | 40 | 60 | 100 |
| Core VI | III | Marketing Management | 6 | 4 | 40 | 60 | 100 |
| Core VII | III | Human Resource Management | 5 | 4 | 40 | 60 | 100 |
| Allied I | III | Business Mathematics | 5 | 4 | 40 | 60 | 100 |
| Allied II | III | Production Management | 5 | 4 | 40 | 60 | 100 |
| | III | Soft Skill | 2 | 2 | | | 100 |
| | III | Environmental Studies | 1 | | | | |

FINANCIAL MANAGEMENT

| | |
|----------------------------------|-------------------------|
| CORE V | Sub Code : 03309 |
| Teaching Hours : 90 Hours | Credit : 04 |

Learning Objectives:

1. To appreciate basic finance concepts.
2. To acquaint the students financial management tools & techniques.
3. To critically evaluate financial viability of investments.

Unit-I

Meaning-Objective and Importance of Finance-Sources of Finance-Function of Financial Management- Role of Financial Manager in Financial Management. (8 Hours)

Unit-II

Capital Structures Planning-Factors Affecting Capital Structure-Determining Debt and Equity Proportion-Theories of Capital Structure-Leverage Concept. (24 Hours)

Unit-III

Cost of Capital-Cost of Equity-Cost of Preference Capital-Cost of Debt-Cost of Retained Earnings-Weighted Average or Composite Cost of Capital (Wacc). (26 Hours)

Unit-IV

Capital Budgeting – Pay back method, Net present Value, Internal rate of return, Profitability index, Accounting rate of return. (16 Hours)

Unit-V

Working Capital- Components of Working Capital-Working Capital Operating Cycle-Factors Influencing Working Capital-Determining or Forecasting Of Working Capital Requirements. (16 Hours)

RECOMMENDED TEXT BOOKS:

1. S.N. Maheswari; Financial Management, Sultan Chand and Sons, 2019.
2. James C Van Horne & Sanjay Dhamjia; Financial Management and Policy, Pearson Publications, 13th Edition, 2019.

REFERENCE BOOKS:

1. I.M. Pandey; Financial Management, Vikas Publishing House, 2015.
2. Prasanna Chandra; Financial Management, TATA McGraw Hill Publications, 2019.
3. Sheridan Titman, Arthur J Keown & John D Martin; Financial Management (Principles and Applications) Pearson Publications, 2019.

ONLINE REFERENCES:

1. http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/financial_management_%5Bwww.accfile.com%5D.pdf
2. <https://freebookcentre.net/business-books-download/Financial-Management.html>
3. http://14.139.242.244/extra/library/library/_13022020100037FinancialManagement.pdf

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Understand the importance of finance and its source to operate the business |
| CO2 | Analysis the structure of capital and determine the debt and equity portion in business |
| CO3 | Know the cost incurred to the company to raise capital through long term sources |
| CO4 | Analyse ARR, IRR, NPV and PI |
| CO5 | Understand the concept of working capital and its importance in administration of finance in business. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | | | | 3 | 2 | 1 |
| CO2 | | | 2 | 3 | | | |
| CO3 | | | | 3 | 3 | | |
| CO4 | | | 2 | 3 | 2 | | |
| CO5 | | | 2 | 2 | 3 | | |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 2 | 1 | | | 3 | 1 |
| CO2 | 2 | 1 | | | 3 | 2 |
| CO3 | 1 | | | | 3 | 3 |
| CO4 | 1 | | | 3 | 1 | 1 |
| CO5 | 2 | | | 3 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

MARKETING MANAGEMENT

| | |
|----------------------------------|-------------------------|
| CORE VI | Sub Code : 03310 |
| Teaching Hours : 90 Hours | Credit : 04 |

Learning Objectives:

1. To impart knowledge about the fundamental concepts of marketing.
2. To provide insight into marketing implications on business.
3. To educate and provide exposure of new marketing initiatives.

Unit I

Fundamentals of Marketing – Role of Marketing – Relationship of Marketing With Other Functional Areas- Concept of Marketing Mix – Marketing Approaches – Various Environmental Factors Affecting the Marketing Functions. (12 Hours)

Unit II

Product – Characteristics – Benefits – Classifications – Consumer Goods – Industrial Goods. New Product Development Process - Product Life Cycle. Branding – Packaging. Pricing – Factors Influencing Pricing Decisions – Pricing Objectives. (20 Hours)

Unit III

Physical Distribution: Importance – Various Kinds of Marketing Channels – Distribution Problems.

A Brief Overview of: Advertising – Publicity –Public Relation – Personal Selling – Direct Selling and Sales Promotion - Buyer Behavior –Buying Motives – Factors Influencing Buyer Behaviour. (20 Hours)

Unit IV

Market Segmentation – Need And Basis of Segmentation - -Targeting – Positioning - Sales Forecasting – Various Methods of Sales Forecasting - Sales Management: Motivation, Compensation and Control of Salesmen
CRM – Importance – A tool to customer loyalty. (25 Hours)

Unit V

Digital Marketing : Introduction, Types (Search Engine Marketing, Social Media Marketing, Content Marketing, Email Marketing, Mobile Marketing) – Applications & Benefits. (13 Hours)

RECOMMENDED TEXT BOOKS :

1. J.JayaSankar; Marketing, Margham Publication, 2019.
2. Philip Kotler, Kevin Lane Keller, Abraham Koshy, MithileshwarJha; Marketing Management: A South Asian perspective, Pearson Prentice Hall, 14th edition.

REFERENCE BOOKS:

1. L.Natarajan; Marketing, Margham Publication, 2019
2. Philip Kotler, Gary Armstrong, Prafulla Agnihotri; Principles of Marketing, 17th edition.
3. Puneet Singh Bhatia; Fundamentals of Digital Marketing, Pearson Publications, 2017.
4. Rajan Saxena; “Marketing Management”, Tata McGraw Hill Publications, 2016.

ONLINE REFERENCES:

1. <https://study.com/academy/lesson/what-is-consumer-behavior-in-marketing-factors-model-definition.html>
2. <https://www.mbaskool.com/business-concepts/marketing-and-strategy-terms/10538-consumer-research.html>
3. <https://www.academia.edu/32346771/MARKETING-MANAGEMENT-NOTES.pdf>
4. https://www.researchgate.net/publication/225084026_Marketing_Management
5. <https://www.contentgarden.org/digital-marketing-fundamentals/>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Understand the fundamental concepts of marketing and apply 4P's of marketing |
| CO2 | Apply and demonstrate the 4P's of marketing. |
| CO3 | Apply and demonstrate STP in marketing. |
| CO4 | Outline the concepts of buyer behavior, sales management techniques and sales forecasting method |
| CO5 | Identify the recent trends of digital marketing. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | | | | | 3 |
| CO2 | 3 | 2 | 3 | 3 | | 2 | 2 |
| CO3 | 3 | | 3 | 3 | 3 | 3 | 3 |
| CO4 | | 2 | | | 2 | | 2 |
| CO5 | | 3 | | 2 | 3 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | | | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | | | 2 | |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

HUMAN RESOURCE MANAGEMENT

| | |
|----------------------------------|-------------------------|
| CORE VII | Sub Code : 03312 |
| Teaching Hours : 90 Hours | Credit : 04 |

Learning Objectives:

1. To understand concepts & importance of human resource management.
2. To equip students on various function of human resource management.
3. To keep students abreast for Human resources practices.

Unit I:

Nature and Scope of Human Resource Management – Difference Between Personnel Management and HRM – Environment of HRM - Human Resource Planning - Recruitment – Selection – Methods of Selection – Uses Of Various Tests – Interview Techniques in Selection and Placement.(25 Hours)

Unit II:

Induction – Training - Methods - Techniques – Identification of the Training Needs -Training and Development – Performance Appraisal – Transfer – Promotion And Termination of Services – Career Development. (20 Hours)

Unit III:

Remuneration – Components of Remuneration – Incentive – Benefits – Motivation -Welfare and Social Security Measures. (10 Hours)

Unit IV:

Labour Relation – Functions of Trade Unions – Forms of Collective Bargaining – -Workers Participation in Management – Types and Effectiveness – Industrial Disputes and Settlement (Laws Excluded) (25 Hours)

Unit V:

Human Resource Audit – Benefits- Scopes – Approaches. E-HRM, Recent trends in HRM. (10 Hours)

RECOMMENDED TEXT BOOKS :

1. Aswathappa; Human Resource Management, MccGraw hill Publishers,2017.
2. Gary Desler; Human Resource Management, Prentice Hall, 12th edition.

REFERENCE BOOKS:

1. J Jayashankar; Human Resource Management, Margham Publications, 2018
2. S P Rao; Human Resource Management, Scholar Tech Press, 2011
3. Wende L frenchhughton; Human Resource Management, Mifflin company Publishers, 4th edition.

ONLINE REFERENCES:

1. https://www.researchgate.net/publication/305954894_Human_Resource_Management_Theory_and_Practice
2. <https://www.freebookcentre.net/business-books-download/Introduction-to-Human-Resource-Management.html>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Understand basic concepts and importance of human resource management |
| CO2 | Provide insights on HR planning, recruitment, selection procedures in organization |
| CO3 | Identify remuneration and its components |
| CO4 | Understand role of trade union and dispute solving mechanisms |
| CO5 | Describe HR Audit, E-HRM and identify other recent trends in HRM. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 2 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 2 | 3 | 3 |
| CO5 | 3 | 2 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

BUSINESS MATHEMATICS

| | |
|----------------------------------|-------------------------|
| ALLIED I | Sub Code : 08321 |
| Teaching Hours : 72 Hours | Credit : 04 |

Learning Objectives:

To understand quantitative methods and its applications in business arena.

Unit –I

Progressions: arithmetic progression – nth term of an AP, sum to n terms of an AP, Geometric progression – nth term of a GP, sum to n terms of a GP (10Hours)

Unit-II

Plane Analytic Geometry: Straight line- length of a line segment – section formula-gradeint or slope of a line, various forms of equation of straight line (15 Hours)

Unit –III

Differential Calculus: Differentiation(involving polynomial function only) – product rule, quotient rule, Applications – Average cost, Marginal Cost, Marginal Revenue, Elasticity, Maxima and Minima, Point of Inflexion (15 Hours)

Unit-IV

Matrices: Types of Matrices, Addition, Subtraction and Multiplication of two matrices, transpose, matrix inversion and solution to system of linear equations(18 Hours)

Unit V

Mathematics for Finance – Simple and Compound Interest – Annuities – amount of an annuity, free hold estate and lease hold estate, sinking fund, Amortization, Discount (14 Hours)

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Restate concept of Arithmetic progression; Solve the problems in A.P; Demonstrate the term geometric progression and solve its problems. |
| CO2 | Define the term Analytic geometry; Solve the problems in straight lines; Differentiate various forms of lines; |
| CO3 | Define the term differential calculus; Define the term Average cost, marginal cost & revenue; Solve the problems in maxima and minima. |
| CO4 | Restate the concept of metrics; Define algebra of matrices; Solve the matrix problem by using matrix inversion method. |
| CO5 | Judge and classify simple and compound interests; Define the term annuity; Differentiate S.I, C.I and Annuity. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO5 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO2 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO3 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO4 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO5 | 1 | 2 | 1 | 3 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

PRODUCTION MANAGEMENT

| | |
|----------------------------------|-------------------------|
| ALLIED II | Sub Code : 03311 |
| Teaching Hours : 72 Hours | Credit : 04 |

Learning Objectives:

1. To provide comprehensive outlook on basic concepts, theories and practices of production.
2. To know the quality concepts & and quality control measures in area of production.

Unit- I

Production System - Introduction -Production And Productivity - Production Management - Objectives - Functions - Scope- Relationship With Other Functional Areas. (12 Hours)

Unit-II

Production Planning and Control - Routing and Scheduling - Dispatching - Maintenance Management -Types of Maintenance - Breakdown - Preventive - Routine - Maintenance Scheduling. (18 Hours)

Unit-III

Plant Location - Introduction - Need For Selecting A Suitable Location - Plant Location Problems - Advantages of Urban-Rural And Semi Urban Locations - Factors Influencing Plant Locations - Plant Layout - Problems - Objectives -Principles - Factors And Types of Layout. (16 Hours)

Unit-IV

Work And Method Study - Importance of Work Study - Procedures - Time Study - Human Considerations in Work Study - Introduction to Method Study - Objectives of Method Study - Steps Involved in Method Study. (16 Hours)

Unit -V

Quality Control -Types of Inspection - Centralized and Decentralized - Business Process Reengineering - TQM. (10 Hours)

RECOMMENDED TEXT BOOKS:

1. P.Saravanavel and S.Sumathi; Production and Materials Management, Margham Publications, 2015
2. N.G. Nair; Production Management, JBA Publishers, Edition 2004

REFERENCE BOOKS:

1. K.ShridharaBhat; Production and Materials Management, Himalaya publishing house, 2012.
2. P. Ramamurthy; Production and Operations Management, JBA publishers, 2nd edition 2013.
3. R.B.Khana; Production and Operations Management, Prentice hall publications, 2007.
4. S.N.Chari; Production and Materials Management, Tata McGraw Hill, 2004.
5. Shubhada.S.Ghorpade; Production and materials management, Vision Publications, 2010

ONLINE REFERENCES:

1. <https://ifwe.3ds.com/sites/default/files/2017-12/nr-ebook-production-management.pdf>
2. https://www.barnesandnoble.com/b/free-ebooks/nook-books/management-leadership/production-operations-management/_/N-ry0Z8qaZto1
3. https://www.academia.edu/23992923/Production_and_Operations_Management_2nd_Edition_by_S._Anil_Kumar_and_N._Suresh
4. https://thefactfactor.com/facts/management/production_operations/production-management/578/

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Provide comprehensive outlook on basic concepts, theories and practices of production |
| CO2 | Describe route chart, maintenance schedule for production. |
| CO3 | Identify right plant location and plant layout of factory |
| CO4 | Know work study & method study, its procedure |
| CO5 | Identify quality control techniques in production |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 3 | 3 | 3 | 2 | 1 | 2 |
| CO2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 2 | 3 | 3 | 3 | 3 | 2 | 2 |
| CO5 | 2 | 3 | 3 | 3 | 2 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 1 | 2 | 2 | 3 | 3 |
| CO2 | 3 | 1 | 2 | 2 | 3 | 3 |
| CO3 | 3 | 1 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 1 | 2 | 2 | 3 | 3 |
| CO5 | 3 | 1 | 2 | 2 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

SEMESTER IV

| Subject Category | Sem | Subject Name | Hours per week | Credits | Marks | | |
|-------------------------|-----|--|----------------|---------|----------|----------|-------|
| | | | | | Internal | External | Total |
| Core VIII | IV | Research Methodology | 5 | 5 | 40 | 60 | 100 |
| Core IX (Elective)** | IV | (A) Advertising management and sales promotion (B) Industrial Relation (C) Family Business Management I | 6 | 5 | 40 | 60 | 100 |
| Core X | IV | Operation Research | 5 | 5 | 40 | 60 | 100 |
| Allied I | IV | Business Statistics | 5 | 4 | 40 | 60 | 100 |
| Allied II | IV | International Trade | 6 | 4 | 40 | 60 | 100 |
| | IV | Soft Skill | 2 | 2 | | | |
| | IV | Environmental Studies | 1 | 2 | 40 | 60 | 100 |

RESEARCH METHODOLOGY

| | |
|----------------------------------|-------------------------|
| CORE VIII | Sub Code : 03413 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objectives :

1. To acquire basic knowledge about research and its approaches.
2. To equip students in carrying out a research project
3. To familiarize the students to present their research findings.

Unit – I:

Nature and scope of social research, Aims, objectives, nature of theory and data, relevance to social research (15 hours)

Unit – II:

Stages of research, selection of problem, formulation of problem, theoretical problem, formulation of hypothesis, research design (15 hours)

Unit – III:

Data collection, technique, observation, schedule, questionnaire, interview methods, Social Survey, importance and scope of social survey, preparation of budgets, staff and its training (25 hours)

Unit -IV: Analysis of data, editing, processing, consolidation and tabulation, application of techniques, scaling techniques (15 hours)

Unit - V:

Research presentation, organization of research presentation, aims and objectives, effectiveness in the presentation of statistical data, rules for arrangement of text, diagrams, references .(20 hours)

RECOMMENDED TEXT BOOKS :

1. Kothari C R; Research Methodology and Techniques, New Age International Pvt Ltd, 2016
2. Ravi Lochanan; Research Methodology, Margham Publications ,2019

REFERENCE BOOKS:

1. John W Creswell ;Craft of Research , University of Chicago Press, 4th edition
2. Gregory and Joseph M Williams; Research Design Qualitative and Quantitative and Mixed method approach , Sage Publications, 5th Edition

ONLINE REFERENCES:

1. https://www.researchgate.net/publication/303381524_Fundamentals_of_research_methodology_and_data_collection
2. https://www.academia.edu/35386086/BOOK_REVIEW_FUNDAMENTALS_OF_RESEARCH_METHODODOLOGY_AND_STATISTICS

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Identify and select social research methods |
| CO2 | Outline stage of research and research design |
| CO3 | Apply appropriate data collection and compile data for analysis |
| CO4 | Outline data analysis techniques |
| CO5 | Prepare and present research findings in standard format |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | 1 | 1 | 3 | 3 | 2 |
| CO2 | 1 | 2 | 3 | 2 | 3 | 3 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 |
| CO4 | 1 | 1 | 1 | 1 | 3 | 3 | 2 |
| CO5 | 2 | 2 | 2 | 3 | 3 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 2 | 2 | 3 | 3 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 1 | 2 | 3 | 2 | 2 | 2 |
| CO4 | 1 | 2 | 3 | 3 | 2 | 2 |
| CO5 | 2 | 2 | 2 | 1 | 2 | 1 |

Correlation levels: 1- Weak 2-Medium 3-High

ADVERTISING MANAGEMENT AND SALES PROMOTION

| | |
|----------------------------------|-------------------------|
| CORE IX (Elective) | Sub Code : 03414 |
| Teaching Hours : 90 Hours | Credit : 04 |

Learning Objectives:

1. To provide basic knowledge about advertising & sales promotions.
2. To develop skills for developing and implementation of advertising and sales promotion activities.
3. To evaluate and analyse the legal, social, ethical implications.
4. To provide exposure to the recent trends in advertisement and sales promotion.

Unit I

Concept and definition of advertisement – evolution – types of advertising – advertising process – social, economic, and legal implications of advertisement.(16 hours)

Unit II

Advertisement Copy –Features – Classification –Copy writing – Steps involved in copy writing – Copy Elements – Layout – Purpose – Characteristics – Essentials of good layout – Functions of the layout – Steps involved in preparation of layout – Principles of effective design & layout. Advertising themes & appeals. (18 hours)

Unit III

Advertising media- Types of Media- Print Media (Newspaper & Magazines, Pamphlets, Posters & Brochures) - Other Media (Direct Mail, Outdoor Media) – Electronic Media (T.V. & Radio), Internet Media –Word of Mouth advertising - Characteristics -Media Planning. (20 hours).

Unit – IV

Advertising Agency : Meaning – Need/Importance, Types, Structure, Functions, Compensation, Selection & Evaluation of advertising agency.
Advertising Budget :Meaning, Methods of determining advertising budget.
Advertising Effectiveness: Need, Objectives, and Measuring advertising effectiveness - Pre-testing & Post-testing techniques (18 hours)

Unit – V

Sales promotion: Definition, Objective, Benefits (Manufacturers, Middlemen, Consumers), Tools of sales promotion schemes - trade oriented and consumer oriented - steps in planning and Implementation of sales promotion (18 hours).

RECOMMENDED TEXT BOOKS:

1. S.A. Chunawalla; Advertising & Sales Promotion Management, Sixth Edition, Himalaya Publications, 2016.
2. P. Saravanavel & S. Sumathi; Advertising & Sales Promotion, Margham Publications, 2017.

REFERENCE TEXT BOOKS:

1. Jaishri Jethwaney & Shruthi Jain, Advertising Management, 2nd Edition, Oxford University Press, 2012.
2. Ruchi Gupta; Advertising Principles & Practices, 1st Edition, SChand Publications, 2012.

3. Rajeev Batra, John G. Myers, David A. Aaker; Advertising Management, Fifth Edition, Pearson Publications.
4. M. N. Mishra; Sales Promotion & Advertising Management, 2nd Edition, Himalaya Publications.
5. S H H Kazmi & Satish K Batra; Advertising & Sales Promotion, 3rd Edition, Excel Books, 2008.
6. Prof. Ritwik Haldar; Advertising & Sales Promotion Management, 1st Edition, Himalaya Publishing House Pvt. Ltd., 2011.
7. William D. Wells, John Burnett, Sandra Moriarty; Advertising Principles & Practice, 7th Edition, Principles & Practice

ONLINE REFERENCES:

1. <https://adage.com/>
2. <https://www.ama.org/#>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Discuss advertising concepts & its implications |
| CO2 | Demonstrate concepts & terminology in developing advertising copy |
| CO3 | Analyse & select different types of advertising media |
| CO4 | Explain & evaluate advertising agency, budget and its effectiveness |
| CO5 | Identify and classify sales promotion techniques – its implementation |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | 3 | 2 | 2 | 2 | 1 |
| CO2 | 3 | 3 | 1 | 3 | 3 | 1 | 3 |
| CO3 | 1 | 3 | 3 | 3 | 3 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 3 | 2 | 2 | 1 |
| CO5 | 3 | 2 | 2 | 2 | 1 | 3 | 1 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | 1 | 1 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 1 | 1 | 3 | 3 |
| CO4 | 3 | 3 | 1 | 1 | 3 | 2 |
| CO5 | 3 | 3 | 1 | 1 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

INDUSTRIAL RELATIONS

| | |
|----------------------------------|-------------------------|
| CORE IX (Elective) | Sub Code : 03415 |
| Teaching Hours : 90 Hours | Credit : 04 |

Learning Objectives:

1. To educate about the Industrial legislations in India.
2. To provide knowledge about maintaining harmonious relations in India and to resolve disputes, handling grievances etc.,
3. To know about growth and implications of trade union.

Unit I:

Industrial Relation: Meaning – Role – Importance – Changing Concepts of Industrial Relations. Overview of labour legislation (Industrial disputes Act, ESI Act & PF Act). (10 hours)

Unit 2:

Industrial Harmony And Conflict – Harmonious Relations In Industry – Importance – Causes of Disputes – Strikes – Lockouts, Lay Outs, Setting of Disputes – Machinery – Negotiations Conciliations, Meditation, Arbitration And Adjudication.(25 hours)

Unit 3:

Employee Dissatisfaction – Grievances – Meaning – Types – Causes – Redressal. Factors Affecting Employees’ Stability.(15 hours)

Unit 4:

Labours Participation in Management – Structure, Scope, Collective Bargaining – Works Committee, Joint Management Council – Pre Requisites for Successful Participation – Role of Government In Collective Bargaining.(25 hours)

Unit 5:

Trade Unions – Growth – Economic, Social And Political Conditions For Trade Union – Objectives - Structures And Functions – Social And Economic Responsibilities of Trade Union.(15hours)

RECOMMENDED TEXT BOOKS :

1. Pradeep Kumar; Personnel Management and Industrial Relations, Kedarnath Ramnath and Company, 2018
2. Tripathi; Personnel Management and Industrial Relations, Sultan Chand and Sons, 2018.

REFERENCE BOOKS:

1. Chris Hall; Trade Union and its state, Princeton University, 2017
2. Ian Beard well; Contemporary Industrial Relation, Oxford University Press, 1996
3. R C Sharma; Industrial relation and labour legislation, PHL learning Pvt ltd, 2016

ONLINE REFERENCES:

1. https://www.academia.edu/4277328/INDUSTRIAL_RELATIONS_AND_LABOUR_WELFARE
2. https://www.researchgate.net/publication/318673488_INDUSTRIAL_RELATIONS

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Understand the role and importance of ethics and values in business |
| CO2 | Analyze the types of ethical issues in business |
| CO3 | Identify and relate internal-external ethics to business environment |
| CO4 | Understand social audit and social responsibility of business towards society |
| CO5 | Familiarize the role of CEO in business |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | 2 | | 3 | 2 | | |
| CO2 | 2 | 3 | 3 | 2 | 3 | | |
| CO3 | | 3 | | 2 | 3 | 3 | 3 |
| CO4 | | 2 | | 3 | 3 | 2 | 2 |
| CO5 | | | | 3 | 2 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | | | | | 2 | |
| CO2 | 2 | 2 | | 3 | 2 | |
| CO3 | 2 | | | 3 | 2 | |
| CO4 | 3 | | | 2 | 3 | |
| CO5 | 2 | | | | 3 | |

Correlation levels: 1- Weak 2-Medium 3-High

FAMILY BUSINESS MANAGEMENT – I

| | |
|----------------------------------|----------------------|
| CORE IX (Elective) | Sub Code :034 |
| Teaching Hours : 90 Hours | Credit : 04 |

Learning Objectives :

1. To impart basic knowledge about family business management
2. To provide understanding of various Indian Trader Families.

Unit I : Introduction

Definition of Business - Family Business – Family Business Management. Origin & Evolution of family business in India. Role & Impact of family business to the Indian Economy. Pros & Cons of family business. Family Genograms.

Unit II : Family Business

Family Constitution – Structure/Components. Nature- Importance – Types - Uniqueness - Strengths & weakness - Challenges in family business.

Unit III : Family Communication & Participation

Family Meetings – Family Councils – Family Offices. Family Meetings as tool for Participation – Creating Environment.

Unit IV : Family Business Planning

Need – Benefits – Obstacles – Parallel Planning Process – Influence of life cycles on family business.

Unit V : Indian Trader Families

Qualities/Characteristics of Indian Family Business – Bohra, Kerala Christians Gujarathis, Khatri, Marwaris, , Parsis, Sindhis

RECOMMENDED TEXT BOOKS:

1. Mukesh Bhatia; Family Business Management, Regal Publications, New Delhi, 2015.

REFERENCE TEXT BOOKS:

1. Ernesto J. Poza, Mary S. Dagherty; Cengage Learning, 2013.
2. IFC Family Business Governance Handbook, 2008.
3. Randel S. Carlock & John L. Ward; Strategic Planning for the family business, Palgrave, 2001.
4. James C. Collins & Jerry J. Porras; Built to Last, William Collins, 1994.

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Discuss family business in Indian context |
| CO2 | Outline concepts of family business |
| CO3 | Explain tools for family communication and participation |
| CO4 | Outline family business planning and its influence on life cycle |
| CO5 | Identify and compile about Indian trader families |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 2 | 3 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO5 | 2 | 2 | 1 | 1 | 3 | 1 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 2 | 3 | 1 | 1 | 3 | 1 |
| CO2 | 3 | 3 | 1 | 2 | 3 | 1 |
| CO3 | 3 | 3 | 1 | 2 | 2 | 1 |
| CO4 | 2 | 3 | 1 | 1 | 3 | 1 |
| CO5 | 2 | 3 | 3 | 3 | 2 | 1 |

Correlation levels: 1- Weak 2-Medium 3-High

OPERATIONS RESEARCH

| | |
|----------------------------------|-------------------------|
| CORE X | Sub Code : 08426 |
| Teaching Hours : 72 Hours | Credit : 05 |

Learning Objectives :

1. To provide basic understanding of operations research and its significance in business.
2. To study and build models for complex decision making.

Unit I

Linear Programming problem -Concept and scope of OR, general mathematical model of LPP, steps of L.P model formulation, Graphical method of the solution of LPP- simple problems. (15 Hours)

Unit II

Transportation problem- Basic definitions, formulation of transportation problem as LPP, Finding an initial basic feasible solution- North -west corner rule, row minima method, column minima method, Least cost entry method-Vogel's approximation method to find the optimal solution. (12 Hours)

Unit III

Assignment problem-Hungarian method- Minimization and Maximization case, unbalanced assignment problem.

Sequencing Problem-Processing n jobs on 2 machines, processing n jobs on 3 machines, processing n jobs on m machines. (13 Hours)

Unit IV

Network models-PERT and CPM — difference between PERT and CPM- constructing network- critical path, various floats, three time estimates for PERT. (12 Hours)

Unit V

Game Theory- Maximin-Minmax criterion, Saddle point, Dominance property, Graphical method for solving $2 \times n$ and $m \times 2$ game. (20 Hours)

RECOMMENDED TEXT BOOKS :

1. P.K Gupta and Manmohan; Operations Research, S.Chand & company.
2. P.R. Vittal; Operations Research, Margham Publications.

REFERENCE BOOKS:

1. Dr.S.P.Rajagopalan; Business Statistics & Operations Research, Tata McGraw Hill.
2. Anand Sharma; Quantitative Techniques for Decision Making, Himalaya Publications

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Relate concept and scope of Operations Research; Demonstrate the steps of LPP model and graphical model; Differentiate LPP and graphical method. |
| CO2 | Define the term transportation problem. Solve the transportation problem by its various methods; Summarise the optimum solution. |
| CO3 | Define the term Assignment; Demonstrate the Hungarian method; Solve the problem on sequencing p |
| CO4 | Define the term Network – PERT and CPM; Differentiate PERT and CPM; Judge and classify constructing network. |
| CO5 | Define the term game theory; Demonstrate maxima and minima in game theory; Define the graphical method for solving $2 \times n$ and $m \times 2$. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO5 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO2 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO3 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO4 | 1 | 2 | 1 | 3 | 2 | 2 |
| CO5 | 1 | 2 | 1 | 3 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

BUSINESS STATISTICS

| | |
|----------------------------------|-------------------------|
| ALLIED I | Sub Code : 03416 |
| Teaching Hours : 72 Hours | Credit : 04 |

Learning Objectives:

1. To introduce statistics and its role in business.
2. To gain knowledge about statistical tools and its implications for business.

Unit I

Introduction – Meaning and Definition of Statistics – Collection and Tabulation of Statistical Data – Presentation of Statistical Data – Graphs and Diagrams. (15 Hours)

Unit II

Measures of Central Tendency – Arithmetic Mean, Median and Mode – Harmonic Mean and Geometric Mean. (15 Hours)

Unit III

Measures of Variation – Standard Deviation – Skewness – Lorenz Curve – Simple Correlation – Scatter Diagram – Karlpearsons Correlation – Rand Correlation – Regression. (20 Hours)

Unit IV

Analysis of Time Series – Methods Of Measuring Trend And Seasonal Variations - Index Numbers – Consumer Price Index – And Cost Of Living Indices. (12 Hours)

Unit V

Concept of Sampling-Types-Quota, Sampling-Cluster-Probability and Random Sampling-Sampling and Non Sampling Errors-Labour Statistics. (10 Hours)

RECOMMENDED TEXT BOOKS :

1. P.R.Vittal; Business Statistics, Margham Publications, 2017.
2. Gareth James, Danilla Witten; An Introduction to Statistical Learning, Seventh Edition, Springer,2017.

REFERENCE BOOKS:

1. S.P.Gupta; Statistical Methods, Sultan and Chands, New Delhi, 2019.
2. S.P.Gupta; Elements of Business Statistics, Sultan and Chands, New Delhi, 2019.
3. David R Anderson; Statistics for Business and Economics, 13th Edition, Cengage, 2019.

ONLINE REFERENCES:

1. <http://www.ddegjust.ac.in/studymaterial/mcom/mc-106.pdf>
2. <https://www.free-ebooks.net/business-textbooks/Basic-Business-Statistics>
3. <https://cnx.org/exports/733d1554-5d75-4798-9e54-7dc1ee5690%405.40.pdf/principles-of-business-statistics-5.40.pdf>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Define different types of data for decision making |
| CO2 | Analyse the measures of central tendency |
| CO3 | Describe the statistics to solve business problems |
| CO4 | Discuss various types of data to solve corporate problems |
| CO5 | Understand the different types of samples to study population |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | | 3 | 3 | | | |
| CO2 | | | 3 | 3 | | | |
| CO3 | | | 3 | 3 | 2 | | |
| CO4 | | 2 | 3 | 3 | | | |
| CO5 | | 2 | 3 | 3 | | | |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 1 | | | 3 | | |
| CO2 | | | | 3 | | |
| CO3 | | | | 3 | 2 | |
| CO4 | 2 | | | 3 | | |
| CO5 | | | | 3 | | |

Correlation levels: 1- Weak 2-Medium 3-High

INTERNATIONAL TRADE

| | |
|-----------------------------------|-------------------------|
| ALLIED II | Sub Code : 03417 |
| Teaching Hours : 108 Hours | Credit : 04 |

Learning Objectives:

1. To familiarize students on basics & theories of International Trade.
2. To impart knowledge about international financial institutions, structure and functions.
3. To provide awareness about recent trends in International Trade and its implications.

Unit I:

Features of International trade, Difference between Internal and International Trade- Importance of International Trade. (16 Hours)

Unit II:

Theories of Foreign Trade – Absolute, Comparative, Equal Cost Differences (Adam Smiths, Ricardo, Haberler, Hecksher- Ohlin Theories Only).(28 Hours)

Unit III:

Balance of Trade, Balance of Payment-Concepts, Causes of Disequilibrium-Methods to Correct Disequilibrium -Fixed and Floating Exchange Rates.(36 Hours)

Unit IV:

Institutional Environment : IMF, IBRD, WTO, ADB, UNCTAD. Trading blocks – ASEAN, SAFTA, SAARC, NAFTA, EU – Types & Importance. (20 Hours)

Unit V:

Globalization of Business, Levels of Globalization, Causes of Globalization, Issues and Concerns in Globalization.

MNC – Meaning, Characteristics, Benefits.

FDI – Meaning, Importance, Forms of International Investments. (20 Hours)

RECOMMENDED TEXT BOOKS :

1. Dr. S.Sankaran; International Trade, Margham publication, 2019.
2. Amrita Narlikar; International Trade and Developing Countries: Bargaining Coalitions in the GATT & WTO, Routledge, 2016.

REFERENCE BOOKS:

1. Francis Cherunilam; International Trade & Export Management, Himalaya Publications, 20th edition, 2017.
2. V.K. Bhalla, International Business, SCHAND publications, First edition, 2013.
3. Avinash Dexit; Theory of International Trade, Cambridge University Press, 2016.

ONLINE REFERENCES:

1. https://www.researchgate.net/publication/312212506_International_trade_theories_and_its_trends
2. <https://www.investopedia.com/terms/i/imf.asp>
3. <https://www.investopedia.com/insights/what-is-international-trade/>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Discuss the difference between internal and international trade and its significance |
| CO2 | Explain international trade theories |
| CO3 | Outline the balance of trade, balance of payment, exchange rate concepts |
| CO4 | Identify the relevance of international institutions and trading blocs. |
| CO5 | Understand globalization and its impact on Indian business scenario |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 2 | 2 | 3 | 2 | 3 |
| CO2 | 2 | 1 | 3 | 3 | 1 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 2 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 1 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

SEMESTER V

| Subject Category | Sem | Subject Name | Hours per week | Credits | Marks | | |
|-------------------------|-----|--|----------------|---------|----------|----------|-------|
| | | | | | Internal | External | Total |
| Core XI (Elective)** | V | (A)Services Marketing (B)Organization Psychology (C)Family Business Management II | 6 | 5 | 40 | 60 | 100 |
| Core XII | V | Business Taxation | 6 | 5 | 40 | 60 | 100 |
| Core XIII | V | Legal Aspects of Business | 6 | 5 | 40 | 60 | 100 |
| Allied I | V | Entrepreneurial Development | 6 | 5 | 40 | 60 | 100 |
| Allied II | V | Materials Management | 6 | 5 | 40 | 60 | 100 |

SERVICE MARKETING

| | |
|----------------------------------|-------------------------|
| CORE XI (Elective) | Sub Code : 03522 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objective :

1. To provide overview of service marketing, its evolution & growth.
2. To understand the marketing mix of services and its implications.
3. To design & implement effective management of service marketing and deliver quality service
4. To appreciate the service marketing strategies adopted in various sectors.

Unit I:

Marketing Services: Introduction Growth of the Service Sector.The Concept of Service. Characteristics of Service – Classification of Service – Designing Of the Service, Blueprinting Using Technology, Developing Human Resources, Building Service Aspiration (16 Hours)

Unit 2:

Marketing Mix in Service Marketing the Seven Ps: Product Decision, Pricing Strategies and Tactics, Promotion of Service and Distribution Methods for Services.
Additional Dimension in Services Marketing – People, Physical Evidence and Process. (12 Hours)

Unit 3:

Effective Management of Service Marketing: Marketing Demand And Supply Through Capacity Planning and Segmentation – Internal Marketing of Services – External Versus Internal Orientation of Service Strategy. (18 Hours)

Unit 4:

Delivering Quality Service: Causes of Service – Quality Gaps.The Customer Expectation versus Perceived Service Gap.Gaps in Services-Quality Standards, Factors and Solutions – Service Performance Gap.Customer Relationship Management. (25 Hours)

Unit 5:

Marketing Of Service With Special Reference To: 1. Financial Services, 2. Health Services, 3. Hospitality Services Including Travel, Hotels And Tourism, 4. Professional Service, 5. Public Utility Service, 6.Educational Services. (19 Hours)

RECOMMENDED TEXT BOOKS :

1. Dr.C.Natarajan; Service Marketing; Margham Publication, 2019.
2. Lovelock Chrisopher and Wirtz Jochen, “Services Marketing: People, Technology, Strategy”, Pearson Education, 7th edition 2011.

REFERENCE BOOKS:

1. Dr.R.Balaji; Service Marketing and Management, Sultan Chand & sons, 2016.
2. Dr. Shajahan S., “Services Marketing: Concepts, Practices and Cases from Indian Environment”, Himalaya Publishing House, 2nd edition 2014.
3. Zenithal (Valarei), Service Marketing, The Indian Perspective, McGraw Hill Publication, 2018.

ONLINE REFERENCES:

1. <http://www.yourarticlelibrary.com/services/4-main-components-of-a-service-explained-with-diagram/34016>
2. <https://www.interaction-design.org/literature/topics/service-design>
3. <https://www.marketing91.com/service-marketing-mix/>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Understand the concepts of service and growth of service sector. |
| CO2 | Apply the 7P's of service marketing. |
| CO3 | Understand service design and effective management of service marketing. |
| CO4 | Explain the service quality gaps. |
| CO5 | Demonstrate service marketing with specific sectors. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | | | | | 3 |
| CO2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| CO3 | 3 | | | | | | 3 |
| CO4 | | 2 | | | 3 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | | | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | | | 2 | |
| CO4 | 3 | 3 | | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

ORGANIZATION PSYCHOLOGY

| | |
|----------------------------------|-------------------------|
| CORE XI (Elective) | Sub Code : 03523 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objectives:

1. To familiarize students concepts of organizational behaviour and work environment.
2. To understand the motivating theories & strategies and their significance in productivity.
3. To understand group dynamics, organization culture & climate and implications in organization.

Unit I:

Need And Scope Of Organizational Behaviour-Theories of Organization-Individual Difference Vs Group Intelligence Tests- Measurement Of Intelligence – Personality Tests-Nature-Types – And Uses of Perception. (18 Hours)

Unit 2:

Motivation – Financial And Non-Financial Motivation Techniques- Job Satisfaction- Meaning – Factors-Theories-Measurement – Morale-Employee Attitudes And Behavior And Their Significance to Employee Productivity. (22 Hours)

Unit 3:

Work Environment- Good House Keeping Practices- Design of Workplace – Fatigue – Causes and Prevention and Their Importance – Leadership—Types And Theories of Leadership. (20 Hours)

Unit 4:

Group Dynamics – Cohesiveness- Co-Operation- -Competition –Conflict –Resolution – Sociometry – Group Norms – Role Position Status. (12 Hours)

Unit 5:

Organizational Culture And Climate – Organizational Effectiveness – Organizational Development – Counseling – And Guidance – Importance of Counselor – Types of Counseling – Information Needed for Counseling. (18 Hours)

RECOMMENDED TEXT BOOKS:

1. J.Jayashankar; Organization Psychology, Margham Publication, 2019.
2. L.M. Prasad; Organizational Behaviour, Sultan Chand & Sons, 2014.

REFERENCE TEXT BOOKS:

1. C D Balaji; Organisational Psychology, Margham Publications, 2017.
2. Laurie J.Mullins; Organization Psychology, Pearson Publication, 2013.
3. Adrzej, Huczynski, David B Uchanan; Organization Psychology, Pearson Publication, 8th Edition, 2013.

ONLINE REFERENCES:

1. https://www.researchgate.net/publication/330409514_UNIT_1_ORGANISATIONAL_BEHAVIOUR
2. <https://www.ebsglobal.net/EBS/media/EBS/PDFs/Organisational-Behaviour-Course-Taster.pdf>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Describe role of organization behavior |
| CO2 | Explain Motivation, its techniques and employee morale. |
| CO3 | Outline work environment and leadership theories |
| CO4 | Understand group dynamics |
| CO5 | Outline organization culture, climate and counseling |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | 3 | 2 | 3 | 3 | 3 |
| CO2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO4 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 | 2 | 2 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

FAMILY BUSINESS MANAGEMENT – II

| | |
|----------------------------------|-----------------------|
| CORE XI (Elective) | Sub Code : 035 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objective :

1. To provide comprehensive outlook on family business ownership, governance and succession.
2. To educate about family business as a career

Unit : I Ownership

Role, Structure, Board of Directors in family business- Advisory Board, Board of Directors, Independent Directors. Advantages & Disadvantage of family business going public. Role of Board in family business planning. Estate plans.

Unit II : Family Governance

Components – Stages of growth in family business – Evolution of ownership – Complexity in cousin companies – Golden rules for setting up governance process.

Unit III : Succession

Succession planning – Succession options – Opportunities & Challenges – Significance of succession options – Structuring the succession process. Role of CEO's spouse.

Unit IV : Next Gen Family Managers & Leaders

Family business as a career - Launching a family business career – Planning a meaningful career – Identify next gen of managers & leaders – Planning for next generation relationships. Influence of lifecycle on family business careers.

Unit V : Family Business Stories

Aditya Birla – Ford – Samsung – Tata Group - Dalmia Group – Hyundai – Hero Motor Corp – LG Group – Reliance Group.

Identify SWOT on your own family business and prepare report.

RECOMMENDED TEXT BOOKS:

1. Mukesh Bhatia; Family Business Management, Regal Publications, New Delhi, 2015.

REFERENCE TEXT BOOKS:

1. Ernesto J. Poza, Mary S. Dagherty; Cengage Learning, 2013.
2. IFC Family Business Governance Handbook, 2008.
3. Randel S. Carlock & John L. Ward; Strategic Planning for the family business, Palgrave, 2001.
4. James C. Collins & Jerry J. Porras; Built to Last, William Collins, 1994.

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Outline ownership in family business |
| CO2 | Discuss governance of family business |
| CO3 | Identify succession options in family business |
| CO4 | Prepare Next Gen family managers & leaders |
| CO5 | Identify SWOT on their own family business and report. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO2 | 3 | 3 | 1 | 2 | 2 | 1 | 3 |
| CO3 | 3 | 1 | 1 | 1 | 3 | 1 | 3 |
| CO4 | 3 | 2 | 1 | 1 | 1 | 3 | 3 |
| CO5 | 2 | 2 | 2 | 2 | 1 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | 1 | 1 | 3 | 1 |
| CO2 | 3 | 3 | 1 | 1 | 3 | 1 |
| CO3 | 3 | 3 | 1 | 1 | 3 | 1 |
| CO4 | 3 | 3 | 1 | 1 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 1 |

Correlation levels: 1- Weak 2-Medium 3-High

BUSINESS TAXATION

| | |
|----------------------------------|-------------------------|
| CORE XII | Sub Code : 03519 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objectives:

1. To provide understanding of Direct taxes and Indirect Taxes.
2. To expose students the legislations for Business taxation.
3. To present the concept of GST and its impact on suppliers and customers.

Unit I:

Objectives Of Taxation – Canons Of Taxation – Tax System In India – Direct And Indirect Taxes – Meaning And Types.(12 Hours)

Unit 2:

Income Tax Act 1961 – Basic Concepts and Definitions – Income, Assessee, Person, Previous Year, Assessment Year, Gross Total Income, Total Income. Meaning of Permanent Account Number, Return of Income, Tds, Advance Tax, Rates of Taxation, Assessment Procedure. (24 Hours)

Unit 3:

Customs Act 1962 - Introduction, Objectives, Definitions, Functions and powers of customs authorities, different types of custom duties. Classification of goods, procedure for assessment and methods of valuation for customs, demand and recovery of customs duty, procedure for claiming customs duty drawback. (18 Hours)

Unit 4:

Definitions of GST – business related person’s capital goods – levy and collection of tax – mixed supply, composite supply – meaning, advantages and disadvantages of unregistered supplier – time and value of supply – goods, services – input tax credit – Registration of GST – person liable for registration, not liable for registration, Registration of casual taxable person, deemed on cancellation of registration, revocation of cancellation of registration. (20 Hours)

Unit 5:

Tax Invoice, Credit and Debit notes –Return of GST, Refunds, payment of tax, assessment and audit. An Overview of Tax Audit – Tax Incentives and Export Promotions, Deductions and Exemptions. (16 Hours)

RECOMMENDED TEXT BOOKS :

1. T. S. Reddy and Hari Prasad Reddy; Business Taxation (GST), Margham Publication, 2019.
2. Brian Spilker, Benjamin Ayers, John Robinson, Edmund Outslay, Ronald Worsham, John Barrick, Connie Weaver; Taxation of Business, 11th edition, McGraw-Hill's, 2020

REFERENCE BOOKS:

1. Akhileshwar Pathak and Savan Godiawala; Business Taxation, McGraw Hill Education, 3rd edition (2014).
2. Dr. Vinod K. Singhania, Dr. Dr. H.C. Mehrotra, Prof. V.P. Agarwal; Goods and Services Tax (G.S.T), Sahitya Bhawan Publications, Edition:5th, 2019
3. Monica Singhania; Corporate Tax Planning & Business Tax Procedures with Case Studies, Taxmann, 23rd Edition, 2019

ONLINE REFERENCES:

1. <https://cleartax.in/s/gst-law-goods-and-services-tax>
2. <https://www.avalara.com/in/en/learn/whitepapers/hsn-codes-goods-service-tax-gst-india.html>
3. <https://www.shiprocket.in/blog/customs-duty-meaning-types-india/>
4. <https://cleartax.in/s/gst-audit-annual-turnover-2-crores>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Explain tax system in India |
| CO2 | Outline Income Tax Act 1961 inclusive underlying concepts & definitions |
| CO3 | Outline Customs Act 1961 inclusive Types (Goods & Custom duty) & procedure. |
| CO4 | Discuss procedures involved in GST Registration and its issues |
| CO5 | Outline Tax audit and relevant taxation procedure |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | 3 | | 1 | | | 2 |
| CO2 | | 2 | 1 | 3 | | 2 | |
| CO3 | 2 | 3 | | 3 | | | |
| CO4 | 3 | 3 | | 2 | 3 | | 3 |
| CO5 | 3 | 3 | 2 | | 3 | 2 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 2 | | | | 3 | |
| CO2 | 3 | 3 | | 3 | 2 | |
| CO3 | 3 | 3 | | | 3 | |
| CO4 | 3 | 3 | | | | 2 |
| CO5 | 3 | 3 | | 1 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

LEGAL ASPECTS OF BUSINESS

| | |
|----------------------------------|-------------------------|
| CORE XIII | Sub Code : 03520 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objective :

1. To introduce the legislations in India for business.
2. To understand the legal legislations about Indian Companies Act, Contracts, Sale of goods, Negotiable Instruments.

Unit-I

Indian Companies Act, 2013 : Company – Definition – Formation - Nature of company – Advantages & Disadvantages of company – Types – Incorporation – Memorandum of Association – Articles of Association – Prospectus (Overview). Difference between private and public company. (18 Hours)

Unit-II

The Indian Contract Act: Meaning and Nature of Contract- Essentials Elements of a Valid Contract- Offer or Proposal and Acceptance- Intention to Create Legal Relations- Consideration- Flaws in contract-flaw capacity and persons-mistake-misrepresentation-coercion-undue influence-legality of object.
Performance of contracts - Discharge of contracts – Modes of discharge – Breach & remedies against breach of contract. (20 hours)

Unit-III

Wagering agreement-contingent contract-quasi contract-contract of indemnity and guarantee-contract of bailment and pledge. (16 Hours)

Unit-IV

Sale of goods Act, 1930 : goods and their classification-conditions and warranties, passing of properties and goods, performance of a contract of sales, buyers right.(18 Hours)

Unit-V

Negotiable Instruments Act, 2013 : Definition and characteristics of Negotiable instruments – Types of Negotiable instruments – Parties to negotiable instruments – Methods of negotiation of instrument – endorsement and delivery of a negotiable instrument – its kinds - negotiation by unauthorized parties – dishonor and discharge of negotiable instruments. (18 hours)

RECOMMENDED TEXT BOOKS :

1. M C Kuchal & Vivek Kuchal; Business Law - Sultan Chands Seventh Edition 2018.
2. Ashcroft & Patterson Barrons; Business Law, Cengage Advantage Book, 19th Edition, 2016.

REFERENCE BOOKS:

1. K.Ramachander, B.Chandrasekara, Chandrakant Kanakahe; Legal aspects of Business – Text, Jurisprudence and Cases, Himalayas Publishing house, 2nd Edition, 2016.
2. N.D. Kapoor; Elements of Company Law, Sultan chand and sons, 30th Edition 2016.
3. Daniel Albuquerque; Legal aspects of Business, Second edition, Oxford HED, 2017.

ONLINE REFERENCES:

1. <https://www.freebookcentre.net/law-books-download/Advanced-Business-Law-and-the-Legal-Environment.html>
2. http://164.100.133.129:81/econtent/Uploads/Business_Law.pdf
3. <http://ebiblioteka.efsa.unsa.ba/xmlui/bitstream/handle/EFSA/543/BUSINESS%20LAW.pdf?sequence=1>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Outline companies Act and discuss incorporation of companies |
| CO2 | Understand contract act and its legal implications |
| CO3 | Identify different types of contract |
| CO4 | Outline sale of goods acts and discuss its legal framework |
| CO5 | Outline Negotiable Instruments Act and discuss its legal framework. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | | | 3 | | | |
| CO2 | 2 | | | 3 | | 2 | |
| CO3 | 2 | | | 3 | 2 | | |
| CO4 | | | | 3 | | | |
| CO5 | | 3 | | 3 | | | |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | | | | 3 | |
| CO2 | 3 | | | 3 | 3 | |
| CO3 | 3 | | | 3 | 3 | |
| CO4 | 3 | | | 3 | 3 | |
| CO5 | 3 | | | | 3 | |

Correlation levels: 1- Weak 2-Medium 3-High

ENTREPRENEURIAL DEVELOPMENT

| | |
|----------------------------------|-------------------------|
| ALLIED I | Sub Code : 03520 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objectives:

1. To motivate students for promoting entrepreneurship.
2. To emphasize the importance of entrepreneurship and its significance in economic development.
3. To facilitate students with various sources promoting entrepreneurship.

Unit I:

Concept Of Entrepreneurship– Meaning – Types – Qualities Of Entrepreneurs – Classification - Factors Influencing Entrepreneurship Function Of Entrepreneurs.(10 Hours)

Unit II:

Entrepreneurial Development – Agencies Commercial Banks – District Industries Centre – National Small Industries Development Organization – Small Industries Service Institute.(20 Hours)

Unit 3:

Project Management Business Idea Generation Techniques – Identification Of Business Opportunities – Feasibility Study- Marketing, Finance, And Technology & Legal Formalities – Preparation of Project Report – Tools of Appraisal. (30 Hours)

Unit 4:

Entrepreneurial Development Programmes (EDP) - Role, Relevance and Achievements – Role of Government in Organizing EDP. (16 Hours)

Unit 5:

Economic Development and Entrepreneurial Growth. (14 Hours)

RECOMMENDED TEXT BOOKS:

1. S. S. KHANKA; Entrepreneurship Development, S Chand Publication,2018.
2. Jayashree Suresh, Entrepreneurial Development,Margham Publication, 2012.

REFERENCE BOOKS:

1. A.K.Singh, Entrepreneurial Development and Management,Laxmi Publication, 2nd Edition
2. Clyton M. Christensen; The Innovator Dilemma, Instaread Summaries, 2017.
3. K.Ramachandran, Entrepreneurial Development,McGraw-Hill Education, 2008
4. Vasanth Desai, Dynamics of Entrepreneurial Development & Management, Himalaya Publishing House, 2016.

ONLINE REFERENCES:

1. <https://www.earlytorise.com/entrepreneurship-development>
2. <https://uk.directhit.com/Entrepreneurial%20development%20book/Look%20no%20further>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Outline concepts, factors, functions, classification of entrepreneurship |
| CO2 | Identify funding sources for entrepreneurship |
| CO3 | Identify business idea generation techniques and outline project report writing |
| CO4 | Discuss EDP and its functions |
| CO5 | Relate Economic growth and entrepreneurial development |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 2 | 2 | 2 | 3 | 3 |
| CO2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 |
| CO3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

MATERIALS MANAGEMENT

| | |
|----------------------------------|-------------------------|
| ALLIED II | Sub Code : 03518 |
| Teaching Hours : 72 Hours | Credit : 05 |

Learning Objectives:

1. To provide functional knowledge on Materials Management.
2. Enable students to gain knowledge on Inventory control, Procurement, Store keeping.
3. To furnish students about Vendor management and Vendor rating.

Unit- 1

Materials Management- Definition-Function-Importance of Materials Management. (14 Hours)

Unit-2

Inventory Control- Function Of Inventory - Importance-Replenishment Stock-MRP- ABC- FSN Analysis - Inventory Control Of Spares And Slow Moving Items -EOQ-EBQ-Stores Planning. (20 Hours)

Unit-3

Purchase Management- Purchasing - Procedure - Dynamic Purchasing - Principles - Price Forecasting - Techniques Of Price Forecasting. (18 Hours)

Unit-4

Store Keeping And Materials Handling- Objectives - Functions - Store Keeping - Stores Responsibilities - Location Of Store House - Centralized Store Room - Equipment – Security Measures - Protection And Prevention Of Stores. (22 Hours)

Unit -5

Vendor Rating - Vendor Management - Purchase Department - Responsibility - Buyer Seller Relationship - Value Analysis - Iso Types. (16 Hours)

RECOMMENDED TEXT BOOKS :

1. P. Saravanavel & S. Sumathi; Production and Materials Management, Margham Publications, 2015.
2. Steve Chapman, Tony K. Arnold, Ann K. Gatewood, Lloyd Clive; Introduction to Materials Management. Eighth Edition, Pearson, 2017.

REFERENCE BOOKS:

1. P. Gopalakrishnan; Purchasing Materials Management, 1s edition, McGraw Hill Education, 2017.
2. P. Gopalakrishnan & Abid Haleem; Hand book of Materials Management, Second Edition, PHI Learning Pvt., Ltd., 2015.
3. Prem Virat; Materials Management, Springer Nature, 2014.

ONLINE REFERENCES:

1. <http://blog.mitsde.com/introduction-to-materials-management/>
2. <https://www.supplychainquarterly.com/topics/Strategy/>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Understand the principles of effective materials management |
| CO2 | Outline inventory control concepts and its replenishment to manage inventory |
| CO3 | Discuss purchase management procedure |
| CO4 | Explain store keeping functions and its security |
| CO5 | Identify Vendor rating mechanisms and vendor relationship management. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | | | | 1 | 1 | 3 |
| CO2 | | 2 | | | | 3 | 2 |
| CO3 | 1 | 2 | 3 | 3 | 3 | | 2 |
| CO4 | | 2 | 2 | 2 | 3 | | 2 |
| CO5 | 2 | 2 | 3 | 2 | | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 1 | | | | 3 | |
| CO2 | 2 | | 1 | | 3 | |
| CO3 | 3 | | | | 2 | |
| CO4 | 3 | | 1 | | 3 | |
| CO5 | 3 | | | | 2 | |

Correlation levels: 1- Weak 2-Medium 3-High

SEMESTER VI

| Subject Category | Sem | Subject Name | Hours per week | Credits | Marks | | |
|------------------|-----|--------------------------|----------------|---------|----------|----------|-------|
| | | | | | Internal | External | Total |
| Core XIV | VI | Business ethics & values | 6 | 5 | 40 | 60 | 100 |
| Core XV | VI | Personality Development | 6 | 5 | 40 | 60 | 100 |
| Core XVI | VI | Project | 6 | 6 | 40 | 60 | 100 |
| Allied I | VI | Financial Services | 6 | 5 | 40 | 60 | 100 |
| Allied II | VI | Information Management | 6 | 5 | 40 | 60 | 100 |

BUSINESS ETHICS AND VALUES

| | |
|----------------------------------|-------------------------|
| CORE XIV | Sub Code : 03624 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objectives :

1. To provide insight about ethics in workplace.
2. To appreciate the relationship between business ethics and corporate social responsibility

Unit- I

Introduction to business ethics - Definition - Role -Importance of Business Ethics in Business - Values - Features of Morality - Role of CEO. (12 Hours)

Unit-II

Ethics in work place – code of conduct – code of ethics. Types of Ethical Issues - Bribes - Coercion -Deception - Theft - Unfair Discrimination. (18 Hours)

Unit-III

Internal Ethics - Hiring Employees - Promotions -Discipline - Wages - Job Description - Exploitation Of Employees - Ethics External - Consumers - Fair Prices - False Claim Advertisement. (24 Hours)

Unit-IV

External Ethics - Environment Protection -Natural -Physical - Society - Social Audit. (16 Hours)

Unit -V

Corporate responsibility : Definition – Case study. Corporate compliance – Definition, Laws & Regulations. Social Responsibilities of Business towards Shareholders - Employees - Customers - Dealer - Vendors - Government. (20 Hours)

RECOMMENDED TEXT BOOKS :

1. S.Sankaran, Business ethics and values, Margham Publication, 2019.
2. Robert W.Kolb; Business Ethics and society, Sage,2nd edition,2018.

REFERENCE BOOKS:

1. A.C.Fernando; Business Ethics and Corporate Governanance, Pearson education India, 2012.
2. Dr. S.S Khanka; Business Ethics and Corporate Governanance; S Chand and company; 2014
3. Jyotsna G B, R.C Joshi; Business Ethics and Corporate Governanance; McGraw Hill, 2019
4. S Prabhakaran; Business Ethics and Corporate Governanance; Excel books, Second edition, 2009

ONLINE REFERENCES:

1. <https://www.humanrightscommission.vic.gov.au/discrimination/discrimination/types-of-discrimination>
2. <http://ddceutkal.ac.in/Syllabus/BECCG-MBA.pdf>
3. <https://www.tutor2u.net/business/reference/external-environment-business-ethics-gcse>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Understand significance of ethics & values in business and outline role of CEO in business |
| CO2 | Analyse types of ethical issues in business environment |
| CO3 | Identify and relate internal ethics to business environment |
| CO4 | Identify and relate external ethics to business environment and outline social audit |
| CO5 | Discuss corporate social responsibility |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | 2 | | 3 | 2 | | |
| CO2 | 2 | 3 | 3 | 2 | 3 | | |
| CO3 | | 3 | | 2 | 3 | 3 | 3 |
| CO4 | | 2 | | 3 | 3 | 2 | 2 |
| CO5 | | | | 3 | 2 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | | | | | 2 | |
| CO2 | 2 | 2 | | 3 | 2 | |
| CO3 | 2 | | | 3 | 2 | |
| CO4 | 3 | | | 2 | 3 | |
| CO5 | 2 | | | | 3 | |

Correlation levels: 1- Weak 2-Medium 3-High

PERSONALITY DEVELOPMENT

| | |
|----------------------------------|-------------------------|
| CORE XV | Sub Code : 03625 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objective :

1. To groom students with proper behaviour, socially and professionally
2. To improve overall personality of the students.
3. To know techniques to overcome and manage stress levels experienced.

Unit I:

Personality definition – Elements of personality – Determinants of personality – personal SWOT analysis.(12 Hours)

Unit II:

Self Esteem – self concept – advantages of high self esteem – characteristics of people with high and low self esteem – steps to building positive self esteem – attitude – factors that determine our attitude – benefits of a positive attitude and consequences of a negative attitude – Motivation – The difference between inspiration and motivation – motivation redefined – external motivation v/s internal motivation.(18 Hours)

Unit III:

Success – defining success – real or imagined obstacles to success – qualities that make a person successful – Reasons for failure – inter personal skills – dealing with seniors, colleagues, juniors, customers, suppliers at the work place – factors that prevent building and maintaining positive relationships – difference between ego and pride – the difference between selfishness and self interest – steps for building a positive personality – body language, understanding body language – projecting positive body language. (20 Hours)

Unit IV:

Recruiter expectation – Career counseling (based on student SWOT analysis) – creating a career path. (20 Hours)

Unit V:

Stress management – causes of stress – handling stress / stress management techniques. (20 Hours)

RECOMMENDED TEXT BOOKS :

1. Wallace (Harold R) and masters Ann, Personality Development, south – western Publishers
2. Swami Sri Kantananda, Personality Development through Human Excellence, Adhyaksha Publications, Edition 2010

REFERENCE BOOKS:

1. Amavanand, Personality Development, Veekumar Publications Pvt. Ltd, 2011.
2. Elizabeth B.Hurlock, Personality Development, Tata McGraw Hill, Edition 2010.
3. K.Rao Prashanth Jyoty, Hand Book on Personality Development
4. Swami Vivekananda, Personality Development, Ramakrishna Mission Institute, 2011

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=jD_hP080U00https://www.artofliving.org/in-en/personality-development
2. <https://books.google.co.in/books?id=qfXrwgEACAAJ&dq=7+Habits+Of+Highly+Effe+ctive+People&hl=en&sa=X&ved=0ahUKEwjUyKGMwPHIAhXBYo8KHSS-D1MQ6AEIKTAA>
3. <https://books.google.co.in/books?id=ZU04cwk7hIEC&printsec=frontcover&dq=stress+management&hl=en&sa=X&ved=0ahUKEwjElODBwPHIAhUW5o8KHQcbBkEQ6AEIKTAA>
4. <https://books.google.co.in/books?id=RzP-VLndJgMC&pg=PT14&dq=RECRUITERS+EXPECTATIONS&hl=en&sa=X&ved=0ahUKEwjJjOzWwPHIAhXBso8KHX-mAgUQ6AEIPjAD>
5. <https://books.google.co.in/books?id=R9b-rQEACAAJ&dq=EQ+IQ&hl=en&sa=X&ved=0ahUKEwiKr6CEwfHIAhUJinAKHSwqDxgQ6AEIKTAA>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | Outline the pattern of thoughts, feelings and behavior |
| CO2 | Enhance communication |
| CO3 | Identify their personality |
| CO4 | Balance EQ/IQ levels |
| CO5 | Transform adolescence to adult stage |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 2 | 1 | 2 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 1 | 2 |
| CO5 | 3 | 2 | 2 | 2 | 1 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 1 | 2 | 3 | 3 | 1 |
| CO2 | 3 | 1 | 2 | 3 | 3 | 2 |
| CO3 | 3 | 1 | 2 | 3 | 3 | 2 |
| CO4 | 3 | 1 | 2 | 3 | 3 | 2 |
| CO5 | 2 | 1 | 2 | 3 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

FINANCIAL SERVICES

| | |
|----------------------------------|-------------------------|
| ALLIED I | Sub Code : 03626 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objectives:

1. To provide overview and understand the importance & role of financial services.
2. To know the comprehensive outlook of SEBI.
3. To provide an in depth understanding of various players in the financial market.

Unit-I

Meaning and importance of financial services – Types of financial services – Financial services and economic environment – Players in Financial Services Sector. (18 Hours)

Unit-II

Merchant Banking – Functions – Issue management – Managing of new issues – Underwriting – -Capital market – Stock Exchange – Role of SEBI.(18 Hours)

Unit-III

Leasing and Hire purchase – Concepts and features – Types of lease Accounts. Factoring – Functions of Factor .(18 Hours)

Unit-IV

Credit Rating – Consumer Finance - Venture capital. DEMAT (18 hours)

Unit-V

Mutual Funds: Meaning – Types – Functions – Advantages – Institutions Involved – UTI.(18 Hours)

RECOMMENDED TEXT BOOKS :

1. M.Y.Khan, Financial Services, TATA McGraw Hill Publications 10th Edition 2019.
2. Clifford Gomez, Financial Markets Institutions and Financial Services, PHI Learning P LTD, 2015.

REFERENCE BOOKS:

1. Santhanam; Financial Services, Margham publications, 2019.
2. K.Natarajan, E.Gordon; Financial Markets & Services; Himalaya Publications House 2019.
3. Peter S Rose, Sylvia C Hudgins; Banking management and Financial Services, TATA McGraw Hill Publications 2017.

ONLINE REFERENCES:

1. http://www.pondiuni.edu.in/storage/dde/downloads/fiiii_mfc.pdf
2. <https://www.sigc.edu/department/commerce/studymet/FinancialServices.pdf>
3. <http://www.ddegjust.ac.in/studymaterial/mba/fm-404.pdf>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | List types of financial services and their role |
| CO2 | Recognize role and functions of merchant banker and capital market |
| CO3 | Compare and contrast factoring and leasing |
| CO4 | Categorise mutual funds based on features |
| CO5 | Explain credit rating, consumer finance, bonds and venture capital. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | | | | 3 | 2 | | |
| CO2 | | | | 3 | 2 | | |
| CO3 | | | | 3 | 2 | | |
| CO4 | | | | 3 | 2 | | |
| CO5 | | | | 3 | 2 | | |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | | | | 2 | |
| CO2 | 3 | | | | 2 | |
| CO3 | 3 | | | | 2 | |
| CO4 | 3 | | | | 2 | |
| CO5 | 3 | | | | 2 | |

Correlation levels: 1- Weak 2-Medium 3-High

INFORMATION MANAGEMENT

| | |
|----------------------------------|-------------------------|
| ALLIED II | Sub Code : 03627 |
| Teaching Hours : 90 Hours | Credit : 05 |

Learning Objectives :

1. To educate basic idea of information systems and its impacts in business.
2. To provide insight about system concepts and development.
3. To provide exposure of new IT initiatives and their applications in business.

Unit-I

Introduction : Data, Information, Information Technology, Information Systems, Information for decision making. (14 hours)

Unit-II

Definition of Management Information System – MIS support for planning, organizing and controlling – Structure of MIS. (12 hours)

Unit-III

Concept of system- Characteristics of system – System classification- categories of information systems – Strategic information system and competitive advantage. Database management system (14 hours)

Unit-IV

System Analysis and design – SDLC – Role of system analyst- Functional information system – Personnel, production, material, marketing. Decision support system and Group decision support system. (25 hours)

Unit-V

Business process outsourcing, e-business, e-governance, Pervasive computing, virtual reality, cloud computing, web analytics. (25 hours).

RECOMMENDED TEXT BOOKS :

1. S.P Rajagopalan, Management Information System, Margham Publications, 2019
2. Robert Schultheis and Mary Summer; Management Information Systems – The Managers View, Tata McGraw Hill, 2008

REFERENCE BOOKS:

1. C.S.V. Murthy, Management Information Systems, Himalaya Publishing House, 2009.
2. James A O' Brain, Management Information Systems, Tata McGraw Hill, 2006
3. Kenneth C Laudon, Jane P. Laudon, Management Information system, Pearson Education Ltd, 2014.
4. Sadagopan S, Management Information Systems, Prentice Hall India, 2014.

ONLINE REFERENCES:

1. <https://www.managementstudyguide.com/management-information-system-articles.htm>
2. <https://erwin.com/news/trend-setting-products-in-data-and-information-management-for-2019/>

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|---|
| CO1 | Explain information system concepts and its role in decision making |
| CO2 | Explain MIS, its structure and role in management functions |
| CO3 | Classify & discuss information system categories, Database Management systems |
| CO4 | Discuss SDLC and functional information system categories |
| CO5 | Outline functions fo BPO and recent trends in information management |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 2 | 2 | 1 | 1 | 1 | 2 |
| CO2 | 3 | 2 | 2 | 1 | 1 | 1 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 1 | 2 | 2 |
| CO5 | 3 | 1 | 2 | 1 | 2 | 2 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 2 | 1 | 1 | 2 | 2 |
| CO2 | 3 | 2 | 1 | 1 | 2 | 2 |
| CO3 | 3 | 2 | 1 | 1 | 2 | 1 |
| CO4 | 3 | 2 | 1 | 1 | 2 | 1 |
| CO5 | 3 | 2 | 1 | 1 | 2 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

PROJECT

| | |
|----------------------------------|--------------------|
| CORE XVI : PROJECT | Sub Code : |
| Teaching Hours : 90 Hours | Credit : 05 |

GUIDELINES FOR THE PROJECT

- The project carries 40 Internal Marks (Internal marks to be given based on reviews & attendance) and 100 External Marks (For Viva voce).
- Each review carries 10 marks (3 reviews – 30 marks) and attendance 10 marks for internals.
- The project should be carried out in a private or public limited company. It should not be done in a partnership / sole proprietorship or firm excluding finance projects.
- Projects have to be carried out preferably in their choice of specialization.
- **No 2 students** should carry out projects in a title or related title with the same company.
- Students who failed to attend the 3 reviews will not be allowed to submit project and attend the final viva-voce.
- Copied /Duplication of projects will not be entertained. Plagiarism test will be undertaken.

- **Project Review**

Ist review (With panel)

Requirements : Company letter/Title of the project/ Chapter I & II & III (With Questionnaire)

II nd review(With guide)

Requirements : Completion of Chapter IV

IIIrd review (With external panel)

Requirements : Submission of rough draft.

PROJECT REPORT FORMAT/CONTENTS

Project report should be in Times New Roman font 14 for headings & 12 for contents with 1.5 line spacing. The project report should contain minimum 50 pages not exceeding 75 pages. The project report should be hard bound in blue colour.

The project report should include Cover page, Bonafide certificate, Declaration, Internship certificate photocopy, Acknowledgement, Contents, List of tables, and List of charts

| | | |
|------------------------------|---------------------------------------|--|
| 1. Cover page | | 6. Viva-voce letter |
| 2. Duplication of cover page | | 7. Acknowledgement |
| 3. Bonafide certificate | | 8. Contents |
| 4. Company certificate | | 9. List of Tables |
| 5. Declaration | | 10. List of Graphs |
| CHAPTER I | INTRODUCTION (Max 4 sides) | 1.1 Introduction about the project title 1.2 Objectives 1.3 Area of Study 1.4 Methodology 1.5 Limitations of the study 1.6 Chapterization |
| CHAPTER II | THEORETICAL OUTLOOK | |
| CHAPTER III | COMPANY PROFILE | |
| CHAPTER IV | DATA ANALYSIS & INTERPRETATION | |
| CHAPTER V | FINDINGS, SUGGESTIONS & CONCLUSION | 5.1 Findings 5.2 Suggestions 5.3. Conclusion |
| REFERENCES | | BOOKS WEBSITES |
| ANNEXURE | | QUESTIONNAIRE |

COURSE OUTCOME:

On completion of the course, student will be able to:

| | |
|-----|--|
| CO1 | To understand problem area or area of improvement in the organization |
| CO2 | To apply and relate his conceptual knowledge in the field of study |
| CO3 | To analyse the data collected related to the objectives of the study |
| CO4 | To interpret the results of data analysis |
| CO5 | To compile and design suggestions/solutions for the study and report the study in prescribed format. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 2 | 2 | 1 | 1 | 3 |
| CO3 | 1 | 1 | 3 | 3 | 1 | 1 | 3 |
| CO4 | 1 | 1 | 3 | 3 | 1 | 1 | 3 |
| CO5 | 3 | 2 | 3 | 3 | 1 | 3 | 3 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 | 3 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 1 |

Correlation levels: 1- Weak 2-Medium 3-High

**Dwaraka Doss Goverdhan Doss Vaishnav College
[Autonomous]**

[Affiliated to University of Madras]



Department of Corporate Secretaryship

Syllabus
Choice Based Credit System [CBCS]
[Outcome Based Education]

**Effective for the batch of students admitted from
the Academic year
2021 - 2022**



TABLE OF CONTENTS

| Sl. No. | PARTICULARS | Page No. |
|-----------------|--|-----------------|
| 1 | Vision, Mission and Program Educational Objectives (PEO) | 3 |
| 2 | Program Outcomes (PO) with Graduate Attributes | 4 |
| 3 | Mapping of POs with PSOs | 5 |
| SCHEME | | |
| 4 | Scheme for First Year (Semester I & II) | 6 |
| 5 | Scheme for Second Year (Semester III & IV) | 7 |
| 6 | Scheme for Third Year (Semester V&VI) | 8 |
| SYLLABUS | | |
| 7 | Syllabus for First Year (Semester I & II) | 9-31 |
| 8 | Syllabus for Second Year (Semester III & IV) | 32-50 |
| 9 | Syllabus for Third Year (Semester V&VI) | 51-84 |
| APPENDIX | | |
| 10 | Appendix - A Outcome Based Education | 85 |
| 11 | Appendix - B Mapping of Outcomes | 86 |
| 12 | Appendix - C Bloom's Taxonomy | 87 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



DEPARTMENT OF CORPORATE SECRETARYSHIP

VISION

“To empower the students with knowledge, skills, attitude and ethics in line with the dynamic changes in the socio-economic environment; to nurture high calibre scholarly attributes fostering good governance; to encourage critical thinking through experiential learning in pursuit of the holistic development of the students.”

MISSION

| | |
|-----------|---|
| M1 | To impart an in-depth knowledge and understanding of core courses in accounting for business and the relevant corporate and other laws |
| M2 | To promote lateral thinking and a spirit of enquiry among students thereby encouraging a creative approach to provide solutions to complex challenges in business entities. |
| M3 | To apply updated teaching learning methods and andragogy to foster experiential learning through the practical application of business knowhow. |
| M4 | To harness the richness of entrepreneurship and multidisciplinary knowledge as a feeder for professional courses and start-ups. |
| M5 | To nurture ethics, governance and social responsibility as the mantras of success for life-long learning. |



PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

| | |
|-------------|--|
| PEO1 | To make Corporate Secretaryship graduates conceptualize, critically analyze and acquire In-depth knowledge of Company law and Secretarial practice by imbuing in them the unique ability of synthesizing knowledge towards adding value in the areas of Corporate Governance |
| PEO2 | To promote lateral thinking by way of enabling Corporate Secretaryship graduates to see at the things from different perspectives there by making them to come out with simple solutions for complex Secretarial problems. |
| PEO3 | To inculcate a spirit of enquiry, so that Corporate Secretaryship Graduates search for facts and truths by developing methodologies that supports critical analysis and legal compliance |
| PEO4 | To ignite the passion for Entrepreneurship in Corporate Secretaryship graduates by orienting them in the application of Modern tools of management and make them learn to select and apply in complex decision making processes. |
| PEO5 | To inculcate a spirit of Ethics and Social Commitment in the personal and professional life of Corporate Secretary ship graduates so that they add value to the society. |

PROGRAMME OUTCOME FOR UNDERGRADUATE

At the end of the programme the student will be able to:

| | |
|------------|--|
| PO1 | To partake in various types of employment, development activities and public dialogue particularly in response to the needs of Industry and Entrepreneurship in the Regional, National and Global arena. |
| PO2 | To promote critical thinking and analytical skills. |
| PO3 | To develop core competency in conceptualisation, problem solving and effective application of skills. |
| PO4 | To develop conceptual understanding , problem solving and application of skills |
| PO5 | To encourage entrepreneurship among the students coupled with strong ethics and communication skills |
| PO6 | To develop a questioning mind in diverse environments for better impact |
| PO7 | To engage in lifelong learning to ensure proficient progress |



Program Specific Outcomes

| | |
|-------------|---|
| PSO1 | Apply knowledge of Company law and Secretarial practice to comply legal formalities and to solve corporate problems with due diligence. |
| PSO2 | Foster analytical and critical thinking abilities for preparation and presentation of Financial Statements |
| PSO3 | Ability to understand, analyze and communicate global, legal and ethical aspects of business. |
| PSO4 | Corporate Secretaryship graduates to acquire in-depth knowledge of Corporate laws and entrepreneurship embedded with ethics |
| PSO5 | To instill a sense of social commitment and strive towards personal victory and value creation to society. |
| PSO6 | Students studying Corporate Secretaryship to be passionate about multidisciplinary approach for problem solving, critical analysis and decision making. |
| PSO7 | To develop value based leadership qualities, give due importance for lateral thinking so that they see things from a perspective which are not just simple but effective. |

Mapping of Program Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| PO1 | 2 | - | 2 | 1 | 1 | 1 | 1 |
| PO2 | 2 | - | 1 | 2 | 2 | 2 | 1 |
| PO3 | 2 | 1 | 2 | 2 | 2 | 3 | 1 |
| PO4 | 3 | - | 2 | 2 | 2 | 3 | 2 |
| PO5 | 2 | 1 | 2 | 3 | 2 | 2 | 1 |
| PO6 | 2 | 1 | 2 | 2 | 2 | 2 | 1 |



COURSES OFFERED TO STUDENTS
(Effective for the batch of students admitted from the Academic Year 2021 – 2022)

SEMESTER – I

| Part | COURSE TITLE | CREDITS | HOURS | CIA | ESE | Total |
|------|--|-----------|-----------|-----|-----|-------|
| I | Language | 3 | 4 + 2* | 40 | 60 | 100 |
| II | English | 3 | 4 | 40 | 60 | 100 |
| III | Core Paper I – Financial Accounting-I | 4 | 5 | 40 | 60 | 100 |
| | Core Paper II – Principles of Management | 4 | 5 | 40 | 60 | 100 |
| | Allied Paper I – Principles of Marketing | 5 | 6 | 40 | 60 | 100 |
| IV | Soft Skills | 3 | 2 | 40 | 60 | 100 |
| | Non-Tamil Students : Basic Tamil / Advanced Tamil(*) Tamil Students: Non – Major Elective- I Everyday Banking | 2 | 2 | 40 | 60 | 100 |
| | Total | 24 | 30 | | | |

SEMESTER – II

| Part | COURSE TITLE | CREDITS | HOURS | CIA | ESE | Total |
|------|--|-----------|-----------|-----|-----|-------|
| I | Language | 3 | 4 + 2* | 40 | 60 | 100 |
| II | English | 3 | 4 | 40 | 60 | 100 |
| III | Core Paper III –Financial Accounting II | 4 | 5 | 40 | 60 | 100 |
| | Core Paper IV – Human Resource Management | 4 | 5 | 40 | 60 | 100 |
| | Allied Paper II – Business Communication | 5 | 6 | 40 | 60 | 100 |
| IV | Soft Skills | 3 | 2 | 40 | 60 | 100 |
| | Non-Tamil Students : Basic Tamil / Advanced Tamil Tamil Students: Non – Major Elective II Fundamentals of Insurance | 2 | 2 | 40 | 60 | 100 |
| | Total | 24 | 30 | | | |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)

Department of Corporate Secretaryship

Course - B.Com (Corporate Secretaryship)



SEMESTER – III

| Part | COURSE TITLE | CREDITS | HOURS | CIA | ESE | Total |
|------|--|-----------|-----------|-----|-----|-------|
| I | Language | 3 | 6 | 40 | 60 | 100 |
| II | English | 3 | 4 | 40 | 60 | 100 |
| III | Core Paper V – Corporate Accounting-I | 4 | 5 | 40 | 60 | 100 |
| | Core Paper VI – Company Law & Secretarial Practice - I | 4 | 5 | 40 | 60 | 100 |
| | Allied Paper III – Business Statistics | 5 | 6 | 40 | 60 | 100 |
| IV | Soft Skills | 3 | 2 | 40 | 60 | 100 |
| | Environmental Studies * | | 2 | | | |
| | Total | 22 | 30 | | | |

* End Semester Examination will be conducted in Semester - IV

SEMESTER – IV

| Part | COURSE TITLE | CREDITS | HOURS | CIA | ESE | Total |
|------|---|-----------|-----------|-----|-----|-------|
| I | Language | 3 | 6 | 40 | 60 | 100 |
| II | English | 3 | 4 | 40 | 60 | 100 |
| III | Core Paper VII – Corporate Accounting-II | 4 | 5 | 40 | 60 | 100 |
| | Core Paper VIII – Company Law & Secretarial Practice - II | 4 | 5 | 40 | 60 | 100 |
| | Allied Paper IV – Business Economics | 5 | 6 | 40 | 60 | 100 |
| IV | Soft Skills | 3 | 2 | 40 | 60 | 100 |
| | Environmental Studies | 2 | 2 | 40 | 60 | 100 |
| | Total | 24 | 30 | | | |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



SEMESTER – V

| Part | COURSE TITLE | CREDITS | HOURS | CIA | ESE | Total |
|------|---|-----------|-----------|-----|-----|-------|
| III | Core Paper IX – Cost Accounting | 4 | 6 | 40 | 60 | 100 |
| | Core Paper X – Practical Auditing | 4 | 6 | 40 | 60 | 100 |
| | Core Paper XI – Income Tax Law, Theory & Practice | 4 | 6 | 40 | 60 | 100 |
| | Core Paper XII – Business Law | 4 | 6 | 40 | 60 | 100 |
| | Elective I – Corporate Governance (Open Elective) | 5 | 5 | 40 | 60 | 100 |
| IV | Value Education | 2 | 1 | 40 | 60 | 100 |
| | Total | 23 | 30 | | | |

SEMESTER – VI

| Part | COURSE TITLE | CREDITS | HOURS | CIA | ESE | Total |
|------|---|-----------|-----------|-----|-----|-------|
| III | Core Paper XIII – Management Accounting | 4 | 6 | 40 | 60 | 100 |
| | Core Paper XIV – Principles of Financial Management | 4 | 6 | 40 | 60 | 100 |
| | Core Paper XV – GST & Customs Law | 4 | 6 | 40 | 60 | 100 |
| | Elective II – Entrepreneurial Development | 5 | 5 | 40 | 60 | 100 |
| | Project - Institutional Training | 5 | 5 | 50 | 50* | 100 |
| V | Extension Activity | 1 | 2 | | | |
| | Total | 23 | 30 | | | |

* Project Report – 30 Marks, Viva Voce – 20 Marks



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper I – FINANCIAL ACCOUNTING-I

| | |
|------------------------------|-----------------------|
| Course Code : 2106101 | Credits : 4 |
| L:P:T:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Analyse various concepts relating to average due date and account current for calculating the debt payments. |
| CO2 | Calculate fire insurance claim for loss of stock (Average clause) |
| CO3 | Explain the different types of errors and rectify those errors by preparing suspense account |
| CO4 | Analyse the wear and tear in machines and need for replacing the machinery at the appropriate time |
| CO5 | Prepare the Final Accounts of a Sole Trading Concern (Adjustments- Closing Stock, Outstanding and Prepaid items, Depreciation, Provision for bad debts, Provision for Discount on debtors, Interest on Capital and Drawings, Manager's Commission) |
| CO6 | Differentiate single and double entry system and able to solve problems with the help of statement of affairs and conversion method |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | 3 | 2 | 1 | - | 2 | - |
| CO2 | 1 | 3 | 2 | 1 | 2 | 2 | - |
| CO3 | 1 | 3 | - | 1 | - | 2 | - |
| CO4 | 1 | 3 | 1 | 1 | 1 | 2 | - |
| CO5 | 1 | 3 | 2 | 1 | 1 | 2 | - |
| CO6 | 1 | 2 | 2 | 1 | 1 | 1 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No | CONTENTS OF MODULE | Hrs | Cos |
|------|---|-----|-----|
| 1 | UNIT- I Introduction to Accounting concepts and conventions, Accounting standards in India [AS and Ind AS], Introduction to AS 1- Disclosure of Accounting policies. Average Due date – Account Current – Insurance Claims – Average Clause (Loss of stock only) | 15 | 1,2 |
| 2 | UNIT- II Classification of errors – Rectification of errors – Preparation of Suspense Account – Investment Accounts- AS13, Classification of investments- Carrying amount of investments- Profit/loss on sale of investments- Disclosure and reporting | 15 | 3 |
| 3 | UNIT- III Depreciation – Meaning, Causes, Types –Provisions in AS 6 –Methods of depreciation- Straight line method, Written down value method [Change in method excluded], Sinking fund method, Annuity method, Revaluation method, Depletion Unit method. | 15 | 4 |
| 4 | UNIT- IV Preparation of Final Accounts of a Sole Trading Concern with adjustments and accounting for Closing Stock, Outstanding, Accrual and Prepaid items, Depreciation, Bad debts & Provision, Reserve for Discount on debtors and creditors, Interest on Capital and Drawings, Manager’s Commission, loss of stock by fire and recovery of insurance claims. Introduction to AS 9- Revenue recognition | 15 | 5 |
| 5 | UNIT- V Accounting from incomplete records – Meaning, Features, Limitations, Distinction between incomplete records[single entry] and Double Entry System – Estimation of Profit / Loss under Statement of Affairs method- Preparation of final statements by Conversion Method | 15 | 6 |

TEXT BOOKS:

1. Gupta R. L., & Gupta V. K. (2019). Financial Accounting. 8th Ed. Sultan Chand & Sons. New Delhi, India. (ISBN: 978-81-8054-732-4)
2. Jain. S. P., & Narang K. L. (2019). Financial Accounting. Kalyani Publishers, New Delhi, India. (ISBN: 978-93-2723-123-6)
3. Shukla, M. C., Gupta, S. C., & Grewal T. S. (2017). Advanced Accounts. 19 Ed. S. Chand Publishing, New Delhi, India. (ISBN: 978-93-5253-314-5)
4. The Institute of Chartered Accountants of India. (2018). Intermediate (IPC) Course Study Material - Paper-1 Accounting. The Institute of Chartered Accountants of India (ICAI), New Delhi, India.

REFERENCE BOOKS:

1. Gupta R. L., & Radhaswamy M. (2018). Advanced Accountancy, Vol. I. 13th Ed. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-81-8054-699-0)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



2. Tulsian P. C. & Tulsian Bharat (2020). Tulsian's Principles and Practice of Accounting With Quick Revision Book. 5th Ed. CA Examination Series, MCGrawHil Education, New Delhi, India. (ISBN: 978-93-8981-169-8)
3. Tulsian P. C., & Tulsian Bharat. (2014). Financial Accounting for B.Com. (Programme). S Chand Publisher. New Delhi, India. (ISBN: 978-93-8431-940-3)
4. Tulsian P. C., & Tulsian Bharat. (2016). Accountancy with Quick Revision (For CA-IPC, Group - I), 11th Ed. S Chand Publisher. New Delhi, India. (ISBN: 978-9352531356)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper II – PRINCIPLES OF MANAGEMENT

| | |
|------------------------------|-----------------------|
| Course Code : 2106102 | Credits : 4 |
| L:P:T:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Define Management and to explain the Management process, Functions of a Manager and Scientific Management |
| CO2 | Explain the different types and steps in Planning and Decision-making and to discuss the Policies, Procedures, Process and Methods in Decision-making |
| CO3 | Compare the different types of Organizations and to explain the Organization Structure, Span of Control, Committees, Departmentalization and Informal Organization. |
| CO4 | Describe Authority and its Delegation, Decentralization, Responsibility, Direction and Leadership Styles. |
| CO5 | Explain the Need, Types and Techniques in Co-ordination |
| CO6 | Describe the Control Process and techniques adopted in business. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| CO2 | 2 | - | 1 | 1 | 2 | 3 | 1 |
| CO3 | 2 | - | 3 | 2 | 2 | 1 | 1 |
| CO4 | 1 | - | 2 | 1 | 2 | 3 | 3 |
| CO5 | 1 | - | 2 | 1 | 2 | 3 | 1 |
| CO6 | 1 | - | 2 | 2 | 2 | 3 | 2 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|--|-----|-----|
| 1 | <p>UNIT- I Management: Definition – Nature & Scope – Role, Skills and Functions of a Manager – Levels of management- Distinction between management & administration- Management as an Art, Science or Profession Development of Scientific Management, Contribution to management- Henry Fayol, Elton Mayo and Peter F. Drucker, Management in Indian literature [Arthashastram, Mahabharatham, Thirukkural]</p> | 15 | 1 |
| 2 | <p>UNIT- II Planning: Definition, Nature & Characteristics – Types of plans – Objectives, Policies, Procedures, Rules, Strategies, Projects, Programmes, Budgets & Methods- Process of Planning — Merits & Demerits- Steps for effective planning Management by Objectives- Definition, Features, Process, Merits & Demerits, Measures to make MBO effective. Decision-making: Definition- Process and Significance –Types, Factors, Problems/ Constraints in decision making, Guidelines to make decisions effective</p> | 15 | 2 |
| 3 | <p>UNIT- III Organisation: Definition- Features, Steps in organizing, Principles of organization, Types of Organizations – Formal & Informal Organization- Line , Line & Staff, Functional, Project, Matrix, Virtual, Network, Committee- Purpose, Types, Merits & Demerits, Measures to make it effective Line & Staff conflict- Arguments for & against Line & Staff- Measures to resolve conflicts Organization Structure – Factors influencing organization structure Span of Control– Factors influencing Span of management Departmentation- Meaning- Factors- Bases of departmentation – Advantages & Disadvantages of different types of departmentation</p> | 15 | 3 |
| 4 | <p>UNIT- IV Authority – Sources of authority- Responsibility- Accountability, Power- Influence Delegation – Definition- Elements- Types- Need- Principles- Barriers – Measures to make delegation effective Centralisation-Decentralization-Merits & Demerits- Factors determining decentralization of authority-Distinction between delegation & decentralization Direction– Definition, Nature, Purpose- Elements-Principles Leadership-Functions of Leader- Qualities for a Leader-Theories and Styles of Leadership.</p> | 15 | 4 |
| 5 | <p>UNIT- V Co-ordination – Need, Types, Techniques and Requisites for excellent Co-ordination Controlling – Definition, Importance, Objectives, Control Process- Requirements for an effective control system- Techniques of control</p> | 15 | 5,6 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



TEXT BOOKS:

1. Gupta C. B. (2018). Business Management. 15th Ed. Sultan Chand & Sons, New Delhi. (ISBN: 978-93-5161-131-8)
2. Durai P. (2019). Principles of Management. 2nd Ed. Pearson Education India, New Delhi, India. (ISBN: 978-93-5306-539-3)
3. Prasad L. M. (2019). Principles and Practice of Management. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-050-2)
4. Tripathi, P. C., & Reddy P. N. (2017). Principles of Management. 6th Ed. MCGraw Hill Education, New Delhi, India. (ISBN: 978-93-5260-535-4)
5. Jayasankar, J. (2015). Principles of Management. Margham Publication, Chennai, Tamil Nadu, India.
6. Robbins, Stephen P., Coulter Mary K., & Randel. A. (2021) Management, 15th Ed. Pearson Education, Inc. US. (ISBN: 978-0-13-558185-8)

REFERENCE BOOKS:

1. Robbins, Stephen P., Coulter Mary A., & DeCenzo David A. (2020) Fundamentals of Management, 11th Ed. Pearson Education, Inc. US. (ISBN: 978-01-3489-880-3)
2. Koontz, Harold., & Weihrich, Heinz. (2020) Essentials of Management An International Perspective, 7th Ed. Tata McGraw-Hill Publishing, New Delhi, India. (ISBN: 978-00-7062-030-8)
3. Morden, Tony. (2021). Principles of Management. 2nd Ed. Routledge Taylor & Francis Group. UK. (ISBN: 978-10-3202-250-5)
4. Pagare Dinkar. (2018). Principles of Management. 6th Ed. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-120-5)
5. Sharma. R. K., Gupta, Shashi. K., & Sharma, Rahul. (2019). Principles of Management. Kalyani Publishers, New Delhi, India. (ISBN: 978-93-5359-796-2)

Note: Latest edition of the books to be referred



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Allied Paper I – PRINCIPLES OF MARKETING

| | |
|------------------------------|-----------------------|
| Course Code : 2106103 | Credits : 5 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Define the importance and role of marketing in the current business world. |
| CO2 | Analyze and demonstrate students towards application of marketing theories in the realm of current business scenario. |
| CO3 | Segment modern marketing methods in relation with global industrial practices. |
| CO4 | Explain Product life-cycle and relevant marketing strategies in various stages |
| CO5 | Discuss basic principles with illustrations to clearly explain elements of marketing. |
| CO5 | Categorize and compare business firms to carryout innovative modern marketing practices for better performance. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | - | 3 | 1 | 2 | 2 | 1 |
| CO2 | 2 | - | 2 | 1 | 2 | 1 | 1 |
| CO3 | 1 | - | 3 | 2 | 2 | 2 | 1 |
| CO4 | 2 | - | 2 | 1 | 2 | 1 | 1 |
| CO5 | 1 | - | 1 | 1 | 1 | 1 | 1 |
| CO6 | 2 | - | 2 | 1 | 3 | 1 | 1 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT- I Introduction to marketing – Meaning – Definition – Functions of Marketing- Functions of Exchange, Function of Physical Supply, Facilitating Functions – Role & Importance of Marketing –Marketing Concepts-Production concept, product concept, selling concept, Marketing concept, Societal concept- Classifications of Markets. | 18 | 1 |
| 2 | UNIT- II Marketing Environment – Micro Environment-Suppliers, Marketing Intermediaries, Customers, Competitors, Public- Macro Environment- Demographic, Economic, Political and legal, Social and Cultural, Physical, Technological | 18 | 2 |
| 3 | UNIT- III Market Segmentation – Concept – Benefits – Basis and Levels – Marketing Mix-- Meaning – Elements of Marketing Mix-Product, Price, Promotion, Distribution- Introduction to Product Life Cycle – Product Mix – Price – Pricing Policy & Methods. | 18 | 3,4 |
| 4 | UNIT- IV Channels of Distribution – Importance – Selection of Distribution Channel – Promotion Mix-Kinds & Factors affecting Promotion Mix, – Advertisement – Objectives – Kinds & Benefits – Sales Promotion & Personal Selling. | 18 | 4 |
| 5 | UNIT- V Consumer Behaviour – Factors influencing consumer behavior – consumer buying decision process – Buying Motives – Consumerism – Recent trends - E- marketing, Green marketing, Digital marketing, Video marketing, Social media marketing, Marketing through Artificial Intelligence. | 18 | 5 |

TEXT BOOKS:

1. Kotler. Philip., Armstrong. Gary., Harris. Lloyd. D., & He. Hongwei. (2020) Principles of Marketing. 8th Ed. Pearson Education, US. (ISBN:978-12-9226-956-6)
2. Jobber. David., & Ellis. Chadwick. Fiona. (2016) Principles and Practice of Marketing. 8th Ed. McGraw-Hill Inc., US. (ISBN: 978-00-7717-414-9)
3. Baines, Paul., Fill, Chris., Rosengren, Sara., & Antonetti, Paolo. (2017). Fundamentals of Marketing. OUP Oxford Publisher, US. (ISBN:978-01-9874-857-1)
4. Gupta, C. B., & Rajan. Nair. (2018). Marketing Management Text & Cases. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-121-9)
5. Baines, Paul., Fill, Chris., & Page, Kelly. (2018). Essentials of Marketing. Oxford University Press, US. (ISBN: 978-01-9873-476-5)
6. Jayasankar, J. (2016). Marketing. Margham Publication, Chennai, Tamil Nadu, India.



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



REFERENCE BOOKS:

1. Etzel, Michael., Walker Bruce, J., Stanton, William., & Pandit, Ajay. (2017) Marketing. 14th Ed. Tata McGraw Hill Education, US. (ISBN: 978-00-7015-156-7)
2. Sharma. Kavita., & Aggarwal, Swati. (2018) Principles of Marketing. Taxmann Publisher, New Delhi, India. (ISBN: 978-93-8795-783-1)
3. Kotler, Philip., & Keller, Lane Kevin. (2018) Marketing Management. 15th Ed. Pearson Education, India. (ISBN: 978-93-3258-740-3)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Non-Major Elective – I EVERYDAY BANKING

| | |
|------------------------------|-----------------------|
| Course Code : 2106104 | Credits : 2 |
| L:P:T:S : 2:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Define bank, pass book, cheque book. Fill up cheque deposit challan, Account opening form and other bank related transactions. Differentiate between Debit card and Debit card, compare fund transfer methods through ECS, NEFT and RTGS |
| CO2 | Create a strong pass word for online transactions, register for different sites for online transactions, pay utility bills through online, .transact through mobile banking for online purchase and payment of bills. |

Mapping cannot be done since the course is offered for other programmes

| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT- I Banking – Definition – pass book – Cheque book – Format of Cheque – Filling up of Cheque- Deposit Challan – Filling up – Clearing cheque – Transfer cheque – Collection Cheque – Payable at par – Demand Draft – application filling – Account Opening form – Filling up – Documents required - Debit Card – Credit Card – ATM Machine – Cash Deposit Machine/ Cash recycler – Pass book printing machine. MICR- IFSC- Fund transfer through ECS – NEFT – RTGS – Form filling for Fund transfer. | 12 | 1 |
| 2 | UNIT- II On line Banking – Sign up – Process – Requirements – Log in – Customer ID – User ID – Pass word – Hints for creating Pass words – change of pass word – on line transactions – Account statements – Fund Transfer – Payment of bills – Utility payments – Loans – Repayment for Loans – other services. Mobile Banking – meaning – importance – Advantages – Mobile Applications (App) – WAP (Wireless Application Protocol)- USSD (Unstructured Supplementary Service Data)- Registration process – through Mobiles – Process at Bank Branch – ATM- User ID-MPIN- change of MPIN –IMPS D(Immediate Mobile Payment System) - UPI(Unified Payment interface) – BHIM(Bharat Interface for money)- NPCI (National Payment Corporation of India) - Bank account Management – Transfer Funds – paying Bills – Locating ATMs - QR code payments- Alerts and notifications- Tracking Spending habits – Cash back-Safe banking methods | 12 | 2 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



REFERENCE BOOKS:

1. Santhanam, B (2019). Banking & Financial Systems, Margham Publications, Chennai, Tamil Nadu, India.
2. Maheshwari, S. N., & Maheshwari, S. K. (2014) Banking Theory, Law and Practice. Kalyani Publications, New Delhi, India. (ISBN: 978-81-272-6408-6)
3. Natarajan, S., & Parameswaran, R. (2019) Indian Banking: For the Students of B.com/B.A. and Management Courses. S. Chand Publishing, New Delhi, India. (978-81-2192-037-7)

WEB REFERENCES:

1. https://en.wikipedia.org/wiki/Online_banking
2. <https://www.sbi.co.in/portal/web/services/internet-banking>
3. <https://www.hdfcbank.com/assets/popuppages/netbanking.htm>
4. <https://www.investopedia.com/terms/m/mobile-banking.asp>
5. www.scotiabank.com/mobile/ca/en/0,,5181,00.html

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|-----------------|-------------------|--------------|----------------|-----------------|---------------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper III – FINANCIAL ACCOUNTING-II

| | |
|------------------------------|-----------------------|
| Course Code : 2106205 | Credits : 4 |
| L:P:T:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyse of the Branch Accounts and its importance in finding out the profits or losses in running a branch. |
| CO2 | Prepare Royalty payment and receivable chart, and Ledger Accounts in the books of Lessee and lessor. |
| CO3 | Calculate the interest to be paid in Hire purchase (Using the guidelines provided) and understanding the importance of hire purchase in the present day context. |
| CO4 | Analysing the problems in Admission, Retirement and Death of a partner, by calculating Revaluation, Partner's Capital Account, Sacrificing Ratio, Gaining Ratio, Good will and Revised Balance Sheet. |
| CO5 | Prepare accounts pertaining to dissolution of Partnership firm |
| CO6 | Analyse the problems in and Insolvency of a partner and calculating the Realisation, Partner's Capital, Deficiency and Bank Account for smooth closing of business. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | 3 | 2 | - | 2 | 2 | - |
| CO2 | 1 | 3 | 1 | 1 | 1 | - | - |
| CO3 | 1 | 3 | 1 | 1 | 1 | 1 | - |
| CO4 | 2 | 3 | 1 | - | 1 | 1 | - |
| CO5 | 1 | 3 | 1 | 1 | 1 | 1 | - |
| CO6 | 1 | 3 | 1 | 1 | - | 1 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENT OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT- I Branch Accounts-Types of Branches –Accounting treatment in respect of Dependent Branches- Debtors system- Stock & Debtors system Only- Importance of Stock and debtors system over Debtors system | 15 | 1 |
| 2 | UNIT- I Royalty accounts --Meaning –Minimum Rent, Shortworkings- Accounting treatment in the books of Lessor & Lessee- Effect of strike, Introduction to AS 19 accounting for lease. | 15 | 2 |
| 3 | UNIT- III Hire Purchase and Instalment System- Default and Repossession. | 15 | 3 |
| 4 | UNIT- IV Partnership Accounts – Admission of a Partner – Retirement of a Partner – Death of a Partner. | 15 | 4 |
| 5 | UNIT- V Dissolution of partnership – Insolvency of a partner (application of Garner Vs Murray rule) – Insolvency of all the partners, Gradual realization of assets and Piece meal distribution | 15 | 5,6 |

TEXT BOOKS:

1. Gupta R. L., & Gupta V. K. (2019). Financial Accounting. 8th Ed. Sultan Chand & Sons. New Delhi, India. (ISBN: 978-81-8054-732-4)
2. Jain. S. P., & Narang K. L. (2019). Financial Accounting. Kalyani Publishers, New Delhi, India. (ISBN: 978-93-2723-123-6)
3. Shukla, M. C., Gupta, S. C., & Grewal T. S. (2017). Advanced Accounts. 19 Ed. S. Chand Publishing, New Delhi, India. (ISBN: 978-93-5253-314-5)
4. The Institute of Chartered Accountants of India. (2018). Intermediate (IPC) Course Study Material - Paper-1 Accounting. The Institute of Chartered Accountants of India (ICAI), New Delhi, India.

REFERENCE BOOKS:

1. Gupta R. L., & Radhaswamy M. (2018). Advanced Accountancy, Vol. I. 13th Ed. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-81-8054-699-0)
2. Tulsian P. C. & Tulsian Bharat (2020). Tulsian's Principles and Practice of Accounting With Quick Revision Book. 5th Ed. CA Examination Series, MCGrawHil Education, New Delhi, India. (ISBN: 978-93-8981-169-8)
3. Tulsian P. C., & Tulsian Bharat. (2014). Financial Accounting for B.Com. (Programme). S Chand Publisher. New Delhi, India. (ISBN: 978-93-8431-940-3)
4. Tulsian P. C., & Tulsian Bharat. (2016). Accountancy with Quick Revision (For CA-IPC, Group -I), 11th Ed. S Chand Publisher. New Delhi, India. (ISBN: 978-9352531356)

Note: Latest edition of the books to be referred



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper IV– HUMAN RESOURCE MANAGEMENT

| | |
|------------------------------|-----------------------|
| Course Code : 2106206 | Credits : 4 |
| L: P:T:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | State the role of HR functions in an organization. |
| CO2 | Analyse the potential sources of recruitment for an organization, describe the procedure of selection and the various types of interviews |
| CO3 | Classify the various methods of training |
| CO4 | Explain the techniques of performance appraisal and various methods of promotions and transfers. |
| CO5 | Apply the concept of workers participation in management. |
| CO6 | Outline the procedure for handling employee grievances and the causes of indiscipline. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | - | 1 | 1 | 1 | 1 | 1 |
| CO2 | 2 | - | 1 | 1 | 3 | 2 | 1 |
| CO3 | 1 | - | 2 | 1 | 2 | 1 | 2 |
| CO4 | 2 | - | 2 | 2 | 2 | 1 | 1 |
| CO5 | 2 | - | 2 | - | 2 | 1 | - |
| CO6 | 1 | - | 2 | 1 | 2 | 2 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENT OF MODULE | Hrs | Cos |
|-------|--|-----|-----|
| 1 | UNIT – I Human Resource Management - Nature and Scope of the HRM - Managerial and Operating Functions - Difference between Personnel management and HRM, Environment of HRM- Recent trends-HRM Accounting, Meaning-Objectives- Need & Limitations, HR Audit- Nature, benefits and scope, Green HRM | 15 | 1 |
| 2 | UNIT- II Human Resource Planning – Recruitment – Factors affecting recruitment- Sources- Merits and demerits, Selection – Stages in Selection – Uses of various Tests – Interview techniques, Placement, Induction- Meaning and objectives. | 15 | 2 |
| 3 | UNIT- III Training – Meaning, Needs, Methods and Techniques – Learning & Development, Career planning & Progression, Performance Appraisal – Objectives, Methods, Benefits and limitations – Employee mobility- Promotion-Meaning- Basis-Seniority Vs Merit, Transfers- Types. | 15 | 3,4 |
| 4 | UNIT- IV Collective Bargaining- Meaning, objectives, Forms, Benefits & Limitations – Workers participation in Management – Types, Features and Methods of securing workers participation | 15 | 5 |
| 5 | UNIT- V Discipline management- Types of discipline, Code of discipline, Causes of indiscipline, Standing orders – Procedure for disciplinary action. Grievance – Meaning, causes, Identification of grievance – Procedure for redressal– Features of Sound grievance procedure | 15 | 6 |

TEXT BOOKS:

1. Aswathappa. K. (2019). Human Resource Management: Text & Cases. 9th Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5260-543-9)
2. Varrkey, Biju., & Dessler, Gary. (2020) Human Resource Management. 16th Ed. Pearson Education, US. (ISBN: 978-93-5394-220-5)
3. Gary, Dessler. (2017) Fundamentals of Human Resource Management. 14th Ed. Pearson Education, US. (ISBN: 978-93-3258-482-2)
4. Durai, Pravin. (2020) Human Resource Management. 3rd Ed. Pearson Education. India. (ISBN: 978-93-5343-426-7)
5. Gupta, C. B. (2018) Human Resource Management Text and Cases. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-123-3)
6. Prasad, L. M. (2018) Human Resource Management. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-111-0)

REFERENCE BOOKS:

1. Preet, Raman. (2019) Future of Human Resource Management: Case Studies with Strategic Approach. Wiley Publication, New Delhi, India. (978-81-2657-806-1)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



2. Rao, P. V. S. (2020) Human Resource Management. Taxman's Publication, New Delhi, India. (ISBN: 978-93-9012-839-6)
3. Noe, Raymond., Hollenbeck, John, R., Gerhart, Barry., & Wright, Patrick, M. (2019). Fundamentals of Human Resource Management. 7th Ed. McGraw-Hill Publication, New Delhi, India. (ISBN: 978-93-5316-677-9)
4. Edwards, Tony., & Rees, Chris. (2019). International Human Resource Management: Globalization, National Systems and Multinational Companies. Pearson Education, US.
5. Aswathappa, K., & Dash, Sadhna. (2020) International Human Resource Management. 3rd Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-8953-827-4)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Allied Paper –II -BUSINESS COMMUNICATION

| | |
|------------------------------|-----------------------|
| Course Code : 2106207 | Credits : 5 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Explain the Role and Importance of Business Communication to ensure the smooth flow of precise information through the Corporate/Entrepreneurial hierarchy. |
| CO2 | Identify and apply the features of various types of Business Letters in the context of Corporate/Entrepreneurial perspectives. |
| CO3 | Outline and understand the techniques and nuances of Modern Methods of Business Communication. |
| CO4 | Design and develop a procedural system of Corporate Correspondence with Government, Directors, Shareholders, Financial Institutions and Vendors. |
| CO5 | Preparation/ Drafting of various Statutory/Non-Statutory Reports and use of updated technological methods of Reporting. |
| CO6 | Develop a clear understanding of the crucial role of Business Communication in Decision Making and success of the business enterprise. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 3 | - | 3 | 2 | 2 | 3 | 1 |
| CO2 | 1 | - | 2 | 2 | 3 | 1 | 1 |
| CO3 | 2 | - | 2 | 1 | 1 | 2 | 3 |
| CO4 | 1 | - | 2 | 1 | 1 | 2 | 1 |
| CO5 | 3 | - | 3 | 1 | 1 | 3 | 1 |
| CO6 | 2 | - | 1 | 2 | 1 | 1 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT – I Business communication – meaning – importance – types – directions – network – process – barriers to effective communication – importance of interpersonal skills, listening skills and emotional intelligence in workplace Layout of business letter – structure of business letter – Date, Salutation, Subject, Body, complementary close, enclosures- Essentials of good business letter | 18 | 1 |
| 2 | UNIT – II Trade enquiries and replies - quotations - Orders - Complaints and Settlement Trade references and status enquiries – collection Letters - Circular letters, Application for appointments and resume. | 18 | 2 |
| 3 | UNIT – III Internal Correspondence – circular, notices, note preparation, announcements, memo, press release Communication before and after meeting – notice and agenda, minutes – Do’s and Dont’s while drafting minutes | 18 | 3 |
| 4 | UNIT – IV Corporate Correspondence - Correspondence with Directors - Shareholders – Government agencies and others | 18 | 4 |
| 5 | UNIT – V Reports - kinds - Annual report - Report by individuals and committees - Report on meeting – Role of technology in Business Correspondence – E-mail- writing effective emails, tips and conventions of mail, Social media communication – ethics and limitations. | 18 | 5,6 |

TEXT BOOKS:

1. Raman, Meenakshi., & Singh, Prakash. (2019) Business Communication. 2nd Ed. Oxford University Press, US. (ISBN: 978-01-9807-705-3)
2. Kaul, Asha. (2018) Business Communication. PHI Learning, New Delhi, India. (ISBN: 978-81-2033-848-7)
3. Kaul, Asha. (2018) Effective Business Communication. PHI Learning, New Delhi, India. (ISBN: 978-81-2035-072-4)
4. Mukherji, Shoma., & Jain, Neera. (2020). Effective Business Communication. 2nd Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-8981-194-0)
5. Sharma, R. C., Mohan, Krishna., Nirban Singh, Virendra. (2020) Business Correspondence and Report Writing - A Practical Approach to Business and Technical Communication. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-9011-300-2)
6. Verma, Shalini. (2017) Business Communication: Essential Strategies for Twenty-first Century Managers. S Chand Publishers, New Delhi, India. (ISBN: 978-93-2598-117-1)
7. Chaney, Lillian., & Martin, Jeanette. (2014) Intercultural Business Communication, Pearson Education, US. (ISBN: 978-93-3253-680-7)
8. Pal, Rajendra., & Korlahalli, J. S. (2016) Essentials of Business Communication. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-81-8054-729-4)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



9. Kalia, Shalini., & Agarwal, Shailja. (2019) Business Communication - A Practice Oriented Approach. Wiley Education, New Delhi, India. (ISBN: 978-81-2655-479-9)
10. Raghunathan, N. S., & Santhanam, B. (2019) Business Communication, Margham Publications, Chennai, Tamil Nadu, India.

REFERENCE BOOKS:

1. Chaturvedi, P. D. & Chaturvedi, Mukesh. (2020) The Art and Science of Business Communication: Skills, Concepts, Cases and Applications. Pearson Education, New Delhi, India. (ISBN: 978-93-3258-738-0)
2. Rentz, Kathryn., Lentz, Paula., & Das, Anupam. (2020). Business Communication A Problem-Solving Approach. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-9018-583-2)
3. Murphy, A. Herta., Hildebrandt, W. Herbert., & Thomas, Jane P. (2018) Effective Business Communication. McGraw-Hill Education, US. (ISBN: 978-00-7018-775-7)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Non Major Elective – II FUNDAMENTALS OF INSURANCE

| | |
|------------------------------|-----------------------|
| Course Code : 2106208 | Credits : 2 |
| L:P:T:S : 2:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Define Insurance, discuss the principles of Insurance, explain the objectives and functions of Insurance, compare the different types of insurance, Explain the duties and functions of IRDA |
| CO2 | Compare the different types of policies in life insurance, fill up the documents relating to insurance, explain the benefits of mediclaim policy, identify and analyse the advantages of Mediclaim policy, discuss the procedure and mode of settlement |

Mapping cannot be done since the course is offered for other programmes

| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|--------------|--|------------|------------|
| 1 | UNIT – I Insurance – Meaning and definition – Features - Principles of Insurance – Objectives and advantages - Types of Insurance – Insurance Regulatory and Development Authority – its Duties and Functions | 12 | 1 |
| 2 | UNIT – II Life Insurance – Types of policies in Life Insurance– Documentation for Insurance – Proposal – Medical Checkup – Cover note - Policy Document. – Mediclaim insurance – objectives – Advantages including I.T. Exemptions - eligibility and coverage – conditions – mode of payments – procedure for claims – mode of settlement – grievance settlement | 12 | 2 |

REFERENCE BOOKS:

1. Karthikeyan, M. Eswari. (2020) Fundamental Principles of Insurance. Sahitya Bhawan Publications, India. (ISBN: 978-81-9441-239-7)
2. Dayal, Hargovind. (2017) The Fundamentals of Insurance - Theories, Principles and Practices. Notion Press, India. (ISBN: 978-19-4794-967-6)
3. Mishra, Kaninika. (2019) Fundamentals of Life Insurance: Theories and Applications. PHI Learning, New Delhi, India. (ISBN: 978-81-2035-266-7)
4. Mishra, M. N., & Mishra, S. B. (2018) Insurance Principles & Practice. S. Chand & Co. New Delhi, India. (ISBN: 978-93-8567-607-9)
5. Sharama, B. S. (2011) Basic Principles of Insurance Applications and Practices. Vista International Publishing House, India. (ISBN: 978-93-8023-961-3)
6. Sengupta Mrinal Chandra, Insurance Finance, Progressive Publishers, New Delhi



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



7. Murthy, A. (2018) Principles and Practice of Insurance. Margham Publications, Chennai, Tamil Nadu, India.

Note: Latest edition of the books to be referred

WEB REFERENCES

1. <https://www.licindia.in/Products/Insurance-Plan>
2. <https://www.policybazaar.com/life-insurance/>
3. <https://www.bankbazaarinsurance.com/insurance/life-insurance.html>
4. <https://nationalinsuranceindia.nic.co.in/portal/page/portal/Corporate/Home/HealthInsuranceProduct>
5. <https://www.starhealth.in/health-insurance-plans>
6. <https://www.apollomunichinsurance.com/mediclaim/mediclaim-policies-in-india.aspx>
7. <https://www.reliancegeneral.co.in/Insurance/Health-Insurance/Health-Gain-Insurance-EMI.aspx>

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper –V - CORPORATE ACCOUNTING-I

| | |
|------------------------------|-----------------------|
| Course Code : 2106309 | Credits : 4 |
| L:P:T:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Define share, Enumerate the types of shares, journalize the transactions relating to issue of shares, forfeiture & reissue of shares. Explain ESOP, buyback of shares and its accounting treatment |
| CO2 | Define a Debenture, identify different types of debentures, Journalise the transactions relating to issue. Understand the Sinking fund mechanism for redemption of debentures. Differentiate between cum interest and ex-interest quotations, compute the loss on cancellation of own debentures, journalize the transactions relating to conversion of debentures. Understand the concept of Underwriting, Compute the net liability of underwriter and the amount of final settlement. |
| CO3 | Define a Preference share. Analyse the conditions relating to redemption of preference shares |
| CO4 | Analyse the sources relating to redemption of debentures & Journalize. Compute the profit prior to incorporation. |
| CO5 | Analyze the need for preparation and presentation of Final accounts of the companies. Understand the format of Profit and loss account and balance sheet. Journalise the adjustment entries and demonstrate their effect in P&L account and B/S. Compute Managerial remuneration, depreciation as per schedule II and Deferred tax. |
| CO6 | Explain Valuation of intangibles as per AS 26 and Compute the value of goodwill. Identify the need for valuation of shares. Compare the different methods of valuation of shares. Compute the value of shares. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | 2 | 1 | 1 | 1 | 2 | - |
| CO2 | 1 | 2 | 1 | 1 | 1 | 2 | - |
| CO3 | 1 | 3 | 1 | 1 | 1 | 2 | - |
| CO4 | 1 | 2 | 1 | 1 | 1 | 1 | - |
| CO5 | 1 | 3 | 2 | 1 | 1 | 1 | - |
| CO6 | 2 | 2 | 1 | 1 | 1 | 1 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs. | Cos |
|-------|--|------|-----|
| 1 | UNIT – I Issue of Shares – various kinds – Forfeiture – Re-issue – Accounting for ESOP, Buy back of shares | 15 | 1 |
| 2 | UNIT – II Issue of Debentures – Sinking fund – purchase and cancellation of own debentures – Cum-interest and Ex-interest quotations - conversion of debentures. Underwriting of Shares and Debentures. | 15 | 2 |
| 3 | UNIT – III Redemption of Preference Shares, Redemption of debentures – Profits prior to Incorporation. | 15 | 3,4 |
| 4 | UNIT – IV Preparation of Company Final Accounts as per Schedule III Companies Act 2013– Computation of Managerial Remuneration, Depreciation as per Schedule II of Companies Act 2013, Computation of deferred tax | 15 | 5 |
| 5 | UNIT – V Valuation of Intangibles [AS 26] - Goodwill, Copyrights, Patents, Trademarks. Valuation of Shares, Securities and financial assets [As per the procedure laid by IBBI] | 15 | 6 |

TEXT BOOKS:

1. Goyal Kumar, Bhushan. (2021). Corporate Accounting: (Set of 2 Volumes). Taxman's Publication, New Delhi, India. (ISBN: 978-93-9083-159-3)
2. Shukla, S. M. (2019) Practical Problems of Corporate Accounting. Sahitya Bhawan Publications, India. (ISBN: 978-93-5173-621-9)
3. Shukla, S. M., & Gupta, K. L. (2021) Corporate Accounting. Sahitya Bhawan Publications, India. (ISBN: 978-93-5173-889-3)
4. Hanif, M., & Mukherjee, A. (2020) Corporate Accounting. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5260-556-9)
5. Zad, N. S. (2021) MCQs on Corporate & Management Accounting (Theory and Problem Based MCQs). Taxmann's Publication, India. (ISBN: 978-93-9058-566-3)
6. Jain, S. P., & Narang, K. L. (2015) Corporate Accounting. Kalyani Publishers, New Delhi, India. (ISBN: 978-93-2725-071-8)
7. Gupta R. L., & Radhaswamy M. (2018). Advanced Accountancy, Vol. I. 13th Ed. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-81-8054-699-0)
8. Shukla, M. C., Gupta, S. C., & Grewal T. S. (2017). Advanced Accounts. 19 Ed. S. Chand Publishing, New Delhi, India. (ISBN: 978-93-5253-314-5)
9. The Institute of Chartered Accountants of India. (2018). Intermediate (IPC) Course Study Material - Paper-1 Accounting. The Institute of Chartered Accountants of India (ICAI), New Delhi, India.



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



10. Maheshwari, S. N., & Maheshwari, Suneel K., & Maheshwari, Sharad K. (2018). Corporate Accounting. 6th Ed. Vikas Publishing House, Chennai, Tamil Nadu, India. (ISBN: 978-93-5271-858-0)

REFERENCE BOOKS:

1. Reddy, T. S. (2019) Corporate Accounting. Margham Publications, Chennai, Tamil Nadu, India.
2. Tulsian P. C. & Tulsian Bharat (2020). Tulsian's Principles and Practice of Accounting with Quick Revision Book. 5th Ed. CA Examination Series, MCGrawHill Education, New Delhi, India. (ISBN: 978-93-8981-169-8)
3. Mukherjee, Soumya., & Mukherjee, Kr. Abhik. (2019) Corporate Accounting. Oxford University Press, India. (ISBN: 978-01-9012-405-2)
4. Radhika, P., & Raman, Anita. (2018) Advanced Corporate Accounting. McGraw-Hill Publication, New Delhi, India. (ISBN: 978-93-5316-493-5)
5. IBBI (2020) Guidelines on Use of Caveats, Limitations and Disclaimers by the Registered Valuers in Valuation Reports. Insolvency and Bankruptcy Board of India, India. (Retrieved from URL: <https://ibbi.gov.in/>)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper VI - COMPANY LAW AND SECRETARIAL PRACTICE – I

| | |
|------------------------------|-----------------------|
| Course Code : 2106310 | Credits : 4 |
| L: P:T:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Define the important terms in Company's Act 2013, classification of Companies and Secretarial standards |
| CO2 | Identify the Rights, Duties and liabilities of Company Secretary. |
| CO3 | Apply the provisions of Company's Act for Incorporation and Registration of Companies and compliance procedure to be adopted by a Company Secretary. |
| CO4 | Discuss the Content of Prospectus and liabilities for misstatement of prospectus. Elaborate the procedure for issue of securities, listing obligations and disclosure requirements. |
| CO5 | Define share, classify its types, differentiate Transfer from Transmission of Shares |
| CO6 | Explain the Role of Members in a Company, Modes of acquisition of membership and their rights and liabilities. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 3 | - | 1 | 1 | 2 | 1 | - |
| CO2 | 2 | - | 1 | 1 | 2 | 2 | - |
| CO3 | 3 | - | 1 | 2 | 2 | 2 | 1 |
| CO4 | 1 | - | 2 | 2 | 1 | 1 | - |
| CO5 | 1 | - | 1 | - | 1 | 1 | - |
| CO6 | 1 | - | 1 | - | 1 | 1 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENT OF MODULE | Hrs | Cos |
|-------|--|-----|-----|
| 1 | UNIT – I Introduction- The Companies Act 2013 – Applicability Definition of Company – Characteristics – Kinds of Companies [including key amendments such as One person company, Small company, Dormant company, Associate company, Producer company], Introduction to Limited Liability Partnership – Distinction between LLP and Company Company Secretary – Definition – Functions U/s 205 – Duties – Role & Responsibilities – statutory duties and liabilities – appointment – removal- An overview of Secretarial standards SS 1- SS 4 | 15 | 1,2 |
| 2 | UNIT – II Formation of Company – Incorporation – Documents to be filed with Registrar – Certificate of Incorporation – Effects of registration – Promoter – Preliminary Contracts – Duties of secretary at the promotion stage, Commencement of business Memorandum of Association – Clauses- Doctrine of Ultra Vires – Alteration Articles of Association – Contents – Entrenchment- alterations – Doctrine of Indoor Management – Distinction between MoA & AoA- Secretary’s duties relating to drafting of MoA & AoA | 15 | 3 |
| 3 | UNIT – III Prospectus – matters to be stated in prospectus – Shelf Prospectus - Red herring prospectus – Abridged Prospectus- Golden rule of Legacy- Mis-statement in prospectus and their consequences- Investors right of Rescission- Conditions. Issue of securities- Public offer and private placement- Dematerialisation & Rematerialisation of securities- Allotment of Securities- Legal provisions governing allotment- Effect of irregular allotment- Share certificate- Provisions and Legal effect- Listing of securities - LODR | 15 | 4 |
| 4 | UNIT – IV Share Capital – Classification – Kinds of shares – Issue of shares at a premium, Prohibition of issue of shares at discount – Issue of sweat equity shares- Alteration of share capital- Further issue of share Capital- Rights shares - ESOP– Bonus shares – Reduction of share capital- Buy Back - Secretary’s duties in connection with issue of shares - Transfer and Transmission of shares- Procedure for transfer- Duties of a secretary for transfer of shares- Grounds for transmission- Distinction between transfer and transmission. | 15 | 5 |
| 5 | UNIT – V Member of a company – Modes of acquiring membership – Who can become a member- Cessation of membership- Rights and liabilities of members – Register and index of members – Shareholders agreement | 15 | 6 |

TEXT BOOKS:

1. Kapoor, N. D. (2020) Company Law and Secretarial Practice. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-167-7)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



2. Dedhia, Vinita Nair., & Ghosh, Abhirup. (2021) Law & Practice Relating to Corporate Bonds & Debentures. Taxmann's Publications, India. (ISBN: 978-93-9058-508-3)
3. Gaffoor, P. M. S., & Thothadri, S. (2014) Company Law & Secretarial Practice II. Vijay Nicole Imprints Publication, Chennai, Tamil Nadu, India. (ISBN: 978-81-8209-368-3)
4. Jain, Anoop. (2019) A Simplified Approach to Advance Company Law. AJ Publications, India.
5. Corporate Professionals (2020) Handbook of Company Law Procedures. Corporate Professionals Publication, India. (ISBN: 978-93-8970-272-9)
6. Zad, N. S., & Bajpai, Divya. (2020) Company Law. Taxmann's Publication, India. (ISBN: 978-93-8992-145-8)
7. Shukla, S. M., & Jain, K. (2021) Company Law and Secretarial Practice. Sahitya Bhawan Publications, India. (ISBN: 978-81-9523-155-3)
8. Gogna, P. P. S. (2016) A Textbook of Company Law. S. Chand Publishing, New Delhi, India. (ISBN: 978-93-5253-120-2)
9. ICSI (2020). Company law Study Material for Executive Programme. Institute of Company Secretaries of India, New Delhi, India.
10. ICSI (2020). Company law Study Material for Professional Programme. Institute of Company Secretaries of India, New Delhi, India.

REFERENCE BOOKS:

1. Taxmann (2021) Companies Act 2013 – As Amended by the Companies (Amendment) Act 2020. Taxmann's Publications, New Delhi, India. (ISBN: 978-93-9058-594-6)
2. Ojha, Avadhesh., Baxi, Amit., Lalwani, Pragya., & Bhandari, Pragya. (2021) Company Law and Practices: Comprehensive Yet Compact all Inclusive Facility. Tax Publishers, Jodhpur, Rajasthan, India.

Note: Latest edition of the books to be referred



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks) - Bloom's Taxonomy

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Allied Paper III - BUSINESS STATISTICS

| | |
|------------------------------|-----------------------|
| Course Code : 2106311 | Credits : 5 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Define statistics and identify various sources of data and methods of collection of data, Diagrammatic presentation of data and Interpretation |
| CO2 | Calculate measures of central tendency and explain their implication on Business performance. Compute various Measures of Dispersion |
| CO3 | Analyze different types of correlation and interpret the relationship between two variables. Define Regression analysis. State its importance in business decisions. List the uses of regression. Differentiate regression and correlation analysis. Develop two regression Lines. |
| CO4 | Define Time series and identify its methods. State the importance of time series. Analysis the situations in which weighted and unweighted index numbers are useful. Analyze the secular trend, seasonal fluctuations and cyclical fluctuations. Develop trend analysis for the upcoming years using the given data. |
| CO5 | Define Index Numbers. State its uses in business decisions making. Discuss the problems involved in the construction of an index number. Construct un-weighted index Number. |
| CO6 | Analysis the steps involved in constructing the cost index numbers. Illustrate Laspeyres, Paasche's, and Fisher's Index Numbers. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | 1 | 2 | 1 | 2 | 2 | - |
| CO2 | 1 | - | 2 | 1 | 2 | 2 | - |
| CO3 | 3 | 2 | 2 | 1 | 2 | 2 | - |
| CO4 | 1 | - | 2 | 2 | 2 | 3 | - |
| CO5 | 1 | - | 2 | 1 | 2 | 2 | - |
| CO6 | 1 | - | 2 | 2 | 2 | 2 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S. No. | CONTENTS OF MODULE | Hrs | Cos |
|--------|--|-----|-----|
| 1 | UNIT – I Statistics- Meaning & Definition - Sources of Statistical data – Primary and Secondary – Collection of Primary Data – Collection of Secondary Data. Classification and Tabulation of Data – Types and Importance – Presentation of Data including Diagrammatic and Graphical methods – Bar Diagram, Pie Diagram, Histogram and Ogive. Frequency Distribution – Frequency Table – Structure and Formation – Discrete and Continuous Series. | 18 | 1 |
| 2 | UNIT – II Measures of Central Tendency / Averages – Arithmetic Mean, Median, Quartiles, Mode, Geometric, Harmonic Mean, Combined Mean and Weighted Mean. Measures of Dispersion – Range, Quartile Deviation, Mean Deviation and Standard Deviation | 18 | 2 |
| 3 | UNIT – III Correlation Analysis – Meaning, Definition, Significance and Types of Correlation, Scatter Diagram, Karl Pearson’s Coefficient of Correlation – Spearman’s Rank Correlation. Regression Analysis – Meaning and Importance – Regression Equations.- Application of regression analysis in Business decisions | 18 | 3 |
| 4 | UNIT – IV Time Series Analysis – Meaning, Need and Components of Time Series – Different Methods – Simple Average Method – Free hand, Semi Average, Moving Average and Least Square Method | 18 | 4 |
| 5 | UNIT – V Index Numbers – Definition, uses, Problems in the construction of Index Numbers Methods of construction of Index Numbers – Types – Unweighted and Weighted Index Numbers. Simple Aggregative method – Simple average of Price Relatives Methods Weighted Index numbers - Laspeyres, Paasche’s, and Fisher’s Index Numbers – Time and Factor Reversal Tests – Cost of Living Index. | 18 | 5,6 |

TEXT BOOKS:

1. Sharma, J. K. (2014) Fundamentals of Business Statistics. Vikas Publishing House, India. (ISBN: 978-93-2597-616-0)
2. Agarwal, B. L. (2013) Basic Statistics. New Age International Publishers, India. (ISBN: 978-81-2243-380-7)
3. Thukral, J. K. (2019) Fundamentals of Business Statistics. Taxmann's Publications, New Delhi, India. (ISBN: 978-93-8618-903-5)
4. Sharma, J. K. (2020) Business Statistics. 5th Ed. Vikas Publishing, India. (ISBN: 978-93-5338-727-3)
5. Levine, David M., Stephan, David F., Szabat, Karthryn A., & Viswanatha, P. K. (2017) Business Statistics: A First Course. 7th Ed. Pearson Education, US. (ISBN: 978-93-3257-895-1)
6. Vohra, N. D. (2017) Business Statistics. McGraw-Hill Education, New Delhi, India. (ISBN: 978-12-5900-487-2)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



7. Doane, David P., Seward, Lori E., & Chowdhury, Shovan. (2020) Applied Statistics in Business and Economics. 6th Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-9011-304-0)
8. Gupta, S. C. (2018) Fundamentals of Statistics. Himalaya Publishing House, New Delhi, India. (ISBN: 978-93-5051-769-7)
9. Gupta, S. P. (2019) Statistical Methods. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-112-7)
10. Gupta, S. C., & Kapoor, V. K. (2020) Fundamentals of Mathematical Statistics. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-173-8)
11. Jaggia, Sanjiv., & Kelly, Alison. (2020) Business Statistics: Communicating with Numbers. 2nd Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-8994-979-7)
12. D.C. Sancheti & V.K. Kapoor- Business Statistics- Sultan Chand & Sons
13. R.S.N.Pillai & V.Bhagavathi – Statistics, S.Chand & Co.

REFERENCE BOOK:

1. Bowerman, Bruce., Connell, Richard O., & Murphree, Emilly. (2019) Business Statistics in Practice: Using Data, Modeling, and Analytics. 8th Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5316-650-2)
2. Anderson, David R., Sweeney, Dennis J., Williams, Thomas A., & Camm, Jeffrey D. (2019) Statistics for Business & Economics. Cengage Learning Publisher, India. (ISBN: 978-93-5350-251-5)
3. Levin, Richard I., Massod H. Siddiqui., David Rubin S., & Sanjay, Rastogi. (2017) Statistics for Management. 8th Ed. Pearson Education, US. (ISBN: 978-81-8495-749-5)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper VII - CORPORATE ACCOUNTING -II

| | |
|------------------------------|-----------------------|
| Course Code : 2106412 | Credits : 4 |
| L:P:T:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Explain the concept of financial reporting. Compare the objectives of financial statements and financial reporting. Identify the users in financial reporting. State the qualitative characteristics, the benefits of financial reporting and reporting under AS 17. |
| CO2 | Identify and analyse different types of amalgamations. Explain the conditions for amalgamations under AS-14, Compute the purchase consideration, prepare the journal entries in the books of transferor company and transferee company. |
| CO3 | Describe the procedure for external reconstruction, apply AS 103 for business combination. |
| CO4 | Explain the need for alteration of share capital. Discuss the procedure for alteration of share capital. Prepare the journal entries for internal reconstruction and capital reduction. Prepare the balance sheet after reconstruction |
| CO5 | Define Holding and subsidiary company, Classify the profits into capital and revenue, compute Cost of control, Minority interest, prepare the consolidated B/S as per AS 21 |
| CO6 | Outline the IBC and CIRP. Compare different methods of liquidation. Compute the commission payable to liquidator. Prepare the Liquidator's final statement of account. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | 3 | 1 | 1 | 1 | 2 | - |
| CO2 | 1 | 2 | 2 | - | 2 | 2 | - |
| CO3 | 1 | 2 | 2 | 1 | 1 | 1 | - |
| CO4 | 1 | 3 | 2 | 1 | 1 | 1 | - |
| CO5 | 1 | 2 | 2 | 1 | 1 | 1 | - |
| CO6 | 1 | 3 | 2 | 1 | 2 | 2 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs. | Cos |
|-------|---|------|-----|
| 1 | UNIT – I Financial reporting - Concept – Objectives - Financial Statements – Objectives, Users in Financial reporting. Qualitative characteristics of financial reporting information – Benefits of Financial reporting, Introduction to AS 17- Segment Reporting- Simple problems. An overview of Business Responsibility and Sustainability Reporting | 15 | 1 |
| 2 | UNIT – II Amalgamation AS 14 – Absorption and external reconstruction of a company – (inter-Company investments excluded), Introduction to Ind AS 103- Business Combinations, Introduction of Demerger and Slump sale | 15 | 2,3 |
| 3 | UNIT – III Alteration of Share Capital, Accounting treatment for Internal Reconstruction and Reduction of Capital. Preparation of revised and reduced Balance sheet | 15 | 4 |
| 4 | UNIT – IV Holding Company Accounts AS 21 – Capital profits and Revenue profits – Cost of control– Non-Controlling interest – Mutual Owings – Unrealized profit on stock – Revaluation of assets and Liabilities- Bonus issue out of pre-acquisition profits & Post acquisition profits, Preparation of Consolidated Balance sheets. | 15 | 5 |
| 5 | UNIT – V Basics of Insolvency and Bankruptcy Code- Corporate insolvency resolution process [CIRP], Liquidation – Liquidator’s final statement of receipts and payments. | 15 | 6 |

TEXT BOOKS:

1. Goyal Kumar, Bhushan. (2021). Corporate Accounting: (Set of 2 Volumes). Taxman's Publication, New Delhi, India. (ISBN: 978-93-9083-159-3)
2. Shukla, S. M. (2019) Practical Problems of Corporate Accounting. Sahitya Bhawan Publications, India. (ISBN: 978-93-5173-621-9)
3. Shukla, S. M., & Gupta, K. L. (2021) Corporate Accounting. Sahitya Bhawan Publications, India. (ISBN: 978-93-5173-889-3)
4. Hanif, M., & Mukherjee, A. (2020) Corporate Accounting. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5260-556-9)
5. Zad, N. S. (2021) MCQs on Corporate & Management Accounting (Theory and Problem Based MCQs). Taxmann's Publication, India. (ISBN: 978-93-9058-566-3)
6. Jain, S. P., & Narang, K. L. (2015) Corporate Accounting. Kalyani Publishers, New Delhi, India. (ISBN: 978-93-2725-071-8)
7. Gupta R. L., & Radhaswamy M. (2018). Advanced Accountancy, Vol. I. 13th Ed. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-81-8054-699-0)
8. Shukla, M. C., Gupta, S. C., & Grewal T. S. (2017). Advanced Accounts. 19 Ed. S. Chand Publishing, New Delhi, India. (ISBN: 978-93-5253-314-5)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



9. The Institute of Chartered Accountants of India. (2018). Intermediate (IPC) Course Study Material - Paper-1 Accounting. The Institute of Chartered Accountants of India (ICAI), New Delhi, India.
10. Maheshwari, S. N., & Maheshwari, Suneel K., & Maheshwari, Sharad K. (2018). Corporate Accounting. 6th Ed. Vikas Publishing House, Chennai, Tamil Nadu, India. (ISBN: 978-93-5271-858-0)

REFERENCE BOOKS:

1. Reddy, T. S. (2019) Corporate Accounting. Margham Publications, Chennai, Tamil Nadu, India.
2. Tulsian P. C. & Tulsian Bharat (2020). Tulsian's Principles and Practice of Accounting With Quick Revision Book. 5th Ed. CA Examination Series, MCGrawHill Education, New Delhi, India. (ISBN: 978-93-8981-169-8)
3. Mukherjee, Soumya., & Mukherjee, Kr. Abhik. (2019) Corporate Accounting. Oxford University Press, India. (ISBN: 978-01-9012-405-2)
4. Radhika, P., & Raman, Anita. (2018) Advanced Corporate Accounting. McGraw-Hill Publication, New Delhi, India. (ISBN: 978-93-5316-493-5)
5. IBBI (2020) Guidelines on Use of Caveats, Limitations and Disclaimers by the Registered Valuers in Valuation Reports. Insolvency and Bankruptcy Board of India, India. (Retrieved from URL: <https://ibbi.gov.in/>)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper VIII - COMPANY LAW & SECRETARIAL PRACTICE- II

| | |
|------------------------------|-----------------------|
| Course Code : 2106413 | Credits : 4 |
| L:P:T:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: at the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Identify different types of borrowings, define the term debentures under Companies Act 2013, state the legal provisions and classify debentures. Explain Creation of charge. |
| CO2 | Apply the provisions of Companies Act 2013 for appointment, removal, remuneration of the directors and their role in company administration |
| CO3 | Describe role of secretary and statutory provisions for conduct of meetings of company |
| CO4 | Discuss the rules pertaining to dividend and unclaimed dividend |
| CO5 | Explain the modes of appointment, rights and duties of the auditors. |
| CO6 | Outline the winding up process of companies as per Companies Act 2013 and IBC |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | - | 2 | 1 | 1 | 1 | - |
| CO2 | 1 | - | 1 | 1 | 2 | 2 | - |
| CO3 | 2 | - | 2 | 1 | 2 | 1 | - |
| CO4 | 1 | - | 1 | 1 | 2 | 1 | - |
| CO5 | 1 | - | 3 | 2 | 3 | 2 | 1 |
| CO6 | 1 | - | 2 | 2 | 2 | 1 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|--|-----|-----|
| 1 | UNIT – I Borrowing- Power of Company to borrow – Types of borrowing – <i>Ultra Vires</i> Borrowing – Debentures – Definition – Types – Difference between Debentures and Shares- Debenture Trustee- Appointment – Duties- Debenture Trust deed- Legal provisions for issue of debentures – An Overview of acceptance of deposits. Charge –Definition- Need for creation of charge - Fixed and floating charges – Registration of charges- Crystallization of Floating charge-Consequences of non-registration of charge - Secretarial duties relating to registration of charges- Mortgage and charge | 15 | 1 |
| 2 | UNIT – II Company management – Appointment of Key managerial personnel- Directors – Independent Directors – Women directors – DIN (Director Identification Number) – Appointment – Disqualification –Maximum no. of directorship-duties – vacation – Resignation – Removal – Powers of Board – Restrictions on powers of Board- Secretarial duties relating to appointment of directors. | 15 | 2 |
| 3 | UNIT – III Meeting- Annual General Meetings - Extra Ordinary General Meeting – Board meeting –Virtual meetings- Secretarial work relating to meetings – Notice – Quorum- Chairman of the meeting - Proxy - Voting and Poll -Resolutions – Types – Minutes – Duties of secretary before , during and after meeting | 15 | 3 |
| 4 | UNIT – IV Dividend – Definition – Interest & Dividend- Types of Dividend-Provisions relating to declaration of dividend- Unpaid dividend account-Investor education and Protection Fund Corporate Social Responsibility- Disclosure requirements Books of accounts – Legal Provisions- Financial Statements – Annual Return – Statutory books - NFRA Auditor – Qualification & Disqualification – Appointment – Powers and duties – Rights- Cost audit- Internal audit | 15 | 4,5 |
| 5 | UNIT – V Winding up – Modes of winding up – Winding up by National Company Law Tribunal –Circumstances- Petition for winding up – Powers of tribunal-Voluntary Liquidation process - Duties of secretary in respect of winding up Introduction to Insolvency Bankruptcy Code [IBC] – Overview of Procedures prescribed. | 15 | 6 |

TEXT BOOKS:

1. Kapoor, N. D. (2020) Company Law and Secretarial Practice. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-167-7)
2. Dedhia, Vinita Nair., & Ghosh, Abhirup. (2021) Law & Practice Relating to Corporate Bonds & Debentures. Taxmann's Publications, India. (ISBN: 978-93-9058-508-3)
3. Gaffoor, P. M. S., & Thothadri, S. (2014) Company Law & Secretarial Practice II. Vijay Nicole Imprints Publication, Chennai, Tamil Nadu, India. (ISBN: 978-81-8209-368-3)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



4. Jain, Anoop. (2019) A Simplified Approach to Advance Company Law. AJ Publications, India.
5. Corporate Professionals (2020) Handbook of Company Law Procedures. Corporate Professionals Publication, India. (ISBN: 978-93-8970-272-9)
6. Zad, N. S., & Bajpai, Divya. (2020) Company Law. Taxmann's Publication, India. (ISBN: 978-93-8992-145-8)
7. Shukla, S. M., & Jain, K. (2021) Company Law and Secretarial Practice. Sahitya Bhawan Publications, India. (ISBN: 978-81-9523-155-3)
8. Gogna, P. P. S. (2016) A Textbook of Company Law. S. Chand Publishing, New Delhi, India. (ISBN: 978-93-5253-120-2)
9. ICSI (2020). Company law Study Material for Executive Programme. Institute of Company Secretaries of India, New Delhi, India.
10. ICSI (2020). Company law Study Material for Professional Programme. Institute of Company Secretaries of India, New Delhi, India.

REFERENCE BOOKS:

1. Taxmann (2021) Companies Act 2013 – As Amended by the Companies (Amendment) Act 2020. Taxmann's Publications, New Delhi, India. (ISBN: 978-93-9058-594-6)
2. Shanthi, J. (2016) Company Law & Secretarial Practice. Margham Publication, Chennai, Tamil Nadu, India. (ISBN: 978-93-8324-257-3)
3. Ojha, Avadhesh., Baxi, Amit., Lalwani, Pragya., & Bhandari, Pragya. (2021) Company Law and Practices: Comprehensive Yet Compact all Inclusive Facility. Tax Publishers, Jodhpur, Rajasthan, India.

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAMS (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Allied Paper IV - BUSINESS ECONOMICS

| | |
|------------------------------|-----------------------|
| Course Code : 2106414 | Credits : 5 |
| L: P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to: 33

| | |
|------------|---|
| CO1 | Recall conceptual definitions in business economics |
| CO2 | Classify and differentiate the important terms in business economics |
| CO3 | Understand and illustrate law of demand, Elasticity of demand and Demand forecasting |
| CO4 | Determine the law of supply, underlying assumptions and properties of Law of diminishing marginal utility and indifference curves |
| CO5 | Explain the law of returns to scales, economies and diseconomies to scale |
| CO6 | Analyse the price and output determination under various market forms |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | 1 | 2 | 2 | 2 | 2 | 1 |
| CO2 | 2 | - | 2 | 2 | 2 | 1 | - |
| CO3 | 2 | - | 2 | 2 | 2 | 2 | - |
| CO4 | 2 | - | 2 | 2 | 2 | 2 | - |
| CO5 | 1 | - | 2 | 2 | 2 | 2 | - |
| CO6 | 1 | - | 3 | 2 | 3 | 3 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|--|-----|-----|
| 1 | <p>UNIT – I Introduction to Economics – Wealth, Welfare and Scarcity - Meaning, Definition, Features, Criticisms - Positive and Normative Economics - Meaning and differences - Concepts - Accounting Profit and Economic Profit: Meaning and differences – Incremental and Marginal Costing: Meaning and differences – Time and Discounting Principles: Meaning and mechanism of operation – Concept of Efficiency: Meaning, definition, elements, and types - Definition, Nature, Scope and Significance of Economics - Cost Classification – Types: Total, Average, Marginal, Opportunity, Incremental, sunk, Implicit, Explicit, Fixed and Variable, Accounting and Economic cost, Past and Future cost, Shut down cost and Abandonment cost, Out of pocket and Book cost, Replacement and Historical cost - Break Even Analysis - Meaning .</p> | 15 | 1,2 |
| 2 | <p>UNIT – II Demand: Meaning, Definition – Types of demand – Features - Determinants of demand - Law of Demand: Meaning, Definition, Assumption, Explanation, Diagrammatic representation, Exceptions, Importance of the law – Elasticity of Demand: Meaning, Definition, Importance, Types, Factors influencing elasticity of demand – Demand Forecasting: Meaning, Definition, Objectives, Types, Methods of demand forecasting - Features of good forecasting method.</p> | 15 | 3 |
| 3 | <p>UNIT – III Law of Supply and determinants: Meaning, Assumptions of law of supply - Consumer Behaviour - Utility: Meaning, Concepts and Features - Law of Diminishing Marginal utility: Meaning, Definition, Assumption, Explanation, Diagrammatical, Limitations, Criticisms – Equi -Marginal Utility: Definition, Assumption, Explanation (with diagram), Limitations, Criticisms – Indifference Curve: Meaning, Definition, Assumptions, Significance and Properties – equilibrium.</p> | 15 | 4 |
| 4 | <p>UNIT – IV Production: Law of Variable Proportion: Meaning, Assumption, Explanation (with diagram) - Three stages of the law: Increasing Returns, Decreasing Returns, Negative returns - Production: Function and its features – Laws of Returns to Scale: Meaning, Definition, Three stages of law of returns to scale: Stage I Increasing Returns to scale, Stage II Constant Returns to scale, Stage III Decreasing Returns to scale - Difference between Laws of variable proportion and returns to scale – Producer’s equilibrium - Least Combination Principle, Limitation - Economies of Scale – Internal and External Economies – Internal and External Diseconomies.</p> | 15 | 5 |
| 5 | <p>UNIT – V Product Pricing: Price and Output Determination under Perfect Competition, Short Period and Long Period Price Determination, Objectives of Pricing Policy, Its importance, Pricing Methods and Objectives – Price Determination under Monopoly, kinds of Monopoly, Price Discrimination, Determination of Price in Monopoly – Monopolistic Competition – Price Discrimination, Equilibrium of Firm in Monopolistic Competition – Oligopoly- Meaning - features, “Kinked Demand” Curve.</p> | 15 | 6 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



TEXT BOOKS:

1. Ahuja, H. L. (2019) Business Economics: Microeconomic Analysis. S Chand Publisher, New Delhi, India. (ISBN: 978-93-5283-736-6)
2. Agarwal, S. K. (2018) Business Economics (For CA Foundation). 5th Ed. S Chand Publisher, New Delhi, India. (ISBN: 978-93-5283-355-9)
3. Dwivedi, D. N. (2009) Essentials of Business Economics. Vikas Publsiher, New Delhi, India. (ISBN: 978-81-2592-400-5)
4. Ahuja, H. L. (2017) Managerial Economics: Analysis of Managerial Decision Making. 9th Ed. S Chand Publisher, New Delhi, India. (ISBN: 978-93-5253-518-7)
5. Varshney R.L., Maheshwari K. L., & Maheshwari, R. K. (2019) Business Economics. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-81-8054-738-6)
6. Sankaran, S. (2015) Business Economics. Margham Publications, Chennai, Tamil Nadu, India.
7. Mehta, P. L. (2016) Managerial Economics - Analysis, Problems, Cases. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-93-5161-059-5)

REFERENCE BOOKS:

1. Maheshwari K. L., & Varshney R.L. (2014) Managerial Economics. Sultan Chand & Sons, New Delhi, India. (ISBN: 978-81-8054-914-4)
2. Tulsian, P. C., & Tulsian, Bharat. (2019) Business Economics and Business & Commercial Knowledge. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5316-746-2)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper IX - COST ACCOUNTING

| | |
|------------------------------|-----------------------|
| Course Code : 2106515 | Credits : 4 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Identify and classify the elements of cost in order to develop cost sheet and generate tender and quotation. |
| CO2 | Apply the techniques of inventory control for determining stock levels and economic ordering quantity. |
| CO3 | Explain various methods of pricing material issues to prepare stores ledger. |
| CO4 | Compare and contrast different methods of remuneration and incentive systems. |
| CO5 | Describe the methods of absorption and recovery of overhead to prepare Overhead distribution summary. |
| CO6 | Carry out various methods of costing to determine the cost and to propose better model in cost decisions. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | 3 | 1 | - | 1 | 2 | - |
| CO2 | 1 | 1 | 2 | 2 | 2 | 2 | - |
| CO3 | 2 | 1 | 2 | 1 | 2 | 1 | - |
| CO4 | 2 | 1 | 2 | 2 | 2 | 2 | - |
| CO5 | 1 | 1 | 2 | 2 | 2 | 2 | - |
| CO6 | 2 | 1 | 2 | 1 | 1 | 2 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT – I Definition, meaning and objectives- Advantages and Importance- Distinction between Cost and Financial Accounting - Elements of Cost and Preparation of Cost Sheets and Tenders. | 18 | 1 |
| 2 | UNIT – II Stores record- purchase records- purchase order- Goods received note- Bin card- Stores Ledger - Inventory Control- ABC Analysis – Economic Ordering Quantity – Maximum, Minimum and Reordering levels – Methods of Pricing Issues (FIFO, LIFO, Simple Average, Weighted average methods only) - Perpetual Inventory System. | 18 | 2,3 |
| 3 | UNIT – III Classification of labour costs, Time Keeping – Time booking – Basic methods of Remuneration – Time Rate System – Payment by Results - incentive schemes – Differential piece rate (Taylor’s, Merrick’s,) Premium Bonus plans (Halsey, Halsey Weir, Rowan Plans only) - labour turnover and remedial measures, treatment of idle time and over time | 18 | 4 |
| 4 | UNIT – IV Definition and Meaning of Overheads (Factory, Administration, Selling and Distribution) – Classification – Apportionment of Overheads – Redistribution (Secondary Distribution) – Absorption of Overheads - Calculation of “Machine Hour Rate”. | 18 | 5 |
| 5 | UNIT – V Job Costing (Excluding Contract Costing) – Process Costing – Normal loss and abnormal loss (Excluding Inter process profit and Equivalent production) (simple problems only) - Operation and Operating Costing | 18 | 6 |

TEXT BOOKS:

1. Shukla, M. C., Gupta, M. P., & Grewal, T. S. (2019) Cost Accounting. S Chand Publisher, New Delhi, India. (ISBN: 978-93-5283-635-2)
2. Arora, M. N., & Katyal, Priyanka. (2019) Cost Accounting: As Per CBCS. Vikas Publishing, New Delhi, India. (ISBN: 978-93-5271-974-7)
3. Tulsian, P. C., & Tulsian, Bharat. (2017) Cost Accounting for CA-IPC (Group-I). S Chand Publisher, New Delhi, India. (ISBN: 978-93-5253-336-7)
4. Rachchh, Minaxi., & Rachchh, Gunvantrai. (2015) Cost Accounting - Methods and Techniques. Vikas Publishers, New Delhi, India. (ISBN: 978-93-2598-440-0)
5. Shukla, M. C., Grewal, T. S., & Gupta, M. P. (2018) Cost Accounting: Texts and Problems. S Chand Publishers, New Delhi, India. (ISBN: 978-81-2191-963-0)
6. Tulsian, P. C., Tushar, Bharat., & Tushar, Tulsian. (2020) Cost and Management Accounting with Quick Revision Book. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-8981-171-1)
7. Agrawal, M. L., & Gupta, K. L. (2018) Advanced Cost Accounting. Sahitya Bhawan Publication, Agra, India.
8. Agrawal, M. L., & Gupta, K. L. (2018) Cost Accounting. Sahitya Bhawan Publication, Agra, India. (ISBN: 978-93-8386-664-9)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



9. Palaniappan, R., & Hariharan, N. (2020) Cost Accounting: Theory & Practices. Dreamtech Press, Noida, India. (ISBN: 978-93-8987-214-9)
10. Lal, Jawahar., Srivastav, Seema., & Singh, Manisha. (2019) Cost Accounting: Text, Problems and Cases. 6th Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5316-838-4)
11. Jain, S. P., Narang, K. L., Agrawal, Simmi., & Sehgal, Monika. (2019) Cost Accounting: Principles and Practice. Kalyani Publishers, New Delhi, India. (ISBN: 978-93-8947-786-3)
12. Thothadri, S., Nafeesa, S., & Jalalutheen, R. B. S. A. (2019) Cost Accounting. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5316-692-2)
13. Hanif, M. (2017) Modern Cost and Management Accounting. McGraw-Hill Education, New Delhi, India. (ISBN: 978-00-7014-493-4)
14. Polimeni, Ralph. S., Handy, Sheila., & Cashin, James A. (2019) Schaum's Outline of Cost Accounting. 3rd Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-8969-133-7)

REFERENCE BOOKS:

1. Bhalla, Kapileshwar., & Sharma, Parveen. (2020) Problems and Solutions in Cost and Management Accounting for CA Intermediate. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-9018-539-9)
2. Reddy, T. S., & Reddy, Hari Prasad Y. (2020) Cost Accounting. Margham Publications, Chennai, Tamil Nadu, India.
3. Arora, M. N. (2021) Cost Accounting: Principles and Practice. 13th Ed. Vikas Publishing, Chennai, Tamil Nadu, India. (ISBN: 978-93-5453-026-5)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAMS (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



CORE PAPER X - PRACTICAL AUDITING

| | |
|------------------------------|-----------------------|
| Course Code : 2106414 | Credits : 4 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Cite and describe important concepts of auditing. |
| CO2 | Classify audit and differentiate between internal check, inter control and internal audit |
| CO3 | Determine the procedure of vouching, verification and valuation of assets and liabilities of business entities |
| CO4 | Explain auditors duty relating to specific items and special audits for different business enterprise |
| CO5 | Apply statutory provisions of Companies Act for appointment, remuneration and removal of auditor and to discuss the rights, duties and liabilities of auditor |
| CO6 | Analyze the management controls exercised within the information technology infrastructure |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | - | 2 | 2 | 2 | 2 | 1 |
| CO2 | 3 | - | 2 | 2 | 2 | 2 | 1 |
| CO3 | 2 | 3 | 2 | 2 | 2 | 2 | 1 |
| CO4 | 3 | - | 3 | 3 | 2 | 2 | 1 |
| CO5 | 2 | 1 | 2 | 2 | 3 | 2 | 3 |
| CO6 | 2 | 1 | 3 | 3 | 2 | 2 | 3 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT – I Meaning and definition of auditing – Distinction between auditing and accounting – objectives – Advantages and limitations of audit – scope of audit – classifications of audits – Audit planning, meaning – Audit programme, meaning, objectives and contents – audit note book, contents, usefulness of audit note book – Audit working papers, meaning. Ownership and custody – Test checking and Routine checking, meaning- Internal control, meaning , definition, objectives, Technique for evaluation of internal control system – Internal check, meaning, objectives, difference between internal control, Internal check and internal audit. | 18 | 1,2 |
| 2 | UNIT – II Vouching, meaning and definitions, objectives – Trading transactions – audit of ledger - Scrutinizing of ledgers - vouching of cash receipts and payments. Vouching of outstanding assets and liability – verification, meaning objectives and process – valuation of assets and liabilities- Distinction between verification and valuation | 18 | 3 |
| 3 | UNIT – III Depreciation and reserves – meaning – Auditor’s duty with regard to depreciation – Reserves and provisions- Distinguish reserves and provision – Depreciation of wasting Assets – Special Audit – Educational Institution, Cinema Theatres, Hospitals, & Hotels. | 18 | 4 |
| 4 | UNIT – IV Appointment of auditors – appointment of first auditor – appointment by central government – filling of casual vacancy – Appointment by special resolution – Re-appointment and compulsory re-appointment – ceiling on the number of Auditorship - Removal of auditor – Remuneration - auditors lien – qualification and disqualification – Duties of the company auditor – Rights and powers of auditors – different classes of auditors – Audit Report – Preparation and Presentation. | 18 | 5 |
| 5 | UNIT – V Information Systems Audit (ISA) – meaning – Division of auditing in ISA environment – Impact of computerization on audit approach – online computer system audit – Types of online computer systems – audit around with the computers – procedure of audit under ISA system. | 18 | 6 |

TEXT BOOKS:

1. Agarwal, O. P. (2014) Auditing. Himalaya Publishing House, India. (ISBN: 978-93-5142-848-0)
2. Kumar, Pavan K. C. H. (2013) CA-IPCC Auditing and Assurance. S Chand Publisher, New Delhi, India. (ISBN: 978-81-2199-830-7)
3. Saxena., Appannaiah., & Reddy. (2010) Auditing-I (Including Skill Development). Himalaya Publishing House, India. (ISBN: 978-93-5024-039-7)
4. Pagare, Dinkar. (2020). Principles and Practice of Auditing. Sultan Chand & Sons Publisher, New Delhi, India. (ISBN: 978-93-5161-170-7)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



5. Tandon, B. N., Sudharsnam, S., & Sundharabahu, S. (2020) A Hand Book of Practical Auditing, 15th Ed. S Chand Publisher, New Delhi, India. (ISBN: 978-81-2192-041-4)
6. Saxena, R. G. (2020) Principles and Practice of Auditing. Himalaya Publishing House, India. (ISBN: 978-93-5299-335-2)
7. Jena, Biswa Mohana., & Das, Braja Kishore. (2019) Auditing Corporate and Governance. Himalaya Publishing House, India. (ISBN: 978-93-5299-622-3)
8. Jena, Biswa Mohana., & Satapathy, Sanjay Kumar. (2019) Principles and Practices of Auditing. Himalaya Publishing House, India. (ISBN: 978-93-5299-421-2)
9. Natrajan, L. (2016) Practical Auditing. Margham Publications, Chennai, Tamil Nadu, India. (ISBN: 978-93-8324-276-4)
10. Vengadamani, S. (2012) Practical Auditing. Margham Publication, Chennai, Tamil Nadu, India. (ISBN: 978-93-8143-063-7)
11. ICAI Study material on Auditing for intermediate Course

REFERENCE BOOKS

1. Zad, N. S. (2019) Company Accounts & Auditing Practices. Taxmann's Scanner Publication, India.
2. ICAI (2020) Auditing and Assurance - Study Material - Paper-6. The Institute of Chartered Accountants of India Publications, New Delhi, India.
3. Chhabra, Sanjay., Talukder, A. K., & Pandey, S. K. (2015) Advanced Auditing. Himalaya Publishing House, India. (ISBN: 978-93-5202-282-3)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAMS (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper XI – INCOME TAX LAW, THEORY & PRACTICE

| | |
|------------------------------|-----------------------|
| Course Code : 2106517 | Credits : 4 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Define important terms under the IT Act 1961, explain Residential Status, identify the residential status, compute the incidence of Tax. Understand the concept of Salary, classify its different forms, identify the taxability of various allowances, perquisites and compare different types of Provident funds. |
| CO2 | Compare the taxability of House properties used for different purposes. Identify the deductions and explain the taxability of Unrealized rent and loss under the head House property. Explain the admissible deductions and specific disallowances for computing Income from Profits and Gains of Business and Profession and treatment of Depreciation and Loss |
| CO3 | Define Capital assets under the IT Act, 1961. Explain Capital Gains, list out the exemptions for Capital Gains, compute the Taxable Capital Gains. Understand the concept of TDS, identify and analyze different incomes taxable under other sources, Evaluate the taxability of various incomes and deductions against each income, compute the taxable income under other sources. |
| CO4 | Apply the clubbing up provisions under different situations. Identify the losses that can be set off inter source and intra source. Explain the provisions for carry forward and set off of losses, Compute the Total Income after setoff and carry forward of losses. |
| CO5 | Analyze the admissible deductions from Gross Total Incomes and specific limits, provisions for availing various deductions. Differentiate between deductions for incomes and deductions for investments / expenses. Compute the Deductions available under various sections |
| CO6 | Discuss the powers and duties of various Income Tax Authorities, State the need and use of PAN, Explain the procedure for Assessment and discuss different types of Assessment. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | - | 2 | 2 | 2 | 3 | - |
| CO2 | 2 | - | 2 | 2 | 2 | 3 | - |
| CO3 | 2 | - | 2 | 2 | 2 | 2 | - |
| CO4 | 2 | - | 2 | 2 | 2 | 2 | - |
| CO5 | 2 | - | 2 | 2 | 2 | 2 | - |
| CO6 | 2 | - | 2 | 2 | 2 | 2 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs. | Cos |
|-------|---|------|-----|
| 1 | UNIT – I Income Tax Act 1961 – Definition of important terms – Income, Person, Assessee, Assessment Year and Previous Year - Residential Status – Incidence of Tax – Incomes exempt from Tax Salaries - Different forms of salary – Provident Funds – Allowances – Perquisites – Other items included in Salary | 18 | 1 |
| 2 | UNIT – II Computation of Income from House Property – Let-out house – Self occupied house – Deduction allowed from house property – Unrealized rent – Loss under the head house property. Computation of profits and gains of business and profession – Admissible deductions – Specific Disallowances – Depreciation – Loss under the head business and profession. | 18 | 2 |
| 3 | UNIT – III Capital Assets – Meaning and Kinds – Procedure for computing Capital Gains – Cost of Acquisition – Exemption of Capital Gains – Loss under head Capital Gains. Income chargeable to tax under the head Income from Other Sources – Dividends – Interest on Securities – Casual Income – Other Incomes – Deduction from Income from Other Sources – Loss under the head Other Sources. | 18 | 3 |
| 4 | UNIT – IV Provisions relating to income of other persons to be clubbed in Assessee. Total Income – Income of minor Child – Deemed Incomes.- Provisions relating to Set-off & Carry forward and Set-off of Losses. Deductions in respect of certain payments – Deduction in respect of income (Deductions applicable to Individuals only) | 18 | 4,5 |
| 5 | UNIT – V Income tax authorities – procedure for assessment – PAN (Permanent Account Number) – Types of assessment. | 18 | 6 |

TEXT BOOKS:

1. Mehrotra, H. C., & Goyal, S. P. (2021) Income Tax. Sahitya Bhawan Publication, Agra, India. (ISBN: 978-93-5173-522-9)
2. Singhania, Vinod K., & Singhania, Monica. (2021) Students' Guide to Income Tax Including GST - Problems & Solutions. Taxmann's Publication, India. (ISBN: 978-81-9493-975-7)
3. Mittal, Preeti Rani., & Bansal, Anshika. (2021) Income Tax - Law and Practice, Sultan Chand & Sons Publisher, New Delhi, India. (ISBN: 978-93-5161-191-2)
4. Gaur, V. P., Narang, D. B., Gaur, Puja., & Puri, Rajeev. (2021) Income Tax Law and Practice. Kalyani Publishers, New Delhi, India. (ISBN: 978-81-9467-500-6)
5. Reddy, T. S., & Reddy, Hari Prasad Y. (2021) Income Tax Theory, Law and Practice. Margham Publication, Chennai, Tamil Nadu, India.



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



REFERENCE BOOKS:

1. Singhania, Vinod K., & Singhania, Kapil. (2021) Taxmann's Direct Taxes Law & Practice. Taxmann's Publication, India. (ISBN: 978-93-9058-583-0)
2. Gabhawala, Mahendra B., Gabhawala, Aprameya M., Gabhawala, Milinda A., Gabhawala, Arpita M., Shah, Aparajita V. (2021) Direct Taxes Ready Reckoner With Tax Planning. Bharat Law House Publications, India.
3. Ahuja, Girish., & Gupta, Ravi. (2021) Practical Approach to Direct & Indirect Taxes. Commercial Law Publishers, India. (ISBN: 978-93-9030-368-7)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper XII - BUSINESS LAW

| | |
|------------------------------|-----------------------|
| Course Code : 2106518 | Credits : 4 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Identify and analyse the nature and forms of Contracts, their regulation and relevance of the concepts and principles of Commercial Law in India. |
| CO2 | Define the basic principles of valid contractual agreements and illustrate the impact of legislation on the Law of Contracts. |
| CO3 | Discuss the circumstances and liabilities of parties in the case of invalid contracts and outline the remedies for breach of contract. |
| CO4 | Explain contracts of Indemnity, Guarantee. Categorise the rights and liabilities of the parties to such contracts. |
| CO5 | Differentiate Bailment and Pledge. State the rights and duties of bailor and bailee |
| CO6 | Outline the Duties and Rights of various kinds of Agents and describe the legal structure to support the principles and practice of Agency. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | - | 1 | 1 | 2 | 1 | - |
| CO2 | 1 | - | 1 | 2 | 2 | 2 | - |
| CO3 | 2 | - | 2 | 1 | 1 | 2 | - |
| CO4 | 1 | - | 2 | 1 | 2 | 1 | - |
| CO5 | 2 | - | 2 | 1 | 2 | 1 | - |
| CO6 | 1 | - | 2 | 2 | 1 | 1 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT-I Meaning of Law – Sources of Law – Classification of Contract – Express & Implied – Valid, Void & Voidable Contracts – Executed & Executory Contracts – Unilateral & Bilateral Contracts. | 18 | 1 |
| 2 | UNIT-II Essential Elements of Contracts – Offer – Acceptance – Lawful Consideration- Capacity of parties. | 18 | 2 |
| 3 | UNIT-III Free Consent – Mistake – Misrepresentation – Fraud – Coercion – Undue influence – Lawful Objects – Discharge of Contracts – Remedies for Breach of Contracts. | 18 | 3 |
| 4 | UNIT-IV Contract of Indemnity & Guarantee – Essentials - Difference between Contract of Indemnity & Contract of Guarantee – Revocations of Continuing Guarantee – Surety's Liability – Rights of Surety – Discharge of Surety from Liability – Bailment – Pledge. | 18 | 4,5 |
| 5 | UNIT-V Contract of Agency – Essentials – creation of agency – Kinds of Agents – Agent Authority – Duties and Rights of Principal – Agent when personally liable – Delegations of Authority – Sub-Agent – Substituted Agent – Termination of Agency – Irrevocable Agency | 18 | 6 |

TEXT BOOKS:

1. Sulphery, M. M., & Basheer, Az-har. (2018) Laws for Business. PHI Learning, India. (ISBN: 978-93-8747-267-9)
2. Sheth, Tejpal. (2017) Business Law. 3rd Ed. Pearson Education, India. (ISBN: 978-93-3258-615-4)
3. Kuchhal, M. C., & Kuchhal, Vivek. (2018) Business Law. 7th Ed. Vikas Publication, India. (ISBN: 978-93-5271-476-6)
4. Tulsian, P. C., & Tulsian, Bharrat. (2017) Business Law. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-3920-346-7)
5. Tulsian, P. C., & Tulsian, Bharat. (2020) Tulsian's Business Laws For CA Foundation Course (New Syllabus). 4th Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-8981-167-4)
6. Arora, Sushma. (2021) Taxmann's Business Laws. 6th Ed. Taxmann's Publication, New Delhi, India. (ISBN: 978-93-9083-177-7)
7. Kapoor, N. D., Abbi, Rajni., Bhushan, Bharat., Kappor, Rajiv., & Kapur, Vijay. (2019) Business Laws. Sultan Chand & Sons Publishers, New Delhi, India. (ISBN: 978-93-8917-410-6)
8. Jagota, Rajni. (2021) Business Laws. Scholar Tech Press, India
9. Gogna, P. P. S. (2018) Business Laws - CA Foundation. S Chand Publishers, New Delhi, India. (ISBN: 978-93-5283-356-6)
10. Varshney, G. K. (2019) Business Law. Sahitya Bhawan Publications, India.
11. N.D.Kapoor: Elements of Mercantile Law, Sultan Chand & Co., New Delhi.
12. Dr. M .R. Sreenivasan: Business Law, 2nd Ed., Margham Publication, Chennai.



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



REFERENCE BOOKS:

1. Aggarwal, Rashmi., & Kaur, Rajinder. (2020) Legal Aspects of Business. Pearson Education, India. (ISBN: 978-93-8955-200-3)
2. Kapoor, N. D., Abbi, Rajni., Bhushan, Bharat., Kapoor, Rajiv., & Kapur, Vijay. (2020) N. D. Kapoor's Elements of Mercantile Law. Sultan Chand & Sons Publishers, New Delhi, India. (ISBN: 978-93-89174-36-6)
3. Tulsian, P. C., & Tulsian, Bharat. (2017) Mercantile Laws for CA-CPT. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-3921-301-5)
4. Pillai, R. S. N., & Bhagavathi (2019) Business Law. 3rd Ed. S Chand & Co. Publishers, New Delhi, India.

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Elective Paper I - CORPORATE GOVERNANCE

| | |
|------------------------------|-----------------------|
| Course Code : 2106519 | Credits : 5 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Understand the evolution, need and scope of corporate governance and outline the conceptual framework of corporate governance |
| CO2 | Explain the contemporary developments in the field of corporate governance in U.S. and compare with India |
| CO3 | Describe the legislative framework of corporate governance in different forms of business entities |
| CO4 | Analyse the diversity in the composition of the board and its effectiveness in corporate governance |
| CO5 | Apply the secretarial standards in board processes |
| CO6 | Determine the relationship between corporate governance and the stakeholders |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 3 | 1 | 1 | 2 | 2 | 1 | 3 |
| CO2 | 2 | 1 | 3 | 2 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 2 | 2 | 2 | 3 | 1 |
| CO4 | 3 | 1 | 2 | 2 | 2 | 2 | 1 |
| CO5 | 2 | 1 | 2 | 2 | 1 | 1 | 3 |
| CO6 | 3 | 1 | 2 | 3 | 3 | 2 | 2 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| Sl No | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT-I Conceptual Framework of Corporate Governance: Introduction, Need and Scope, Evolution of Corporate Governance, Management vs. Ownership, Majority vs Minority, Corporate Governance codes in major jurisdictions, Sarbanes Oxley Act, US Securities and Exchange Commission; OECD Principles of Corporate Governance; Developments in India, Corporate Governance in Indian Ethos, Corporate Governance – Contemporary Developments. | 18 | 1,2 |
| 2 | UNIT-II Legislative Framework of Corporate Governance in India: Listed Companies, Unlisted Companies, PSUs, Banks and Insurance Companies. | 18 | 3 |
| 3 | UNIT-III Board Effectiveness: Composition and Structure, Duties and Liabilities, Evolution of Jurisprudence, Diversity in Board Room, Women Director, Nominee Directors; Selection and Appointment Process, Independent Directors: expectations, liabilities and their role, code of conduct, responsibilities and effectiveness. | 18 | 4 |
| 4 | UNIT-IV Board Processes through Secretarial Standards. Board Committees: Composition & Terms of Reference, Roles and Responsibilities. | 18 | 5 |
| 5 | UNIT-V Corporate Governance and Shareholders' Rights. Corporate Governance and other Stakeholders: Employees, Customers, Lenders, Vendors, Government and Regulators, Society, etc. | 18 | 6 |

TEXT BOOKS:

1. Fernando, A. C., Satheesh, E. K., & Muraleedharan, K. P. (2018) Corporate Governance: Principles, Policies and Practices. 3rd Ed. Pearson Education, New Delhi, India. (ISBN: 978-93-5306-266-8)
2. Das, Subhash Chandra. (2018) Corporate Governance In India—An Evaluation. 4th Ed. PHI Learning, India. (ISBN: 978-93-8747-297-6)
3. Goel, Sandeep. (2019) Corporate Governance: Principles and Practices. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5316-829-2)
4. Khanka, S. S. (2014) Business Ethics and Corporate Governance (Principles & Practice). S Chand & Co Publishers, New Delhi, India. (ISBN: 978-81-2194-286-7)
5. Jha, Aruna. (2020) Taxmann's Auditing and Corporate Governance. Taxmann's Publication, New Delhi, India. (ISBN: 978-93-9058-520-5)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



6. Gupta, C. B., & Singha, Neha. (2020) Auditing and Corporate Governance. Scholar Tech Press, India.
7. Prasad, Kesho. (2018) Corporate Governance. 3rd Ed. PHI Learning, New Delhi, India. (ISBN: 978-81-2034-893-6)
8. Roy, C. K. (2011) Corporate Governance Values And Ethics. JBC Press, India. (ISBN: 978-93-8009-746-6)
9. Fernando, A. C. (2019) Corporate Governance - Principles, Policies and Practices. 2nd Ed. Pearson Education, New Delhi, India. (ISBN: 978-81-3175-845-8)

REFERENCE BOOKS:

1. Indian Institute of Corporate Affairs (2015) Corporate Governance. Taxmann's Publication, New Delhi, India. (ISBN: 978-93-5071-774-5)
2. Kumar, Anil., Gupta, Lovleen., & Arora, Jyotsna Rajan. (2020) Taxmann's Auditing and Corporate Governance. Taxmann's Publication, New Delhi, India. (ISBN: 978-93-9060-903-1)
3. Bajpai, G. N. (2016) The Essential Book of Corporate Governance. Sage Publication, New Delhi, India. (ISBN: 978-93-8598-521-8)
4. Journals – (a) ICSI – Chartered Secretary (b) ICSI – Student Company Secretary – E-bulletin
5. Companies Act, 2013 and Rules
6. SEBI (2015) Listing Obligations and Disclosure Requirements – Regulations. SEBI, India.

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)
Core Paper XIII - MANAGEMENT ACCOUNTING



| | |
|------------------------------|-----------------------|
| Course Code : 2106620 | Credits : 4 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Define Management accounting. List out the functions of management accounting Discuss the use of Management accounting as a tool in decision making. Analyze the role of management accountant with regard to evolving the financial policy of an industrial enterprise. Differentiate management accounting, financial accounting and cost accounting. |
| CO2 | Identify the role of ratio analysis in the interpretations. Explain the different techniques of analysis and interpretations of financial statements. .Prepare comparative income statement using the financial statement of a company. Categorize the ratios based on the various heads. Give an interpretation for the financial statement using ratio analysis. |
| CO3 | State the significance of fund flow statement. Describe the significance of fund flow statement. Use the fund flow statement to predict the financial position of a company. |
| CO4 | Construct new cash flow statement of the company from the past two years. Compare the fund flow statement and cash flow statement. |
| CO5 | List out the uses of budget in management. Give examples of five budgets that may be prepared and employed by a manufacturing company. Prepare a proforma of flexible budget of a manufacturing concern for their imaginary activity levels in a suitable form. Outline a plan for sales budget and purchase budget. What considerations are necessary in the preparation of such budgets? Generate a sample cash budge for a manufacturing company. |
| CO6 | List out the limitations of BEP. Explain the concepts of BEP and CVP. Analyze the terms marginal costing and absorption costing and bring out its difference. Develop a break even chart to find the various levels of activity. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | 2 | 1 | 2 | 1 | 3 | 1 |
| CO2 | 1 | 3 | 2 | 1 | 2 | 2 | - |
| CO3 | 1 | 3 | 1 | 1 | 2 | 1 | - |
| CO4 | 1 | 3 | 1 | 1 | 1 | 1 | |
| CO5 | 1 | 1 | 2 | 1 | 2 | 2 | - |
| CO6 | 1 | 1 | 1 | 1 | 1 | 1 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT-I Management Accounting – Meaning, Scope, Importance and Limitations - Management Accounting vs. Cost Accounting - Management Accounting vs. Financial Accounting. | 18 | 1 |
| 2 | UNIT-II Analysis and interpretation of Financial Statements- nature, objectives, and tools – methods - Comparative Statements, Common Size Statement and Trend Analysis. Ratio analysis - interpretation, benefits and limitations. Classifications of ratios - liquidity, profitability, turnover, Solvency. | 18 | 2 |
| 3 | UNIT-III Fund Flow Statement - Cash Flow Statement (As per AS 3) | 18 | 3,4 |
| 4 | UNIT-IV Budget and budgetary control- meaning, objectives, merits and demerits- types of budgets- production, cash and flexible budgets | 18 | 5 |
| 5 | UNIT-V Marginal Costing (excluding Decision-Making) - Absorption Costing and Marginal Costing - CVP Analysis - Break-Even Analysis - Break Even Chart | 18 | 6 |

TEXT BOOKS:

1. Srinivasan, N. P., & Murgan, Sakthivel M. (2018) Principles and Practice of Management Accounting. New Age International Publishers, India. (ISBN: 978-81-2243-078-3)
2. Khan, M. Y., & Jain, P. K. (2017) Management Accounting: Text, Problems and Cases. 7th Ed. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5260-678-8)
3. Pillai, R. S. N., & Bagavathi, V. (2018) Management Accounting. S Chand & Co Publisher, New Delhi, India.
4. Prasath, Saravana. (2019) Advanced Management Accounting. Wolters Kluwer Publishers, India. (ISBN: 978-93-8933-504-0)
5. Maheswari, S. N. (2015) Management Accounting. Sultan Chand Publications, New Delhi, India.
6. Sharma and Shashi K. Gupta- Management accounting, Kalyani Publishers

REFERENCE BOOKS:

1. Reddy, T. S., & Reddy, Hari Prasad Y. (2019) Management Accounting. Margham Publication, Chennai, Tamil Nadu, India.
2. Gupta, K. L. (2018) Management Accounting. Sahitya Bhawan Publications, Agra, India.
3. Tulsian, P. C., Tulsian, Bharat., & Tulsian, Tushar. (2020) Tulsian's Cost and Management Accounting with Quick Revision Book. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-8981-171-1)
4. Zad, N. S. (2021) MCQs on Corporate & Management Accounting Theory and Problem Based MCQs. Taxmann's Publication, New Delhi, India.

Note: Latest edition of the books to be referred



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper XIV - PRINCIPLES OF FINANCIAL MANAGEMENT

| | |
|------------------------------|-----------------------|
| Course Code : 2106621 | Credits : 4 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | List out the objectives of financial management and identify the sources of fund |
| CO2 | Define and understand, leverages and its types |
| CO3 | Apply the techniques of capital budgeting for investment decisions |
| CO4 | Compute cost of capital and classify them |
| CO5 | Explain dividend policies and describe various dividend models |
| CO6 | Determine the factors influencing working capital and to forecast working capital requirements |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | 3 | 2 | 2 | 3 | 2 | 1 |
| CO2 | 2 | 1 | 2 | 2 | 2 | 3 | 1 |
| CO3 | 2 | 1 | 2 | 2 | 2 | 3 | 1 |
| CO4 | 1 | 1 | 2 | 2 | 2 | 3 | 1 |
| CO5 | 2 | 1 | 2 | 2 | 2 | 2 | 1 |
| CO6 | 2 | 3 | 2 | 2 | 2 | 3 | 1 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S. No. | CONTENTS OF MODULE | Hrs | Cos |
|--------|---|-----|-----|
| 1 | UNIT-I Meaning, objectives and Importance of Finance – Sources of finance – Functions of financial management – Role of financial manager in Financial Management - Capital structures planning - Factors affecting capital structures – Determining Debt and equity proportion – Theories of capital structures – Leverage concept. (Theory only). | 18 | 1,2 |
| 2 | UNIT-II Capital Expenditure Control – Capital Budgeting Techniques – Pay-Back Period – Accounting Rate of Return (ARR) – Net Present Value (NPV) method – Internal Rate of Return (IRR) – Risk Analysis. | 18 | 3 |
| 3 | UNIT-III Cost of capital – Cost of equity – cost of preference capital – Cost of debt – Cost of retained earnings – weighted Average (or) composite cost of capital (WACC). | 18 | 4 |
| 4 | UNIT-IV Dividend policies – Factors affecting dividend policies - Company Law provisions on dividend payment –Various Dividend Models (Walter's, Gordon's, M.M. Hypothesis) (Theory only). | 18 | 5 |
| 5 | UNIT-V Working capital – components of working capital – working capital operating cycle – Factors influencing working capital – Determining (or) Forecasting of working capital requirements. | 18 | 6 |

TEXT BOOKS:

1. Pandey, I. M. (2021) Financial Management. 25th Ed. Pearson Education, New Delhi, India. (ISBN: 978-93-9057-725-5)
2. Berk, Jonthan., & Demarzo, Peter. (2016) Financial Management. Pearson Education, New Delhi, India. (ISBN: 978-93-3257-650-6)
3. Rustagi, R. P. (2020) Taxmann's Fundamentals of Financial Management. Taxmann's Publication, New Delhi, India. (ISBN: 978-93-9012-836-5)
4. Chandra, Prasanna. (2019) Financial Management, Theory and Practice. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5316-652-6)
5. Chandra, Prasanna. (2020) Fundamentals of Financial Management. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-8981-126-1)
6. Tulsian, P. C., Tulsian, Bharat., & Tulsian, Tushar. (2020) Tulsian's Financial Management for CA Intermediate. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-8981-133-9)
7. Jhabak, Pawan. (2015) Advanced Financial Management. Himalaya Publishing House, India. (ISBN: 978-93-5097-011-9)
8. Mohan, Madana M., Rao, Syamala G., & Sheela, P. (2015) Financial Management. Himalaya Publishing House, India. (ISBN: 978-93-5202-008-9)

REFERENCE BOOKS:

1. Maheswari, S. N. (2018) Financial Management. Sultan Chand & Sons Publishers, New Delhi, India.



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



2. Khan, M. Y., & Jain, P. K. (2018) Financial Management: Text, Problems and Cases. McGraw-Hill Education, New Delhi, India. (ISBN: 978-93-5316-218-4)
3. Kishore, Ravi M. (2020) Taxmann's Financial Management-Theory/Problems/Cases. Taxmann's Publication, New Delhi, India. (ISBN: 978-93-8992-174-8)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Core Paper XIV - GOODS AND SERVICE TAX & CUSTOMS LAW

| | |
|------------------------------|-----------------------|
| Course Code : 2106622 | Credits : 4 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Identify the Concept of Goods & Service Tax. Identify the need of GST in India Define the concept of Supply |
| CO2 | Describe the Input Tax Credit under GST. |
| CO3 | Discuss the procedure for registration under GST. Explain Tax Invoice. Explain the procedure for cancellation of registration |
| CO4 | Describe the Accounts and Records to be maintained under Sec 39 of GST Act Differentiate Electronic Cash Ledger and Electronic Credit Ledger |
| CO5 | Analyze the concept of Customs Duty. Describe the different types of Customs Duty Outline the procedure for Assessment of Customs duty |
| CO6 | List the procedures for Export and Import under Customs Duty. Describe Baggage Rules & Exemptions |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | - | 1 | 1 | 2 | 1 | - |
| CO2 | 1 | - | 1 | 1 | 2 | 1 | - |
| CO3 | 1 | - | 1 | 1 | 1 | 1 | - |
| CO4 | 1 | - | 1 | 1 | 1 | 1 | - |
| CO5 | 1 | - | 1 | 1 | 1 | 1 | - |
| CO6 | 1 | - | 1 | 1 | 1 | 1 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S.No. | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | UNIT-I Genesis of GST in India – Concept of GST – Need for GST in India – Framework of GST as introduced in India – Benefits of GST Concept of Supply (Section 7 of CGST Act) – Composite and Mixed Supplies (Section 8 of CGST Act) – Interstate Supply (Section 7 of IGST Act) – Intra State Supply (Section 8 of the IGST Act) - Time of Supply (Section 12 & 13 of CGST Act) – Value of Supply (Section 15 of CGST Act.) | 18 | 1 |
| 2 | UNIT-II Input Tax Credit – Eligibility and conditions – Registration – Persons liable for registration – Compulsory registration – Procedure for registration- Amendment of registration- Cancellation of registration.- Tax invoice, Credit and Debit Notes | 18 | 2,3 |
| 3 | UNIT-III Accounts and Records – Payment of Tax, interest, penalty – Electronic cash ledger-Electronic credit ledger – Electronic Liability Register – Returns – Furnishing details of outward supplies – Furnishing details of inward supplies- Furnishing of returns. (Section 39 of CGST Act) | 18 | 4 |
| 4 | UNIT-IV Basic Concepts- Important Definitions, Territorial Waters, High Seas,- Levy and Collection of Customs duty - Types of Custom Duties, Valuation of goods , Procedure for Assessment of Customs duty | 18 | 5 |
| 5 | UNIT-V Customs Procedures, Import and Export Procedures, Baggage Rules & Exemptions | 18 | 6 |

TEXT BOOKS

1. Gupta, Vineet., & Gupta, N. K. (2019) Bharat's Fundamentals of Goods & Services Tax. Bharat Law House Publisher, New Delhi, India. (ISBN: 978-93-5139-668-0)
2. Kaparti, Amarendar. (2021) Indirect Tax Laws. Bharat Law House Publishers, New Delhi, India. (ISBN: 978-93-86921-16-1)
3. Gupta, Vineet., & Gupta, N. K. (2020) Goods and Service Tax with Customs Law - Knowledge Testers - Theory and Practical. Sultan Chand & Sons Publisher, New Delhi, India. (ISBN: 978-93-5161-190-5)
4. Saha, R. G., & Devi, Usha. (2020) GST and Customs Duty, Himalaya Publishing House, India. (ISBN: 978-93-5367-979-8)
5. Swain, Anil Kumar., & Agrawal, Gopa Prasad. (2018) GST Concepts and Applications. Himalaya Publishing House, India. (ISBN: 978-93-5273-883-0)
6. Thoomkuzhy, Thomas Joseph., Jacob, Jaya M., & Chacko, Chinnu Mariam. (2017) GST The Essentials of Goods and Services Tax. Himalaya Publishing House, India. (ISBN: 978-93-5273-467-2)
7. Mehrotra, H. C., & Agarwal, V. P. (2020) Goods and Service Tax (G.S.T.). 4th Ed. Shitya Bhawan Publication, Agra, India.



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



8. Bansal, K. M. (2021) Taxmann's GST & Customs Law. 5th Ed. Taxmann's Publication, New Delhi, India. (ISBN: 978-93-9058-537-3)
9. N.K. Gupta & Sunnania Batia: Goods & Services Tax – Indian Journey, Barat's Publication

REFERENCE BOOKS:

1. Haldia, Arpit., & Salim, Mohd. (2020) Taxmann's GST Law & Practice – A Compendium of CGST/IGST Acts along with a Gist of Relevant Rules/Circulars/Notifications & Case Laws. Taxmann's Publication, New Delhi, India. (ISBN: 978-81-9493-978-8)
2. Singhanian, K Vinod. (2021) Taxmann's Students' Guide to GST & Customs Law. 6th Ed. Taxmann's Publication, New Delhi, India. (ISBN: 978-93-9058-550-2)
3. ICAI (2020). ICAEW - Paper-5: Indirect Tax Laws - Study Material. The Institute of Chartered Accountants of India Publication, New Delhi, India.

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Elective Paper II - ENTREPRENEURIAL DEVELOPMENT

| | |
|------------------------------|-----------------------|
| Course Code : 2106623 | Credits : 5 |
| L:P:T:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Define the key terms, List the attributes and functions, Classification of entrepreneurs and Enumerate the factors influencing entrepreneurs. |
| CO2 | Discuss the various agencies for entrepreneurial development and their functions. |
| CO3 | Use the various business idea generation techniques and Prepare a business project proposal incorporating the various techniques of ranking a business proposal. |
| CO4 | Construct a framework for a typical EDP. |
| CO5 | Explain the role of entrepreneurs in economic growth. |
| CO6 | Analyse the recent trends in entrepreneurship and evaluate the development of women entrepreneurs. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 1 | - | 2 | 3 | 2 | 1 | - |
| CO2 | 1 | - | 2 | 3 | 1 | 1 | - |
| CO3 | 2 | - | 2 | 3 | 2 | 1 | - |
| CO4 | 1 | - | 2 | 3 | 2 | 1 | - |
| CO5 | 1 | - | 2 | 3 | 3 | 1 | - |
| CO6 | 1 | - | 1 | 3 | 2 | 2 | 2 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



| S. No. | CONTENTS OF MODULE | Hrs | Cos |
|--------|--|-----|-----|
| 1 | UNIT I Concept of Entrepreneurship – Entrepreneurship – Meaning – Types - Qualities of an Entrepreneur - Classification of Entrepreneurs - Factors influencing Entrepreneurship - Functions of Entrepreneur. | 18 | 1 |
| 2 | UNIT II Entrepreneurial Development – Agencies - Commercial Banks - District Industries Centre - National Small Industries Corporation - Small Industries Development Organisation - Small Industries Service Institute - All India Financial Institutions (IDBI, IFCI, ICICI, IRDBI.) | 18 | 2 |
| 3 | UNIT III Business Idea Generation Techniques - Identification of Business Opportunities - Feasibility Study - Marketing, Finance, Technology & Legal Formalities - Preparation of Project Report Tools of Appraisal. | 18 | 3 |
| 4 | UNIT IV Entrepreneurial Development Programmes (EDP) - their role, relevance and achievements - Role of Government in organizing EDPs - critical evaluation. | 18 | 4 |
| 5 | UNIT V Role of Entrepreneur in economic growth - strategic approaches in the changing economic scenario for Small-Scale Entrepreneurs – Networking - Niche play, Geographic Concentration, Franchising / Dealership - Development of Women Entrepreneurship. | 18 | 5,6 |

TEXT BOOKS:

1. Khanka, S. S., (2015) Entrepreneurial Development. S. Chand & Co Publisher, New Delhi, India.
2. Suresh, Jayshree. (2017) Entrepreneurial Development. Margham Publication, Chennai. Tamil Nadu. India. (ISBN: 978-93-8143-011-8)
3. Desai, Vasant., Appannaiah., Reddy, P. N., & Krishna, Gopal. (2014) Entrepreneurial Development. Himalaya Publishing House, India. (ISBN: 978-93-5142-453-6)
4. Bhatia, R. C. (2020) Entrepreneurship: Business and Management. Sultan Chand & Sons Publisher, New Delhi, India. (ISBN: 978-93-5161-172-1)
5. Gupta, C. B., & Khanka, S. S. (2017) Entrepreneurship & Small Business Management. Sultan Chand & Sons Publisher, New Delhi, India. (ISBN: 978-93-5161-094-6)
6. Sharma, Sangeeta. (2018) Entrepreneurship Development. PHI Learning, New Delhi, India. (ISBN: 978-81-2035-270-4)
7. Gupta, C. B., & Srinivasan, N. P. (2020) Entrepreneurial Development. Sultan Chand & Sons Publisher, New Delhi, India. (ISBN: 978-93-5161-132-5)

REFERENCE BOOKS:

1. Gupta, C. B. (2017) Entrepreneurship – Text and Cases. Sultan Chand & Sons Publisher, New Delhi, India. (ISBN: 978-93-5161-110-3)
2. Murthy, C. S. V. (2017) Small Scale Industries and entrepreneurial Development. Himalaya Publishing House, India. (ISBN: 978-93-5273-056-8)



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



3. Desai, Vasant. (2019) The Dynamics Of Entrepreneurial Development And Management. Himalaya Publishing House, India. (ISBN: 978-93-5097-028-7)

Note: Latest edition of the books to be referred

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (40 Marks)

| Bloom's Category | CIA-1 | CIA-2 | GENERIC SKILLS | ATTENDANCE |
|--------------------------|--------------|--------------|-----------------------|-------------------|
| Marks (out of 40) | 10 | 15 | 10 | 5 |
| Remember | 3 | 5 | 5 | |
| Understand | 3 | | | |
| Apply | 4 | 5 | 5 | |
| Analyze | | 5 | | |
| Evaluate | | | | |
| Create | | | | |

ESE – END SEMESTER EXAM (100 Marks)

| Remember | Understand | Apply | Analyze | Evaluate | Create |
|-----------------|-------------------|--------------|----------------|-----------------|---------------|
| 15 | 20 | 30 | 20 | 15 | - |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



INSTITUTIONAL TRAINING – PROJECT REPORT AND VIVA-VOCE

| | |
|------------------------------|-----------------------|
| Course Code : 2106624 | Credits : 5 |
| L:P:T:S : 0:5:0:0 | CIA Marks : 50 |
| Exam Hour : 01 | ESE Marks : 50 |

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Identify, gather, organize, analyze and interpret the data relating to a particular concept |
| CO2 | Demonstrate the conceptual understanding of the topic chosen for presentation |
| CO3 | Develop presentation and leadership skills |
| CO4 | Demonstrate the skills required for effective presentations |
| CO5 | Justify the methodology of presenting the topic chosen |
| CO6 | Apply the creative approaches in designing and delivering the content of presentation |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 |
| CO4 | 3 | 2 | 2 | 2 | 3 | 2 | 2 |
| CO5 | 2 | 1 | 3 | 3 | 2 | 2 | 2 |
| CO6 | 2 | 2 | 2 | 3 | 2 | 2 | 2 |



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



Institutional Training Project Report evaluation Guidelines:

- A panel consisting of One External Examiner and one internal guide will evaluate the project report and conduct viva voce examinations
- The External examiner in the panel will value the Project report and viva voce for a maximum of 50 marks.
- Internal guide will also value the project report for 50 marks.

CIE & SEE Components:

1. The marks given by guide will be considered as CIA component.
2. The marks given by Panel will be considered as ESE component.

Criteria for allotting marks:

| Sl.NO | Criteria | Marks |
|--------------|--|-----------|
| 1. | Introduction, Scope and Significance | 10 |
| 2 | Contents and adequacy of coverage | 5 |
| 3 | Communication skills and level of confidence | 5 |
| 4 | Topic Knowledge | 10 |
| 5 | Recent trends and creativity | 10 |
| 6. | Time Management, Question and answer Session | 10 |
| TOTAL | | 50 |

ASSESSMENT PATTERN

CIA- CONTINUOUS INTERNAL ASSESSMENT (50 Marks)

| Bloom's Category | Tests |
|------------------|-------|
| Remember | 5 |
| Understand | 5 |
| Apply | 15 |
| Analyse | 10 |
| Evaluate | 10 |
| Create | 5 |

ESE – END SEMESTER EXAM (50 Marks)

| Remember | Understand | Apply | Analyse | Evaluate | Create |
|----------|------------|-------|---------|----------|--------|
| 5 | 5 | 15 | 10 | 10 | 5 |



PERFORMANCE ANALYSIS OF COMPANY
LTD.

A PROJECT REPORT FOR INSTITUTIONAL TRAINING.

*Submitted in partial fulfillment of
the requirements for award of the degree of
B.Com (Corporate Secretaryship)*

By

Name of the student
Register number:



Dept. of Corporate Secretaryship
D.G. Vaishnav College,
Chennai-600 106.
April – 2021



DWARAKADOSS GOVERDHAN DOSS VAISHNAV COLLEGE
(AUTONOMOUS)

“GOKUL BAGH” 833, PERIYAR E.V.R. SALAI,
ARUMBAKKAM, CHENNAI-600 106

INSTITUTIONAL TRAINING REPORT

REGISTER No. _____

ROLL No. _____

Certified bonafide record of work done by _____

during the year 2021-2022

Signature of the Student

Signature of the Head of Dept.

Internal Examiner

External Examiner



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



CERTIFICATE

This is to certify that (name of the student) bearing Roll No. (xxxx), is a bonafide student of B.Com., Corporate Secretaryship course of D.G.Vaishnav College affiliated to University of Madras, Chennai during the year 2020-2023, The Institutional Training report on “(Title of Report)” is prepared by him/her under the guidance of (Name of the guide), in partial fulfillment of requirements for the award of the degree of B.Com., (Corporate Secretaryship) of Madras University, Chennai.

Signature of Internal Guide

Signature of HOD

Signature of Principal



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



DECLARATION

I, student name , hereby declare that the Institutional Training report entitled “Title of the project” with reference to “(Organization with place)” prepared by me under the guidance of (Guide Name), faculty of B.Com.,(CS) Department, .

I also declare that this Institutional Training Report is towards the partial fulfillment of the university regulations for the award of the degree of B.Com. (Corporate Secretaryship) by Madras University, Chennai. .

I have undergone Internship training for a period of Four weeks. I further declare that this report is based on the original study undertaken by me and has not been submitted for the award of a degree/diploma from any other University / Institution.

Signature of Student

Place:

Date



Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Department of Corporate Secretaryship
Course - B.Com (Corporate Secretaryship)



TABLE OF CONTENTS

Chapter -1 Profile of the company

Chapter -2 Financial Analysis

Chapter -3 Statistical Analysis

Chapter -4 Summary of Findings and Suggestions

Chapter -5 My experience with Institutional Training



APPENDIX A

OUTCOME BASED EDUCATION

Outcome-based education (OBE) is an educational theory that bases each part of an educational system around goals (outcomes). By the end of the educational experience each student should have achieved the goal. There is no specified style of teaching or assessment in OBE; instead classes, opportunities, and assessments should all help students achieve the specified outcomes.

There are three educational Outcomes as defined by the National Board of Accreditation:

Program Educational Objectives: The Educational objectives of an engineering degree program are the statements that describe the expected achievements of graduate in their career and also in particular what the graduates are expected to perform and achieve during the first few years after graduation. [nbaindia.org]

Program Outcomes: What the student would demonstrate upon graduation. Graduate attributes are separately listed in Appendix C

Course Outcome: The specific outcome/s of each course/subject that is a part of the program curriculum. Each subject/course is expected to have a set of Course Outcomes



APPENDIX B - MAPPING OF OUTCOMES

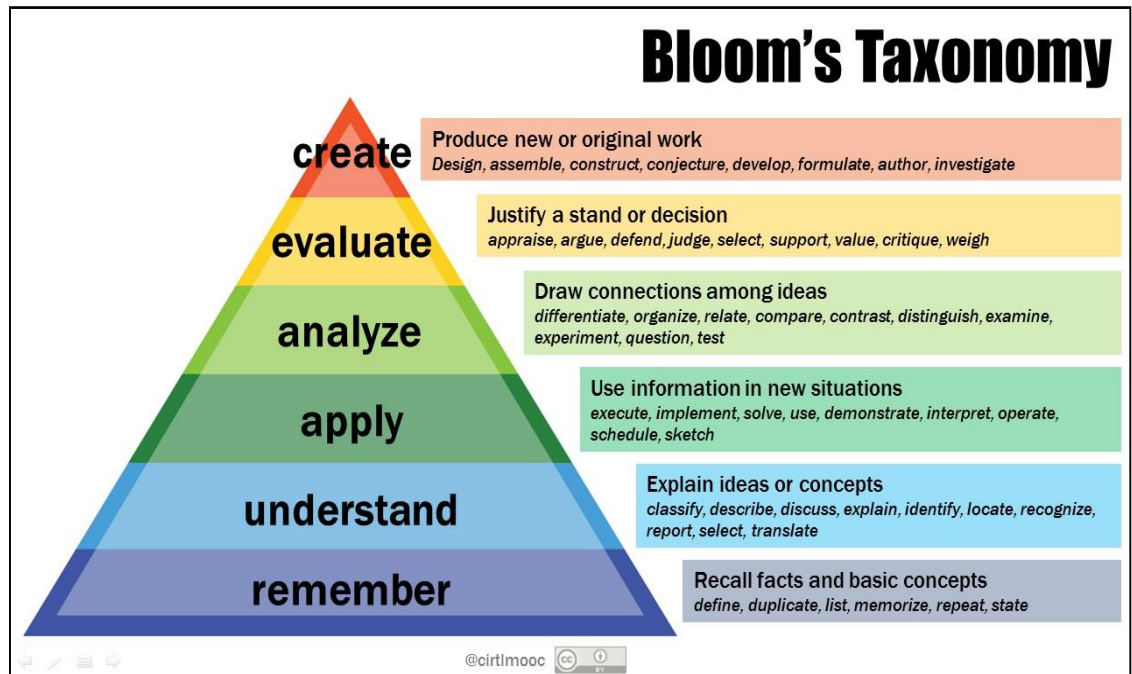




APPENDIX C

BLOOM'S TAXONOMY

Bloom's taxonomy is a classification system used to define and distinguish different levels of human cognition—i.e., thinking, learning, and understanding. Educators have typically used Bloom's taxonomy to inform or guide the development of assessments (tests and other evaluations of student learning), curriculum (units, lessons, projects, and other learning activities), and instructional methods such as questioning strategies. [eduglosarry.org]



Department of Physics (Day)

ACADEMIC YEAR 2021-2022

I to VI Semesters

SCHEME AND SYLLABUS

| CONTENTS | PAGE NO. |
|--|-----------------|
| 1. Vision, Mission and Program Educational Objectives (PEO) | 5-7 |
| 2. Program Outcomes (PO) with Graduate Attributes | 8 |
| 3. Mapping of POs with PEOs | 10 |

SCHEME

| | |
|-------------------------------------|-----------|
| 4. Scheme of First Semester | 14 |
| 5. Scheme of Second Semester | 14 |
| 6. Scheme of Third Semester | 15 |
| 7. Scheme of Fourth Semester | 16 |
| 8. Scheme of Fifth Semester | 17 |
| 9. Scheme of Sixth Semester | 18 |
| 10. Scheme of Sixth Semester | 19 |

SYLLABUS

| | |
|---|----|
| 11. Syllabus of First Semester: | |
| a) Core Paper I -Mechanics and Properties of Matter | 21 |
| b) Allied Physics Paper – I for B.Sc.Mathematics students | 26 |
| 12. Syllabus of Second Semester: | |
| a) Core Paper II - Thermal Physics and Acoustics | 29 |

| | |
|--|----|
| b) Core Practical I | 34 |
| c) Allied Physics Paper – II for B.Sc.Mathematics students | 36 |
| d) Allied Physics Practicals for B.Sc.Mathematics students | 40 |

13. Non Major Electives

| | |
|--|----|
| 1. Physics in Everyday Life-1 | 42 |
| 2. Physics in Everyday Life-2 | 45 |
| 3. AstroPhysics | 47 |
| 4. Non-Conventional Energy Sources | 50 |
| 5. BioPhysics | 52 |
| 6. Introduction to Numerical Methods | 55 |
| 7. Contribution of India to Modern Science | 57 |

14. Syllabus of Third Semester:

| | |
|---|----|
| a) Core Paper III -Optics | 60 |
| b) Allied Physics Paper – I for B.Sc.Chemistry students | 65 |

15. Syllabus of Fourth Semester:

| | |
|--|----|
| a) Core Paper IV -Atomic Physics | 68 |
| b) Core Practical II | 72 |
| c) Allied Physics Paper – II for B.Sc.Chemistry students | 74 |
| c) Allied Physics Practicals for B.Sc.Chemistry students | 78 |

16. Syllabus of Fifth Semester:

| | |
|--|-----|
| a) Core Paper V -Electricity and Electromagnetism | 80 |
| b) Core Paper VI- Mathematical methods in Physics | 84 |
| c) Core Paper VII -Solid State Physics | 87 |
| d) Core Paper VIII - Basic Electronics | 90 |
| e) Elective I (Any one of the below) | |
| I a. Applied Electronics | 93 |
| I b. Problem Solving in Physics | 96 |
| I c. Numerical Methods | 99 |
| | |
| 17. Syllabus of Sixth Semester: | |
| a) Core Paper IX -Relativity and Quantum Mechanics | 102 |
| b) Core Paper X- Nuclear and Particle Physics | 105 |
| c) Elective II (Any one of the below) | |
| II a. Digital Electronics | 108 |
| II.b. GeoPhysics | 111 |
| II c. Medical Physics | 114 |
| d) Elective III (Any one of the below) | |
| III a.Microprocessor Fundamentals | 117 |
| III b Fiber Optics | 119 |
| III c..Astrophysics | 122 |
| III d. Weather Forecasting | 125 |
| e) Core Practical III | 128 |
| f) Core Practical IV | 129 |
| g) Core Practical V | 131 |
| 18. APPENDIX Graduate Attributes | 133 |

Institution

VISION

To impart value based quality academia; to empower students with wisdom and to charge them with rich Indian traditions and culture; to invoke the self, to broaden the same towards nation building, harmony and Universal brotherhood.

MISSION

To ensure sustained progress and development in imparting quality education, to pioneer new avenues of teaching and research and to emerge as an institution with potential for excellence.

DEPARTMENT OF PHYSICS

VISION

To train the students to develop the scientific temper, achieve excellence in education in the field of Physics and related areas and equip them with skills, knowledge and become life- long learners.

MISSION

| | |
|-----------|---|
| M1 | To create an academic base that responds to the need of the students to understand the basics of Physics and it's ever evolving nature of applications in explaining all observed natural phenomenon as well as predicting the future applications to the new phenomenon with a global perspective. |
| M2 | Apply one's knowledge and understanding relating to physics and skills to new/unfamiliar contexts and to identify and analyze problems and issues and seek solutions to real-life problems. |
| M3 | To be a tool for transformation marching in the toad map of our country's vision towards Higher Education. |

PROGRAMME EDUCATION OBJECTIVES (PEOs)

| | |
|-------------|---|
| PEO1 | Create the facilities and environment in all the educational institutions to consolidate the knowledge acquired at +2 and to motivate and inspire the students to create deep interest in Physics, to develop broad and understanding of physical concepts, principles and theories of Physics. |
| PEO2 | Emphasize the discipline of Physics to be the most important branch of science for pursuing the interdisciplinary higher educations and/or research in interdisciplinary and multidisciplinary. |
| PEO3 | Succeed in obtaining job opportunities appropriate to their interests, as well |

| | |
|-------------|--|
| | aspire for higher education and cultivate abilities. |
| PE04 | Imparting fundamental and 21 st century skills and training to be life – long learners and demonstrate analytical skills and global competency. |
| PE05 | Improve leadership qualities in creating successful citizens with rational thinking and scientific temper. |

PEO TO MISSION STATEMENT MAPPING

| MISSION STATEMENTS | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 |
|---------------------------|-------------|-------------|-------------|-------------|-------------|
| M1 | 2 | 3 | 3 | 3 | 3 |
| M2 | 2 | 3 | 3 | 3 | 2 |
| M3 | 3 | 3 | 3 | 3 | 3 |

CORRELATION: 3- STRONG

2- MEDIUM

1- LOW

PROGRAM OUTCOMES (PO) IN RELATION TO GRADUATE ATTRIBUTES

PROGRAMME OUTCOMES

On completion of B.Sc. Physics program, the students of our Department will be able to:

| S.No. | GRADUATE ATTRIBUTES | PROGRAMME OUTCOMES |
|-------|--|--|
| 1. | Disciplinary knowledge and skills | Acquire a fundamental, systematic, coherent understanding of the academic field of Physics, its different learning areas applications in basic Physics as well its linkages with related disciplinary areas. (PO1) |
| 2. | Skilled communicator | Demonstrate relevant problem-solving skills that are required to solve different types of Physics-related problems with well-defined solutions, to develop communication skills involving the ability to listen carefully, to read texts and research papers analytically and to present complex information in a concise manner, to improve analytical skills, to construct logical arguments using correct technical language related to Physics, to develop ICT skills and personal skills such as the ability to work both independently and in a group. Gain necessary skills to communicate various concepts and applications of STEM to peer group and common man. (PO2) |
| 3. | Critical thinker and problem solver | Plan and execute Physics-related experiments, analyze and interpret the acquired data using appropriate software and report the findings of the experiments while relating the findings to relevant theories of Physics. Develop systematic analysis by deduction analogy, argument and reasoning. (PO3) |

| | | |
|-----|---|--|
| 4. | Sense of inquiry | Analyze Nature and laws of Physics by asking relevant questions in a sequential manner by inductive method. (PO4) |
| 5. | Team player/worker | Collaborate effectively and gain the ability to work both independently and in group. (PO5) |
| 6. | Skilled project manager | Understand the flow of Project/experimentation; gather men, method and means for its implementation. (PO6) |
| 7. | Digitally Efficient | Seek e-resources and update Scientific information and skills through ICT tools. (PO7) |
| 8. | Ethical awareness / reasoning | Demonstrate professional behavior such as being objective, unbiased and truthful in all aspects of work and avoiding unethical, irrational behavior such as fabricating, falsifying or misrepresenting data or committing plagiarism; the ability to identify the potential ethical issues in work-related situations; appreciation of intellectual property, environmental and sustainability issues; and promoting safe learning and working environment. (PO8) |
| 9. | National and International perspective | Participate in global citizen science projects using e-learning materials as well execute proposals of National and International importance. (PO9) |
| 10. | Lifelong learners | Learn, Unlearn, Relearn as well seeks solution to real life problems. (PO10) |

Mapping of POs TO PEOs

| PEO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|--------|------|------|------|------|------|------|------|------|------|-------|
| PEO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| PEO 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| PEO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| PEO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| PEO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

PROGRAM SPECIFIC OUTCOMES

PSO1 - Understand, identify basic principles and concepts of various branches of Physics, correlate and solve the problems in the field of core and applied Physics.

PSO2 - Demonstrate the acquired knowledge of Physics on various scientific issues.

PSO3 - Design various experiments, electronic circuits investigate and become capable problem solver, using mathematical, conceptual and hands on skills.

PSO4 - Apply analytical abilities acquired from the class room / laboratory and promote scientific ideas, harness renewable and nonconventional energy resources.

PSO5 - Appreciate their experimental learning beyond the classroom; construct logical arguments, using technical language, develop programming skills, approach open-ended problems and innovate solutions.

Above 1 to 3 goals are foundational goals leading to fundamental understanding of Physics. All the courses and various modules on the courses are built on the foresaid goals. The goals 3 to 5 are realized through laboratory experiments, projects and e- learning resources.

DEPARTMENT OF PHYSICS

ELIGIBILITY FOR ADMISSION

A pass in the Higher Secondary Examination by the Govt. of Tamil Nadu or an Examination accepted as equivalent thereof by the Syndicate of the University of Madras with Physics and Mathematics as major subjects of study.

DURATION OF THE COURSE

Duration of the course is three academic years consisting of six semesters. And each semester comprises of not less than 90 working days.

B.Sc. Physics Curriculum

Physics is one of the basic and fundamental sciences. The curriculum for the Graduate programme in physics is revised as per the UGC guidelines on Learning Outcome based education criteria course framework and integrated common regulations under CBCS of University of Madras. The learner-centric courses let the student progressively develop a deeper understanding of various aspects of physics. The courses will train students with sound theoretical and experimental knowledge that suits the need of academics and industry. In addition to the theoretical course work, students also learn Physics Laboratory methods for different branches of physics, specialized measurement techniques, analysis of observational data, including error estimation. Students will have deeper understanding of laws of nature through the subjects like classical Mechanics, quantum mechanics, statistical physics etc. Students' ability of problem Solving will be enhanced. Students can apply principles in physics to real life problems. Subjects like integrated electronics and microprocessors will enhance the logical skills as well as employability skills. Numerical methods and mathematical Physics provides analytical thinking and provides a better platform for higher level Physics and research. The restructured courses with well defined objectives and learning outcomes, provides guidance to prospective students in choosing the elective courses to broaden their skills in the field of physics and interdisciplinary areas. Elective modules of the framework offer students choice to gain knowledge and expertise in specialized domains of physics like astrophysics, medical physics, etc.

ELIGIBILITY FOR THE AWARD OF DEGREE

A candidate shall be eligible for the award of the degree only if she/he has undergone prescribed course of study for a period of not less than three academic years and passed the

examination of all the six semesters prescribed earning a minimum of 140 credits as per the distribution given for Part I, II, III, IV & V and also fulfilled such other conditions as have been prescribed thereof.

SCHEME OF EXAMINATIONS

As per the university regulation the following split up of marks for theory and practical are to be followed.

(i) SPLIT UP FOR INTERNAL AND EXTERNAL MARKS FOR THEORY AND PRACTICAL PAPER:

| S.No. | Paper | Internal | External | Total |
|--------------|--------------|-----------------|-----------------|--------------|
| 1. | Theory | 40 | 60 | 100 |
| 2. | Practical | 40 | 60 | 100 |

(ii) SPLIT UP FOR INTERNAL ASSESSMENT MARKS (40) FOR THEORY:

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | Tests | Attendance | Quizzes, Assignments, Seminars, etc | Current Affairs, Hands-on activities, etc |
|--------------------------|--------------|-------------------|--|--|
| Marks (out of 50) | 20 | 5 | 5 | 10 |
| Remember | | | 5 | |
| Understand | | 5 | | |
| Apply | 10 | | | 10 |
| Analyze | 5 | | | |
| Evaluate | 5 | | | |
| Create | | | | |

(iii) SPLIT UP FOR INTERNAL ASSESSMENT MARKS (40) FOR PRACTICALS:

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | Tests | Attendance | Record |
|--------------------------|--------------|-------------------|---------------|
| Marks (out of 50) | 20 | 5 | 5 |
| Remember | | | 5 |
| Understand | | 5 | |
| Apply | 5 | | |
| Analyze | | | |
| Evaluate | 5 | | |
| Create | 10 | | |

iv) ESE- Semester End Examination - THEORY (Exam for 100 Marks; weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 20 |
| Understand | 20 |
| Apply | 30 |
| Analyse | 15 |
| Evaluate | 10 |
| Create | 5 |

v) ESE- Semester End Examination – PRACTICALS (Exam for 100 Marks; weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 5 |
| Understand | 20 |
| Apply | 15 |
| Analyse | 20 |
| Evaluate | 15 |
| Create | 20 |

COURSE STRUCTURE

Scheme of First Semester

| S.No. | Course Components | Subjects | Inst. Hrs | Credits | Exam Hrs | Max. Marks | | |
|-------|-------------------|---|-----------|---|----------|------------|------------|-------|
| | | | | | | Ext. Marks | Int. Marks | Total |
| 1 | PART I | Language Paper I | 4 | 3 | 3 | 60 | 40 | 100 |
| 2 | PART II | English Paper I | 4 | 3 | 3 | 60 | 40 | 100 |
| 3 | PART III | Core Paper I Mechanics and Properties of Matter | 6 | 5 | 3 | 60 | 40 | 100 |
| | | Core Practical I | 3 | Practical examination at the end of Semester II | | | | |
| 4 | | Allied Mathematics 1 | 9 | 5 | 3 | 60 | 40 | 100 |
| 5 | Part IV | Non-Major Elective NME / Basic Tamil | 2 | 2 | 3 | 60 | 40 | 100 |
| 6 | | Soft Skill I | 2 | 2 | 3 | 60 | 40 | 100 |
| | Total | | 30 | 20 | | 360 | 240 | 600 |

Scheme of Second Semester

| S.No. | Course Components | Subjects | Inst. Hrs | Credits | Exam Hrs | Max. Marks | | |
|-------|-------------------|-------------------|-----------|---------|----------|------------|------------|-------|
| | | | | | | Ext. Marks | Int. Marks | Total |
| 1 | PART I | Language Paper II | 4 | 3 | 3 | 60 | 40 | 100 |
| 2 | PART II | English Paper II | 4 | 3 | 3 | 60 | 40 | 100 |

| | | | | | | | | |
|---|----------|--|----|----|---|-----|-----|-----|
| 3 | PART III | Core Paper II Thermal Physics and Acoustics | 6 | 5 | 3 | 60 | 40 | 100 |
| | | Core Practical I | 3 | 4 | 3 | 60 | 40 | 100 |
| 4 | | Allied Mathematics II | 9 | 5 | 3 | 60 | 40 | 100 |
| 5 | Part IV | Non-Major Elective/ Basic Tamil | 2 | 2 | 3 | 60 | 40 | 100 |
| 6 | | Soft Skill II | 2 | 2 | 3 | 60 | 40 | 100 |
| | Total | | 30 | 24 | | 420 | 280 | 700 |

Scheme of Third Semester

| S.No. | Course Components | Subjects | Inst. Hrs | Credits | Exam Hrs | Max. Marks | | |
|-------|----------------------|-----------------------------------|--------------|--|-------------|--|---------------|-------|
| | | | | | | Ext. Marks | Int. Marks | Total |
| 1 | PART I | Language Paper III | 6 | 3 | 3 | 60 | 40 | 100 |
| 2 | PART II | English Paper III | 4 | 3 | 3 | 60 | 40 | 100 |
| 3 | PART III | Core Paper III Optics | 6 | 5 | 3 | 60 | 40 | 100 |
| | | Core Practical II | 3 | | | Practical examination at the end of Semester IV | | |
| 4 | | Allied Chemistry I | 6 | 5 | 3 | 60 | 40 | 100 |
| 5 | | Allied Chemistry Practicals | 3 | Practical examination at the end of Even Semester | | | | |

| | | | | | | | | |
|---|---------|---------------------------|----|---|---|-----|-----|-----|
| 6 | Part IV | Environmental Studies EVS | 2 | Examination at the end of Even Semester | | | | |
| 7 | | Soft Skill III | 2 | 2 | 3 | 60 | 40 | 100 |
| | Total | | 30 | 18 | | 300 | 200 | 500 |

Scheme of Fourth Semester

| S.No. | Course Components | Subjects | Inst. Hrs | Credits | Exam Hrs | Max. Marks | | |
|-------|-------------------|--|-----------|---------|----------|------------|------------|-------|
| | | | | | | Ext. Marks | Int. Marks | Total |
| 1 | PART I | Language Paper IV | 6 | 3 | 3 | 60 | 40 | 100 |
| 2 | PART II | English Paper IV | 4 | 3 | 3 | 60 | 40 | 100 |
| 3 | PART III | Core Paper IV Atomic Physics | 6 | 5 | 3 | 60 | 40 | 100 |
| | | Core Practical II | 3 | 4 | 3 | 60 | 40 | 100 |
| 4 | | Allied Chemistry II | 6 | 5 | 3 | 60 | 40 | 100 |
| 5 | | Allied chemistry Practicals | 3 | 5 | 3 | 60 | 40 | 100 |
| 6 | Part IV | Environmental Studies EVS | 2 | 2 | 3 | 60 | 40 | 100 |
| 7 | | Soft Skill III | 2 | 2 | 3 | 60 | 40 | 100 |
| | Total | | 30 | 29 | | 480 | 320 | 800 |

Scheme of Fifth Semester

| S.No. | Course Components | Subjects | Inst. Hrs | Credits | Exam Hrs | Max. Marks | | | |
|-------|-------------------|--|-----------|---|----------|------------|------------|-------|--|
| | | | | | | Ext. Marks | Int. Marks | Total | |
| 1 | PART III | Core Paper V Electricity and Electromagnetism | 5 | 5 | 3 | 60 | 40 | 100 | |
| 2 | | Core Paper VI Mathematical methods in Physics | 5 | 5 | 3 | 60 | 40 | 100 | |
| 3 | | Core Paper VII Solid State Physics | 4 | 5 | 3 | 60 | 40 | 100 | |
| 4 | | Core Paper VIII Basic Electronics | 4 | 5 | 3 | 60 | 40 | 100 | |
| 5 | | Elective I a. Applied Electronics or b. Problem Solving in Physics or c. Numerical Methods | 4 | 4 | 3 | 60 | 40 | 100 | |
| 6 | | Core Practical III | 3 | Practical examination at the end of Semester VI | | | | | |
| 7 | | Core Practical IV | 3 | | | | | | |
| 8 | | Core Practical V | 2 | | | | | | |
| 9 | PART IV | Value Education | - | 2 | | | | 100 | |
| | Total | | 30 | 26 | | | | 600 | |

Scheme of Sixth Semester

| S.No. | Course Components | Subjects | Inst. Hrs | Credits | Exam Hrs | Max. Marks | | |
|-------|-------------------|--|----------------------|---------|----------|------------|------------|-------|
| | | | | | | Ext. Marks | Int. Marks | Total |
| 1 | PART III | Core Paper IX Relativity and Quantum Mechanics | 6 | 5 | 3 | 60 | 40 | 100 |
| 2 | | Core Paper X Nuclear and Particle Physics | 6 | 5 | 3 | 60 | 40 | 100 |
| 3 | | Elective II a. Digital Electronics or b. Medical Physics or c. Geo Physics | 5 | 4 | 3 | 60 | 40 | 100 |
| 4 | | Elective III a. Microprocessor Fundamentals or b. Astrophysics or c. Fiber Optics or d. Weather Forecasting | 5 | 4 | 3 | 60 | 40 | 100 |
| 6 | | Core Practical III | 3 | 4 | 3 | 60 | 40 | 100 |
| 7 | | Core Practical IV | 3 | 4 | 3 | 60 | 40 | 100 |
| 8 | | Core Practical V | 2 | 3 | 3 | 60 | 40 | 100 |
| 9 | | PART IV | Extension activities | - | 1 | | | |
| | Total | | 30 | 30 | | 480 | 220 | 700 |

ALLIED PHYSICS

| S.No. | Semester | Subjects | Inst. Hrs | Credits | Exam Hrs | Max. Marks | | |
|-------|---------------|---------------------------|-----------|---|----------|------------|------------|-------|
| | | | | | | Ext. Marks | Int. Marks | Total |
| 1 | Odd Semester | Allied Physics I | 6 | 5 | 3 | 60 | 40 | 100 |
| 2 | | Allied Practicals | 3 | Practical Examination at the end of Even semester | | | | |
| 3 | Even Semester | Allied Physics II | 5 | 5 | 3 | 60 | 40 | 100 |
| 4 | | Allied Physics Practicals | 3 | 4 | 3 | 60 | 40 | 100 |

Question Paper Pattern for B.Sc Physics Degree Course based on CBCS Pattern

(except non-major elective)

THEORY

Maximum Ext. Marks: 100

Duration: 3 hours

| | | |
|---|--------------------|--------------------|
| | PART A (50 words) | |
| To answer 10 questions | | |
| out of 12 questions (at least two questions from each unit) | | 10x2marks=20 marks |
| | PART B (200 words) | |
| To answer 5 questions | | |
| out of 7 question (at least one question from each unit) | | 5X7 marks=35 marks |
| | PART C (500 words) | |
| To answer 3 questions | | |
| out of 5 question (at least one question from each unit) | | 3X15marks=45 marks |
| | Total | 100 marks |

PRACTICALS

Maximum Ext. Marks: 60

Duration: 3 hours

The external examiner will prepare a question paper on the spot with the help of the Question Bank supplied by the controller's office.

Practical Exam will be conducted ONLY at the end of even semester of every academic year

SEMESTER – I

(SYLLABUS)

MECHANICS AND PROPERTIES OF MATTER

| | |
|-----------------------------|-----------------------|
| Course Code : 09101 | Credits 5 |
| L: T: P: S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

Mechanics is a branch of Physics dealing with study of motion which is a fundamental idea in all of Science. A study of the properties of Matter leads to information which is of practical value to both the physicist and the engineers and also gives us some information about the internal forces which act between the Constituent parts of the substance. The students who undergo this course are successfully bound to get a better insight and understanding of the subject Mechanics and Properties of Matter.

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) , K6(Creating)

| | | |
|------------|--|--------------|
| CO1 | To Discuss and use Laws of impact, study the behavior of rigid body dynamics. | K2,K3 |
| CO2 | Examine the definition for centre of gravity in hemisphere, hollow hemisphere, etc. | K3,K4 |
| CO3 | Study the elastic behavior in terms of three moduli of elasticity and working of torsion Pendulum. Study of bending of beams and analyze the expression for Young's Modulus. | K3,K4 |
| CO4 | Analyze the performance of hydrostatic and hydrodynamics. | K3 |

| | | |
|------------|--|--------------|
| CO5 | Explain the surface tension and viscosity of fluid and support the interesting phenomena associated with liquid surface. Soap films provide an analogue solution to many engineering problems. | K2,K3 |
|------------|--|--------------|

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated - 1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

| S.No. | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|------------|
| 1 | <p>Unit 1: Impulse and Impact</p> <p>Impulse – impact – Laws of impact – direct impact and oblique impact between two smooth spheres – loss of kinetic energy – conservation of linear momentum -- motion of two interacting bodies – reduced mass- reduction of two body problem into single body problem.</p> <p>Gravitation</p> <p>Moment of inertia – Parallel axes theorem – moment of inertia of hollow sphere, solid cone - Compound pendulum – theory – equivalent simple pendulum – reversibility of centre of oscillation and</p> | 1 | CO1 |

| | | | |
|---|---|---|-----|
| | suspension –determination of g and k– Newton’s law of gravitation(statement) - Determination of G by Cavendish method - Kepler’s law (statement). | | |
| 2 | <p>Unit 2: Statics, hydrostatics</p> <p>Centre of parallel forces – Centre of mass – Centre of gravity – Centre of gravity of uniform triangular lamina – Centre of gravity of uniform parallelogram lamina, solid and hollow hemisphere – Centre of pressure – vertical rectangular lamina – vertical triangular lamina – condition for equilibrium of a floating body</p> <p>Hydrodynamics</p> <p>Streamline and turbulent flow - equation of continuity of flow –Euler’s equation of unidirectional flow – Torricelli’s theorem – Bernoulli’s theorem - applications – Venturimeter – Pitot’s tube – atomizer pump – Bunsen burner</p> | 1 | CO2 |
| 4 | <p>Unit 4: Bending of beams</p> <p>Cantilever – expression for bending moment – expression for depression – cantilever oscillations – expression for time period – experiment to find Young’s modulus – Non uniform bending – experiment to determine Young’s modulus by Koenig’s method – Uniform bending – expression for elevation – experiment to determine Young’s modulus using pin and microscope by non uniform method – experiment to determine Young’s modulus by opticlever method – I-form girders</p> | 1 | CO4 |
| 5 | <p>Unit 5: Fluid dynamics</p> <p>Surface tension - definition – excess of pressure over curved surface – spherical drop – cylindrical drop – spherical bubble – cylindrical</p> | 1 | CO5 |

| | | | |
|--|--|--|--|
| | <p>bubble - determination of surface tension by drop weight method – experiment to determine interfacial surface tension – surfactants – variation of surface tension with temperature – Jaegar’s method.</p> <p>Viscosity - definition – Coefficient of viscosity of liquid – critical velocity – Rate of flow of liquid in a capillary tube – Poiseuille’s formula –experimental determination by capillary flow method – variation of viscosity of a liquid with temperature – Viscosity of gases – Rankine’s method – Application.</p> | | |
|--|--|--|--|

TEXT BOOKS:

1. M. Narayanamoorthy. Mechanics – Part I and II, National Publishing Company.
2. D.S. Mathur (2001). Mechanics (2nd Edition), S. Chand &Co.
3. M. Narayanamoorthy & N. Nagarathinam (1989). Statistics, Hydrostatics and Hydrodynamics, National Publishing Company, Chennai.
4. Brij Lal and N. Subramaniam (1994). Properties of Matter, S. Chand & Co., New Delhi.
5. D.S. Mathur (2001). Elements of Properties of Matter, S. Chand & Co., New Delhi.

REFERENCE BOOKS:

1. C.J. Smith (1960). General Properties of Matter, Orient Longman Publishers.
2. D. Halliday, R. Resnick and J.Walker (2001). Fundamentals of Physics (6th edition), Wiley New York.
3. P.K. Chakrabarty (2001). Mechanics and General Properties of Matter, Books and Allied (P) Ltd.
4. H.R. Gulati (1982). Fundamentals of General Properties of Matter, S. Chand & Co., New Delhi.

WEB LINKS :

<https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work>

<http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html>

<https://www.youtube.com/watch?v=gT8Nth9NWPM>

<https://www.youtube.com/watch?v=9mXOMzUruMQ&t=1s>

<https://www.youtube.com/watch?v=m4u-SuaSu1s&t=3s>

<https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work>

<https://learningtechnologyofficial.com/category/fluid-mechanics-lab/>

Physics –I for Allied

(For I B.Sc. Mathematics students)

Effective for 2021 -24 batch onwards

| | |
|-----------------------------|-----------------------|
| Course Code : 09102 | Credits 05 |
| L: T: P: S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives: Demonstrate basic principles of physics and one's knowledge of physics relate theoretical concepts acquired at schooling level to do experiments.

Course Outcomes: At the end of the Course, the Student will be able to:

**Knowledge level - K1(Remembering), K2(Understanding), K3(Applying), K4(Analyzing)
K5(Evaluating), K6(Creating)**

| | | |
|------------|---|---------------------------|
| CO1 | Explain SHM, Extend their knowledge in the study of various dynamic motions analyzes and it demonstrates mathematically. Relate theory with practical applications in medical field. | K2, K4 |
| CO2 | Explain their knowledge of understanding about materials and their behaviors and apply it to various situations in laboratory and real life. Connect droplet theory with Corona transmission. | K3 |
| CO3 | Comprehend basic concept of thermodynamics concept of entropy and associated theorems able to interpret the process of flow temperature physics in the background of growth of this technology. | K5 |
| CO4 | Articulate the knowledge about electric current resistance, capacitance in terms of potential electric field and electric correlate the connection between electric field and magnetic field and analyze them mathematically verify circuits and apply the concepts to construct circuits and study them. | K3, K4, K6 |
| CO5 | Interpret the real life solutions using AND, OR, NOT basic logic gates and intend their ideas to universal building blocks. Infer operations using Boolean algebra and acquire elementary ideas of IC circuits. . Acquire information about various Govt. programs/ institutions in this field. | K2 |
| CO6 | Construct circuits using semiconductor devices and ICs and analyze their working. | K3,K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3

moderately correlated – 2

weakly correlated –1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S.No. | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | <p>Unit 1: Waves, Oscillations and Ultrasonics</p> <p>Simple harmonic motion – composition of two simple harmonic motion at right angles (periods in the ratio 1:1) – Lissajous figures – uses – laws of transverse vibrations of strings – determination of a.c frequency using sonometer (steel and brass wires)</p> <p>Ultrasound- production – piezoelectric method – Application of ultrasonics : In Medical field- lithotripsy, ultrasonography- ultrasonoimaging- ultrasonics in dentistry, physiotherapy, ophthalmology – advantages of noninvasive surgery – Ultrasonics in green chemistry</p> | 1 | CO1 |

| | | | |
|---|---|---|-----------|
| 2 | <p>Unit 2: Properties of Matter</p> <p>Elasticity: Elastic constant – bending of beam – theory of non- uniform bending – determination of Young’s modulus by non uniform bending – energy stored in a stretched wire – torsion of a wire – determination of rigidity modulus by torsional pendulum</p> <p>Viscosity: streamline and turbulent motion – critical velocity – coefficient of viscosity – Poiseuille’s formula – comparison of viscosities – burette method</p> <p>Surface tension: definition – Molecular Theory behind Human saliva Droplets formation–shape, size and lifetime- Physics behind COVID transmission through droplets- drop weight method – interfacial surface tension.</p> | 1 | CO2 |
| 3 | <p>Unit 3: Heat and Thermodynamics</p> <p>Joule-Kelvin effect – Joule-Thomson porous plug experiment – theory – temperature of inversion – Liquefaction of Oxygen gas– Linde’s process of Liquefaction from separation from Air– Liquid oxygen for medical Purpose– importance of cryocoolers -thermodynamic system – thermodynamic equilibrium – laws of thermodynamics – heat engine – Carnot’s cycle– efficiency – entropy – change of entropy in reversible and irreversible process.</p> | 1 | CO3 |
| 4 | <p>Unit 4: Electricity and Magnetism</p> <p>Potentiometer – principle – measurement of thermo emf using potentiometer –magnetic field due to a current carrying conductor – Biot Savart’s law – field along the axis of the coil carrying current - peak, average and RMS values of ac current and voltage – power factor and current values in an ac circuit – Types of switches in household and factories– Smart wifi switches– fuses and circuit breakers in houses</p> | 1 | CO4 |
| 5 | <p>Unit 5: Digital Electronics and Digital India</p> <p>Logic gates : OR, AND, NOT, NAND, NOR , EXOR logic gates – Universal building blocks – Boolean algebra – De Morgan’s theorem – verification – Overview of initiatives Government of India: Software Technological Parks of India under MeitY; – NIELIT- Semiconductor Laboratories under Dept. of Space – An Introduction to Digital India</p> | 1 | CO5 & CO6 |

TEXT BOOKS:

1. R. Murugesan (2001). Allied Physics, S. Chand & Co, New Delhi.
2. Brijlal and N. Subramanyam (1994). Waves and Oscillations, Vikas Publishing house, New Delhi.
3. Brij Lal and N. Subramaniam (1994). Properties of Matter, S. Chand & Co., New Delhi.
4. J.B. Rajam and C.L. Arora (1976). Heat and Thermodynamics (8th edition), S. Chand & Co., New Delhi.
5. R. Murugesan (2005). Optics and Spectroscopy, S. Chand & Co, New Delhi.
6. A. Subramaniyam Applied Electronics (2nd Edition), National Publishing Co., Chennai.

REFERENCE BOOKS:

1. Resnick Halliday and Walker (2018). Fundamentals of Physics (11th edition), John Willey and Sons, Asia Pvt. Ltd., Singapore.
2. V.R. Khanna and R.S. Bedi (1998). Text book of Sound (1st edition), Kedharnaath Publish & Co, Meerut.
3. N.S. Khare and S.S. Srivastava (1983). Electricity and Magnetism (10th Edition), Atma Ram & Sons, New Delhi.
4. D.R. Khanna and H.R. Gulati (1979). Optics, S. Chand & Co. Ltd., New Delhi.
5. V.K. Metha (2004). Principles of electronics (6th edition), S. Chand and company.

WEB LINKS:

https://youtu.be/M_5KYncYNyc

<https://youtu.be/ljJLJgIvaHY>

https://youtu.be/7mGqd9HQ_AU

<https://youtu.be/h5jOAw57OXM>

<http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html>

<https://www.youtube.com/watch?v=gT8Nth9NWPM>

<https://www.youtube.com/watch?v=9mXOMzUruMQ&t=1s>

<https://www.youtube.com/watch?v=m4u-SuaSu1s&t=3s>

<https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work>

<https://learningtechnologyofficial.com/category/fluid-mechanics-lab/>

SEMESTER II

THERMAL PHYSICS AND ACOUSTICS

| | |
|-----------------------------|-----------------------|
| Course Code : 09204 | Credits : 5 |
| L: T: P: S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

Thermal Physics forms one of the core foundations of Modern Physics and plays a significant role in understanding Condensed Matter Physics, Material Science, even to High Energy Physics and Astrophysics. The study of Acoustics helps the students to understand the significance of their field in the study of geologic, atmospheric phenomena, medicine. Thermal Physics and Acoustics serve as an introductory course to Statistical Mechanics.

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|-----------|
| CO1 | To acquire knowledge on how to distinguish between temperature and heat. Introduce him/her to the field of thermometry and explain practical measurements of high temperature as well as low temperature physics. Student identifies the relationship between heat capacity, specific heat capacity. The study of Low temperature Physics sets the basis for the students to understand cryogenics, superconductivity, superfluidity and Condensed Matter Physics | K2 |
|------------|---|-----------|

| | | |
|------------|--|-----------|
| CO2 | Derive the efficiency of Carnot's engine. Draw the significance of first law and second law of thermodynamics. Discuss the implications of the laws of Thermodynamics in diesel and petrol engines and analyze their performance of thermodynamic systems viz efficiency by problems. An Insight into thermodynamic properties like enthalpy, entropy. | K4 |
| CO3 | Study the process of thermal conductivity and apply it to good and bad conductors. | K3 |
| CO4 | Understand physical characteristics of SHM and obtaining solution of the oscillator using differential equations. Use Lissajous figures to understand SHM vibrations of same frequencies and different frequencies. | K3 |
| CO5 | Familiarize with general terms in acoustics like intensity, loudness, reverberation, etc., and study in detail about production, detection, properties and uses of ultrasonic waves. | K2 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated - 1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|----------|--|-----|-----|
| 1 | <p>Unit 1: Thermometry and Calorimetry</p> <p>Platinum resistance thermometer – Calendar and Griffith’s bridge – thermistor – specific heat capacity – specific heat capacity of solids – Dulong and Petit’s law – specific heat capacity of liquid – method of mixtures –half time correction – specific heat capacity of gases – Meyers relation.</p> <p>Low temperature physics</p> <p>Joule-Kelvin effect – porous plug experiment - significance of Boyle temperature -temperature of inversion – liquefaction of gases – Linde’s method of liquefying air.</p> | 1 | CO1 |
| 2 | <p>Unit 2: Thermodynamics</p> <p>Thermodynamic equilibrium – zeroth law of thermodynamics – first law of thermodynamics – Reversible and irreversible processes – second law of thermodynamics-Heat engine – Carnot’s engine – Carnot’s theorem – Internal combustion engines – petrol and diesel engines – thermodynamic scale of temperature (No derivation) - Entropy – entropy and available energy – temperature – entropy diagram for Carnot’s cycle - III Law of thermodynamics – Nernst’s heat theorem.</p> | 1 | CO2 |

| | | | |
|---|---|---|-----|
| 3 | <p>Unit 3: Conduction and Radiation</p> <p>Prevost's theory of heat exchange – Kirchoff's Law - thermal conductivity – rectilinear flow of heat – thermal conductivity of a good conductor – Forbe's method – thermal conductivity of a bad conductor – Lee's disc method – radiation – blackbody radiation – Wien's law – Stefan's law – Rayleigh Jeans Law – Planck's law (no derivation), Newton's law of cooling from Stefan's law – Solar constant – Pyroheliometer – temperature of sun and other stellar objects.</p> | 1 | CO3 |
| 4 | <p>Unit 4: Waves and Oscillations</p> <p>Simple harmonic motion - combination of two SHMs in a straight line – at right angles – Lissajous figures - uses – free, damped, forced oscillations and resonance – examples and application of resonance – laws of transverse vibration – determination of frequency of a tuning fork using sonometer – determination of a.c. frequency using sonometer – steel wire – brass wire.</p> | 1 | CO4 |
| 5 | <p>Unit 5: Ultrasonics and Architectural acoustics</p> <p>Ultrasonics – production – piezo electric crystal method – magnetostriction method – diffraction of ultrasonics waves – ultrasonic interferometer – ultrasonic grating applications.</p> <p>Acoustics of buildings – reverberation – absorption coefficient – Sabine's formula – acoustics aspects of halls and auditoriums – intensity and loudness of sound – intensity level – decibel – noise pollution.</p> | 1 | CO5 |

TEXT BOOKS:

1. D.S. Mathur (1993). Heat and Thermodynamics, Sulthan Chand & Sons, New Delhi.
2. Brijlal and N. Subramanyam (2000). Heat and Thermodynamics S.Chand & Co, New Delhi.

3. Narayanamoorthy and KrishnaRao (1969). Heat, Triveni Publishers, Madras.
4. V.R.Khanna and R.S.Bedi (1998). Text book of Sound (1st edition), Kedharnaath Publish & Co, Meerut.
5. Brijlal and N. Subramanyam (2001). Waves and Oscillations, Vikas Publishing house, New Delhi.
6. Ghosh, (1996). Text book of Sound, S.Chand & Co, New Delhi.

REFERENCE BOOKS:

1. Zemansky (2011). Heat and Thermodynamics (8th edition), McGraw Hill Book Co. Inc., New York.
2. Resnick Halliday and Walker (2018). Fundamentals of Physics (11th edition), John Willey and Sons, Asia Pvt. Ltd., Singapore.
3. Carroll M. Leonard (1965). Fundamentals of Thermodynamics, Prentice-Hall of India (P) Ltd., New Delhi.
4. J.B. Rajam and C.L. Arora (1976). Heat and Thermodynamics (8th edition), S. Chand & Co. Ltd., New Delhi.
5. Jin Sheng Hieh (1975). Principles of Thermodynamics (1st edition), McGraw – Hill Kogakusha Ltd., Tokyo.
6. Warren Giedt (1971). Thermodynamics (1st edition), Van Nostrand Reinhold Company, New York.

WEB LINKS:

https://youtu.be/M_5KYncYNyc

<https://youtu.be/ljJLJgIvaHY>

https://youtu.be/7mGqd9HQ_AU

<https://youtu.be/h5jOAw57OXM>

<https://www.youtube.com/watch?v=4M72kQulGKk&vl=en>

Physics –II for Allied

(For I B.Sc. Mathematics students)
Effective for 2021-24 batch onwards

| | |
|--------------------------------|-----------------------|
| Course Code : 0 9 2 0 5 | Credits 5 |
| L: T: P: S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

Understand the basic concepts of optics, modern physics, concepts of relativity and quantum physics, semiconductor physics, and digital electronics. Plan and execute experiments and appropriate methods.

Course Outcomes: At the end of the Course, the Student will be able to:

**Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing)
,K5(Evaluating) ,K6(Creating)**

| | | |
|------------|---|-------|
| CO1 | Explain the concepts of Interference diffraction using principles of superposition of waves and rephrase the concept of polarization based on wave patterns | K2 |
| CO2 | Outline the basic foundation of different atom models and various experiments establishing quantum concepts. Relate the importance of interpreting improving theoretical models based on observation. Appreciate interdisciplinary nature of science and in solar energy related applications. | K3,K4 |
| CO3 | Summarize the properties of nuclei, nuclear forces structure of atomic nucleus and nuclear models. Solve problems on decay rate half life and mean life. Interpret nucleus process like fission and fusion . Understand the importance of nuclear energy, safety measures carried and get our Govt.agencies like DAE guiding the country in the nuclear field. | K3,K2 |
| CO4 | To describe the basic concepts of relativity like equivalence principle, inertial frames and Lorentz transformation. Extend their knowledge on concepts of relativity and translate the mathematical equation to physical concepts and vice versa. Relate this with current research in this field and get an overview of research projects of National and International importance , like LIGO, ICTS, and opportunities available for them. | K3,K2 |
| CO5 | Summarize the working of semiconductor devices like junction diode, zener diode, transistors and practical devices we daily use like USB chargers and EV charging stations. | K2,K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S.No. | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | <p>Unit 1 : Optics</p> <p>Interference – interference in thin films - Colors of thin films – air wedge – determination of diameter of a thin wire by air wedge – Diffraction – bending of light vs. bending of sound - normal incidence – experimental determination of wavelength using diffraction grating (no theory) - polarization – polarization by double reflection – Brewster’s law – optical activity- application in Sugar industries</p> | 1 | CO1 |

| | | | |
|---|---|---|-----|
| 2 | <p>Unit 2: Atomic Physics</p> <p>Atom model – Bohr atom model – mass number – atomic number – nucleons- vector atom model – various quantum numbers – Pauli’s exclusion principle – electronic configuration of elements and periodic classification of elements - Bohr magneton – Stark effect – Zeeman effect (Elementary ideas only) – Photo electric effect- Einstein’s Photoelectric equation-Applications of photoelectric effect : Solar cells, solar panels, digital cameras</p> | 1 | CO2 |
| 3 | <p>Unit 3: Nuclear Physics</p> <p>Nuclear model – liquid drop model – magic numbers - shell model – nuclear energy – mass defect – binding energy – radioactivity – uses – half life – mean life - radio isotopes and its uses –controlled and uncontrolled chain reaction - nuclear fission – energy released in fission – chain reaction – critical reaction – critical size- atom bomb – nuclear reactor - breeder reactor – importance of commissioning PFBR in our country- heavy water disposal, safety of reactors: Seismic and floods- introduction to DAE, IAEA - nuclear fusion - thermonuclear reactions – difference between fission and fusion.</p> | 1 | CO3 |
| 4 | <p>Unit 4 : Introduction to relativity and Gravitational waves</p> <p>Frame of reference - postulates of special theory of relativity – Galilean transformation equations - Lorentz transformation equations – derivation – length contraction – time dilation – twin paradox - mass energy equivalence – An introduction on Gravitational waves, LIGO, importance of GWAstrophysics –ICTS, opportunities at International Centre for Theoretical Sciences</p> | 1 | CO4 |
| 5 | <p>Unit 5: Semiconductor Physics</p> <p>pn junction diode - forward and reverse biasing - characteristic of diode – zener diode – characteristic of zener diode – voltage regulator – Full wave bridge rectifier- construction and working- advantages (no mathematical treatment)- USB cell phone charger- introduction to e-Vehicles and EV charging stations</p> | 1 | CO5 |

TEXT BOOKS:

1. R. Murugesan (2005). Allied Physics, S. Chand & Co, New Delhi.
2. K. Thangaraj and D. Jayaraman (2004). Allied Physics, Popular Book Depot, Chennai.
3. Brijlal and N. Subramanyam (2002). Text book of Optics, S. Chand & Co, New Delhi.
4. R. Murugesan (2005). Modern Physics, S. Chand & Co, New Delhi.
5. A. Subramaniyam Applied Electronics (2nd Edition), National Publishing Co., Chennai.

REFERENCE BOOKS:

1. Resnick Halliday and Walker (2018). Fundamentals of Physics (11th edition), John Willey and Sons, Asia Pvt.Ltd., Singapore.
2. D.R. Khanna and H.R. Gulati (1979). Optics, S. Chand & Co. Ltd., New Delhi.
3. A.Beiser (1997). Concepts of Modern Physics, Tata McGraw Hill Publication, New Delhi.
4. Thomas L.Floyd (2017). Digital Fundamentals (11th edition), Universal Book Stall – New Delhi.
5. V.K. Metha (2004). Principles of electronics (6th edition), S.Chand and company.

WEB LINKS:

<https://www.berkshire.com/learning-center/delta-p-facemask/>

<https://www.youtube.com/watch?v=QrhxU47gtj4>

https://www.youtube.com/watch?time_continue=318&v=D38BjgUdL5U&feature=emb_logo

<https://www.youtube.com/watch?v=JrRrp5F-Qu4>

<https://www.validyne.com/blog/leak-test-using-pressure-transducers/>

<https://www.validyne.com/blog/basics-pneumotach-flow-measurement/>

<https://www.atoptics.co.uk/atoptics/blsky.htm> -<https://www.metoffice.gov.uk/weather/learn-about/weather/optical-effects>

<https://www.metoffice.gov.uk/weather/learn-about/weather/optical-effects>

https://books.google.co.in/books?id=grqxTeY1z4oC&pg=PA897&lpg=PA897&dq=size+of+nitrogen+molecule+and+blue+light&source=bl&ots=hC0V9FvzP-&sig=ACfU3U270Hhk0SD3yXV10QDHjPrC1qGnDg&hl=en&sa=X&ved=2ahUKEwjKgrP6rvzpAhWNyDgGHRB_DGYQ6AEwDnoECA0QAQ#v=onepage&q=size%20of%20nitrogen%20molecule%20and%20blue%20light&f=false

<https://youtu.be/JLz7qASICYU>

<https://youtu.be/u6m4II-qZ58>

<https://youtu.be/C0HsQykDdKg>

CORE PRACTICAL-I

| | |
|-----------------------------|-----------------------|
| Course Code : 09207 | Credits 4 |
| L: T: P: S : 0:0:3:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

This course opens the window to the students about

- *the methods of experimental physics*
- *the Emphasis to laboratory techniques as accuracy of measurements & data analyze*
- *Concept that is learnt in the classroom will be translated to the laboratory sessions thus providing a hands-on leaving experience.*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|----|
| CO1 | Apply the knowledge of mathematics physics fundamentals and using instrumentation, technics to arrive at solutions for various problems. | K3 |
| CO2 | Translate basics laws and theories to demonstrations to determine various preparations of materials given. | K2 |
| CO3 | Relate application of experiment in real life situation. | K3 |
| CO4 | Demonstrate experiments involving basic concept of properties of matter, sound, heat, optics and usage of KT tools. | K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

LIST OF EXPERIMENTS:

1. Young's modulus – Non-uniform bending – Pin & microscope
2. Young's modulus – Uniform bending – Optic lever – scale and telescope
3. Rigidity modulus – Torsional pendulum (without identical masses)
4. Rigidity modulus and moment of inertia – Torsional pendulum (with identical masses)
5. Surface tension and interfacial surface tension – drop weight method
6. Coefficient of viscosity of liquid using graduated burette (radius of capillary tube by Mercury pellet method)
7. Comparison of viscosity of liquid by burette method – Hare's apparatus given
8. Sonometer – Verification of laws and frequency of tuning fork
9. Sonometer – Relative density of a solid and liquid
10. Specific heat capacity of a liquid – Newton's law of cooling
11. Specific heat capacity of liquid – Method of mixtures (Half-time correction)
12. Focal length, Power, R and refractive index of a long focus convex lens
13. Focal length, Power, R and refractive index of a concave lens
14. Spectrometer – refractive index of a liquid – hollow prism
15. P.O. Box – Temperature coefficient of resistance of a coil Note: Use of Digital balance is permitted
16. Error and statistical analysis of data
17. Plotting graphs using software for a given data
18. Learning to use software to detecting the values of electrical components and basics laws of physics

Allied Physics – Practical

(For I B.Sc. Mathematics students)

| | | |
|-----------------------------|------------------|-------------|
| Course Code : 09208 | Credits | 5 |
| L: T: P: S : 0:0:3:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives:

The aim of this course is to enable the students to gain practical knowledge of various basic concepts of physics.

Course Outcomes: At the end of the Course, the Student will be able to:

| | | |
|------------|---|------|
| CO1 | Relate scientific methods and recall the process of measuring different physical variables. | (K2) |
| CO2 | Demonstrate the fundamentals of instrumentation data acquisition and interpretation of results. | (K2) |
| CO3 | Apply the concepts of Physics to understand material properties. | (K3) |
| CO4 | Experiment with fundamental of optics, acoustics, electricity and magnetism. | (K3) |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

LIST OF EXPERIMENTS:

(Any 15 experiments)

1. Young's Modulus by Non-uniform bending using Pin and Microscope
2. Young's Modulus by Non-uniform bending using Optic lever – Scale and telescope
3. Rigidity modulus by Static torsion method

4. Rigidity modulus by torsional oscillations without mass
 5. Surface tension and interfacial tension – Drop Weight method – Hare’s apparatus given.
 6. Comparison of viscosities of two liquids – Burette method
 7. Specific heat Capacity of a liquid – Half time correction
 8. Sonometer – Determination of a.c frequency
 9. Newton’s rings - Radius of curvature
 10. Air wedge – Thickness of a wire
 11. Spectrometer – Grating – Wavelength of Mercury lines – Normal Incidence
 12. Potentiometer – low range Voltmeter Calibration
 13. P.O. Box – Specific resistance of a coil
 14. Figure of merit – Table Galvanometer
 15. Construction of AND, OR, NOT gates – using diodes and transistor
 16. Zener Diode – Study of Characteristics
 17. NAND gate as a Universal logic gate
 18. NOR gate as a Universal logic gate
 19. Verification of De Morgan’s Theorems.
 20. Deflection magnetometer – Field along the axis of the coil – Determination of BH.
 21. Refraction order of liquid hollow prism – Spectrometer
 22. Determination of latitude and longitude of a place
 23. Junction diode - study of characteristics
 24. Refraction order of solid prism – Spectrometer
- Note: Use of digital balance is permitted

NON MAJOR ELECTIVE PAPERS

Learning Objectives:

By studying this course students will be able to

- *Demonstrate her/his understanding of facts and ideas on various facts of Physics.*
- *Relate the strong contribution to Laws of Nature and daily life.*

1. PHYSICS IN EVERYDAY LIFE - I

| | |
|-----------------------------|-----------------------|
| Course Code : 09103 | Credits 2 |
| L: T: P: S : 2:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

**Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) ,
K5(Evaluating) ,K6(Creating)**

| | | |
|------------|---|-------|
| CO1 | Extend the basic knowledge of workforce energy to understand real life happening. | K2,K3 |
| CO2 | Relate different forms of energy and interpret working of various appliances / concepts involving energy. | K2,K3 |
| CO3 | Demonstrate the application of heat energy in everyday life. | K2,K3 |
| CO4 | Build the concepts and understanding about light its proportion various phenomena. | K2,K3 |
| CO5 | Extend the knowledge of heat to understand the principle behind various happenings day to life. | K2,K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|----------|--|-----|-----|
| 1 | Unit-1: Force- Newton's laws of motion- circular motion – centripetal force – centrifugal force. Principle Behind Centrifuge – washing machine. Reason Behind 1) We weigh less in moon. 2) Long jumpathletes run a little before they jump. 3) Iron nails, safety pins which havesharp edge poke easily, polished knife cut easily. 4) While jumping around in a bike with high speed, if the rider loses his control, why is he thrown outside? 5) Speed increases when we slide. | 1 | CO1 |
| 2 | Unit-2: Energy – different forms of energy – Law of conservation of energy. Principle Behind Electric bulb-tube light-CFL bulbs. Reason Behind 1) Electric bulb adds to global warming. 2) Electric bulbs are replaced by CFL. 3) TV flickers when cell phone nearby rings? 4) Why tube light does not give shadow unlike an electric bulb? 5) Why are LED arrays used for illuminating in these days instead of fluorescent tubes? | 1 | CO2 |
| 3 | Unit-3: Boiling point – variation of boiling point with pressure – latent heat. Principle Behind Pressure cooker – microwave oven – milk boiler – fridge. Reason Behind 1) Metal vessels must not be used in microwave oven. 2) Salt is used to melt ice on roads during winter. 3) Cooking in a pressure cooker saves fuels and time. 4) While glucose is dissolved in | 1 | CO3 |

| | | | |
|---|---|----------|------------|
| | water, water becomes cold. 5) When detergents dissolve in water it gives out heat. | | |
| 4 | Unit-4: Light – reflection. Principle Behind Traffic sticker – laws of reflection – total internal reflection – refraction – constructive interference – destructive interference - diamonds glow. Reason Behind 1) Why do stars twinkle? 2) Why do we get rainbow? 3) Deep swimming pools look shallow. 4) Peacock feathers, soap bubbles give beautiful colors. 5) We use black umbrellas to protect ourselves from sunlight. | 1 | CO4 |
| 5 | Unit-5: Expansion due to heat – evaporation. Principle Behind Mud pot - cool drink straw- why do we sweat. Why it is so? 1. Wet clothes that are spread out dry faster 2. Hot milk kept in big bowl cool faster 3. Why we are not able to open our closed wooden door easily during rainy season? 4. Why do rails have links in between? 5. Why does glass bottle with hot water breaks when we suddenly pour cold water on it? | 1 | CO5 |

TEXT BOOKS:

1. The Learner's series – Everyday science. Jean Lave, Published by Infinity Books, New Delhi
2. Sujatha (2007). Ean? Etharku? Eppadi? Vol I & II, Vikatan publishers Chennai.
3. Kasturi Ranga (2006). The Hindu speaks on Science, Vol I & II Publishers, Chennai.
4. Q-Series, How and Why-Popular Science books, NISCAIR, New Delhi.
5. P.Ayngaranesan (2007). Theriyuma?, Arumbu Publishers, Chennai.

2. PHYSICS IN EVERYDAY LIFE – II

Learning Objectives:

By studying this course students will be able to

- *Demonstrate her/his understanding of facts and ideas on various facts of Physics.*
- *Relate the strong contribution to Laws of Nature and daily life.*

| | |
|------------------------------------|---------------------------|
| Course Code : 09206 | Credits 2 |
| L: T: P: S : 2:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|-------|
| CO1 | Apply the idea of Bernoulli’s theorem to interpret various important things around us. | K2,K3 |
| CO2 | Summarize principles of physics to understand the concept of real life situation. | K2,K3 |
| CO3 | Plan experiments to translate the learning into hands on activities. | K2,K3 |
| CO4 | Relate the optical phenomena in sky and space with knowledge of light. | K2,K3 |
| CO5 | Construct demonstration and build on the basic ideas on sound and acoustics. | K2,K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | <p>Unit-1: Bernoulli's theorem.</p> <p>Principle Behind Gas stove burner- room- spray- fan- atomizer- syringe. Reason Behind 1. We should not stand at the edge of the platform, when the express train crosses the station 2. LPG gas has peculiar odor 3. Blades in a fan are slightly curved 4. When wind blows strongly why roofs fly away not pushed down. 5. You get water in showers forcefully.</p> | 1 | CO1 |
| 2 | <p>Unit-2: surface tension – capillary rise – osmosis.</p> <p>Principle Behind Wick in oil lamp – rain coat. Reason Behind 1. Soap removes dirt and detergents clean clothes. 2. Some insects are able to walk on water 3. Water from soil goes to plants 4. Pickle becomes saltier and smaller 5. Gulab jamun become sweeter and swell.</p> | 1 | CO2 |
| 3 | <p>Unit-3: Friction – lubrication – Newton's law of gravitation.</p> <p>Principle Behind Speed breaker – walking stick and crutches. Reason Behind 1. We get high tide during new moon and full moon day 2. A snake cannot crawl on smooth surface and lizard cannot move on tiles 3. Why do not we get eclipse during every new moon and full moon? 4. Planets revolve round the sun. 5. We use oil along with fuel in vehicles</p> | 1 | CO3 |
| 4 | <p>Unit-4: Myopia – Hypermetropia – power of lens.</p> <p>Principle Behind Contact lens - reading lens- spectacles correct short sightedness- spectacles corrects long sightedness. Reason Behind 1. Cotton kept under lens burnt in sunlight 2. Sky is blue 3. Sky appears reddish during sun rise and sunset 4. Dust particle in path of sunray passing through a small hole in a dark room becomes more visible. 5.</p> | 1 | CO4 |

| | | | |
|---|--|---|-----|
| | Space above atmosphere is colorless. | | |
| 5 | <p>Unit-5: Sound waves – reverberation – echo – noise - earth quake – Richter scale.</p> <p>Principle Behind Reason Behind 1) Sound is heard first in TV, before picture, while lightning is seen before thunder. 2) We get less noise outside, when people talk inside glass room and also we don't hear noise from outer space. 3) Bursting of balloon or electric bulb produce noise. 4) Building reverberates (or) glass panes crack sometimes when an aeroplane passes. 5) Gravels are put in between the rails in railway tracks.</p> | 1 | CO6 |

TEXT BOOKS:

1. The Learner's series – Everyday science – Published by Infinity Books, New Delhi
2. Sujatha (2007). Ean? Etharku? Eppadi? Vol I & II, Vikatan publishers Chennai.
3. Kasturi Ranga (2006). The Hindu speaks on Science, Vol I & II Publishers, Chennai.
4. Q-Series, How and Why-Popular Science books, NISCAIR, New Delhi.
5. P.Ayngaranesan (2007). Theriyuma?, Arumbu Publishers, Chennai.

3. ASTROPHYSICS

Learning Objectives:

By studying this course students will be able to

- *Demonstrate her/his understanding of facts and ideas on various facts of AstroPhysics.*
- *Relate the strong contribution to astronomical instruments, solar system, universe , galaxies.*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|-------|
| CO1 | Extend the knowledge of optics to understand the working various astronomical instruments | K2,K3 |
| CO2 | Outline various physical concepts of Solar System | K2,K3 |
| CO3 | Interpret the Solar System based on various models | K2,K3 |
| CO4 | Rephrase the concept of Stellar evolution under white dwarf – Supernovae | K2,K3 |
| CO5 | Apply their knowledge and develop cognition about theories of universe and galaxies | K2,K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|----------|--|-----|------------|
| 1 | Unit 1: Astronomical instruments Optical telescopes-refracting telescope-reflecting telescope- types of reflecting telescopes – detectors and image processing | 1 | CO1 |

| | | | |
|---|--|---|--------------------------|
| 2 | Unit 2: Solar system The Sun- physical and orbital data-photosphere-chromosphere-corona- solar prominences – sunspot - solar flare- mass of the sun- solar constant- temperature of the sun- sources of solar energy-solar wind. | 1 | CO2 CO3 |
| 3 | Unit 3: Members of the solar system Mercury – Venus- Earth – Mars – Jupiter- Saturn- Uranus- Neptune- Pluto- Moon – Bode’s law – asteroids- comets – meteors. | 1 | CO4 |
| 4 | Unit 4: Stellar evolution Birth and death of a star –brightness of a star – stellar distance- Chandrasekar limit- white dwarfs- Neutron stars – black holes- Supernovae. | 1 | CO5 |
| 5 | Unit 5: Theories of the Universe and Galaxies Origin of the Universe - the big bang theory- the steady state theory- the oscillating universe theory – Hubble’s law. Galaxies – types of galaxies- Milky way | 1 | CO6 |

TEXT BOOKS:

1. K.S.Krishnaswamy (2002). Astrophysics - a modern perspective, New Age International (P) Ltd, New Delhi
2. Baidyanath Basu (2001). An introduction to Astro physics, second printing, Prentice – Hall of India (P) Ltd, New Delhi.
3. Dr.P.Iyemperumal (2002).Vindaimigu paerandam(Tamil), Chennai.
4. Dr.P.Iyemperumal, Tamizhaga vaanaviyal sindanaigal (Tamil),World Tamil Research Centre, Chennai.
5. Mohan Sundar rajan (2003). Indriya Vinveli (Tamil), NBT New Delhi.
6. Dept.of.Physics, DGVC College (1977). Topics in Physics Compiled, Rochouse & Sons, Chennai.

REFERENCE BOOKS:

| | | | | | | | | | | | | | | | |
|------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| Sl NO | CONTENTS OF MODULE | Hrs | COs |
|--------------|---|------------|--------------------------|
| 1 | Unit 1 : Solar energy Conventional Energy sources – Renewable Energy sources- solar energy – solar radiation and its measurements- solar energy collectors- parabolic collector- storage of solar energy | 1 | CO1 |
| 2 | Unit 2 : Applications of solar energy Solar water heater- solar driers- solar cells- solar electric power generation- solar distillation- solar pumping – solar cooking | 1 | CO2 CO3 |
| 3 | Unit 3: Wind energy Basic principles of wind energy conversion- power in the wind – forces in the Blades- wind energy conversion- Advantages and disadvantages of wind energy conversion systems (WECS) Energy storage- Applications of wind energy | 1 | CO4 |
| 4 | Unit 4: Oceanic energy Energy from the oceans- Energy utilization- Energy from tides- Basic principle of tidal power – Utilization of tidal energy | 1 | CO5 |
| 5 | Unit 5 : Energy from other sources Chemical energy – Nuclear energy - Energy storage and distribution | 1 | CO6 |

TEXT BOOKS:

1. G.D. Rai (1996). Non-conventional sources of energy (4th edition), Khanna Publishers, New Delhi.
2. S.P.Sukhatme (1997). Solar Energy, Principles of thermal collection and storage (2nd edition), Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
3. A.K.Bakhshi (2006). Energy, National Book Trust, New Delhi.
4. Dept.of.Physics, DGVC College (1977). Topics in Physics Compiled, Rochouse & Sons, Chennai.

REFERENCE BOOKS:

1. S. Rao and Dr. Parulekar (2015). Energy Technology, Khanna Publishers.
2. Jyoti Parikh (1997). Energy Models for 2000 and beyond, Tata McGrawHill Publishers, New Delhi.

5. BIOPHYSICS

Learning Objectives:

By studying this course students will be able to

- *Demonstrate her/his understanding of facts and ideas on various facts of biomechanics, connection between Physics and biology*

Course Outcomes: At the end of the Course, the Student will be able to:

| | | |
|------------|---|-------|
| CO1 | Extend the knowledge on hydrodynamics to understand the fluid flow under various circumstances. | K2,K3 |
| CO2 | Explain the physiology of respiration using the concept of transport of gases. | K2,K3 |
| CO3 | Interpret hearing and the physics of audition. | K2,K3 |
| CO4 | Construct the ideas to understand vision, power of eye myopia and hypermetropia. | K2,K3 |
| CO5 | Rephrase various concept of biomechanics, locomotion in the background of laws of physics. | K2,K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-----|
| 1 | Unit 1: Fluid Flow Steady laminar flow, turbulence, capillary rise, Poiseuille's formula, energetics of fluid flow, hemodynamics, fluid flow in plants | 1 | CO1 |
| 2 | Unit 2: Gas Transport Ideal gas, convection and diffusion of gases, Physiology of respiration. | 1 | CO2 |
| 3 | Unit 3: Physics of Audition Transverse and longitudinal waves, physiological characteristics of sound, human ear, Doppler Effect. | 1 | CO3 |

| | | | |
|---|---|---|------------|
| 4 | Unit 4: Physics of Vision Wave nature of light, lenses, focal length, refractive power, retina and photoreceptors, resolving power of eye, short sight and long sight, contact lenses | 1 | CO4 |
| 5 | Unit 5: Biomechanics Introduction, biostatics, mechanical properties of muscle, biodynamic, locomotion on land, water and air. | 1 | CO5 |

TEXT BOOKS:

1. P. K. Srivastava (2005). Elementary Biophysics: An Introduction, Narosa Publishing House, New Delhi.
2. Vasantha Pattabhi and N. Gautham (2009). Biophysics (2nd edition), Narosa Publishing House, New Delhi.

REFERENCE BOOKS:

1. Rodney Cotterill (2005). Biophysics: An Introduction, Wiley and Sons, England
2. Philip Nelso (2003). Biological physics: Energy, Information and Life, W. H. Freema and Co., New York.
3. Daniel M (1992). Basic biophysics and biologists, Wiley International, New Delhi.
4. Sybesma C (1989). Biophysics: An Introduction, Kluwer Publishers, New York.

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|------------|
| 1 | Unit-1: Statistics Mean, median, mode, standard deviation, variance, range, co-efficient of variation, covariance Related problems-role of Statistical methods in Physics | 1 | CO1 |
| 2 | Unit-2: Probability Probability theory – application of probability in physics- Relation to randomness and errors- types of errors in physics-Theory of errors - errors analysis | 1 | CO2 CO3 |
| 3 | Unit-3 Curve fitting Curve fitting, principle of least squares- Straight line fitting- numerical problems | 1 | CO4 |
| 4 | Unit-4 Computational techniques Iteration – iteration techniques – Bisection method, Newton-Raphson method –numerical problems | 1 | CO5 |
| 5 | Unit-5 Numerical analysis Trapezoidal rule- Simpson's 1/3rd Rule- Numerical problems | 1 | CO6 |

TEXT BOOKS:

1. Sathya Prakash (1996). Mathematical Physics, Sultan Chand and Sons, New Delhi.
2. M.K. Venkatraman (1990). Numerical method, National Publishing Company.
3. V. Rajaraman (2003). Numerical methods, Prentice - Hall India Pvt. Ltd.,
4. P. Kandasamy, K. Thilagavathy and K. Gunavathy (2002). Numerical methods, S. Chand & Co.

REFERENCE BOOKS:

1. B.D. Gupta (1996). Mathematical Physics, Vikas Publishing House Pvt. Ltd., New Delhi.
2. Jain Iyenger and Jain (2004). Numerical methods for Scientific and Engineering computation New Age International (P)Ltd.,
3. S.S.Sastry (2003). Numerical methods, Prentice Hall of India Pvt. Ltd., New Delhi

7. CONTRIBUTION OF INDIA TO MODERN SCIENCE

Learning Objectives:

By studying this course students will be able to

- *Get an overview of different views on Philosophy and Physics*
Appreciate contribution of our country to Modern Science

Course Outcomes: At the end of the Course, the Student will be able to:

| | | |
|------------|---|-------|
| CO1 | Explain the view of world in the Greco- Roman perspective. | K2,K3 |
| CO2 | Compare and contrast Indian knowledge system with Western World view summarize contribution of our country to Mathematics and astronomy. | K2,K3 |
| CO3 | Outline the idea of cognition in plants impact of Swami Vivekanandha, J.C Bose, Schrodinger and Heisenberg. Interpret evolution of duality principle. | K2,K3 |
| CO4 | Relate the growth of science and Technology with great trigonometrical survey of India | K2,K3 |
| CO5 | Interpret the importance of Triple helix Structure based on x-ray crystallography and outline the contribution of many Indian Physicist | K2,K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated - 1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| Sl. No. | CONTENTS OF MODULE | Hrs | COs |
|---------|---|-----|------------|
| 1 | Unit -1 Aristotle's view of world –Pythagorean view-Indian Philosophy and its impact on Greek Philosophers-Geocentric theory-Heliocentric theory-Newtonian view of world | 1 | CO1 |
| 2 | Unit -2 Contribution of Indians to Mathematics and Astronomy-Indian Mathematicians during 10th to 15th century-Almagest - Ptolemy-Mathematicians from Kerala- Value of Pi-Contributions of Ramanujan | 1 | CO2 CO3 |
| 3 | Unit-3 Idea of Biosphere-Ecosystem-Pyramid & Oceanic circle-Cognition in plants-J.C.Bose-Impact of Vivekananda on J.C.Bose – Einstein-wave particle duality- Quantum theory-Double Slit experiment Heisenberg-Copenhagen scientist-Schrodinger – Impact of Indian philosophy in the | 1 | CO4 |

| | | | |
|---|--|----------|------------|
| | evolution of duality principle- S.N. Bose –Saha | | |
| 4 | Unit-4 The great trigonometrical survey of India –Sir C.V. Raman- Raman effect and his contributions- Prof. K.S. Krishnan- Swami Vivekananda and genesis of I Sc | 1 | CO5 |
| 5 | Unit-5 Prof. G.N. Ramachandran- Triple Helix Structure of collagen- Crik & Watson-Dorothy Hudkinson ECG. Sundarshan | 1 | CO6 |

TEXT BOOKS:

1. Journey into light:Life and Science of C.V.Raman by G.Venkatraman : Some famous Indian Scientist by TIFR Booklet
2. Book series on History of Science & Technology, Government of India.
3. Arvind Gupta (2019), Bright Sparks
4. Vignettes in Physics by G.Venkatraman
5. Seeing and Believing by Richard Panek
6. Surely you're Joking Mr.Feynman by Feynman, Leighton et al
7. Uncommon wisdom by Fritj of Capra
8. Cosmos by Carl Sagan

SEMESTER – III

OPTICS

| | |
|-----------------------------|-----------------------|
| Course Code : 09309 | Credits : 05 |
| L: T: P: S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

In this course, students are exposed to

** Concept related to lens and prism*

** Working knowledge of optical physics including interference, diffraction, polarization, Spectroscopy & laser physics*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|-----------------|
| CO1 | Outline basic knowledge of principles and theories about the behavior of light. | K2 |
| CO2 | Discuss the principle of superposition of wave so thus, uses these ideas to understand the wave nature of light through working of interferometer. | K2 |
| CO3 | Extend the knowledge about nature of light through diffraction techniques; apply mathematical principles to analyze the optical instruments. | K2,K3,K4 |
| CO4 | Interpret basic formulation of polarization and gain knowledge about polarimeter . | K3 |
| CO5 | Relate the principles of optics to various fields such as spectroscopy and laser physics. | K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |

| | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |
| CO5 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-----|
| 1 | <p>Unit 1: Geometrical Optics</p> <p>Refraction – laws of refraction – refractive index using a microscope – critical angle – air cell – refraction through a prism – angle of minimum deviation – dispersion through a prism – spectrum – dispersive power - Combination of two small angled prisms to produce dispersion without deviation - deviation without dispersion - defects of images – coma – distortion - Spherical aberration in lenses - methods of minimizing spherical aberration - condition for minimum spherical aberration in the case of two lenses separated by a distance - Chromatic aberration in lenses - Condition for achromatism of two thin lenses (in and out of contact) – achromatic prisms.</p> | 1 | CO1 |
| 2 | <p>Unit 2: Interference</p> <p>Interference- Young’s double slit experiment-Analytical treatment of interference - expression for intensity - condition for maxima and minima in terms of phase and path difference – interference in thin films – reflected ray- transmitted ray – colors of thin films - Air wedge - determination of diameter of thin wire - test for optical flatness - Haidinger's fringes - Michelson's interferometer - theory - applications - determination of wavelength - thickness of thin transparent material.</p> | 1 | CO2 |
| 3 | <p>Unit 3: Diffraction</p> <p>Fresnel diffraction - diffraction at a circular aperture – at a narrow wire - Fraunhofer diffraction - single slit - double slit , Plane transmission grating – theory – normal incidence – experimental determination of wavelength using grating - oblique incidence (theory) - Dispersive power of a grating - Rayleigh's criterion for resolution - limit of resolution of the eye - resolving power of telescope, microscope - Difference between resolving power and dispersive power.</p> | 1 | CO3 |

| | | | |
|---|---|---|-----|
| 4 | <p>Unit 4: Polarization</p> <p>Double refraction - Nicol prism -polarizer and analyzer - Huygen's explanation of double refraction in uniaxial crystals - dichroism - polaroids and their uses - quarter wave plate – half wave plate - plane, elliptically and circularly polarized light - production and detection - Babinet's compensator - optical activity - Fresnel's explanation of optical activity - specific rotatory power - determination using Laurent's half shade polarimeter.</p> | 1 | CO4 |
| 5 | <p>Unit 5: Spectroscopy</p> <p>Introduction to spectroscopy - Electromagnetic spectrum - characterization of electromagnetic radiation - quantization of energy - regions of the spectrum -- Brownian motion – Tyndall effect - scattering of light – blue of the sky – halo of the moon - - Raman effect - experimental set up - Characteristics of Raman lines - Lasers - ruby laser - He-Ne laser, CO₂ laser - construction and working - application of lasers.</p> | 1 | CO5 |

TEXT BOOKS:

1. Subrahmanyam N., BrijLal and M.N. Avadhanulu (2006). A Text book of Optics S.Chand & Co., New Delhi.
2. Khanna D.R. & Gulati H.R (1979). Optics, S.Chand & Co., New Delhi.
3. R. Murugesan and Kiruthiga Sivaprasath (2006). Optics and Spectroscopy, S. Chand & Co., New Delhi.
4. Aruldhas (2005). Molecular structure and spectroscopy, Prentice Hall of India Pvt. Ltd., New Delhi.

REFERENCE BOOKS:

1. D. Halliday, R. Resnick and J. Walker (2001). Fundamentals of Physics (6th edition), Wiley, New York.
2. Ajay Ghatak (1998). Optics, Tata McGraw-Hill publishing Co. Ltd., New Delhi.
3. Gurdeep Chatwal and Sham Anand (1990). Spectroscopy, Himalaya Publishing House.

WEB LINKS:

<https://science.nasa.gov/ems/>

https://www.youtube.com/watch?v=tL3rNc1G0qQ&list=RDCMUCzwo7UIGkb-8Pr6svxWo-LA&start_radio=1&t=2472

<https://imagine.gsfc.nasa.gov/educators/gammaraybursts/imagine/index.html>

<http://www.thephysicsmill.com/2014/03/23/sky-blue-lord-rayleigh-sir-raman-scattering/>

<http://www.thephysicsmill.com/2014/03/23/sky-blue-lord-rayleigh-sir-raman-scattering/>

<https://www.youtube.com/watch?v=DwD3HD6t5Vs>

<https://www.youtube.com/watch?v=E0Z8rn2dBmM>

https://www.youtube.com/watch?v=PvYdgYq0_pc

<https://www.youtube.com/watch?v=qxlR7ZdgV7w>

https://www.youtube.com/watch?time_continue=135&v=0b1fqodmZJ0&feature=emb_logo

<https://spaceplace.nasa.gov/blue-sky/en/>

<https://www.youtube.com/watch?v=xWMei1IUG7E>

https://eesc.columbia.edu/courses/ees/climate/lectures/radiation_hays/

<https://www.nrcan.gc.ca/maps-tools-publications/satellite-imagery-air-photos/remote-sensing-tutorials/introduction/interactions-atmosphere/14635>

http://math.ucr.edu/home/baez/physics/General/BlueSky/blue_sky.html

<https://www.rebresearch.com/blog/why-isnt-the-sky-green/>

<https://sciencenotes.org/why-is-the-sky-green-before-a-tornado/>

<https://www.youtube.com/watch?v=ndXhTjMr1hk>

<https://www.bbvaopenmind.com/en/science/leading-figures/john-tyndall-the-man-who-explained-why-the-sky-is-blue/>

<https://www.validyne.com/blog/leak-test-using-pressure-transducers/>

<https://www.validyne.com/blog/basics-pneumotach-flow-measurement/>

<https://www.atoptics.co.uk/atoptics/blsky.htm>

<https://www.metoffice.gov.uk/weather/learn-about/weather/optical-effects>

<https://www.metoffice.gov.uk/weather/learn-about/weather/optical-effects>

https://books.google.co.in/books?id=grqxTeY1z4oC&pg=PA897&lpg=PA897&dq=size+of+nitrogen+molecule+and+blue+light&source=bl&ots=hC0V9FvzP-&sig=ACfU3U270Hhk0SD3yXV10QDHjPrC1qGnDg&hl=en&sa=X&ved=2ahUKEwjKgrP6rvzpAhWNyDgGHRB_DGYQ6AEwDnoECA0QAQ#v=onepage&q=size%20of%20nitrogen%20molecule%20and%20blue%20light&f=false

<https://www.youtube.com/watch?v=71Rp-jG6Eek&list=RDCMUCPKnBhy8PqPLapWIZ7orlKQ&index=1>

<https://www.youtube.com/watch?v=MZktgCWvHIE>

https://www.youtube.com/watch?time_continue=129&v=iMGvTYDC5MA&feature=emb_logo

<https://www.youtube.com/watch?v=uohd0TtqOaw>

https://www.youtube.com/watch?v=LAQ1m_1W5ys

<https://www.youtube.com/watch?v=VyQA4j-7K4>

<https://www.youtube.com/watch?v=KDaQhpYYo50>

Physics –I for Allied

(For II B.Sc. Chemistry students)
Effective for 2020-23 batch onwards

| | |
|----------------------|----------------|
| Course Code : 09310 | Credits 05 |
| L: T: P: S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives: Demonstrate basic principles of physics and one's knowledge of physics relate theoretical concepts acquired at schooling level to do experiments.

Course Outcomes: At the end of the Course, the Student will be able to:

**Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing)
K5(Evaluating) ,K6(Creating)**

| | | |
|------------|---|---------------------------|
| CO1 | Explain SHM, Extend their knowledge in the study of various dynamic motions analyzes and it demonstrates mathematically. Relate theory with practical applications in medical field. | K2, K4 |
| CO2 | Explain their knowledge of understanding about materials and their behaviors and apply it to various situations in laboratory and real life. Connect droplet theory with Corona transmission. | K3 |
| CO3 | Comprehend basic concept of thermodynamics concept of entropy and associated theorems able to interpret the process of flow temperature physics in the background of growth of this technology. | K5 |
| CO4 | Articulate the knowledge about electric current resistance, capacitance in terms of potential electric field and electric correlate the connection between electric field and magnetic field and analyze them mathematically verify circuits and apply the concepts to construct circuits and study them. | K3, K4, K6 |
| CO5 | Interpret the real life solutions using AND, OR, NOT basic logic gates and intend their ideas to universal building blocks. Infer operations using Boolean algebra and acquire elementary ideas of IC circuits. Acquire information about various Govt. programs/ institutions in this field. | K2 |
| CO6 | Construct circuits using semiconductor devices and ICs and analyze their working. | K3,K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3

moderately correlated – 2

weakly correlated –1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S.No. | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | <p>Unit 1: Waves, Oscillations and Ultrasonics</p> <p>Simple harmonic motion – composition of two simple harmonic motion at right angles (periods in the ratio 1:1) – Lissajous figures – uses – laws of transverse vibrations of strings – determination of a.c frequency using sonometer (steel and brass wires)</p> <p>Ultrasound- production – piezoelectric method – Application of ultrasonics : In Medical field- lithotripsy, ultrasonography- ultrasonoimaging- ultrasonics in dentistry, physiotherapy, ophthalmology – advantages of noninvasive surgery – Ultrasonics in green chemistry</p> | 1 | CO1 |

| | | | |
|---|---|---|-----------|
| 2 | <p>Unit 2: Properties of Matter</p> <p>Elasticity: Elastic constant – bending of beam – theory of non- uniform bending – determination of Young’s modulus by non uniform bending – energy stored in a stretched wire – torsion of a wire – determination of rigidity modulus by torsional pendulum</p> <p>Viscosity: streamline and turbulent motion – critical velocity – coefficient of viscosity – Poiseuille’s formula – comparison of viscosities – burette method</p> <p>Surface tension: definition – Molecular Theory behind Human saliva Droplets formation–shape, size and lifetime- Physics behind COVID transmission through droplets- drop weight method – interfacial surface tension.</p> | 1 | CO2 |
| 3 | <p>Unit 3: Heat and Thermodynamics</p> <p>Joule-Kelvin effect – Joule-Thomson porous plug experiment – theory – temperature of inversion – Liquefaction of Oxygen gas– Linde’s process of Liquefaction from separation from Air– Liquid oxygen for medical Purpose– importance of cryocoolers -thermodynamic system – thermodynamic equilibrium – laws of thermodynamics – heat engine – Carnot’s cycle-efficiency – entropy – change of entropy in reversible and irreversible process.</p> | 1 | CO3 |
| 4 | <p>Unit 4: Electricity and Magnetism</p> <p>Potentiometer – principle – measurement of thermo emf using potentiometer –magnetic field due to a current carrying conductor – Biot Savart’s law – field along the axis of the coil carrying current - peak, average and RMS values of ac current and voltage – power factor and current values in an ac circuit – Types of switches in household and factories– Smart wifi switches- fuses and circuit breakers in houses</p> | 1 | CO4 |
| 5 | <p>Unit 5: Digital Electronics and Digital India</p> <p>Logic gates : OR, AND, NOT, NAND, NOR , EXOR logic gates – Universal building blocks – Boolean algebra – De Morgan’s theorem – verification – Overview of initiatives Government of India: Software Technological Parks of India under MeitY; – NIELIT- Semiconductor Laboratories under Dept. of Space – An Introduction to Digital India</p> | 1 | CO5 & CO6 |

TEXT BOOKS:

7. R. Murugesan (2001). Allied Physics, S. Chand & Co, New Delhi.
8. Brijlal and N. Subramanyam (1994). Waves and Oscillations, Vikas Publishing house, New Delhi.
9. Brij Lal and N. Subramaniam (1994). Properties of Matter, S. Chand & Co., New Delhi.
10. J.B. Rajam and C.L. Arora (1976). Heat and Thermodynamics (8th edition), S. Chand & Co., New Delhi.
11. R. Murugesan (2005). Optics and Spectroscopy, S. Chand & Co, New Delhi.
12. A. Subramaniam Applied Electronics (2nd Edition), National Publishing Co., Chennai.

REFERENCE BOOKS:

6. Resnick Halliday and Walker (2018). Fundamentals of Physics (11th edition), John Wiley and Sons, Asia Pvt. Ltd., Singapore.
7. V.R. Khanna and R.S. Bedi (1998). Text book of Sound (1st edition), Kedharnaath Publish & Co, Meerut.
8. N.S. Khare and S.S. Srivastava (1983). Electricity and Magnetism (10th Edition), Atma Ram & Sons, New Delhi.
9. D.R. Khanna and H.R. Gulati (1979). Optics, S. Chand & Co. Ltd., New Delhi.
10. V.K. Metha (2004). Principles of electronics (6th edition), S. Chand and company.

WEB LINKS:

https://youtu.be/M_5KYncYNyc

<https://youtu.be/ljJLJgIvaHY>

https://youtu.be/7mGqd9HQ_AU

<https://youtu.be/h5jOAw57OXM>

<http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html>

<https://www.youtube.com/watch?v=gT8Nth9NWPM>

<https://www.youtube.com/watch?v=9mXOMzUruMQ&t=1s>

<https://www.youtube.com/watch?v=m4u-SuaSu1s&t=3s>

<https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work>

<https://learningtechnologyofficial.com/category/fluid-mechanics-lab/>

SEMESTER – IV

ATOMIC PHYSICS

| | |
|-----------------------------|-----------------------|
| Course Code : 09411 | Credits 5 |
| L: T: P: S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

*This course provides a coherent and concise coverage of *evolution of atom models *atomic structure and its spectra.*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) ,K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|-----------|
| CO1 | Identify the properties of positive rays and explain various man spectrographs. | K3 |
| CO2 | Demonstrate a working, quantitative understanding of the photoelectric effect and list same photoelectric devices and explain performance. | K2 |
| CO3 | Develop semi classical model of the atom and show how these model lead to quantum mechanics. | K4 |
| CO4 | Apply selection ruler and analyze the fine structure of atomic spectra. | K4 |
| CO5 | Make use of the effect of magnetic field on atomic spectra and explain normal and anomalous Zeeman effect. | K3 |
| CO6 | Distinguish between continues and characteristic X-ray spectra and to input how the Compton established the particle nature of radiation. | K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO6 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |

| Sl. NO | CONTENTS OF MODULE | Hrs | COs |
|--------|--|-----|------------|
| 1 | <p>Unit 1: Discharge phenomenon through gases</p> <p>Movement of charge in transverse electric and magnetic fields - specific charge of an electron - Dunnington's method- positive rays – Dempster’s mass spectrograph – Bainbridge mass spectrograph - critical potential – experimental determination of critical potential – Frank and Hertz experiment – Davis and Gaucher experiment.</p> | 1 | CO1 |
| 2 | <p>Unit 2: Photo-electric effect</p> <p>Photo electric effect - Lenard’s experiment - Richardson and Compton experiment - Laws of photoelectric emission – Einstein’s photo electric equation – Experimental verification of Einstein’s photo electric equation by Millikan’s experiment - photo electric cell - photo emissive cell - photovoltaic cell - photo conducting cell – photomultiplier</p> | 1 | CO2 CO3 |
| 3 | <p>Unit 3: Atomic structure</p> <p>Bohr atom model - Sommerfield atom model – various quantum numbers - Vector atom model - Pauli's exclusion principle - electronic configuration of elements and periodic classification - coupling schemes - LS and JJ coupling - spatial quantization - Stern and Gerlach experiment - Bohr magneton</p> | 1 | CO4 |
| 4 | <p>Unit 4: Fine structure of spectral lines</p> <p>Spectral terms and notations - selection rules - intensity rule and interval rule - fine structure of sodium D lines - Zeeman effect – Zeeman shift - Larmor's theorem - Debye's explanation of normal Zeeman effect - anomalous Zeeman effect - theoretical explanation - Lande's 'g' factor - explanation of splitting of D1 and D2 lines of sodium - Paschen - Back effect - Stark effect (qualitative study only).</p> | 1 | CO5 |
| 5 | <p>Unit 5: X-Rays</p> <p>X- rays - continuous X-rays - characteristic X-ray Bragg's law in one dimension – Bragg’s spectrometer - uses of X- rays - Compton effect – expression for Compton shift in wavelength spectra – absorption of X-rays by matter – Moseley’s law - diffraction of X- rays - - experimental verification</p> | 1 | CO6 |

TEXT BOOKS:

1. J.B. Rajam (2004). Atomic Physics (20th Edition), S. Chand & Co., New Delhi.
2. D.L. Sehgal, K.L. Chopra and N.K. Sehgal (1991). Modern Physics (7th Edition), Sultan Chand & Sons Publication, New Delhi.
3. N. Subrahmanyam and BrijLal (2000). Atomic and Nuclear Physics (5th Edition), S. Chand & Co. New Delhi.
4. R. Murugesan, Kiruthiga Sivaprasath(2008). Modern Physics, S. Chand & Co., New Delhi.

REFERENCE BOOKS:

1. J.H. Hamilton and Yang (1996). Modern Physics, McGraw-Hill Publication.
2. A. Beiser (1997). Concepts of Modern Physics, Tata McGraw-Hill, New Delhi.
3. D. Halliday, R. Resnick and J. Walker (2001). Fundamentals of Physics (6th Edition), Wiley, New York .
4. Kenneth S. Krane (1998). Modern Physics, John Willey & sons, Canada.

WEB LINKS:

<http://hyperphysics.phy-astr.gsu.edu/hbase/quantum/atomstructcon.html>

<http://hyperphysics.phy-astr.gsu.edu/hbase/Bohr.html>

<https://physics.info/atomic-models/>

<http://hyperphysics.phy-astr.gsu.edu/hbase/quantum/xrayc.html>

<https://physics.info/x-ray/>

<https://www.youtube.com/watch?v=MFPKwu5vugg>

<http://hyperphysics.phy-astr.gsu.edu/hbase/mod1.html>

<https://www.youtube.com/watch?v=v-1zjdUTu0o>

<https://physics.info/photoelectric/https://www.livescience.com/58816-photoelectric-effect.html>

Physics –II for Allied

(For II B.Sc. Chemistry students)
Effective for 2020-23 batch onwards

| | |
|-----------------------------|-----------------------|
| Course Code : 09412 | Credits 5 |
| L: T: P: S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

Understand the basic concepts of optics, modern physics, concepts of relativity and quantum physics, semiconductor physics, and digital electronics. Plan and execute experiments and appropriate methods.

Course Outcomes: At the end of the Course, the Student will be able to:

**Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing)
,K5(Evaluating) ,K6(Creating)**

| | | |
|------------|---|-------|
| CO1 | Explain the concepts of Interference diffraction using principles of superposition of waves and rephrase the concept of polarization based on wave patterns | K2 |
| CO2 | Outline the basic foundation of different atom models and various experiments establishing quantum concepts. Relate the importance of interpreting improving theoretical models based on observation. Appreciate interdisciplinary nature of science and in solar energy related applications. | K3,K4 |
| CO3 | Summarize the properties of nuclei, nuclear forces structure of atomic nucleus and nuclear models. Solve problems on decay rate half life and mean life. Interpret nucleus process like fission and fusion . Understand the importance of nuclear energy, safety measures carried and get our Govt.agencies like DAE guiding the country in the nuclear field. | K3,K2 |
| CO4 | To describe the basic concepts of relativity like equivalence principle, inertial frames and Lorentz transformation. Extend their knowledge on concepts of relativity and translate the mathematical equation to physical concepts and vice versa. Relate this with current research in this field and get an overview of research projects of National and International importance , like LIGO, ICTS, and opportunities available for them. | K3,K2 |
| CO5 | Summarize the working of semiconductor devices like junction diode, zener diode, transistors and practical devices we daily use like USB chargers and EV charging stations. | K2,K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S.No. | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | <p>Unit 1 : Optics</p> <p>Interference – interference in thin films - Colors of thin films – air wedge – determination of diameter of a thin wire by air wedge – Diffraction – bending of light vs. bending of sound - normal incidence – experimental determination of wavelength using diffraction grating (no theory) - polarization – polarization by double reflection – Brewster’s law – optical activity- application in Sugar industries</p> | 1 | CO1 |

| | | | |
|---|---|---|-----|
| 2 | <p>Unit 2: Atomic Physics</p> <p>Atom model – Bohr atom model – mass number – atomic number – nucleons- vector atom model – various quantum numbers – Pauli’s exclusion principle – electronic configuration of elements and periodic classification of elements - Bohr magneton – Stark effect –Zeeman effect (Elementary ideas only) – Photo electric effect- Einstein’s Photoelectric equation-Applications of photoelectric effect : Solar cells, solar panels, digital cameras</p> | 1 | CO2 |
| 3 | <p>Unit 3: Nuclear Physics</p> <p>Nuclear model – liquid drop model – magic numbers - shell model – nuclear energy – mass defect – binding energy – radioactivity – uses – half life – mean life - radio isotopes and its uses –controlled and uncontrolled chain reaction - nuclear fission – energy released in fission – chain reaction – critical reaction – critical size- atom bomb – nuclear reactor - breeder reactor – importance of commissioning PFBR in our country- heavy water disposal, safety of reactors: Seismic and floods- introduction to DAE, IAEA - nuclear fusion - thermonuclear reactions – difference between fission and fusion.</p> | 1 | CO3 |
| 4 | <p>Unit 4 : Introduction to relativity and Gravitational waves</p> <p>Frame of reference - postulates of special theory of relativity – Galilean transformation equations - Lorentz transformation equations – derivation – length contraction – time dilation – twin paradox - mass energy equivalence – An introduction on Gravitational waves, LIGO, importance of GWAstrophysics – ICTS, opportunities at International Centre for Theoretical Sciences</p> | 1 | CO4 |
| 5 | <p>Unit 5: Semiconductor Physics</p> <p>pn junction diode - forward and reverse biasing - characteristic of diode – zener diode – characteristic of zener diode – voltage regulator – Full wave bridge rectifier- construction and working-advantages (no mathematical treatment)- USB cell phone charger-introduction to e-Vehicles and EV charging stations</p> | 1 | CO5 |

TEXT BOOKS:

6. R. Murugesan (2005). Allied Physics, S. Chand & Co, New Delhi.
7. K. Thangaraj and D. Jayaraman (2004). Allied Physics, Popular Book Depot, Chennai.
8. Brijlal and N. Subramanyam (2002). Text book of Optics, S. Chand & Co, New Delhi.
9. R. Murugesan (2005). Modern Physics, S. Chand & Co, New Delhi.
10. A. Subramanyam Applied Electronics (2nd Edition), National Publishing Co., Chennai.

REFERENCE BOOKS:

6. Resnick Halliday and Walker (2018). Fundamentals of Physics (11th edition), John Wiley and Sons, Asia Pvt.Ltd., Singapore.
7. D.R. Khanna and H.R. Gulati (1979). Optics, S. Chand & Co. Ltd., New Delhi.
8. A. Beiser (1997). Concepts of Modern Physics, Tata McGraw Hill Publication, New Delhi.
9. Thomas L. Floyd (2017). Digital Fundamentals (11th edition), Universal Book Stall – New Delhi.
10. V.K. Metha (2004). Principles of electronics (6th edition), S. Chand and company.

WEB LINKS:

<https://www.berkshire.com/learning-center/delta-p-facemask/>

<https://www.youtube.com/watch?v=QrhxU47gtj4>

[https://www.youtube.com/watch?time_continue=318&v=D38BjgUdL5U&feature=emb](https://www.youtube.com/watch?time_continue=318&v=D38BjgUdL5U&feature=emb_logo)

[logo https://www.youtube.com/watch?v=JrRrp5F-Qu4](https://www.youtube.com/watch?v=JrRrp5F-Qu4)

[https://www.validyne.com/blog/leak-test-using-pressure-](https://www.validyne.com/blog/leak-test-using-pressure-transducers/)

[transducers/ https://www.validyne.com/blog/basics-pneumotach-flow-measurement/](https://www.validyne.com/blog/basics-pneumotach-flow-measurement/)

<https://www.atoptics.co.uk/atoptics/blsky.htm> -

<https://www.metoffice.gov.uk/weather/learn-about/weather/optical-effects>

<https://www.metoffice.gov.uk/weather/learn-about/weather/optical-effects>

[https://books.google.co.in/books?id=grqxTeY1z4oC&pg=PA897&lpg=PA897&dq=size+of](https://books.google.co.in/books?id=grqxTeY1z4oC&pg=PA897&lpg=PA897&dq=size+of+nitr)

[+nitr](https://books.google.co.in/books?id=grqxTeY1z4oC&pg=PA897&lpg=PA897&dq=size+of+nitr)

[ogen+molecule+and+blue+light&source=bl&ots=hC0V9FvzP-&sig=ACfU3U270Hhk0SD3yXV10QDHjPrC1qGnDg&hl=en&sa=X&ved=2ahUKEwjKgrP6rv](https://books.google.co.in/books?id=grqxTeY1z4oC&pg=PA897&lpg=PA897&dq=size+of+nitr)

[zpAhWNyDgGHRB_DGYQ6AEwDnoECA0QAQ#v=onepage&q=size%20of%20nitrogen%20molecule%20and%20blue%20light&f=false](https://books.google.co.in/books?id=grqxTeY1z4oC&pg=PA897&lpg=PA897&dq=size+of+nitr)

<https://youtu.be/JLz7qASICYU>

<https://youtu.be/u6m4II-qZ58>

<https://youtu.be/C0HsQykDdKg>

CORE PRACTICAL-II

| | |
|-----------------------------|-----------------------|
| Course Code : 09413 | Credits : 4 |
| L: T: P: S : 0:0:3:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to

- *Explain demonstrating various optical phenomena principles, working and application of optical instruments.*
- *Understanding the basic concept of electricity, magnetism, optics and properties of matter and their applications.*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|----|
| CO1 | Develop skills to understand the concept of elastic constants of solid and acquire knowledge of applications. | K3 |
| CO2 | Demonstrate experiments to involving various optical phenomena, principles, workings and application of optical instruments. | K2 |
| CO3 | Apply standard method to calibrate the analog meters and to measure various physical quantities. | K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

LIST OF EXPERIMENTS:

1. Young's modulus - cantilever - depression - Static method-Scale and telescope
2. Young's modulus - cantilever oscillations - Dynamic method
3. Rigidity modulus - Static torsion
4. Compound pendulum - g and k
5. Sonometer - A.C. Frequency - Using Steel wire.
6. Melde's string - frequency, Relative Density of a solid and liquid
7. Thermal conductivity of a bad conductor - Lee's disc method
8. Spectrometer - μ of a glass prism - i-d Curve
9. Spectrometer - Grating N and λ - normal incidence method
10. Spectrometer - Grating N and λ - minimum deviation method
11. Air wedge - Thickness of a wire
12. m and BH - deflection magnetometer -Tan C position and vibration magnetometer
13. Carey Foster's bridge - Temperature coefficient of resistance of a coil
14. Potentiometer - Calibration of low range voltmeter
15. Potentiometer - Ammeter calibration.
16. Figure of merit of galvanometer (Mirror Galvanometer or Table Galvanometer).
17. Determination of conductivity of Human body and various liquids using EXP EYES – software.
18. Verification of the Malus law for plane polarized light
19. Determination of the specific rotation of sugar solution using polarimeter
20. Characteristics of laser diode

Allied Physics – Practical

| | |
|-----------------------------|-----------------------|
| Course Code : 09414 | Credits 4 |
| L: T: P: S : 0:0:3:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

The aim of this course is to enable the students to gain practical knowledge of various basic concepts of physics.

Course Outcomes: At the end of the Course, the Student will be able to:

| | | |
|------------|---|------|
| CO1 | Relate scientific methods and recall the process of measuring different physical variables. | (K2) |
| CO2 | Demonstrate the fundamentals of instrumentation data acquisition and interpretation of results. | (K2) |
| CO3 | Apply the concepts of Physics to understand material properties. | (K3) |
| CO4 | Experiment with fundamental of optics, acoustics, electricity and magnetism. | (K3) |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

LIST OF EXPERIMENTS:

(Any 15 experiments)

1. Young's Modulus by Non-uniform bending using Pin and Microscope
2. Young's Modulus by Non-uniform bending using Optic lever – Scale and telescope
3. Rigidity modulus by Static torsion method
4. Rigidity modulus by torsional oscillations without mass
5. Surface tension and interfacial tension – Drop Weight method – Hare's apparatus given.
6. Comparison of viscosities of two liquids – Burette method
7. Specific heat Capacity of a liquid – Half time correction
8. Sonometer – Determination of a.c frequency
9. Newton's rings - Radius of curvature
10. Air wedge – Thickness of a wire
11. Spectrometer – Grating – Wavelength of Mercury lines – Normal Incidence
12. Potentiometer – low range Voltmeter Calibration
13. P.O. Box – Specific resistance of a coil
14. Figure of merit – Table Galvanometer
15. Construction of AND, OR, NOT gates – using diodes and transistor
16. Zener Diode – Study of Characteristics
17. NAND gate as a Universal logic gate
18. NOR gate as a Universal logic gate
19. Verification of De Morgan's Theorems.
20. Deflection magnetometer – Field along the axis of the coil – Determination of BH.
21. Refraction order of liquid hollow prism – Spectrometer
22. Determination of latitude and longitude of a place
23. Junction diode - study of characteristics
24. Refraction order of solid prism – Spectrometer

Note: Use of digital balance is permitted

SEMESTER – V

ELECTRICITY AND ELECTROMAGNETISM

| | |
|-----------------------------|-----------------------|
| Course Code : 09515 | Credits : 05 |
| L: T: P: S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

The aim of the course is

**to acquire knowledge about chemical effects of electric current and understand various circuit laws, network theorems*

**to enable the student to get strong foundation in magnetism, as well laws associated with it and their application*

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Demonstrate the relationship between thermodynamics and electricity. (K2) |
| CO2 | Compare and contrast D.C and A.C circuits. (K2) |
| CO3 | Apply theorems to construct and solve electric circuits. (K3) |
| CO4 | Design and construct experiments as well to analyze and interpret magneto static concepts. (K4,K6) |
| CO5 | Relate the principles and of electromagnetic and build simple circuits involving inductors. (K3) |
| CO6 | Discuss the four fundamental equation that govern all electromagnetic phenomena.(K2) |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3

moderately correlated – 2

weakly correlated –1

| CO/PO/ PSO | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 4 | 5 | |
| CO1 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| CO6 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 |

| SI NO | CONTENTS OF MODULE | Hrs | Cos |
|-------|--|-----|----------------|
| 1 | <p>Unit 1: Chemical Effects of Electric Current</p> <p>Faraday's laws of electrolysis - ionic velocities and mobilities - Calculation - experimental determination of ionic mobilities - transport number. Thermoelectricity- Peltier effect - Experimental determination of Peltier coefficient - Thomson coefficient - experimental determination of Thomson coefficient - application of thermodynamics to a thermocouple and connected relations - thermoelectric diagram and uses.</p> | 1 | CO1 |
| 2 | <p>Unit 2 : DC and AC Circuits</p> <p>DC Circuits - Growth and decay of current in a circuit containing resistance and inductance - growth and decay of charge in a circuit containing resistance and capacitor - growth and decay of charge in an LCR circuit - condition for the discharge to be oscillatory - frequency of oscillation - network analysis - Thevenin and Norton's Theorems.</p> <p>AC Circuits - AC voltage and current - Power factor and current values in AC circuit containing LCR - series and parallel resonant circuits - AC motors - single phase, three phase - star and delta connections - electric fuses - circuit breakers.</p> | 1 | CO2 CO3 |
| 3 | <p>Unit 3: Magnetic effect of electric current</p> <p>Biot and Savart's law - magnetic field intensity due to a solenoid carrying current - effect of iron core in a solenoid – magnetic field at a point due to circular current carrying coil -</p> | 1 | CO4 |

| | | | |
|---|--|---|-----|
| | Helmholtz galvanometer - moving coil ballistic galvanometer - theory - damping correction – experimental determination of the absolute capacity of a condenser using B.G – experiment to compare the capacitance, emf of cells using B.G. | | |
| 4 | <p>Unit 4: Electromagnetic induction and its applications</p> <p>Faraday's laws of electromagnetic induction - inductance - determination of self inductance of a coil using Anderson method - mutual inductance - experimental determination of absolute mutual inductance - coefficient of coupling - earth inductor - Uses of earth inductor - measurement of horizontal component of the earth's magnetic field - measurement of vertical component of earth's magnetic field – angle of dip - calibration of B.G. - Induction coil and its uses.</p> | 1 | CO5 |
| 5 | <p>Unit 5: Maxwell's equations and ElectroMagnetic Theory</p> <p>Basic equations - types of currents - vacuum displacement current - Maxwell's equations - Maxwell's equations in free space - electromagnetic waves in free space - propagation of electromagnetic wave in a non conducting medium - Hertz Experiment - energy density of electromagnetic wave - Poynting's theorem - energy per unit volume.</p> | 1 | CO6 |

TEXT BOOKS:

1. M. Narayanamurthy & N. Nagarathnam, (1996), Electricity & Magnetism, NPC pub., (revised edition). ISBN: 1 – 86094 – 630 – 5. 8
2. Brijlal and Subrahmanyam; (2000), Electricity and Magnetism, S. Chand & Co., New Delhi. ISBN: 8121904676

3. D. Chattopadhyay and P.C. Rakshit, (2001), Electricity & Magnetism, Books and Allied (P) Ltd. ISBN: 9788173812514
4. B.D. Dugal and C.L. Chhabra, Shobanlal Nagin, (2005), Fundamentals of Electricity and Magnetism, (5th edition), S. Chand & Co., New Delhi. ISBN: 81 7058 634 8
5. R. Murugesan, (2008), Electricity and Magnetism, S. Chand & Co., New Delhi. ISBN: 978812191705

REFERENCE BOOKS:

1. K.K. Tewari, (2002), Electricity & Magnetism, S. Chand & Co., New Delhi. ISBN: 9788121906678
2. D.J. Griffiths, (2003), Introduction to Electrodynamics, (3rd Edition), Printice Hall of India Pvt. Ltd., New Delhi. ISBN: 9789332550445

WEB LINKS:

<https://www.youtube.com/watch?v=6bKJrGCuJk>

https://www.youtube.com/watch?v=xER1_SYql44

<https://www.youtube.com/watch?v=tC6E9J925pY>

<https://www.youtube.com/watch?v=nGQbA2jwkWI>

<https://www.youtube.com/watch?v=bIDTHzEfhtY>

<https://www.youtube.com/watch?v=CACD5jX8fsY>

<https://www.youtube.com/watch?v=JZ2pDlhqPio>

https://www.youtube.com/watch?v=LFJjls7B6_c

https://www.youtube.com/watch?v=evVb_i9NXsY

<https://courses.lumenlearning.com/physics/chapter/20-5-alternating-current-versus-direct-current/>

<https://www.elprocus.com/main-difference-between-ac-and-dc-currents/>

https://www.tf.uni-kiel.de/matwis/amat/elmat_en/kap_2/backbone/r2_3_3.html

<http://electricalenergydzumeshiko.blogspot.com/2017/08/electrical-energy-hyperphysics.html>

<http://www.physicshandbook.com/topic/topics/seebeck%20effect.html>

MATHEMATICAL METHODS IN PHYSICS

| | |
|-----------------------------|-----------------------|
| Course Code : 09517 | Credits 5 |
| L: T: P: S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

The aim of this course is to

**Prepare the students to solve various physical phenomena using mathematical tools like vectors, matrixes, serves solution approach, special function.*

**To educate them necessary classical dynamics to understand various physical systems.*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|----|
| CO1 | Discuss basic mathematical concepts in vector calculus and apply them to solve problems in hydrodynamics. | K2 |
| CO2 | Outline the fundamentals of matrixes and illustrate their importance in physics. | K2 |
| CO3 | Explain special functions such as Beta Gamma and series solution of Bessel and Legendre differential equations. | K2 |
| CO4 | Deduce Lagrangian equation of motion and compute solutions of various simple physical systems. | K5 |
| CO5 | Solve Hamiltonians of simple system and derivations of equation of motion. | K3 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | 2 | 2 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 2 | 3 | 3 | 2 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|----------|--|-----|-----|
| 1 | Unit 1: Vector Analysis Scalar and vector fields: Gradient, divergence and curl - physical interpretation, Lamellar and solenoidal field – (only definition), line, surface and volume integrals – Gauss Divergence theorem – Stoke’s theorem – Green’s theorem - Application of vectors to hydrodynamics: Equation of continuity, Bernoulli’s theorem. | 1 | CO1 |
| 2 | Unit 2: Matrices Characteristic equation of a matrix – eigen values and eigen vectors – Cayley Hamilton theorem – Theorems on eigen values and eigen vectors – Hermitian and unitary matrices – Diagonalisation of matrices – matrices in Physics: rotation matrix, Pauli spin matrices (elementary ideas only). | 1 | CO2 |
| 3 | Unit 3: Special functions Gamma and Beta functions – definition – Evaluation – other forms of the functions – symmetry property of Beta function- relation between Beta and Gamma functions - Series solutions of Bessel’s differential equation and Legendre differential equation. | 1 | CO3 |
| 4 | Unit 4: Lagrangian formulation Mechanics of a system of particles – Degrees of freedom – constraints – Generalised coordinates – Configuration space – principle of virtual work – D’Alembert’s principle – Lagrange’s equation of motion from D’Alembert’s principle for a conservative system - Applications of | 1 | CO4 |

| | | | |
|---|---|---|-----|
| | Lagrange's equation: Atwood's machine, a bead sliding on uniformly rotating wire – simple pendulum | | |
| 5 | Unit 5: Hamiltonian formulation Phase space – Hamiltonian function H – physical significance – Hamilton's equations - Applications of Hamiltonian equations: Simple pendulum – motion of a particle in a central force field. | 1 | CO5 |

TEXT BOOKS:

1. Satya Prakash (1996). Mathematical Physics, S. Chand & Sons, New Delhi.
2. J.C. Upadhyaya (2003). Classical Mechanics, Himalaya Publishing House, Mumbai
3. R. Murugesan (1996). Mechanics and Mathematical methods, S. Chand & Company, New Delhi.

REFERENCE BOOKS:

1. B.D. Gupta (1996). Mathematical Physics, Vikas Publishing House Pvt. Ltd, New Delhi.
2. H. Goldstein (1985). Classical Mechanics, Special Indian Student Edition Narosa Publishing House, New Delhi.

WEB LINKS:

<https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-61-aerospace-dynamics-spring-2003/lecture-notes/lecture7.pdf>

<http://kestrel.nmt.edu/~raymond/classes/ph321/notes/lagrange/lagrange.pdf>

<http://www.iitg.ac.in/physics/fac/padmakumarp/Courses/PH101/Lecture7.pdf>

<https://www.physics.rutgers.edu/~shapiro/507/book3.pdf>

[https://phys.libretexts.org/Bookshelves/Classical_Mechanics/Book%3A_Classical_Mechanics_\(Tatum\)/14%3A_Hamiltonian_Mechanics/14.03%3A_Hamilton's_Equations_of_Motion](https://phys.libretexts.org/Bookshelves/Classical_Mechanics/Book%3A_Classical_Mechanics_(Tatum)/14%3A_Hamiltonian_Mechanics/14.03%3A_Hamilton's_Equations_of_Motion)

<https://cds.cern.ch/record/399399/files/p1.pdf>

<https://www.youtube.com/watch?v=PFDu9oVAE-g>

<https://www.mathsisfun.com/algebra/eigenvalue.html>

<https://medium.com/fintechexplained/what-are-eigenvalues-and-eigenvectors-a-must-know-concept-for-machine-learning-80d0fd330e47>

SOLID STATE PHYSICS

| | | |
|-----------------------------|------------------|-------------|
| Course Code : 09517 | Credits | 5 |
| L: T: P: S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives:

On taking this course the student will be able to learn and assimilate,

- *Fundamentals concepts of crystal structure.*
- *Different methods of X-ray analysis of crystal structure.*
- *Types of bonding in crystals.*
- *The behavior of dielectric and magnetic materials and their application.*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|------|
| CO1 | Summarize the fundamentals of crystals structure; Related the significance of crystal study with industry and other applications. | (K2) |
| CO2 | Experiment with X-ray diffraction techniques; Apply proper methods to explore crystal imperfections. | (K3) |
| CO3 | Compare and contrast bonding in crystals. | (K5) |
| CO4 | Investigate the theoretical fundamentals of lattice vibrations; The theory with the applications such as super conductivity. | (K5) |
| CO5 | Analyze concepts of dielectrics; Categorize types of polarization and apply theory to inspect different types of materials. | (K4) |
| CO6 | Compare the different types of magnetic materials and discuss the necessary theory to understand their basic properties of magnetic materials. | (K5) |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated - 1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |
| CO6 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

| S. NO | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|------------|
| 1 | <p>Unit I: Crystal structure</p> <p>Crystal Lattice – Primitive cell - Unit cell - Seven classes of crystals - Bravais Lattice – crystal planes and Miller Indices – inter planar spacing in crystal lattice - structure of crystals - Simple cubic, Face centered Cubic, Body Centered Cubic crystal structure, Hexagonal close packed structure, Sodium Chloride, Diamond, Zinc Blende and Cesium Chloride structure</p> | 1 | CO1 |
| 2 | <p>Unit II: X- rays in crystal study</p> <p>Diffraction of X-rays by crystals - Bragg's Law in one dimension - Experimental method in X-ray Diffraction - Laue method, rotating crystal method - Powder photograph method - Von Laue's equations – crystal imperfections - point defects, line defects - surface defects - volume defects - effects of crystal imperfections</p> | 1 | CO2 CO3 |

| | | | |
|---|---|---|-----|
| 3 | <p>Unit III: Bonding and Super Conductivity</p> <p>Types of bonds in crystals – Ionic, covalent, metallic, van-der-waal’s and hydrogen bonding – characteristic of various bonding – cohesive energy of cubic ionic crystals – Madelung constant for sodium chloride crystal – Phonons – monoatomic one dimensional lattice – specific heat of solids – Einstein’s theory – Debye theory.</p> <p>Super conductivity – general properties of super conductors - Meissner effect – Type I and Type II super conductors – applications of super conductors.</p> | 1 | CO4 |
| 4 | <p>Unit IV: Dielectrics</p> <p>Fundamental definitions in dielectrics - different types of Electric polarization - frequency and temperature effects on polarization -dielectric loss - local Field on Internal Field Clausius- Mosotti Relation - Determination of dielectric constant - dielectric Breakdown - properties of different types of insulating materials.</p> | 1 | CO5 |
| 5 | <p>Unit V: Magnetic materials</p> <p>Different type of magnetic materials - Langevin's theory of diamagnetism - Langevin's theory of paramagnetism - Weiss theory of paramagnetism - qualitative explanation of Heisenberg's internal field quantum theory of ferromagnetism.</p> | 1 | CO6 |

TEXT BOOKS:

1. Charles Kittel (2004). Introduction to Solid State Physics (7th edition), John Wiley and sons.
2. Arumugam.M (1997). Material Science, Anuradha Technical Book publishers.
3. P.K. Palanisamy (2005). Solid State Physics, Scitech publications (India) Pvt. Ltd.
4. R. Murugesan and Kiruthiga Sivaprasath (2005). Modern physics, S.Chand and Company New Delhi.

REFERENCE BOOKS:

1. V.Raghavan (2004). Material Science and Engineering First Course (5th edition), Prentice Hall (India) Pvt. Ltd.
2. S.L. Kakani and L. Hemrajani (1997). Text Book of Solid State Physics, Sultan Chand and sons, New Delhi.
3. A.J. Dekker (2005). Solid State Physics, Macmillan India Ltd.
4. Arthur Bieser (2005). Concepts of Modern Physics (6th edition), Tata Mc. Graw Hill.
5. S.O. Pillai (2005). Solid state physics (6th edition), New Age International Pvt.Ltd.

WEB LINKS:

<https://youtu.be/ZXqjx0a1tBA>
<https://youtu.be/yTDF13vUoNo>
<https://youtu.be/ztw-osPIrSE>
<https://youtu.be/rm0NCgqDKB8>
<https://youtu.be/B1JzFAD1GAo>

BASIC ELECTRONICS

| | |
|------------------------------------|--------------------------|
| Course Code : 09518 | Credits 5 |
| L: T: P: S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

- *By studying this course student will be able to acquire theoretical and application orientation knowledge on semiconductor and various semiconductor devices.*
- *They will be able to construct various electronic circuits and study them in detail.*

Course Outcomes: At the end of the Course, the Student will be able to:

| | | |
|------------|---|-----------------|
| CO1 | Interpret the conductivity behavior of solids based on their knowledge acquired in atomic physics course. Explain the properties of semiconductors, their basic configuration, their characteristics, construct and analyze various electronic circuits which have very relevant applications, classify various rectifier circuits based on their efficiency and components used. | K2,K3,K4 |
| CO2 | To extend the ideas of diodes to understand transistors, build amplifier circuits and analyze based on various parameters. | K3 |
| CO3 | Classify various transistors amplifier circuits based on their nature, characteristics and working. | K3 |
| CO4 | Develop oscillators, models using amplifiers construct, classify and categorize various types of oscillators. Extend these oscillators towards designing different types of multivibrators. | K3 |
| CO5 | Identify the need for special semiconductor devices, Extend their theoretical knowledge in construction of these devices and analyze their behavior using application oriented electronic circuits. | K3,K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|----------|--|-----|----------------|
| 1 | <p>Unit 1: Semiconductors:-</p> <p>Energy bands in a solid – intrinsic semiconductors – extrinsic semiconductors – Fermi level - pn junction – volt – ampere characteristic curve – biasing the pn junction - diode as rectifier – half wave rectifier – full wave rectifier – centre tapped, bridge rectifier – efficiency and ripple factor - circuits using diode – clipper, clamper – zener diode – zener diode as voltage regulator.</p> | 1 | CO1 |
| 2 | <p>Unit II: Transistors:-</p> <p>Basic transistor amplifier – Transistor input and collector characteristics – common base and common emitter amplifier – relation between α and β – transistor biasing techniques – emitter bias – voltage divider bias. Transistor hybrid model – the h parameter – analysis of transistor amplifier (CE only) circuit using h parameters.</p> | 1 | CO2 CO3 |

| | | | |
|---|--|---|-----|
| 3 | Unit III: Transistor amplifiers:- Emitter follower, RC coupled amplifier – analysis using h parameters – frequency response – power amplifiers – classification – class A, push – pull, class B, power amplifier – collector efficiency – differential amplifier – Ad, ACM and CMRR. | 1 | CO4 |
| 4 | Unit IV: Oscillator and switching circuits: Feedback in amplifier – negative feedback - Essential of transistor oscillator – basic LC oscillator circuit – Hartley oscillator – phase shift oscillator – Wein’s bridge oscillator – expression for frequency. Types of multivibrators – Astable – monostable and bi-stable multivibrators. | 1 | CO5 |
| 5 | Unit V: Special semiconductor devices: Junction field transistor (JFET) – characteristics – Common source FET amplifier – UJT – characteristics – UJT as relaxation oscillator – SCR – characteristic – SCR as a rectifier. | 1 | CO6 |

TEXT BOOKS:

1. V.K. Metha (2006). Principles of electronics (10th edition), S.Chand and company.
2. M. K. Bagde, S.R. singh and Kamal Singh (2002). Elements of electronics, S.Chand and company.
3. R.S. Sedha (1998). A Textbook of Applied Electronics, S. Chand and Company, New Delhi.
4. Gupta and Kumar (1991). Handbook of Electronics, Pragati Prakashan, Meerut.

EFERENCE BOOK

1. Allen Mottershead (1989). Electronic devices and circuits, Prentice Hall of India.
2. Millman and Halkias (2005). Integrated electronics, Tata McGrawHill Publication, New Delhi.
3. Mitchell E Schultz (2006). Grob’s Basic Electronics (10th Edition), Tata McGraw Hill., New Delhi.

WEB LINKS:

- <https://youtu.be/NMD4KECE-7I>
<https://youtu.be/KynKHr2cXgk>
<https://youtu.be/MNp-WxkF5h4>
<https://youtu.be/rERBi7Ao9To>
https://youtu.be/dQbrI_iQWig

ELECTIVE 1

(Any one of the three below)

I a.APPLIED ELECTRONICS

| | |
|----------------------|----------------|
| Course Code : 09519 | Credits 4 |
| L: T: P: S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

This course helps the students to gain basic ideas of the construction and working of digital electronic devices / circuit to understand the fundamentals of communication systems, design circuit for solving problems.

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|----------|
| CO1 | Summarize the characteristics of operational amplifier its parameters and construct circuit to perform various mathematical operation. | K2,K3 |
| CO2 | Solve simultaneous equation and differential equation using electronic circuit analyzes the performance of electronic circuit in handling mathematical equations. Design circuits to generate waveform to perform analog computation. | K3,K4,K6 |
| CO3 | Extend their knowledge of digital analog circuit to understand 555 times, design circuits which are very commonly used in various applications. | K4 |
| CO4 | Compare digital and analog systems, discuss the need for conversion and design circuits for the same. | K4 |
| CO5 | Classify semiconductor memories based on the principle of operation, categorize and compare them based on the size and other memory parameters. | K2 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| | | |
|---------------|-----------|------------|
| CO/PO/ | PO | PSO |
|---------------|-----------|------------|

| | | | | | | | | | | | | | | | |
|------------|----------|----------|----------|----------|-----------|----------|----------|----------|----------|-----------|----------|----------|----------|----------|----------|
| PSO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 3 | 3* | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | COs |
|--------------|---|------------|------------|
| 1 | Unit I: Operational Amplifier fundamentals Characteristics– op-amp parameters – inverting amplifier- non- inverting amplifier – unity follower – summing amplifier – difference amplifier. Differentiator, integrator, comparator using op-amp. | 1 | CO1 |
| 2 | Unit II: Analog computation and waveform generation Analog computation and waveform generation using op amp - solving simultaneous equation – second order differential equation – squarewave generation (astable operation) – sine wave generation – Wien’s Bridge oscillator. | 1 | CO2 |
| 3 | Unit III: 555 Timer 555 Timer – internal block diagram – and working – applications – Schmitt Trigger – astable, monostable multivibrator. | 1 | CO3 |

| | | | |
|---|---|---|-----|
| 4 | Unit IV: D/A and A/D converters Introduction – Binary weighted resistor D/A converter – R -2R ladder method – resolution A/D converter – counter type – successive approximation type – resolution. | 1 | CO4 |
| 5 | Unit V: Semiconductor Memories Semiconductor memories- classification based on Principle of operation – ROM – organization – 256 x 4 ROM – 1K x 4 ROM – PROM – EPROM – EEPROM – Random Access Memory (RAM) – static RAM –Dynamic RAM –memory parameters | 1 | CO5 |

TEXT BOOKS:

1. Ramakant A. Gayakwad (1994). Op- AMPs and Linear Integrated Circuits, Prentice Hall of India.
2. V. Vijayendran, S. Viswanathan (2005). Introduction to Integrated Electronics, (printers and publishers) Pvt. Ltd, Chennai.
3. Millman and Halkias (2005). Integrated electronics, Tata McGrawHill Publication, New Delhi.

REFERENCE BOOKS:

1. D. Roy Choudhury and Shail Jian (2003). Linear integrated circuits, New Age International (P) Ltd.
2. J. Millman and C. Halkias (2001). Integrated Electronics , Tata McGraw Hill, New Delhi.

WEB LINKS:

<https://learnabout-electronics.org/Amplifiers/amplifiers60.php>

<https://www.youtube.com/watch?v=kiiA6WTCQn0>

<https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-01sc-introduction-to-electrical-engineering-and-computer-science-i-spring-2011/unit-3-circuits/op-amps/>

https://www.youtube.com/watch?v=HicZcgdGxZY&list=PLwjK_ iyK4LLCnW-df- 53d-6yYrGb9zZc

<https://www.youtube.com/watch?v=66KqmPRy1uI>

<https://courses.lumenlearning.com/zeliite115/chapter/reading-read-only-memory/>

<http://www.555-timer-circuits.com/>

I b NUMERICAL METHODS

| | |
|-----------------------------|-----------------------|
| Course Code : | Credits 4 |
| L: T: P: S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives: *By studying this course student will be able to learn fundamentals of Numerical methods*

Course Outcomes: **At the end of the Course, the Student will be able to:**

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|--------------|
| CO1 | Solve simultaneous equations using method of triangularisation | K2,K3 |
| CO2 | Find the inverse of a matrix using Gauss Jordan Method | K3 |
| CO3 | Solve Algebraic, Transcendental and Differential Equation using different methods | K3,K4 |
| CO4 | To fit a curve for the given data using principles of least squares | K3,K4 |
| CO5 | Integrate the functions using different rules like Simpsons 1/3 rule | K3,K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3

moderately correlated – 2

weakly correlated –1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | Unit 1: Method of Triangularisation - Gauss elimination method - Inverse of a matrix - Gauss- Jordan method | 1 | CO1 |
| 2 | Unit 2: Numerical solution of algebraic, transcendental and differential equation Bisection method – Regula falsi method - Newton - Raphson method - - Horner's method - Solution of ordinary differential equation - Euler's method. | 1 | CO2 |
| 3 | Unit 3: Interpolation Finite differences – Operators $\Delta \nabla D$ – Relation between operators –Linear interpolation – Interpolation with equal intervals – Newton forward interpolation formula –Newton backward interpolation formula. | 1 | CO3 |

| | | | |
|---|---|---|-----|
| 4 | Unit 4: Curve fitting Principles of least squares - fitting a straight line - linear regression - fitting an exponential curve. | 1 | CO4 |
| 5 | Unit 5: Numerical integration Trapezoidal Rule - Simpson's 1/3 rule and 3/8 rule - Applications - Weddle's rule | 1 | CO5 |

TEXT BOOKS:

Trapezoidal Rule - Simpson's 1/3 rule and 3/8 rule - Applications - Weddle's rule Books for Study:

1. M.K.Venkatraman, (1990) Numerical methods, National Publishing Company.
2. V. Rajaraman, (2003) Numerical methods, Prentice - Hall India Pvt. Ltd.
3. P. Kandasamy, K. Thilagavathy and K. Gunavathy, (2002) Numerical methods, S. Chand & Co.

REFERENCE BOOKS:

1. Numerical methods for Scientific and Engineering computation, Jain Iyenge and Jain, New Age International (P) Ltd. (2004).
2. Numerical methods, S.S. Sastry, Prentice Hall of India Pvt. Ltd., New Delhi (2003).

Web Site:

<http://www.sst.ph.ic.ac.uk/angur/lectures/compphys/compphys.html>.

ELECTIVE I c. PROBLEMS SOLVING SKILLS IN PHYSICS

| | |
|-----------------------------|-----------------------|
| Course Code : | Credits 4 |
| L: T: P: S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

Physics without problems “pressure”

To inculcate the problem solving skills in different areas of physics

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|--------------|
| CO1 | Think Laterally and provide necessary solution | K2,K3 |
| CO2 | Use appropriate mathematical methods to given problem | K3 |
| CO3 | Verify whether the answer obtained is correct or not | K3,K4 |
| CO4 | Use logical and other skills to solve problem | K3,K4 |
| CO5 | Clear all the entrance examinations leading higher education in premier institutions | K3,K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3 moderately correlated – 2 weakly correlated –1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S. NO | CONTENTS OF MODULE | Hrs | Cos |
|-------|--|-----|-----|
| 1 | <p>UNIT 1: Problems in mechanics</p> <p>Newton laws of motion for various systems (1, 2 and 3 dimension), Conservation laws and collisions, Rotational mechanics, central force, Harmonic oscillator, special theory of relativity</p> | 1 | CO1 |
| 2 | <p>UNIT 2: Problems in thermal physics</p> <p>Kinetic theory– Laws of Thermodynamics – Ideal Gas law–Various Thermodynamic process– Entropy calculation for various process– Heat engine–TS and PV diagram–Free energies and various relations</p> | 1 | CO2 |
| 3 | <p>UNIT 3: Problems in electricity & magnetism</p> <p>Electrostatics– calculation of Electrostatic quantities for various configurations– Conductors, Magneto statics– Calculation of Magnetic quantities for various configuration, Electromagnetic induction, Poynting vector, Electromagnetic waves.</p> | 1 | CO3 |
| 4 | <p>UNIT 4: Problems in quantum mechanics</p> <p>Origin of Quantum mechanics– Fundamental Principles of Quantum mechanics– potential wells and harmonic oscillator– Hydrogen atom</p> | 1 | CO4 |

| | | | |
|---|---|----------|------------|
| | UNIT 5: Problems in general physics & mathematics | | |
| 5 | Plotting the graphs for various elementary and composite functions– Elasticity–Viscosity and surface tension– fluids– Buoyancy–pressure– Bernoulli’s theorem–applications– waves and oscillations, Errors and propagation of errors | 1 | CO5 |

TEXT BOOKS:

1. Charles Kittel, Walter D knight, Mechanics (in SI units) (Berkeley Physics course–volume 1), Tata McGraw Hill publication, second edition.
2. S.C.Garg, RM Bansal &CK Ghosh, Thermal physics, (Tata McGraw Hill Publications), 1stedition.
3. E.M.Purcell, Electricity &magnetism(in SI units), Tata Mcgraw hill Publication, 2ndEdition.
4. N.Zettili, Quantum mechanics, Wiley Publishers, second edition.
5. David. J.Griffith, Introduction to quantum mechanics, Pearson cPublications, second edition

REFERENCE BOOKS:

6. Halliday&Resnick, Fundamentals of Physics, Wiley Publications, 8thEdition
7. Nelkon and Parker, Advanced level physics, CBS publishers, 7thedition
8. AmithAgarwal, Play with graphs, ArihantPublications
9. D.S.Mathur, Properties of matter, S.Chand Publications, 11th Edition

SEMESTER - VI

RELATIVIY & QUANTUM PHYSICS

| | |
|-----------------------------|-----------------------|
| Course Code : 09620 | Credits 5 |
| L: T: P: S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

The aim of this course is to acquire sufficient knowledge in relativity, properties of matter wave, operator formalism, schrodinger wave equation and applications.

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|--------------|
| CO1 | To describe the basic concepts of relativity and to translate the mathematical equations to physical concepts and vice-versa. | (K2) |
| CO2 | To identify the wave nature of matter; to illustrate the wave-particle duality with experiments. | (K3) |
| CO3 | To apply the concepts of basic postulates Quantum mechanics; compute the Schrodinger equation for the systems. | (K3) |
| CO4 | Associated the Quantum mechanics wave functions with the corresponding operators and eigen values. | (K4) |
| CO5 | To deduce angular momentum operators. To evaluate various commutator relations of orbital and spin angular momenta. | (K4) (K5) |
| CO6 | To solve the Schrodinger equation of physically important one dimension potentials. | (K5) |
| CO7 | To estimate the shape of wave functions; to conceive methods such as separation of variables to solve three dimension problems. | (K6) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/ PSO | Strongly correlated – 3 | | | | | | | | | | moderately correlated – 2 | | | | | weakly correlated –1 | | | | |
|---------------|-------------------------|---|---|---|---|---|---|---|---|----|---------------------------|---|---|---|---|----------------------|--|--|--|--|
| | PO | | | | | | | | | | PSO | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 | | | | | |
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | | | | | |
| CO2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | | | | | |

| | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 2 |
| CO4 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 2 |
| CO6 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO7 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|------------|
| 1 | <p>Unit I: Relativity</p> <p>Frame of reference – Gallilean transformation – Michelson – Morley experiment – Postulates of special theory of relativity – Lorentz transformation – length contraction – time dilation – relativity of simultaneity – addition of velocities – variation of mass with velocity – mass energy equation – elementary ideas of general theory of relativity – Principle of equivalence – Bending of rays of light due to gravitational field- shift of spectral lines - Minkowski’s four dimensional space.</p> | 1 | CO1 |
| 2 | <p>Unit II: Wave nature of matter</p> <p>Matter wave – phase and group velocity – wave packet – expression for de Broglie wavelength – experimental confirmation of particle waves – Davisson and Germer’s experiment – G.P. Thomson’s experiment – applications of electron diffraction – electron microscope – principle of complementarity – Heisenberg’s uncertainty principle – experimental illustration of uncertainty principle – applications of uncertainty principle.</p> | 1 | CO2 CO3 |
| 3 | <p>Unit III: Schrodinger’s Equation</p> <p>Inadequacy of classical mechanics – basic postulates of wave mechanics – properties of wave function – probability interpretation of a wave function – operator formalism – linear operators – self – adjoint operators – expectation value – eigen values and eigen functions – commutativity and compatibility – Schrodinger’s equation - steady state and time dependent form.</p> | 1 | CO4 |

| | | | |
|---|---|---|-----|
| 4 | Unit IV: Angular Momentum Orbital angular momentum operators and their commutation relations – elementary ideas of spin angular momentum of an electron – Pauli matrices – spin matrices - properties. | 1 | CO5 |
| 5 | Unit V: Solution of Schrodinger's Equations Free particle solution – particle in a box – Qualitative treatment of the Barrier penetration problem (one dimension only), linear harmonic oscillator, rigid rotator and Hydrogen atom | 1 | CO6 |

TEXT BOOKS:

1. Brijlal Subramanyam, (1990), Mechanics and Relativity, S. Chand & Co., New Delhi, ISBN: 8121926114
2. G. Aruldas, (2002), Quantum mechanics, Prentice Hall India.
ISBN: 9789390464869
3. R. Murugesan and Kiruthiga Sivaprasath, (2008), Modern Physics, S. Chand & Co. ISBN:9789352533107
4. Satyaprakash, (2009), Quantum Mechanics, Pragati Prakashan, Meerut.
ISBN: 9789387812352

REFERENCE BOOKS:

1. P.M. Mathews and S. Venkatesan, (2005), A text book of Quantum mechanics, Tata McGraw – Hill, New Delhi. ISBN: 9780071322140
2. Arthur Beiser. (1997), Concepts of modern physics, (5th edition), Tata McGraw – Hill, New Delhi. ISBN: 9780072448481
3. A. Ghatak and Loganathan, Quantum mechanics, McMillan India Pvt. Ltd.
ISBN: 9781402018503

4. V.K. Thankappan, (2003), Quantum Mechanics, New Age International (P) Ltd. Publishers, New Delhi. ISBN: 9781781830871

WEB LINKS:

<https://youtu.be/TcmGYe39XG0>

<https://youtu.be/wCOz9AOEDgM>

<https://youtu.be/iS-e4BMmpF4>

NUCLEAR AND PARTICLE PHYSICS

| | |
|-----------------------------|-----------------------|
| Course Code : 09621 | Credits 5 |
| L: T: P: S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives: On taking course the student will be able to

**Gain an insight into the theories of nuclear structure & radioactivity.*

**Understand the working of various particle detectors and accelerators.*

**Obtain knowledge about various nuclear reactions and their application.*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|-----------|
| CO1 | Characterize nuclei based on their general properties and describe qualitatively models of nuclear structure. | K2 |
| CO2 | Outline the mechanism of radioactivity and summarize the necessary theories related to it. | K2 |
| CO3 | Quantify radioactivity and describe its dependence using concepts of half life. | K2 |
| CO4 | Relate the properties of nature of nuclear system with radiation detectors and particle acceleration. | K3 |
| CO5 | Paraphrase basic aspects of nuclear reaction and calculate Q-value and realize the nature of the reaction. | K2 |

| | | |
|------------|---|-----------|
| CO6 | Apply the fission and fusion well as nuclear energy in nuclear reactors and stellar energy in star. | K3 |
| CO7 | Appraise the theoretical prediction of nuclear reaction to understand the host of sub atomic particle nature reveals. | K5 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3

moderately correlated – 2

weakly correlated –1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 1 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 2 |
| CO5 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO6 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO7 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | 3 | 3 | 1 | 3 | 2 |

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|------------|
| 1 | Unit I: General Properties of Nuclei Nuclear size, charge, mass-determination of nuclear radius-mirror nucleus - mass defect and binding energy-packing fraction – nuclear spin – magnetic dipole moment – electric quadrupole moment – nuclear models – liquid drop model – Weizacker semi empirical mass formula – shell model and magic numbers – nuclear forces-meson theory of nuclear force(qualitative) | 1 | CO1 |
| 2 | Unit II: Radioactivity Natural radioactivity – properties of alpha, beta and gamma rays - alpha rays – characteristics determination of e/m of alpha particle – determination | | CO2 |

| | | | |
|---|---|---|-----|
| | of range of alpha particle– Geiger Nuttal experiment and law – α -ray spectra – Gamow’s theory of α -decay (qualitative study) – beta rays – characteristics - beta ray spectra – neutrino hypothesis – violation of parity conservation – gamma rays – determination of wavelength - internal conversion – nuclear isomerism - law of disintegration – half life and mean life period – units of radioactivity – transient and secular equilibrium – radiocarbon dating – age of earth | 1 | CO3 |
| 3 | Unit III: Radiation Detectors and Particle Accelerators Ionization chamber – G.M. Counter and resolving time – scintillation counter – photo multiplier tube – Linear accelerators – cyclotron – synchrocyclotron - betatron. | 1 | CO4 |
| 4 | Unit IV: Nuclear Reactions Conservation laws – nuclear reaction Kinematics-Q-value-threshold energy – artificial radioactivity – radioisotopes and its uses – classification of neutrons – nuclear fission – chain reaction – critical mass and size – nuclear reactor-breeder reactor – transuranic elements – nuclear fusion – thermonuclear reactions – sources of stellar energy. | 1 | CO5 |
| 5 | Unit V: Elementary Particles Classification of elementary particles – particles and anti particles – anti matter - fundamental interaction – elementary particle quantum numbers – isospin and strangeness – conservation laws. | 1 | CO6 |

TEXT BOOKS:

1. N. Subrahmanyam and Brijlal(1996). Atomic and nuclear Physics, S. Chand & Co., New Delhi.
2. Tayal D.C (2006). Nuclear Physics, Himalaya publishing House, Mumbai.
3. R.C. Sharma (2000). Nuclear Physics, K. Nath& Co., Meerut.
4. R. Murugesan and Kiruthiga Sivaprasath (2005). Modern physics, S. Chand and Company, New Delhi.

REFERENCE BOOKS:

1. R.R. Roy and B.P. Nigam (1997). Nuclear Physics, New Age International (P) Ltd., New Delhi.

2. Irving Kaplan (2002). Nuclear Physics, Narosa Publishing house, New Delhi.

WEB LINKS:

<http://hyperphysics.phy-astr.gsu.edu/hbase/nuccon.html>

<http://hyperphysics.phy-astr.gsu.edu/hbase/Nuclear/nucstructcon.html>

<http://hyperphysics.phy-astr.gsu.edu/hbase/Nuclear/radact.html>

<http://hyperphysics.phy-astr.gsu.edu/hbase/Particles/parcon.html>

https://www.int.washington.edu/users/mjs5/Class_560/lec560_1/node2.html

<https://brilliant.org/wiki/nuclear-decay/>

<https://www.britannica.com/science/radioactivity>

<https://www.youtube.com/watch?v=1iOI8PIosVU>

<https://home.cern/science/accelerators/how-accelerator-works>

<http://abyss.uoregon.edu/~js/ast123/lectures/lec07.html>

Elective II

(Any one of the three below)

I a.DIGITAL ELECTRONICS

| | |
|-----------------------------|-----------------------|
| Course Code : 09622 | Credits 4 |
| L: T: P: S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives: By studying this course student will be able to learn fundamentals of Boolean algebra synthesis of Boolean functions and combinational and sequential circuits and basics of IC fabrication technology.

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|--------------|
| CO1 | Classify numbers based on various number systems using digital technology and apply to solve binary operation. | K2,K3 |
| CO2 | Interpret real life situations using AND, OR, NOT, basic logic gates and extend their ideas to universal building blocks. Infer operation using Boolean Algebra simplify using mapping techniques. | K3 |
| CO3 | Construct analyze digital circuits - combinational and using logic circuits. | K3,K4 |
| CO4 | Build sequential circuits and analyze working. | K3,K4 |
| CO5 | Construct digital circuits – registers and counters analyze their working. | K3,K4 |
| CO6 | Explain basic of IC technology various process during fabrication and integration. | K2 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3

moderately correlated – 2

weakly correlated –1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-----|
| 1 | Unit 1: Number System and Binary Code Introduction, binary, octal and hexadecimal number system. Binary operations-addition; Subtraction, multiplication and division. Subtraction using 1's and 2's complement; BCD system. | 1 | CO1 |
| 2 | Unit 2: Combinational Logic Design Boolean algebra-De Morgan's theorem- basic logic gates- NAND and NOR as universal gates-SOP, POS- Karnaugh map representation and simplification, pair, quad, octet (limited to four variables). Arithmetic circuits - half and full adders, half and full subtractors), BCD adder. Demultiplexers /Decoders, Multiplexers, Encoders, Code converters(BCD-to Binary, Binary to BCD converters). | 1 | CO2 |
| 3 | Unit 3 : Flip flops Sequential logic circuits – 1-bit memory, Latch, R-S Flip flop, J-K Flip flop – Race-around condition – master – Slave Flip flop – T and D flip flops. | 1 | CO3 |
| 4 | Unit 4: Registers and counters Registers, Modes of operation, shift right, shift left registers. Counters (4 bit). Ripple (or) asynchronous Counters – synchronous counters –Up - down counters – decade counter – BCD counter. | 1 | CO4 |
| 5 | Unit 5: Introduction to IC technology Basic fabrication steps: epitaxial growth, oxidation, photolithography, etching, diffusion, ion implantation, film deposition and metallisation. Process integration for integrated Circuits, Diodes and transistor for monolithic circuits, integrated resistors, capacitors. | 1 | CO5 |

TEXT BOOKS:

1. V. Vijayendran (2005). Introduction to Integrated Electronics, S. Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai.
2. R.P.Jain (1996). Digital Electronics by Practice Using Integrated Circuits, Tata McGraw Hill.
3. J. Millman and C. Halkias (2001). Integrated Electronics, Tata McGraw Hill, New Delhi.
4. Malvino Leach (1992). Digital Principles and Application (4th Edition), Tata McGraw Hill.

REFERENCE BOOKS:

1. D. Roy Choudhury and Shail Jain (2003). Linear Integrated Circuits, New Age International (P) Ltd.
2. I.J. Nagrath (1999). Electronics - Analog and Digital, Prentice Hall of India, New Delhi.

WEB LINKS:

Digital Electronics videos created by our alumni

<https://youtu.be/JLz7qASICYU>

<https://youtu.be/u6m4II-qZ58>

<https://youtu.be/C0HsQykDdKg>

Other sources

<https://youtu.be/-paFaxtTCKI>

https://youtu.be/s1DSZEaCX_g

ELECTIVE II b. GEOPHYSICS

| | | |
|-----------------------------|------------------|-------------|
| Course Code : | Credits | 4 |
| L: T: P: S : 5:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives:

To make the students understand the basic principles of geophysics, geomagnetism and concepts of earthquakes.

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | <p>Unit 1: Physics of the earth</p> <p>Introduction to Geophysics- Earth as a member of the solar system- Atmosphere-Ionosphere- Asthenosphere-Lithosphere-Hydrosphere and Biosphere-Meteorology-Oceanography and Hydrology</p> | 1 | CO1 |
| 2 | <p>Unit 2: Geophysical and geochemical methods</p> <p>Geophysical methods: Geo referencing using Arc GIS software- Electrical methods- Quantitative interpretation of Vertical Electrical Sounding curves –Preparing pseudo cross section for electrical resistivity data and interpretation. Geochemical methods: Introduction-Principles of groundwater chemistry-Sources of contamination- Ground water quality analysis using geochemical methods.</p> | 1 | CO2 |
| 3 | <p>Unit 3: Introduction to seismology</p> <p>The earth’s interior and crust as revealed by earthquakes-Rayleigh waves and Love waves- Elastic rebound theory-Continental drift -Earthquake magnitude and intensity-Horizontal seismograph and seismograph equation-Tsunami-Causes and Impacts-Tsunami warning systems.</p> | 1 | CO3 |
| 4 | <p>Unit 4: Geomagnetism and gravity</p> <p>Historical introduction –The physical origin of magnetism-Causes of the main field-Dynamo theory of earth’s magnetism. Gravitational potential-Laplace’s equation and Poisson’s equation-Absolute and relative measurements of gravity-Worden gravimeter.</p> | 1 | CO4 |
| 5 | <p>Unit 5: Geochrology and geothermal physics</p> <p>Radioactivity of the earth-Radioactive dating of rocks and minerals- Geological time scale- The age of the earth. Flow of heat to the surface of the earth –Sources of heat within the earth-Process and heat transport and internal temperature of earth.</p> | 1 | CO5 |

TEXT BOOKS:

1. Arthur W.Hounslow, 1995. Water quality data -Analysis and Interpretation, Lewis publishers Washington D.C.
2. Cook A.H, 1973. Physics of the Earth and Planets, McMillanPress, London.
3. John Milsom, Field geophysics-The geophysical field guide III edition, Wiley publications, England.
4. Krauskopf. K.B, 1967. Introduction to Geochemistry, McGraw Hill.
5. RamachandraRao, 1975. Outline of geophysical prospecting-a manual for geologists, University of Mysore.

REFERENCE BOOKS:

1. Garland, Introduction to Geophysics (11 edition), WB Saunder Company, London,
2. William Lowrie, Fundamentals of Geophysics (11Edition), Cambridge press UK.
3. Nils-Axel Morne, Geochronology-Methods and case studies, INTECH publications.
4. John Raferty, 2011. Geochronology –Dating and Precambrian time –The beginning of the world as we know it, Britannica Educational publishers, New York-.
5. Don L.Anderson, 1989. Theory of the Earth, Blackwell scientific Publications-UK.

ELECTIVE II c. MEDICAL PHYSICS

| | | |
|-----------------------------|------------------|-------------|
| Course Code : | Credits | 4 |
| L: T: P: S : 5:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives: *To gain a broad and fundamental understanding in Physics while developing particular expertise in medical applications Learning Outcomes:*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|--------------|
| CO1 | Functional knowledge regarding the need of radiological protection | K2,K3 |
| CO2 | Gain knowledge on diagnostic and therapeutic application like X-rays, Ultrasound imaging , Magnetic resonance imaging etc., | K3 |

| | | |
|------------|---|--------------|
| CO3 | Gets familiar with various detectors used in medical imaging | K3,K4 |
| CO4 | Hands on training which will be useful for the students to enter the job market | K3,K4 |
| CO5 | Learn importance concepts of radiation as an applied knowledge | K3,K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3

moderately correlated – 2

weakly correlated –1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S.No. | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | <p>Unit-1: X-rays</p> <p>Electromagnetic spectrum - production of x-rays - x-ray spectra - Brehmsstrahlung - Characteristic x-ray - X-ray tubes - Coolidge tube - x-ray tube design - tube cooling - stationary mode - Rotating anode x-ray tubes -Tube rating - quality and intensity of x-ray. X- ray generator circuits - half wave and full wave rectification - filament circuit - kilo voltage circuit - high frequency generator - exposure timers - HT cables.</p> | 1 | CO1 |

| | | | |
|---|--|---|-----|
| 2 | <p>Unit-2: Radiation physics</p> <p>Radiation units - Exposure - Absorbed dose - rad to gray - kera relative biological effectiveness - Effective dose: Sievert (Sv)- Inverse Square Law - Interaction of radiation with matter - Linear Attenuation coefficient- Radiation Detectors -Thimble Chamber - Condenser Chambers - Geiger counter - Scintillation counter -Ionization Chamber - Dosimeters - Survey methods - Area monitors - TLD and Semiconductor Detectors.</p> | 1 | CO2 |
| 3 | <p>UNIT-3: Medical imaging physics</p> <p>Radiological Imaging - Radiography - Filters - grids - Cassette - X-ray film - Film processing - Fluoroscopy - Computed Tomography Scanner - Principle Function -Display - Generations - Mammography- Ultrasound imaging - Magnetic Resonance Imaging - Thyroid Uptake system - Gamma camera (Only Principle, function and display)</p> | 1 | CO3 |
| 4 | <p>Unit-4: Radiation therapy physics</p> <p>Radiotherapy - Kilo voltage machines - Deep Therapy Machines - Telecobalt machines - Medical Linear Accelerator - Basics of Teletherapy units - Deep x-ray, telecobalt units, Medical linear accelerator - Radiation Protection - External Beam Characteristics - Phantom - Dose maximum and build up - Bolus - Percentage depth dose - Tissue - Air ratio - Back Scatter factor.</p> | 1 | CO4 |
| 5 | <p>Unit-5: Radiation protection</p> <p>Principles of radiation protection - Protective materials - Radiation effects -Somatic, genetic stochastic and deterministic effect- Personal monitoring devices- TLD film badge - Pocket dosimeter.</p> | 1 | CO5 |

TEXT BOOKS:

1. Dr. K. Thayalan, Jayapee Brothers (2003). Basic Radiological Physics, Medical Publishing Pvt. Ltd. New Delhi .
2. Williams and Wilkins (1990) Christensen's Physics of Diagnostic Radiology: Curry, Dowdey and Murry -Lippincot
3. FM Khan, Williamd and Wilkins, (2003) Physics of Radiation Therapy (Third edition).
4. The essential Physics of Medical Imaging: Bushberg, Seibert, Leidhold

Elective III

(Any one of the below four)

III a. MICROPROCESSOR FUNDAMENTALS

| | |
|-----------------------------|-----------------------|
| Course Code : 09623 | Credits 4 |
| L: T: P: S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course students can understand

**Basic concepts of microprocessor.*

**Programming instructions and interfacing concepts.*

Course Outcomes: At the end of the Course, the Student will be able to:

| | | |
|------------|---|----|
| CO1 | Explain the basic concepts of microprocessor architecture and describe the functions of different pins. | K2 |
| CO2 | Apply programming instruction sets of microprocessor and execute assembly language programs. | K3 |
| CO3 | Recognize basic ideas of memory; Extend their knowledge in memory interfacing to 8085. | K2 |
| CO4 | Apply the programming techniques to interface I/O ports to 8085. | K3 |
| CO5 | Developing algorithm to find solution for real time problems. | K6 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S.No. | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-----|
| 1 | Unit 1: Architecture Architecture of 8085 – registers, flags, ALU, address and data bus, demultiplexing address/data bus – control and status signals – control bus, Programmer’s model of 8085 – Pin out diagram – Functions of different pins. | 1 | CO1 |
| 2 | Unit 2: Programming Techniques Instruction set of 8085 – data transfer, arithmetic, logic, branching and machine control group of instructions – addressing modes – register indirect, direct, immediate and implied addressing modes. Assembly language & machine language – programming techniques: addition, subtraction, multiplication, division, ascending, descending order, largest and smallest (single byte) | 1 | CO2 |
| 3 | UNIT 3: Interfacing memory to 8085 Memory interfacing – Interfacing 2kx8 ROM and RAM, Timing diagram of 8085 (MOV Rd, Rs – MVI Rd, data(8) . | 1 | CO3 |
| 4 | Unit 4: Interfacing I/O Ports to 8085 Interfacing input port and output port to 8085 – Programmable peripheral interface 8255 – control word-three modes of operation- flashing LEDs. | 1 | CO4 |
| 5 | Unit 5: Interrupts Interrupts in 8085 - hardware and software interrupts – RIM, SIM instructions – priorities – simple polled and interrupt controlled data transfer. | 1 | CO5 |

TEXT BOOKS:

1. R.S. Gaonkar (1992). Microprocessor Architecture programming and application with 8085 / 8080A, Wiley Eastern Ltd.
2. V. Vijayendran (2003). Fundamental of microprocessor 8085, S. Viswanathan Publishers, Chennai.
3. B. Ram. Fundamentals of Microprocessors and microcomputers, DhanpatRai publication.

REFERENCE BOOKS:

1. Aditya Mathur (1987). Introduction to microprocessor, Tata Mc.Graw Hill Publishing Company Ltd.
2. Douglas V. Hall (1983). Microprocessor and digital system by (2nd Edition), McGraw Hill Company.

WEB LINKS:

Microprocessor fundamentals

<https://youtu.be/VhMWtJUiAgQ>

<https://youtu.be/uvupli4nik8>

<https://www.youtube.com/watch?v=YFhLBXggbL4&list=PL6So-guiA-TXZqMUZ0pjAdTz4JFK9dnBn>

<https://youtu.be/-i3FLKezNqg>

ELECTIVE III b. FIBRE OPTICS

| | | |
|-----------------------------|------------------|-------------|
| Course Code : | Credits | 4 |
| L: T: P: S : 5:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives: To gain in depth knowledge in optical fibres , application in telecom field

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | <p>Unit 1: Fiber optics – Introduction Structure of fiber-why silica (SiO₂) as fiber-Snell’s Law- Total internal reflection-meridional and skew rays- - acceptance angle and cone- numerical aperture- Goos-Haenchen shift-step and graded index fibers - single mode and multimode fiber – V-number – number of modes in step and graded multimode fibers. Analog & digital optical fiber communication (OFC) system- advantages of OFC.</p> | 1 | CO1 |
| 2 | <p>Unit 2: Transmission characteristics of optical fibers</p> <p>Losses in silica glass fibers-intrinsic, extrinsic and OH- absorption losses – scattering losses- Linear: Rayleigh and Mie scattering, Nonlinear: Stimulated Brillouin and Raman scattering- intramodal and intermodal dispersion losses-micro and macro bending losses-evanescent field-attenuation spectrum for an ultra-low-loss single mode fiber.</p> | 1 | CO2 |
| 3 | <p>Unit 3: Optical fiber connection</p> <p>Introduction - Multimode and single mode fiber joints–Fusion and mechanical splices– Cylindrical ferrule & duplex and multiple fiber connectors –Grin-rod lenses-Three & four port and WDM couplers</p> | 1 | CO3 |
| 4 | <p>Unit 4: Optical sources</p> <p>Basic concepts of absorption and emission of radiations-LED power and efficiency-Double heterojunction LED-surface & edge emitting LED– optical output power-output spectrum- modulation bandwidth-reliability- LASER diodes-Gain guided lasers-quantum-well lasers- Fiber lasers.</p> | 1 | CO4 |
| 5 | <p>Unit 5: Optical detectors</p> <p>Optical detection principles-quantum efficiency-responsivity-PIN photodiode-speed of response-noise-Avalanche Photodiodes (APD): Germanium APD-Merits and demerits- multiplication factor-Mid-infrared photodiodes – photo transistors-photo conductive detectors-eye diagrams.</p> | 1 | CO5 |

TEXT BOOKS:

1. John M. Senior, (2009). Optical fiber communications: Principles and Practice), Pearson-Prentice Hall, (unit I – V)
2. Gerd Geiser, (2017). Optical Fiber Communications, (5th edition), Tata McGraw-Hill Education Pvt. Ltd., (unit IV-V)

REFERENCE BOOKS:

1. Henry Zanger and Cynthia Zanger, (1991). Fiber Optic Communication And Other Application, Merrill Pub. Co.
2. N. Sharma, (1987) Fiber Optics in Telecommunications, Tata McGraw Hill.
3. K. Kao Charles, (1982). Optical Fiber Systems: Technology, Design and Applications, (1st edition) McGraw- Hill.
4. Govind P Agrawal, John Wiley (2007). Fiber-optic communication systems.
5. Ajoy Ghatak and K. Thyagarajan, (2004). Introduction to fiber optics. Cambridge University Press.
6. K. Thyagarajan and Ajoy Ghatak, John Wiley (2007). Fiber optic essentials.

ELECTIVE III c. ASTROPHYSICS

| | | |
|-----------------------------|------------------|-------------|
| Course Code : | Credits | 4 |
| L: T: P: S : 5:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives: *To make the students understand the nature of universe from various theories and phenomena. To study the importance and science behind the Astrophysics for the future invention and space research.*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|--------------|
| CO1 | There are many institutions have the department as Department of Physics and Astronomy that offers courses and jobs for the students those who study Astrophysics. | K2,K3 |
|------------|--|--------------|

| | | |
|------------|--|--------------|
| CO2 | The Indian institute of Astrophysics and several other astronomical institutions offer the job opportunities based on this course. | K3 |
| CO3 | Later in future after the study and experience, the job opportunities are available in famous Indian agencies like DRDO and ISRO and in foreign astronomical institutions and agencies | K3,K4 |
| CO4 | Understand the evolution of stars, white dwarfs, binary stars, quasars | K3,K4 |
| CO5 | Learn about various galaxies, cosmic rays | K3,K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3 moderately correlated – 2 weakly correlated –1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S.No. | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|------------|
| 1 | Unit 1: Earliest astronomy and theories of universe Earliest Astronomy (2500 – 100 BC) – Pythagorean Spherical Earth – Aristotle’s Earth as Centre – Copernicus Theory – Kepler’s Law – Galileo’s observations – Newton’s Synthesis. Origin of the universe – The Big Bang Theory – The steady state theory – The Oscillating | 1 | CO1 |

| | | | |
|---|---|---|-----|
| | Universe theory | | |
| 2 | Unit 2: Astronomical scales and instruments Astronomical Scales – Astronomical Distance – Mass and Time – Stellar Temperature – Astronomical Instruments –The Earth’s Atmosphere and the Electromagnetic Radiation – Optical Telescopes – Radio Telescopes – The Hubble Space Telescope (HST) – Astronomical Spectrographs – Photographic Photometry – Photoelectric Photometry – Spectrophotometry. | 1 | CO2 |
| 3 | Unit 3: Solar system The sun – Structure of the Sun – Nuclear reactions in sun – Photosphere – Chromosphere – corona – solar prominences – Sunspot cycle – Theory of sunspots – Solar flare – solar constant – Temperature of the sun – Solar energy – Solar wind – Other members of the solar system. | 1 | CO3 |
| 4 | Unit 4: Stellar evolution Birth of a star– Death of a star –Red giant stars – Chandrasekhar limit – white dwarfs – Black holes – Quasars – Nebulae – Supernovae Binary stars – Origin of binary stars – Variable stars – Flare stars – Constellations – Zodiac – Magnitude and brightness – Luminosities of stars –Measurement of stellar distance – Geometrical parallax method – Distancefrom red shift measurement | 1 | CO4 |
| 5 | Unit 5: The milky way galaxy The milky way – Basic Structure and Properties of the Milky Way – The General Rotation Law – Density Distribution of Gas and Spiral structure of the Galaxy – The Mass of the Galaxy – Magnetic Field in the Galaxy – Cosmic Rays – Continuous Radio Emission in the Galaxy – Hubble’s law – Types of galaxies. | 1 | CO5 |

TEXT BOOKS:

1. Astronomy, S. Kumaravelu, (1993). Janki calendar corporation, Sivakasi.
2. Physics of the Universe, Hewish. (1992). A, CSIR publication, New Delhi.
3. Inside Stars, Biman Basu, (1992). CSIR Publication, New Delhi.
4. Cosmic Vistas, Biman Basu, (2002). National Book Trust of India.

5. Space today, Mohan Sundara Rajan, (2000). National Book Trust of India.
6. William K. Hartmann, (1990). The Cosmic Voyage through time and space, Wads worth Publishing company, California.
7. Astronomy, Baker and Fredrick, (1964). ninth edition, Van No strand Rein hold, Co, New York
8. Textbook of Astronomy and Astrophysics with elements of cosmology, V.B. Bhatia, Narosa Publication.
9. B.W. Carroll & D.A. Ostlie, Modern Astrophysics Addison-Wesley Publishing Co.
10. M. Zeilik and S.A. Gregory, Introductory Astronomy and Astrophysics, (4th Edition), Saunders College Publishing.

ELECTIVE III d. WEATHER FORECASTING

| | | |
|-----------------------------|------------------|-------------|
| Course Code : | Credits | 4 |
| L: T: P: S : 5:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives *To enable them to develop an awareness and understanding regarding the causes and effects of different weather phenomenon and basic forecasting techniques*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|--|--------------|
| CO1 | To learn basic techniques to measure temperature and its relation with cyclones and anti-cyclones.. | K2,K3 |
| CO2 | Gain knowledge of simple techniques to measure wind speed and its directions, humidity and rainfall | K3 |
| CO3 | Understand various causes of climate change like global warming, air pollution, aerosols, ozone depletion, acid rain | K3,K4 |
| CO4 | Develop skills needed for weather forecasting. | K3,K4 |
| CO5 | Uncertainties in predicting weather based on statistical analysis. | K3,K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated – 3

moderately correlated – 2

weakly correlated –1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-----|
| 1 | <p>Unit 1: Introduction to Atmosphere</p> <p>Elementary idea of atmosphere- Physical structure and composition- compositional layering of the atmosphere- Variation of pressure and temperature with height- Air temperature- Requirements to measure air temperature- Temperature sensors- types; atmospheric pressure: its measurement- Cyclones and anticyclones- its characteristics.</p> | 1 | CO1 |
| 2 | <p>Unit 2: Measuring the Weather</p> <p>Wind- forces acting to produce wind; wind speed direction units, its direction- measuring wind speed and direction; humidity, clouds and rainfall, radiation: absorption, emission and scattering in atmosphere- Radiation laws.</p> | 2 | CO2 |
| 3 | <p>Unit 3: Weather Systems Global wind systems- air masses and fronts- classifications- jet streams- local thunderstorms- tropical cyclones: classification- tornadoes- hurricanes</p> | 1 | CO3 |

| | | | |
|---|---|---|-----|
| 4 | Unit 4: Climate and Climate Change Climate: its classification- causes of climate change-global warming and its outcomes- air pollution- aerosols, ozone depletion, acid rain, environmental issues related to climate. | 1 | CO4 |
| 5 | Unit 5: Basics of Weather Forecasting: Weather forecasting: analysis and its historical background- need of measuring weather- types of weather forecasting- weather forecasting methods- criteria of choosing weather station- basics of choosing site and exposure- satellites observations in weather forecasting- weather maps- uncertainty and predictability- probability forecasts. | 1 | CO5 |

TEXT BOOKS:

1. Aviation Meteorology (2014). I.C. Joshi, 3rd edition, Himalayan Books
2. Stephen Burt, (2012), The weather Observers Hand book, Cambridge University Press.
3. S.R. Ghadekar, (2001), Meteorology, Agromet Publishers, Nagpur.
4. S.R. Ghadekar, (2005), Text Book of Agrometeorology, Agromet Publishers, Nagpur.
5. Charls Franklin Brooks, (1924), Why the weather, Chpraman & Hall, London.
6. John G. Harvey, (1995), Atmosphere and Ocean, The Artemis Press.

CORE PRACTICAL III

| | |
|-----------------------------|-----------------------|
| Course Code : 09624 | Credits : 4 |
| L: T: P: S : 0:0:3:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

This course opens the window to the student about

- *The design of the concepts of electricity, magnetism, light that are learnt in the theory, providing hands on learning experience.*

Course Outcomes: At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|-----------|
| CO1 | The student will be able to Analyze the nature of light both quantitative and quantitatively. | K4 |
| CO2 | Apply the theory the design basic electrical circuits. | K3 |
| CO3 | Associate theoretical concepts like seebeck effect and electromagnetism with practical demonstration. | K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

LIST OF General Experiments (Any 15 experiments)

1. Young's modulus – Koenig's method – Non uniform bending.
2. Young's modulus – Non uniform bending – optic lever – scale and telescope.
3. Newton's Rings - R_1 R_2 and μ of a long focus convex lens.
4. Spectrometer $i - i'$ curve fixing i .
5. Spectrometer – Cauchy's constants and dispersive power of material of the prism.

6. Field along the axis of a circular coil – Deflection Magnetometer – B_H and M .
7. Field along the axis of a Circular coil – vibration magnetic needle.
8. EMF of Thermocouple – Potentiometer (199P method).
9. EMF of Thermocouple – Potentiometer (108P method).
10. Calibration of high range Voltmeter – Potentiometer.
11. Figure of merit – B.G.
12. Internal resistance of a cell – B.G.
13. Comparison of Capacitances – B.G.
14. Comparison of EMFs – B.G.
15. Absolute capacitance of a capacitor -B.G.
16. Series resonance Circuit – LCR – finding L , Resonant frequency, Bandwidth, Q .
17. Spectrometer – narrow angled Prism.
18. To determine Self inductance of the coil by Anderson's bridge.
19. Absolute inductance of a coil – B.G.
20. Strain Gauge – Piezoelectric sensor.
21. To draw B-H Curve of Iron using Solenoid and determine energy loss and hysteresis.

CORE PRACTICAL IV

| | | |
|-----------------------------|------------------|-------------|
| Course Code : 09625 | Credits | 4 |
| L: T: P: S : 0:0:3:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives:

This course helps the students to acquire practical knowledge to design basic electrical circuits using diodes, transistors etc.

- *Relate digital electronics concepts learnt in lecture session to construct digital circuits.*

Course Outcomes:

At the end of the Course, the Student will be able to:

Knowledge level - K1(Remembering) ,K2(Understanding),K3(Applying) ,K4(Analyzing) , K5(Evaluating) ,K6(Creating)

| | | |
|------------|---|----|
| CO1 | Substitute basic laws and theories learnt in class to use junction diode, Zener diode, transistors etc. | K2 |
| CO2 | Apply the theory to design basic electrical circuits. | K3 |
| CO3 | Analyze the response of various electrical devices using the circuits construction. | K4 |
| CO4 | Interpret the application of basic circuit to create amplification, oscillation, regulate power supply, logical combinations etc. | |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

LIST OF Basic Electronics EXPERIMENTS (Any 15 experiments)

1. Full wave Rectifier.
2. Bridge rectifier.
3. Zener regulated power supply – 9V - regulation characteristics.
4. Transistor characteristics – CB mode.
5. Transistor characteristics – CE mode.
6. Single Stage RC coupled amplifier – gain – frequency response.
7. Emitter follower.
8. Hartley oscillator.
9. Colpitt's oscillator.
10. Transistor – astable multivibrator.
11. Basic logic gates – AND, OR, NOT gates using diodes & transistors.
12. NAND/NOR universal building blocks.
13. De Morgan's theorem – Verification.
14. Half adder – full adder using IC - XOR, AND and OR gates.

15. Half subtractor, full subtractor using IC - XOR, AND and OR gates.
16. 4 bit ripple counter using IC 7473.
17. Decade counter - IC 7490.
18. To study the output and transfer characteristics of JEET
19. UJT – characteristics and relaxation oscillator.

CORE PRACTICAL V

| | |
|-----------------------------|-----------------------|
| Course Code : 09626 | Credits 3 |
| L: T: P: S : 0:0:2:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student acquires

- Practical knowledge to design electronic circuits using OP-AMP-555 timer, microprocessor and related software.

Course Outcomes: At the end of the Course, the Student will be able to:

| | | |
|------------|---|-----------|
| CO1 | Solve combinational circuits of linear IC's and compute the necessary output. | K3 |
| CO2 | Relate the theory learnt to design OP-AMP and IC-555 circuits. | K3 |
| CO3 | Apply the algorithm learnt in classroom to write and execute assembly language program using 8085 Microprocessor. | K3 |
| CO4 | Correlate theoretical and practical ideas with software | K4 |

Mapping of Course Outcomes to Program Outcomes:

Strongly correlated - 3

moderately correlated - 2

weakly correlated -1

| CO/PO/ PSO | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| O4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

LIST OF Applied Electronics EXPERIMENTS (Any 15 experiments)

1. OP Amp – IC 741 – Inverting amplifier, non –inverting amplifier, unity follower.
2. OP Amp – Summing and difference amplifier.
3. Op Amp – Differential amplifier – CMRR.
4. OP Amp – AC frequency response.
5. OP Amp – Square wave generator.
6. OP Amp – Wien’s bridge oscillator.
7. OP Amp – Phase Shift oscillator.
8. 555 Timer – astable multivibrator.
9. 555 Timer – Schmitt Trigger.
10. D/A convertor – 4 bit binary weighted resistor method.
11. μ p- 8085 8 bit addition, multiplication.
12. μ p- 8085 8 bit subtraction, division.
13. μ p - Sorting in ascending order – 8 bit data.
14. μ p -Sorting in descending order – 8 bit data.
15. μ p - Finding the largest number in an array.
16. μ p - Finding the smallest number in an array.
17. OP Amp – Solving simultaneous equation.
18. Analyzing IC-555 oscillator and OP Amp integrator using EXP EYES – Software.
19. Analyzing OP Amp inverting and non-inverting amplifier using EXP EYES – Software.
20. Design and verification of OP Amp as integrator and differentiator.
21. Analyzing (a) Diode I-V characteristics
(b) Rectifier characteristics
(c) Transistor characteristics using EXP EYES – Software.

APPENDIX

The Graduate Attributes of B.Sc.Physics programme are as follows:

- **Disciplinary knowledge and skills:** Capable of demonstrating
 - (i) Good knowledge and understanding of major concepts, theoretical principles and experimental findings in Physics and other related fields of study, including broader interdisciplinary subfields.
 - (ii) Ability to use modern instrumentation and laboratory techniques to design and perform experiments is highly desirable.
- **Skilled communicator:** Ability to transmit complex technical information in a clear and concise manner in a simple language for better understanding.
- **Critical thinker and problem solver:** Ability to employ critical thinking and efficient problem solving skills
- **Sense of inquiry:** Capability for asking relevant/appropriate questions relating to the issues and problems and planning, executing and reporting the results of a theoretical or experimental investigation.
- **Team player/worker:** Capable of working effectively in diverse teams in classroom, laboratory and Physics workshop, in industry and field-based situations.
- **Skilled project manager:** Capable of identifying/mobilizing appropriate resources required for a project, and manage a project through to completion, while observing responsible and ethical scientific conduct; and safety and laboratory hygiene regulations and practices.
- **Digitally Efficient:** To analyze acquired data using computers, utilize e-learning tools effectively, create teaching learning materials.
- **Ethical awareness / reasoning:** The graduate should be capable of demonstrating ability to think and analyze rationally with modern and scientific outlook and identify ethical issues related to one's work, and adopting objectives, unbiased and truthful actions in all aspects of work.

- **National and international perspective:** To motivate the students to develop an idea on various projects of National and International significance.
- **Lifelong learners:** Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge/skill development and reskilling in all areas of Physics.

DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE

(Autonomous)

**“College with Potential for Excellence”
(Linguistic Minority Institution),**

“Gokulbagh” 833, Periyar E.V.R. Salai,
Arumbakkam, Chennai – 106



Department of Botany

B.Sc., Plant Biology and Plant Biotechnology (2021-2022)

CHOICE BASED CREDIT SYSTEM (CBCS)

OUTCOME BASED EDUCATION (OBE)

PROGRAMME CODE: 13

(Applicable for students admitted from the academic year 2021-22)

DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE

VISION

To impart value-based quality academia; to empower students with wisdom and to charge them with rich Indian traditions and culture; to invoke the self, to broaden the same towards nation building, harmony and Universal brotherhood.

MISSION

To ensure sustained progress and development in imparting quality education, to pioneer new avenues of teaching and research and to emerge as an institution with potential for excellence.

DEPARTMENT OF BOTANY

VISION

“Exploration of Plants and realize their significance in the entire Ecosystem”

MISSION

| | |
|-----------|--|
| M1 | <i>To impart fundamental knowledge in conventional and advanced areas of Biological Science.</i> |
| M2 | <i>To develop human resource with expertise in skill based areas of plant sciences.</i> |
| M3 | <i>To ignite students with requisite knowledge for lifelong learning and achieve greater heights in the field of research, entrepreneurship and teaching positions in Biological sciences.</i> |

Programme Educational Objectives (PEO)

| | |
|-------|---|
| PEO 1 | Find employment in plant-based industries leading herbaria, botanical gardens, and educational institutions |
| PEO 2 | Develop the skills necessary to succeed in competitive examinations or start preparing for success as an entrepreneur. |
| PEO 3 | To instil greater knowledge and practical abilities that will allow them to function in interdisciplinary environments. |

PEO to Mission Statement Mapping

| Mission Statements | PEO1 | PEO2 | PEO3 |
|---------------------------|-------------|-------------|-------------|
| M1 | 2 | 1 | 3 |
| M2 | 3 | 3 | 1 |
| M3 | 3 | 2 | 3 |

Correlation: 3 Strong 2 Medium 1 Low

PROGRAMME OUTCOMES

At the completion of the B.Sc. Plant Biology & Plant Biotechnology programme, the students of our Department will be able to:

| S.NO | GRADUATE ATTRIBUTES | PROGRAMME OUTCOMES |
|------|--|---|
| 1. | Knowledge | Attain in-depth Knowledge in the field of plant and animal diversity in terms of structure, function and environmental relationships. (PO1) |
| 2. | Critical Thinking | Apply the knowledge of biology to make scientific queries and enhance the comprehension potential. (PO2) |
| 3. | Problem Solving | Identify the taxonomic position of plants and animals using principles and methods of nomenclature. Mapping of chromosomes, solving Bio statistical problems, and also experiments related to plant physiology (PO3) |
| 4. | Usage of modern tools | Demonstrate practical observation of both internal and external features of plants & animals and experiments using Biological tools and techniques (Like Oil immersion Microscope, Light Microscope, Dissection Microscope, calorimeter, Ganong's potometer) for cellular and fundamental metabolism of plants with an understanding of the application and limitations. (PO4) |
| 5. | Communication | Practice successful transfer of scientific knowledge and biological information both in oral and in writing and also making effective ICT presentations. (PO5) |
| 6. | Life-long Learning | Study incessantly by self to cope with growing competition for higher studies and employment. Enhance the acquired skills for lifelong learning in the broadest context of technological and social change. (PO6) |
| 7. | Ethical Practices and Social Responsibility | Demonstrate and practice social, environmental, and biological ethics. (PO7) |
| 8. | Independent and Reflective Learning | Use of skills in interdisciplinary and multidisciplinary areas of life sciences and their applications and develop a passion to pursue a career in the field of Life science. (PO8) |

MAPPING OF PO TO PEO

| PEO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|
| PEO1 | 1 | 1 | 2 | 3 | 2 | 3 | 1 | 3 |
| PEO2 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 3 |
| PEO3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 |

Correlation: 3 Strong 2 Medium 1 Low

PROGRAMME SPECIFIC OUTCOMES (PSO)

At the time of graduation Our Graduates would be able to:

| | |
|-------------|--|
| PSO1 | Evaluate, Analyse and interpret diversity of plant and animal life forms, using specific identification key characteristic features and its significance in structured framework, including critical understanding of the established theories, principles and concepts of a number of advanced and emerging issues in the field of Life sciences. |
| PSO2 | Demonstrate comprehensive knowledge in various plant and animal structure and functions (both internal & external), physiological metabolism, Gene concepts, genome, cell organelles & tissue culture. |
| PSO3 | Elucidate the knowledge of distribution of plants, herbal medicines, methods of gardening, different habitats and their degradation and analyse the diseases of crop plants and their control measures, study about communicable and non-communicable diseases and health & hygiene. |
| PSO4 | Apply the knowledge of Life science to solve complex problems in research labs using the latest biological tools and techniques. |
| PSO5 | Comprehend the latest developments in the field of Life science, both theoretical and practical and also on entrepreneurial development skills in a way to foster their core competency and lifelong learning. |

MAPPING OF PO WITH PSO

| PO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---------------|-------------|-------------|-------------|-------------|-------------|
| PO1 | 2 | 3 | 3 | 3 | 2 |
| PO2 | 3 | 3 | 3 | 3 | 1 |
| PO3 | 1 | 1 | 1 | 3 | 2 |
| PO4 | 3 | 3 | 1 | 3 | 3 |
| PO5 | 2 | 2 | 2 | 1 | 3 |
| PO6 | 3 | 1 | 2 | 3 | 3 |
| PO7 | 1 | 1 | 1 | 1 | 1 |
| PO8 | 3 | 2` | 2 | 2 | 3 |

Correlation: 3 Strong 2 Medium 1 Low

ELIGIBILITY FOR ADMISSION

Pass in H.S.C or CBSE examination conducted by state board /central board with Mathematics, Physics, Chemistry, Biology or Botany, Zoology, as main subject are eligible.

DURATION OF THE COURSE

The duration of the course is three years (six semesters). Each academic year shall be divided into two semesters. The odd semesters shall consist of the period from June to November and the even semester from December to April. There shall be not less than 91 working days for each semester.

ATTENDANCE & EVALUATION

A candidate who has less than 75% attendance shall not be permitted to write the end- semester examination in the course in which the shortfall exists.

Evaluation will be done by continuous internal assessment throughout the course. Each semester will have minimum two CIA tests, followed by Generic skills towards the end of the semester. End-semester examination will be conducted at the end of each semester.

A candidate has to secure a minimum of 50 percent of marks (inclusive Two CIA Tests marks, generic skills & End- Semester examination mark) in each paper.

A candidate should have passed in soft skills, Value education papers and credits obtained in extension activity for successful completion of the course.

END SEMESTER EXAMINATION

There shall be one End-semester examination of 3 hours duration carrying 100 marks in each paper covering the entire syllabus prescribed for the course. The End semester examination is normally a written examination for theory and laboratory-based for practical papers.

Each theory paper carries 100 marks, 50 marks for end semester examination and 50 marks for continuous internal assessment. Similarly, for practical examinations, each paper carries 100 marks, 50 for external evaluation and 50 marks for the continuous internal assessment.

The subjects included in Part IV paper carries 100 marks, 50 marks for end semester examination and 50 marks for continuous internal assessment.

TOTAL NUMBER OF PAPERS

| Subjects | Papers |
|-----------------------|---------------|
| Language | 4 |
| English | 4 |
| Core | 11 |
| Elective | 3 |
| Allied | 4 |
| Core practicals | 6 |
| Allied practicals | 2 |
| Soft skill | 4 |
| Non major elective | 2 |
| Value education | 1 |
| Environmental studies | 1 |
| Value Added Course | 1 |
| Extension activity | - |

ELIGIBILITY FOR THE AWARD OF DEGREE

A Candidate shall be eligible for the award of the degree only if she/he has undergone the prescribed course of study in the college for a period of not less than three academic years and passed the examinations of all the Six Semesters prescribed earning a minimum of **140 credits** as per the distribution given in Regulations for Part I, II, III, IV & V and also fulfilled such other conditions as have been prescribed thereof.

Note: Autonomous Colleges Continue to follow the existing credits distribution Scheme and to have flexibility of distribution of credits in Part III & IV.

END SEMESTER EXAM QUESTION PAPER PATTERN-THEORY

MAXIMUM MARKS (100)

| | |
|-------------|--|
| Section - A | Answer all the 10 Questions (10 x 2= 20 marks) |
| Section – B | Answer the 5 Questions in either/or pattern choice (5 x 7 = 35 marks) |
| Section - C | Answer all the Questions [Q. NO: 16 is compulsory] (3 × 15 = 45 marks) |

SCHEME ON EXAMINATIONS

As per the University Regulation, the following split up of marks for Theory, and practicals are to be followed.

SPLIT UP FOR INTERNAL AND EXTERNAL MARKS FOR THEORY AND PRACTICAL PAPER:

| Sl. No. | Paper | Internal | External | Total |
|----------------|--------------|-----------------|-----------------|--------------|
| 1. | Theory | 50 | 50 | 100 |
| 2. | Practical | 50 | 50 | 100 |

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (50 Marks)

| Bloom's Category | CIA | Third Component (15 Mrks) | Attendance |
|--------------------------|------------|--|-------------------|
| | | Assignments/poster presentation/ power point presentation/group Discussion/ filed visits/quiz | |
| Marks (out of 50) | 30 | 15 | 5 |
| Remember | 5 | | |
| Understand | 5 | | |
| Apply | 5 | | |
| Analyze | 5 | | |
| Evaluate | 5 | | |
| Create | 5 | | |

ESE- Semester End Examination (100 Marks; weightage 50%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 20 |
| Understand | 20 |
| Apply | 30 |
| Analyse | 15 |
| Evaluate | 10 |
| Create | 5 |

SCHEME OF I SEMESTER

| S. No | Course Components | Subjects | Ints. Hrs/ Wk | Credit | Total Hrs | Max Marks | | |
|-------|-------------------|---|------------------|-----------|------------|---|------------|------------|
| | | | | | | Ext. Mrk | Int. Mrk | Total |
| 1 | PART –I | Language paper – I | 4 | 3 | 60 | 50 | 50 | 100 |
| 2 | PART –II | English Paper –I | 4 | 3 | 60 | 50 | 50 | 100 |
| 3 | PART –III | Core Paper -1 Bio-techniques, Fungi and Lichens | 6 | 4 | 90 | 50 | 50 | 100 |
| | | Core Paper -2 Practical -I Bio-techniques, Fungi and Lichens | 3 | 2 | 45 | 50 | 50 | 100 |
| | | Allied Paper -1 Zoology | 6 | 4 | 90 | 50 | 50 | 100 |
| | | Allied Practical Zoology | 3 | | 45 | Practical Examination at the end of II semester | | |
| 4 | PART –IV | Non-Major Elective- I Vermitechnology | 2 | 2 | 30 | 50 | 50 | 100 |
| | | Soft Skills -I | 2 | 2 | 30 | 50 | 50 | 100 |
| | Total | | 30 | 20 | 450 | 420 | 280 | 700 |

SCHEME OF II SEMESTER

| S. No | Course Components | Subjects | Ints. Hrs/ Wk | Credit | Total Hrs | Max Marks | | |
|-------|-------------------|---|---------------|-----------|------------|------------|------------|------------|
| | | | | | | Ext. Mrk | Int. Mrk | Total |
| 1 | PART –I | Language paper – II | 4 | 3 | 60 | 50 | 50 | 100 |
| 2 | PART –II | English Paper –II | 4 | 3 | 60 | 50 | 50 | 100 |
| 3 | PART –III | Core Paper -3 Algae and Bryophytes | 6 | 4 | 90 | 50 | 50 | 100 |
| | | Core Paper -4 Practical -II Algae and Bryophytes | 3 | 2 | 45 | 50 | 50 | 100 |
| | | Allied Paper -2 Zoology | 6 | 4 | 90 | 50 | 50 | 100 |
| | | Allied Zoology Practical Zoology (Covering Both Allied 1&2) | 3 | 2 | 45 | 50 | 50 | 100 |
| 4 | PART –IV | Non-Major Elective II- Public Health and Hygiene | 2 | 2 | 30 | 50 | 50 | 100 |
| | | Soft Skills -II | 2 | 2 | 30 | 50 | 50 | 100 |
| 5 | PART –V | Value Added Course Ethics and Human Values (2021 -2022 Batch) Gardening (From 2022 – 2023 Batch Onwards) | | 2 | | | 50 | 50 |
| | Total | | 30 | 24 | 450 | 480 | 370 | 850 |

SCHEME OF III SEMESTER

| S. No | Course Components | Subjects | Ints. Hrs/ Wk | Credits | Total Hrs | Max Marks | | |
|-------|-------------------|---|------------------|-----------|------------|---|------------|------------|
| | | | | | | Ext. Mrk | Int. Mrk | Total |
| 1 | PART –I | Language paper – III | 6 | 3 | 90 | 50 | 50 | 100 |
| 2 | PART –II | English Paper –III | 4 | 3 | 60 | 50 | 50 | 100 |
| 3 | PART –III | Core Paper -5 Pteridophytes, Gymnosperms and Paleobotany | 6 | 4 | 90 | 50 | 50 | 100 |
| | | Core Paper -6 Practical -III Pteridophytes, Gymnosperms and Paleobotany | 3 | 2 | 45 | 50 | 50 | 100 |
| | | Allied Paper -1 Chemistry | 5 | 4 | 75 | 50 | 50 | 100 |
| | | Allied Practical Chemistry | 3 | 2 | 45 | Practical Examination at the end of IV semester | | |
| 4 | PART –IV | EVS (AECC) Ability Enhancement Compulsory Course | 1 | - | 15 | Term End Exam at the end of IV semester | | |
| | | Soft Skills -III | 2 | 2 | 30 | 50 | 50 | 100 |
| 5 | PART -V | MOOC Courses | | 2 | | | | |
| | Total | | 30 | 22 | 450 | 360 | 240 | 600 |

SCHEME OF IV SEMESTER

| S. No | Course Components | Subjects | Ints. Hrs/ Wk | Credit | Total Hrs | Max Marks | | |
|-------|-------------------|---|---------------|-----------|------------|------------|------------|------------|
| | | | | | | Ext. Mrk | Int. Mrk | Total |
| 1 | PART –I | Language paper – IV | 6 | 3 | 90 | 50 | 50 | 100 |
| 2 | PART –II | English Paper –IV | 4 | 3 | 60 | 50 | 50 | 100 |
| 3 | PART –III | Core Paper -7 Morphology, Taxonomy Of Angiosperms and Economic Botany | 6 | 4 | 90 | 50 | 50 | 100 |
| | | Core Paper -8 Practical -IV Morphology, Taxonomy Of Angiosperms and Economic Botany | 3 | 2 | 45 | 50 | 50 | 100 |
| | | Allied Paper -2 Chemistry | 5 | 4 | 75 | 50 | 50 | 100 |
| | | Allied Practical -II Chemistry (Covering Both Allied 1&2) | 3 | 2 | 45 | 50 | 50 | 100 |
| 4 | PART –IV | EVS (AECC) | 1 | 2 | 15 | 50 | 50 | 100 |
| | | Soft Skills -IV | 2 | 2 | 30 | 50 | 50 | 100 |
| | Total | | 30 | 22 | 450 | 480 | 320 | 800 |

SCHEME OF V SEMESTER

| S. No | Course Components | Subjects | Ints. Hrs/ Wk | Credit | Total Hrs | Max Marks | | |
|-------|-------------------|---|---------------|-----------|------------|------------|------------|------------|
| | | | | | | Ext. Mrk | Int. Mrk | Total |
| 1 | PART –III | Core Paper -9 Plant Anatomy & Embryology | 5 | 5 | 75 | 50 | 50 | 100 |
| | | Core Paper -10 Plant Ecology and Biodiversity | 5 | 5 | 75 | 50 | 50 | 100 |
| | | Core Paper -11 Genetics, Cell Biology & Molecular Biology | 6 | 5 | 90 | 50 | 50 | 100 |
| | | Core Paper -12 Plant Biotechnology and Plant Breeding | 6 | 5 | 90 | 50 | 50 | 100 |
| | | Core Elective Paper - 1 Forestry & Phytogeography | 4 | 4 | 60 | 50 | 50 | 100 |
| | | Core Paper – 13 Practical -V (Covering Papers 9,10,11 & 12) | 3 | 2 | 45 | 50 | 50 | 100 |
| 4 | PART –IV | Value Education | 1 | 2 | 15 | 50 | 50 | 100 |
| | | | | | | | | |
| | Total | | 30 | 28 | 450 | 420 | 280 | 700 |

SCHEME OF VI SEMESTER

| S. No | Course Components | Subjects | Ints. Hrs/ Wk | Credit | Total Hrs | Max Marks | | |
|-------|-------------------|--|---------------|-----------|------------|------------|------------|------------|
| | | | | | | Ext. Mrk | Int. Mrk | Total |
| 1 | PART –III | Core Paper -14 Microbiology and Plant Pathology | 6 | 5 | 90 | 50 | 50 | 100 |
| | | Core Paper -15 Plant Physiology | 6 | 5 | 90 | 50 | 50 | 100 |
| | | Core Paper -16 Plant Biochemistry, Bioinformatics and Biostatistics | 6 | 5 | 90 | 50 | 50 | 100 |
| | | Core Elective Paper - 2 Agriculture & Herbal Science | 4 | 4 | 45 | 50 | 50 | 100 |
| | | Core Elective Paper - 3 Entrepreneurial Botany | 4 | 4 | 75 | 50 | 50 | 100 |
| | | Core Paper – 17 Practical -VI (Covering Papers 14,15 &16) | 3 | 2 | 45 | 50 | 50 | 100 |
| 2 | PART –IV | Extension Activities | - | 2 | - | - | - | - |
| | | Skill Enhancement Course (SEC) | - | - | - | - | - | - |
| | Total | | 30 | 27 | 450 | 420 | 280 | 700 |

SEMESTER I

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|---|-----------------------|---|---|---|---|---------|
| 13101 | BIOTECHNIQUES, FUNGI & LICHENS | Core paper - I | 6 | 0 | 0 | 0 | 4 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| First | First | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand the working principle and applications of light and electron microscopes. The student will also be able to understand the working mechanism and applications of rotary and sledge microtome. They also will be able to recognize Habit, life forms and reproductive structures of lower forms of plants. The student will be able to understand the classification of Fungi and Lichens. The subject also throws light on the economic importance of Fungi and Lichens.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Understand the basic principles and scope of Biotechniques. | K1,K2, K3, K4, K5 |
| CO2 | Acquire fundamental knowledge about Bio-instruments. | K1,K2, K3, K4, K5 |
| CO3 | Assess knowledge of fungi with respect to classification and its importance to mankind. | K1,K2, K3, K4, K5 |
| CO4 | Identify various life forms of Fungi. | K1,K2, K3, K4, K5,K6 |
| CO5 | Outline the salient features and importance of Lichens. | K1,K2, K3, K4, K5, K6 |

K1 - Remember

K4 - Analyze

K2 - Understand

K5 - Evaluate

K3 - Apply

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 2 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 3 | 2 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | 2 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 1 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | <p>MODULE – I BIOTECHNIQUES 1.1 Working Principle, Construction and Applications of Light Microscopes: Compound, Polarizing and Phase contrast Microscope 1.2 Working Principle, Construction and Applications of Transmission Electron Microscopy (TEM), Scanning Electron Microscopy (SEM), Preparation of specimen for TEM & SEM - Dehydration, Infiltration, Embedding and Sectioning. 1.3 Microtomes – Rotary, Sledge (Wood Microtome) and Ultra – Structure and Applications. 1.4 Sectioning - Free hand section and Serial section (Microtomy). Preparation of Paraffin block. 1.5 Stains – Types and Uses. Methods of Staining - Simple and Differential Staining; Positive and Negative staining; single and double staining. 1.6 Fixatives - Types (FAA and Carnoy’s fluid; Glutar-aldehyde and Osmium Tetroxide) and uses.</p> | 18 | CO1 |
| 2 | <p>MODULE – II Principle, technique and applications of the following Bio-techniques: 2.1 pH meter: Basic principles of pH meter and its operation, types of Electrodes, Measurement of pH, Application. 2.2 Centrifugation: Principle, types of centrifuges (Bench & Ultra), types of rotors, Application. 2.3 Principle, laws of absorption, operations and uses of Colorimeter and Spectrophotometer. Ultraviolet and Visible Spectrophotometry (single and double beam, double wavelength Spectrophotometers). Beer – Lambert’s Law.</p> | 18 | CO2 |

| | | | |
|---|---|----|-----|
| | 2.5 Whole mount preparations. Special techniques: Smear, Squash, Maceration and Peeling. | | |
| 3 | MODULE – III FUNGI 3.1 Introduction and Evolution of Fungi. 3.2 General characteristics, Habit, Nutrition types, cell structure, mycelium – its modifications. 3.3 Reproduction: Vegetative, Asexual, Sexual, Para-sexual; Fruiting bodies, Life cycle patterns. 3.4 Classification of Fungi by G.C. Ainsworth (1971) - Order level 3.5 Economic importance of Fungi. | 18 | CO3 |
| 4 | MODULE – IV Structure and reproduction with reference to the following fungal forms: a) <i>Albugo</i> b) <i>Mucor</i> c) <i>Peziza</i> d) <i>Agaricus</i> e) <i>Colletotrichum</i> f) <i>Puccinia</i> | 18 | CO4 |
| 5 | MODULE – V LICHENS 5.1 General features, Nature, Occurrence, distribution, thallus organization, types, Vegetative, Asexual and Sexual Reproduction. 5.2 Structure and life cycle of <i>Parmelia</i> and <i>Usnea</i> . 5.3 Economic importance of Lichens – Secondary metabolites. 5.4 Role in Succession and Monitoring Pollutants. | 18 | CO5 |

TEXT BOOKS:

1. Vashishta B.R, Sinha A.K & Anil Kumar (2016). *Botany for Degree Students – Fungi*, S. Chand & Company, ISBN:9789352533008
2. Annie Ragland, Arumugam. N (2016). *Fundamentals of Plant Anatomy and Microtechniques*, Saras Publication, ISBN :9788193307663
3. Awasthi D.D (2013). *A hand book of lichens* (1st Ed), M/s Bishen Singh Mahendra Pal Singh, ISBN: 9788121101813
4. Ponmurugan P & Gangathara Prabhu B (2013). *Biotechniques*, MJP Publishers, ISBN :9788180941191
5. S.V.S Rana (2012). *Biotechniques (Theory & Practice)*, Rastogi Publications (3rd Ed), ISBN:9788171339938
6. Sharma O.P (2008). *Fungi And Allied Microorganisms*, McGraw Hill India, ISBN:9780070700383
7. Prasad M.K & Krishna Prasad M (2000). *Outlines of Microtechnique*, Emkay Publications, ISBN: 9788185712291

REFERENCE BOOKS:

1. Gray P (2020). *Handbook of Basic Microtechniques-* Alpha Edition, ISBN: 9789354009150
2. Edward Chee Tak Yeung, Claudio Stasolla, Michael John Sumner (2015). *Plant Microtechniques and Protocols* (1st Ed), Springer Nature. ISBN:9783319199436
3. Alexopoulos C.J, Mims C.W, Blackwell M (2007). *Introductory Mycology* (4th Ed.), Wiley, ISBN: 9788126511082
4. Webster, J. (2007). *Introduction to Fungi*, Cambridge University Press (3rd Ed.), ISBN: 9780521727006
5. Vernon Ahmadjian & Mason E. Hale (1974). *The Lichens*, Academic Press Inc, ISBN: 978012044950

WEBSITES:

1. <https://microbiologyonline.org/about-microbiology/introducing-microbes/fungi>
2. <https://www.anbg.gov.au/lichen/what-is-lichen.html>

Core Paper: II BIOTECHNIQUES, FUNGI & LICHENS

PRACTICAL – I

| | | | |
|----------|----------|----------|-----------|
| L | T | P | Cr |
| 0 | 0 | 3 | 2 |

LEARNING OUTCOMES:

At the end of the Course, the Student will be able to:

1. Understand the basic principles and uses of Microscopes.
2. To prepare and identify microslides of Fungi, Lichens.

BIOTECHNIQUES

1. Maceration technique
2. Freehand sectioning – Any plant material.
3. Identification of Stains and Fixatives
4. Photographs of Microscopes, pH meter, Centrifuge, Colorimeter, Spectrophotometer, and Electrophoresis.

FUNGI

1. Whole mount preparations of Fungi
2. Sectioning of Macroscopic fungi
3. Economic importance of fungi and Lichens (Photographs)
4. Preparation of agar media for fungal culture (Protocol).
5. Identification of Fungi included in Theory Syllabus.

LICHENS

1. Identification of Lichens included in Theory Syllabus.

Field visit / trip to collect the Fungi/Lichens in natural Habitat

SEMESTER II

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|----------------------|------------------|---|---|---|---|---------|
| 13205 | ALGAE AND BRYOPHYTES | Core paper - III | 6 | 0 | 0 | 0 | 4 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| First | Second | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On taking this course the student will be able to recognize Habit, life forms and reproductive structures of lower forms of plants. The student will be able to understand the classification of Algae and Bryophytes. The subject also throws light on the economic importance of algae. It provides knowledge on structure and reproduction of certain selected Bryophytes forms.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Classification of different forms of algae and its evolution | K1, K2, K3, K4, K5 |
| CO2 | Study about different forms of Algae. | K1, K2, K3, K4, K5 |
| CO3 | Acquire knowledge on the commercial importance of Algae. | K1, K2, K3, K4, K5, K6 |
| CO4 | Classification of different forms of Bryophytes and its evolution | K1, K2, K3, K4, K5 |
| CO5 | Acquire knowledge on the commercial importance of Bryophytes. | K1, K2, K3, K4, K5, K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K5 - Evaluate

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PS O | PO | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | <p>MODULE – I ALGAE 1.1 Introduction and Evolution of Algae. Classification of Algae F.E. Fritsch (1945) 1.2 Distribution - Range of thallus organization – Pigmentation- Flagellation- Reserve food – Reproduction (Vegetative/ Asexual/ Sexual) and Life cycle patterns. 1.3 General characteristics of major classes of Algae (Cyanophyceae, Chlorophyceae, Bacillariophyceae, Phaeophyceae, Xanthophyceae, and Rhodophyceae).</p> | 18 | CO1 |
| 2 | <p>MODULE – II Life history of the following representative genera of Algae: 2.1. <i>Nostoc</i> 2.2 <i>Ulva</i> 2.3 <i>Caulerpa</i> 2.4 <i>Navicula</i> (Diatom) 2.5 <i>Sargassum</i> 2.6 <i>Gracilaria</i></p> | 18 | CO2 |
| 3 | <p>MODULE – III 3.1 Algal Biotechnology: Single Cell Proteins (SCP): <i>Spirulina</i> as single cell protein - production and harvesting of algal biomass – factors affecting biomass production. 3.2 Seaweed cultivation in India – Resources, methods, problems and uses of seaweeds. 3.3 Economic importance of Algae: Algae as food and fodder, use of algae in agriculture and space research, commercial products of algae: Agar - Agar,</p> | 18 | CO3 |

| | | | |
|----------|--|-----------|------------|
| | Alginates, Carrageen in, Diatomite, Minerals and Elements - Algae in Cosmetics, Medicine, Bio-fuels and Bio-fertilizers. 3.4 Conservation of Algae: Threats to freshwater and marine algae, Threatened Algal species and its conservation. | | |
| 4 | MODULE – IV BRYOPHYTES 4.1 Introduction and Evolution of Bryophytes. Classification (Watson 1963). 4.2 General Characteristics of the Major Subdivision: Hepaticopsida, Anthocerotopsida and Bryopsida. 4.3 Fossil Bryophytes - Fossil Hepaticopsida, Fossil Bryopsida. 4.4 Economic Importance of Bryophyte. | 18 | CO4 |
| 5 | MODULE – V A detailed study of Morphology, Anatomy and Reproduction of the following Genera: 5.1 <i>Marchantia</i> 5.2 <i>Anthoceros</i> 5.4 <i>Polytrichum</i> | 18 | CO5 |

TEXT BOOKS:

1. Sambamurty A.V.S.S (2020). *A Textbook of Bryophytes, Pteridophytes, Gymnosperms and Paleobotany*, Dreamtech Press, ISBN: 9789389447187
2. Vashishta B.R, Singh V.P & Sinha A.K (2012). *Botany for Degree Students – Algae*, S. Chand & Company, ISBN:9788121935210
3. Sharma O.P (2011). *Text book of Algae*, McGraw Hill Education, ISBN:9780070681941
4. Vashishta. B.R, Sinha A.K & Adarsh Kumar (2011). *Botany for Degree Students – Bryophytes*, S. Chand & Company, ISBN:9788121935692

REFERENCE BOOKS:

1. Watson E.V (2018). *The Structure and Life of Bryophytes*, Scientific publishers, ISBN: 9789388043533
2. Dinabandhu Sahoo (2013). *Common Seaweeds of India*, I K International Publishing House Pvt. Ltd, ISBN:9788190777063
3. Perumal, G M, Anand, N (2009). *Manual of Freshwater Algae of Tamil Nadu*, Bishen Singh Mahendra Pal Singh, ISBN:9788121106948
4. Smith G.M. (1994). *Manual of Phycology*, Scientific Publishers Journals, ISBN: 9788172330910
5. Fritsch F.E (1935). *Structure and Reproduction of Algae*, Cambridge University Press, ISBN: 9780521050418

WEBSITES:

1. <https://www.britannica.com/science/algae>
2. <https://www.anbg.gov.au/bryophyte/what-is-bryophyte.html>

Core Paper: IV ALGAE AND BRYOPHYTES**PRACTICAL – II**

| L | T | P | Cr |
|----------|----------|----------|-----------|
| 0 | 0 | 3 | 2 |

LEARNING OUTCOMES:

At the end of the Course, the Student will be able to:

1. Prepare and identify micro slides of Algae and Bryophytes.

ALGAE

1. Micropreparation of the types prescribed in the syllabus.
2. Identifying the micro slides relevant to the syllabus.
3. Morphological and Anatomical study of Algae prescribed in the syllabus.
4. Visit to Algal Biotechnology laboratories.

BRYOPHYTES

1. Micropreparation of the types prescribed in the syllabus.
2. Identifying the micro slides relevant to the syllabus.
3. Morphological and Anatomical study of Bryophytes prescribed in the syllabus.

Field visit / trip to collect Algae / Bryophyte specimens.

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|---------------------------|-------------------------|---|---|---|---|---------|
| 13209 | ALLIED ZOOLOGY - I | Allied paper - I | 6 | 0 | 0 | 0 | 4 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| First | First | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On learning this course the student will be able to understand the outline classification of the animal kingdom including both invertebrates and vertebrates. The students will also be able to know the different Habit, Habitat, Structure, pathogenic effects of some lower invertebrates and will be able to know the different physiological systems of lower and higher animals.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Understand the broad outline classification of Animal kingdom (Invertebrates & Vertebrates) | K1&K2 |
| CO2 | Understand and Discuss the various parasites that causes diseases in animals and man | K1,K2 & K3 |
| CO3 | Analyse and Compare the life history of different species lower organisms | K3& K4 |
| CO4 | Understand and Evaluate the origin of higher animals from the lower animals during evolution at different era | K4&K5 |
| CO5 | Understand and Create a knowledge on different organ and organ systems of higher animals | K3,K4,K5 & K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K5 - Evaluate

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 1 | 1 |

STRONGLY CORRELATED -3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED -1

| | | | |
|---|--|----|-----|
| 1 | <p>MODULE – I INVERTEBRATES 1.1. Broad outline Classification of Invertebrates up to class level 1.2. Protozoa -Type study: <i>Entamoeba histolytica</i>, <i>Plasmodium vivax</i>. 1.3. Porifera - Type study: Scypha (Sycon) 1.4. Coelenterate- Type study: <i>Obelia geniculata</i> (Obelia colony) 1.5. Platyhelminthes- Type study: <i>Taenia solium</i> (Tapeworm)</p> | 18 | CO1 |
| 2 | <p>MODULE – II 2.1. Annelida- Type study: <i>Hirudineria granulosa</i> (Leech) 2.2. Arthropoda- Type study: <i>Penaeus indicus</i> (Prawn) 2.3. Mollusca- Type study: <i>Lamellidens marginalis</i> (Freshwater mussel) 2.4. Echinodermata- Type study: <i>Asterias rubens</i> (Star fish)</p> | 18 | CO2 |
| | <p>MODULE – III 3.1. Chordata- Outline Classification of Chordates up to class level 3.2. Vertebrates-Pisces- Type study: Shark- External morphology, Digestive system, Respiratory system, Circulatory system-Heart- (External, Internal structure and its mechanism of working), Urinogenital system and Nervous system-Brain-(Dorsal and Ventral structure)</p> | 18 | CO3 |
| 4 | <p>MODULE – IV 4.1. Amphibia-Type study: Frog- External morphology, Digestive system, Respiratory system, Circulatory system- Heart (External, Internal structure and its mechanism of working), Urinogenital system and Nervous system-Brain-(Dorsal and Ventral structure) 4.2. Reptilia-Type study: Calotes- External morphology, Digestive system, Respiratory system, Circulatory system - Heart- (External, Internal structure and its mechanism of working), Urinogenital system and Nervous system-Brain-(Dorsal and Ventral structure)</p> | 18 | CO4 |
| 5 | <p>MODULE – V 5.1. Aves-Type study: Pigeon- External morphology, Digestive system, Respiratory system, Circulatory system - Heart- (External, Internal structure and its mechanism of working), Urinogenital system and Nervous system-Brain-(Dorsal and Ventral structure). 5.2. Mammalia-Type study: Rabbit- External morphology, Digestive system, Respiratory system, Circulatory system - Heart- (External, Internal structure and its mechanism of working), Urinogenital system and Nervous system-Brain-(Dorsal and Ventral structure)</p> | 18 | CO5 |

TEXTBOOKS:

1. Jordan E.L & Verma P.S (2013). *Chordate Zoology*, S. Chand & Company, ISBN:9788121916394
2. Agarwal V.K (2011). *Zoology for Degree Students B.Sc. First Year*, S. Chand & Company, ISBN:9788121935500
3. Jordan E.L and Verma P.S (2009). *Invertebrate Zoology*, S. Chand & Company, ISBN:9788121903677

REFERENCE BOOKS:

1. Kotpal R.L (2014). *Modern Textbook of Zoology Invertebrates*, Rastogi Publications, ISBN:9789350780404
2. Ekambaranatha Ayyar M & Ananthkrishnan T.N (2009). *Outlines of Zoology*, Vol.I and Vol.II, Viswanathan S Printers Pvt Ltd, ISBN:978187156383
3. T. Murugan, N. Arumugam, M.G. Ragunathan, A (2019). *Text Book of Invertebrates*, Saras Publications, ISBN : 9789386519429
4. N. Arumugam, A. Thangamani, S. Prasanna kumar, L.M. Narayanan (2019). *A Text Book of Chordates*, Saras Publications, ISBN : 9789386519351

WEBSITES:

1. <https://www.britannica.com/animal/invertebrate>
2. <https://www.dkfindout.com/us/animals-and-nature/animal-kingdom/what-is-vertebrate/>
3. http://www.biology4kids.com/files/vert_main.html

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|------------------------|----------------------------|---|---|---|---|---------|
| 13103 | VERMITECHNOLOGY | Part IV: NME -I | 2 | 0 | 0 | 0 | 2 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| First | First | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On learning this course Students will be able to develop skills and self employability to prepare the vermicompost in a limited space and demonstrate and describe the various methods of decomposing process. The students will also get the knowledge on vermiculture and production of bio-manure and will get self-employment. They will also turn towards organic farming; will help to maintain a pollution free environment.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Understand the scope of Vermiculture techniques and apply different wastes for vermicompost | K1,K2 &K3 |
| CO2 | Discuss the role of local species of earthworm in vermitechnology and vermicompost production | K1 & K2 |
| CO3 | Design and apply the knowledge for the construction of various vermibeds for compost production and Procedure for vermicompost a bio-manure | K3 & K4 |
| CO4 | Evaluate the quality and quantity of vermicompost | K5 |
| CO5 | Create and apply methods to reduce the bio-enemies of earthworms during vermicomposting process | K6 |

K1 - Remember

K-2 - Understand

K3 - Apply

K4 - Analyze

K-5 - Evaluate

K-6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |

STRONGLY CORRELATED -3, MODERATELY CORRELATED - 2, WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|---|------|-----|
| 1 | MODULE – I VERMITECHNOLOGY 1.1. Introduction: Definition and concept of vermiculture. 1.2. Influence of soil organisms in vermitechnology- bacteria, earthworms, entomofauna mites etc. 1.3. Litter degradation and decomposition. 1.5. Problems in vermiculture and remedial solutions. | 06 | CO1 |
| 2 | MODULE – II 2.1. Types of earthworms: Endemic and exotic species of earthworms. 2.2. Ecological classification of earthworms- epigeic, anecic and endogeic forms. 2.3. Physical, chemical and biological changes caused by earthworms in soil-drilospheres and vermicasts. | 06 | CO2 |
| 3 | MODULE – III 3.1. Vermicomposting- Vermicomposting materials, Vermicomposting methods (raised bed method and pot method). 3.2. Establishment of vermiculture unit: materials required and maintenance of vermiculture unit. | 06 | CO3 |
| 4 | MODULE – IV 4.1. Vermicompost- harvesting of vermicompost- quality, properties and advantages over chemical fertilizers, packing and marketing- cost benefit analysis. | 06 | CO4 |
| 5 | MODULE – V 5.1. Natural enemies of earthworms- pets, parasites and pathogens affecting earthworms. 5.2. Use of earthworms in food and medicine- ayurvedic and unani medicine. 5.3. Recycling of food wastes in vermitechnology. 5.4. Application and scope of vermitechnology. | 06 | CO5 |

TEXT BOOKS:

1. Jordan E.L and Verma P.S (2009). *Invertebrate Zoology*, S. Chand & Company, ISBN:9788121903677
2. Gupta P.K (2008). *Vermicomposting For Sustainable Agriculture*, Agrobios, ISBN:9788177542349

REFERENCE BOOKS:

1. Edwards C.A (2011). *Vermiculture Technology: Earthworms, Organic Wastes, and Environmental Management*, CRC Press, ISBN:978143980987
2. Subba Rao N.S (1995). *Soil Microorganisms and Plant Growth*, Science Publishers, ISBN:9781886106185

WEBSITES:

1. <https://technology4agri.wordpress.com/2013/02/12/vermitechnology-an-introuction/>
2. https://vermitechnology.com/vermitechnology/?doing_wp_cron=1574957760.9421699047088623046875

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|---------------------|-------------------|---|---|---|---|---------|
| 13206 | ALLIED ZOOLOGY - II | Allied Paper - II | 6 | 0 | 0 | 0 | 4 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| First | Second | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On taking this course the student will list the distinctive features and importance of various cell organelles. The student can distinguish the structure of DNA and RNA. The students will be able to know how sex determined in man and will know the genetic disorders caused by chromosomal mutations and students able to understand the physiological activities of various organ and organ systems. The students will able to know the treatment methods of sewage effluents and also develop a self employability on Apiculture, Sericulture and Poultry farming.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|-----|---|---|
| CO1 | Understand and Discuss the animal cell structure, stem cell and its applications, cancer cell, and its properties. Acquire the knowledge on molecular structure of Gene, Inborn errors of metabolism and X and Y linked inheritance in man | K1,K2, K3 |
| CO2 | Discuss the gametogenesis process– Fertilization- Cleavage and Gastrulation in Frog and in Man. | K1,K2,K3&K4 |
| CO3 | Analyse various physiological activities of different organs and organ systems in Man. Apply the knowledge on functions of different hormones | K3 & K4 |
| CO4 | Create a awareness, scope and importance of sericulture and apiculture | K4,K5&K6 |
| CO5 | Create a awareness, scope and importance of poultry rearing techniques for commercial production Evaluate the quantity and quality of poultry and dairy production | K5 &K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K5 - Evaluate

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 |
| CO2 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO4 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO5 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |

STRONGLY CORRELATED -3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | <p>MODULE – I CELL BIOLOGY 1.1. Organization of eukaryotic cell (Animal cell) - Stem cell - types of stem cell, application of stem cells, stem cell therapy. Cancer cell- types and properties of cancer cells.</p> <p>GENETICS 1.2. Molecular structure of Gene-Gene concept- Gene function- Inborn errors of metabolism with reference Amino Acid metabolism (Albinism, Alkaptonuria and Phenylketonuria) Genetic Engineering and its applications- X and Y – linked inheritance.</p> | 18 | CO1 |
| 2 | <p>MODULE – II DEVELOPMENTAL BIOLOGY 2.1 Gametogenesis – Spermatogenesis, Oogenesis, Fertilization- Cleavage and Gastrulation in Frog and in Mammals (Man).</p> | 18 | CO2 |

| | | | |
|---|--|----|-----|
| 3 | MODULE – III HUMAN PHYSIOLOGY: 3.1. Digestion, Structure of Heart, Cardiac cycle, composition of blood, Heart diseases- Ischemia, Myocardial infarction, Rheumatic Heart disease, Stroke. 3.2. Excretion-Structure of Kidney, Nephron, Mechanism of Urine formation and Kidney failure. 3.3. Endocrine glands- Structure and functions of Pituitary, thyroid, Islets of Langerhans, Adrenal, Testis and Ovary. | 18 | CO3 |
| 4 | MODULE – IV ECONOMIC ZOOLOGY SERICULTURE 4.1. Commercial variety of mulberry, Biology of Mulberry SilkWorm – types of silkworm Rearing operation – CHAWAKI and late age rearing techniques – physical and commercial characters of cocoon. APICULTURE 4.2. Apiculture – Biology of Different Honey Bee Types, bee hives method of beekeeping application for modern methods of apiculture – Extraction of honey – Economic importance of honey. | 18 | CO4 |
| 5 | MODULE – V POULTRY REARING 5.1. Morphology of different breeds of Chicken, Poultry rearing - Brooding and rearing of chicks, by products of poultry - Nutritive value of Egg. DAIRY FARMING 5.2. Dairy Cattle Classification- Indigenous and exotic breeds - Morphology Description- Dairy cattle Management | 18 | CO5 |

TEXT BOOKS:

- Supriti Sarkar (2014). *Introduction to Economic Zoology*, New Central Book Agency, ISBN: 9788173818998
- Shukla G.S (2014). *Economic Zoology*, Rastogi Publications, ISBN:9789350780350

REFERENCE BOOKS:

- Ashok Kumar Rathoure (2015). *Applied and Economic Zoology*, Daya Publishing House, ISBN:9789351246466
- Ram Prabhu Jayasurya R (2013). *Economic Zoology*, Saras Publication, ISBN:9789382459262

WEBSITES:

- [https://www.sciencedaily.com/terms/cell_\(biology\).htm](https://www.sciencedaily.com/terms/cell_(biology).htm)
- <https://plato.stanford.edu/entries/cell-biology/>
- <https://bscb.org/learning-resources/softcell-e-learning/what-is-a-cell/>

ALLIED ZOOLOGY PRACTICAL

| L | T | P | Cr |
|---|---|---|----|
| 0 | 0 | 3 | 2 |

LEARNING OUTCOMES:

On taking this course the student will be able to identify

1. The various animals' specimens and their association in various habits and habitats
2. The practical procedures involved in dissection of digestive, nervous of cockroach and prawn and mounting procedures on slides

DISSECTION:

Prawn- Nervous system

Fish: Digestive system (Any Bony fish)

MOUNTING:

1. Prawn appendages (Maxilla I & II, Mandible, Maxillepeds, Non-chelate leg and Chelate leg)
2. Fish scales-Ctenoid and Cycloid scales
3. Buccal Smear Preparation by Using Vital Stain to study squamous epithelial cells
4. Karyotyping- Male and Female Karyotype Identification - Using Flashcards- Charts
5. Identification of Blood Groups Using Antisera.

SPOTTERS:

Entamoeba, *Paramecium* *Sycon*, *Obelia geniculata*, *Obelia* (medusa) *Fasciola hepatica* (Entire and T.S.), *Taenia solium* (Entire and T.S.) *Scolex Proglottids*. Leech (Entire and T.S.), Cockroach mouth parts, Mosquito mouth parts, Prawn entire, Freshwater mussel, Shark Entire (Placoid scale), Frog entire, Calotes entire, Pigeon Entire (feathers) and Rabbit Entire.

Animal Association: Mutualism: Hermit crab and Sea anemone

Commensalism: Shark and Sucker fish

Parasitism: *Ascaris lumbricoides*

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|------------------------------------|-----------------------------|---|---|---|---|---------|
| 13206 | PUBLIC HEALTH & HYGIENE | Part IV: NME -II | 2 | 0 | 0 | 0 | 2 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| First | Second | 50 | 50 | 03 |

LEARNING OBJECTIVES:

The course focuses on various communicable and non-communicable diseases, causing source, and their control measures. It also provides awareness on public Health for a better society. The students also will be able to know the first aid, Nursing, Dressing and care duties.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome. | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Understand the scope of public health and hygiene and problems related to unhygienic conditions and malnutrition of human beings | K1, K2 |
| CO2 | Create awareness on various pollution and their ill effects and their causing sources | K1, K2, K3, K4 |
| CO3 | Remember the various communicable diseases and their control measures of man | K3, K4, K5 |
| CO4 | Analyse the various non-communicable diseases and control measures in man Evaluate data of people are affected by mental illness and drug addict | K3, K4, K5 |
| CO5 | Create, apply, and analyze Health Education awareness in India for the betterment of society | K3, K4, K5 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K-5 - Evaluate

K-6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 1 | 2 | 1 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 1 | 2 | 3 | 3 | 3 | 2 | 2 | 1 | 3 | 2 | 3 |

STRONGLY CORRELATED -3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | <p>MODULE – I</p> <p>1.1. Scope of Public Health and Hygiene- Concepts of Health and Disease- History of Public Health in India.</p> <p>1.2. Nutrition and Health: Classification of foods- Nutritional deficiencies – Vitamin deficiencies- Balanced diet- Nutritional requirements of special groups.</p> | 06 | CO1 |
| 2 | <p>MODULE – II</p> <p>2.1. Environment and Health: Water- sources, pollution, purification – water quality standards.</p> <p>2.2. Air: Ventilation – Air pollution- Noise pollution – Radiation effects- Solid waste and excreta disposal – Sewage treatment.</p> | 06 | CO2 |
| 3 | <p>MODULE – III</p> <p>3.1. Communicable disease: Respiratory infections: Measles, Rubella, Mumps, Diphtheria, MERS, SARS COVID-19, Intestinal infections- Poliomyelitis, Cholera, Typhoid, Amoebiasis.</p> <p>3.2. Arthropod infections: Malaria, Filariasis, Dengue AND Chickengunya</p> <p>3.3. Zoonosis: Rabies, Plaque, Japanese encephalitis.</p> <p>3.4. Surface infection: Tetanus, Leprosy, STD and AIDS- Causes, Transmission, Symptoms and Preventive Measures</p> | 06 | CO3 |
| 4 | <p>MODULE – IV</p> <p>4.1. Non-Communicable Diseases: Coronary Heart Diseases- Hypertension, Atherosclerosis, Myocardial Infarction and Stroke, Diabetes- IDDM and NIDDM-Obesity</p> <p>4.2. Occupational Health Hazards: Physical, Chemical, Mechanical, Biological and Psychological.</p> <p>4.3. Mental Health: Causes of Mental illness- Health- Alcoholism and Drug Abuse - Prevention and Rehabilitation Measures. Deaddiction programme</p> | 06 | CO4 |
| 5 | <p>MODULE – V</p> <p>5.1. Health Education: Health Planning in India- Health Programmes in India – WHO- Non- Governmental Voluntary Health Organizations.</p> <p>5.2. First Aid and Nursing: Methods- Dressing – Care- Duties- Preparations. First Aid-Basic Aspects of First Aid.</p> | 06 | CO5 |

TEXT BOOKS:

1. Dass K (2021). *Public Health and Hygiene*, Notion Press, ISBN: 9781639209613
2. Park K(2013). *Text Book of Preventive and Social Medicine*, Banarsidas Bhanot, ISBN:9789382219026

REFERENCE BOOKS:

1. James W. Holsinger Jr (2021). *Contemporary Public Health: Principles, Practice, and Policy*, The University Press of Kentucky, ISBN:978081318077
2. Sudhir R. Wagh (2015). *Public Health and Hygiene*, Success Publications, ISBN:97893515850.

WEBSITES:

1. <http://aiihph.gov.in/>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1808522/>
3. https://en.wikipedia.org/wiki/Public_health

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|--------------------------------|---------------------------|---|---|---|---|---------|
| 13206 | ETHICS AND HUMAN VALUES | VALUE ADDED COURSE | 0 | 0 | 0 | 0 | 3 |

LEARNING OBJECTIVES:

After completion of this course, student will be able to know how he can be a self-decision making person and know how he can get self-satisfaction. The students are expected to become more aware of their surroundings, society, social problems and their sustainable solutions, while keeping human relationships and human nature in mind.

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|----------|--|------|------------|
| 1 | MODULE – I ETHICS 1.1 Introduction – Definition – History – Nature and Scope of Ethics – Division of Ethics (Meta- ethics; Normative ethics; Applied ethics) 1.2– Ethics and other sciences – Ethics and Religion – Ethics in Private and Public Relationships - Importance of ethics in Human life. | | CO1 |
| 2 | MODULE – II 2.1 Evolution of Ethics in India: Ancient period (Vedic, Pre – historic & Buddhism and Jainism) 2.2 Medieval period (Bhakti movement) 2.3 Modern period (Raja Ram Mohan Roy, Dayanand Saraswati, Swami Vivekananda, M. K. Gandhi, B. R. Ambedkar, Ishwar Chandra Vidyasagar & M. N. Roy) | | CO2 |
| 3 | MODULE – III 3.1 Ethics in Public Administration: Status and Problems 3.2 Ethical Concerns and Dilemmas in Government and Private Institutions-Laws, Rules, Regulations and Conscience as Sources of Ethical Guidance 3.3 Accountability and Ethical Governance; Strengthening of Ethical and Moral Values in Governance 3.4 Ethical Issues in International Relations and Funding - Case Studies of successful administrators. | | CO3 |
| 4 | MODULE – IV 4.1 Applied Ethics: International Ethics - Bioethics - Environmental Ethics – Business Ethics - Media Ethics – Social Ethics 4.2 Ethical management - Ethical Conflicts in Cosmopolitan Culture and Urbanisation. | | CO4 |
| 5 | MODULE – V HUMAN VALUES 5.1 Definition - Characteristics of values – Types of values (Theoretical, Economic, Aesthetic, Social, Political & Religions) – | | CO5 |

| | | | |
|--|---|--|--|
| | <p>5.2 Sources of values (Family factor, social factors, personal factors, cultural factors, religious factors, & Life experiences) – Values and beliefs – values in workplace – values and attitudes - Importance of Values - Role of Family, Society and Educational Institutions in inculcating Values.</p> <p>5.3 Case study: Sudha Chandran – Hellen Keller – Stephen Hawking & Franklin Rosevelt.</p> | | |
|--|---|--|--|

TEXT BOOKS:

1. Naagarazan R.S (2020). *A Textbook on Professional Ethics and Human Values*, New Age International Private Limited, ISBN:9789389802436
2. Premvir Kapoor (2019). *Professional Ethics and Human Value*, Khanna Publishing, ISBN:9789386173652

REFERENCE BOOKS:

1. Ethics in Governance (2007). *Second Administrative Reforms Commission (4th Report)*, Government of India.
2. Jayshree Suresh & Raghavan B. S (2003). *Human Values and Professional Ethics: Values and Ethics of Profession*, S Chand & Company, ISBN:9788121924528

WEBSITES:

1. <https://www.iedunote.com/values-attitudes-difference>
2. <http://egyankosh.ac.in/handle/123456789/3788>
3. <https://darp.gov.in/sites/default/files/ethics4.pdf>

Note: The above syllabus was implemented in 2021-2022 now the below syllabus will be adopted from 2022-2023 onwards

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|------------------|---------------------------|---|---|---|---|---------|
| | GARDENING | VALUE ADDED COURSE | 0 | 0 | 0 | 0 | 3 |

LEARNING OBJECTIVES:

After completion of this course, student will be able to gain knowledge and importance of gardening. They will be able to be successful Entrepreneurs.

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|---|------|-----|
| 1 | MODULE – I Gardening – Introduction, features, and types 1.1 Scope and introduction to gardening. 1.2 Different kinds of gardens (Indoor and Outdoor). 1.3 Gardening features, and the importance of the garden. 1.4 Tools used in gardening: Axe, crowbar, Hoe, Hosepipe, knives, labels, Lawnmower, Pickaxe, pruning shear, Saw, Secateurs, Sieve, spade and Shovel, Sprinklers/rainbirds, Sickle, Sword, Trowel, Watering can and pots/containers. | | CO1 |
| 2 | MODULE – II Different types of Gardens and their importance 2.1 Home garden – suitable plants for home gardening 2.2 Detailed aspects of roof garden, terrace garden, and vertical garden 2.3 Advantages and limitations in establishing different types of gardens 2.4 Importance, features, and maintenance of commercial gardening | | CO2 |
| 3 | MODULE – III Different kinds of plants suitable for gardening 3.1 Suitable plants for different kinds of gardens. 3.2 Different shade-loving plants for home gardening. 3.3 Suitable annuals, perennials, and flowering trees for commercial/ornamental gardening. 3.4 A detailed description of potted plants such as outdoor, foliage, flowers, creepers, climbers, etc. | | CO3 |
| 4 | MODULE – IV 4.1 Soil and its preparation: Physical texture and composition of the soil, soil types, soil pH, preparation of beds, and preparation of soil mixtures/garden soil. 4.2 Fertilizers, Organic Manures, and Substrates: Fertilizers; Farm Yard Manure (FYM), compost, leaf mold, bone meal, Oilcakes, wood ash, charcoal, peat moss, Sphagnum Moss, shredded bark, sawdust, and wood shavings; Vermiculite and Vermicompost. 4.3 Potting, Repotting, and Transplantation: Types of pots, Plants suitable for pot culture, Potting, Repotting, and Transplantation. | | CO4 |

| | | | |
|---|--|--|------------|
| | 4.4 Pruning: Introduction, objectives; Types and seasons of pruning, special pruning techniques, differential pruning technique, pruning of flowering and fruit plants | | |
| 5 | MODULE – V Plant Propagation techniques 5.1 Introduction to plant propagation. Sexual Propagation / Seed Propagation: Concept, advantages, disadvantages, seed germination, seed dormancy, the viability of seed, seed health, Pre-germination treatments, and growth of seedlings in bed. 5.2 Asexual Propagation / vegetative propagation: Concept, advantages, disadvantages/limitations; propagation by specialized vegetative structures (Bulb, Tubers, root, stem corm, Rhizome, runner, offset, suckers, etc.) 5.3 Types of propagation- Cutting, layering, grafting, and budding. | | CO5 |

TEXT BOOKS:

1. Pramila Mehra (2019). *Teach Yourself Gardening*, Hind Pocket Books, ISBN : 9353494516

REFERENCE BOOKS:

1. Kevin Espiritu (2019). *Field Guide To Urban Gardening*, Cool Springs Press, ISBN : 076036396X

WEBSITES:

1. https://agritech.tnau.ac.in/horticulture/horti_Landscaping_vertical%20gardening.html

SEMESTER III

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|--|-----------------------|---|---|---|---|---------|
| | PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY | Core paper - I | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|--------|----------|-----|-----|------------|
| Second | Third | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand structural variation in Pteridophytes and Gymnosperms. The student will be able to study the classification of Pteridophytes and Gymnosperms. It provides knowledge on structure and reproduction of certain selected Pteridophytes forms. The course will enable the student to know about the steles, sporangial organization and economic importance of Pteridophytes. On taking this course, the Student will also be able to get a glimpse of fossil plants and their time period.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|--|
| CO1 | Understand about first land plants and classify them. | K1, K2, K3, K4,K5, |
| CO2 | List out living forms of vascular plants | K1, K2, K3, K4,K5 |
| CO3 | Discuss about first naked seed bearing plants and Economic Importance of Gymnosperms. | K1, K2, K3, K4,K5, K6 |
| CO4 | Evaluate external and internal features of naked seed bearing plants | K1,K3, K4,K5, |
| CO5 | Identify fossil plants and discuss the significance of fossils. | K1, K2, K3, K4,K5, K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K-5 - Evaluate

K-6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 3 | 2 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 3 | 3 | 1 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 3 | 1 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 3 | 3 | 2 | 1 |
| CO5 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 3 | 3 | 3 | 3 | 1 | 1 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | MODULE – I PTERIDOPHYTES 1.1 General Characteristics, Classification (Sporne 1956), General Characteristics of Major Subdivisions Psilopsida, Lycopsida, Sphenopsida, Pteropsida. 1.2 Stelar Evolution. 1.3 Homospory and Heterospory 1.4 Origin and evolution of Pteridophytes. 1.5 Economic importance of Pteridophytes. | 18 | CO1 |
| 2 | MODULE – II 2.1 A detailed study of Morphology, Anatomy and Reproduction of the following Genera: <i>Lycopodium, Selaginella, Equisetum, Adiantum and Marsilea</i> | 18 | CO2 |
| 3 | MODULE – III GYMNOSPERMS 3.1 General characteristics, Distribution, and Classification (Sporne, 1965). 3.2 Salient features of Pteridospermales, Bennettitales, Cycadales, Cordaitales, Coniferales and Gnetales. 3.3 Origin and evolution of Gymnosperms. 3.4 Economic Importance of Gymnosperms. | 18 | CO3 |
| 4 | MODULE – IV 4.1 A detailed study of Morphology, Anatomy and Reproduction of the following Genera: <i>Cycas, Pinus and Gnetum</i> | 18 | CO4 |

| | | | |
|----------|--|-----------|------------|
| 5 | MODULE – V PALEOBOTANY 5.1 Introduction – Define Fossils, Fossil types (Compression, Impressions, Petrifications, Amber and Coal balls) 5.2 Economic Importance of Fossils. 5.3 Geological time scale. 5.4 Birbal Sahni (Father of Indian Paleobotany) and his contribution. 5.5 Salient features of fossil plants - <i>Lepidodendron</i> , <i>Lepidocarpon</i> , <i>Calamites</i> and <i>Williamsonia</i> . | 18 | CO5 |
|----------|--|-----------|------------|

TEXT BOOKS:

1. Pandey B.P. (2022). *College Botany*, S.Chand & Company, ISBN : 9789355010612
2. A.V.S.S. Sambamurty (2020). *A Textbook of Bryophytes, Pteridophytes, Gymnosperms and Paleobotany*. S.Chand & Company, ISBN : 9788121904049
3. Singh V, Pandey P.C & Jain D.K (2019). *Text book of Botany*, (5th ed) Rastogi publications, ISBN : 9789350781296

REFERENCE BOOKS:

1. Manickam V.S & Irudagaraj V (2003). *Pteridophyte Flora of Nilgiris, South India*, (1st Ed) M/s Bishen Singh Mahendra Pal Singh, ISBN : 9788121103862
2. Kramer K.U. & Green P.S. (1990). *Pteridophytes and Gymnosperms: 1 (The Families and Genera of Vascular Plants)*, ISBN : 9783540517948

WEBSITES:

1. <https://www.plantsnap.com/plant-encyclopedia/pteridophytes/>
2. <https://www.thoughtco.com/what-are-gymnosperms-4164250>
3. <https://palaeobotany.org/>

**PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY
PRACTICAL – III**

| L | T | P | Cr |
|----------|----------|----------|-----------|
| 0 | 0 | 3 | 2 |

LEARNING OUTCOMES:

At the end of the Course, the Student will be able to:

1. To prepare and identify microslides of Pteridophytes, Gymnosperms specimens.
2. To identify microslides of fossils.

PTERIDOPHYTES

1. Micropreparation of types prescribed in the theory.
2. Identification of Permanent slides.

GYMNOSPERMS

1. Micropreparation of types prescribed in the theory.
2. Identification of Permanent slides.

PALAEOBOTANY

1. Identifying the fossil slides/photographs relevant to the syllabus.

| Course Code | Course Title | Category | L | T | P | S | Credits |
|--------------------------|------------------------------|--------------|---|---|---|---|---------|
| 09-18/13412/35433 | ENVIRONMENTAL STUDIES | PART IV: EVS | 4 | | | | 2 |

| Year | Semester | CIA | ESE | Exam Hours |
|--------|----------------|-----|-----|------------|
| Second | Third & Fourth | 40 | 60 | 03 |

LEARNING OBJECTIVES:

The student will be able to understand various natural resources and environmental aspects along with factors affecting it and volunteer themselves for social activities. They will be able to know the conservation strategies of natural resources and how to prevent the different types of pollution and create awareness on AIDS.

Course Outcomes

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|--|---|
| CO1 | Discuss the natural resources and apply the conservative methods of natural resources. | K1 & K3 |
| CO2 | Analyse how ecosystem are formed and functions of an ecosystem and natural curiosity and creativity for the immediate surroundings | K4 |
| CO3 | Create a awareness and control measures of various types of Pollutants,their causing effects and awareness conservation on biodiversity | K6 |
| CO4 | Apply the methods for sewage treatment and rain water harvesting | K2 & K3 |
| CO5 | Evaluate the human population ratio with developed countries and their sharing ratio of natural resources. Acquire the awareness on communicable disease (AIDS) and awareness on natality | K5 & K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K-5 - Evaluate

K-6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 |

**STRONGLY CORRELATED -3, MODERATELY CORRELATED – 2,
WEAKLY CORRELATED -1**

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | <p>MODULE – I</p> <p>1.1 The Multidisciplinary nature of environmental studies.</p> <p>1.2 Definition, Scope and Importance. Need for public awareness.</p> | 15 | CO1 |
| 2 | <p>MODULE – II</p> <p>2.1 Natural Resources</p> <p>2.2 Renewable and non-renewable resources</p> <p>2.3 Natural resources and associated problems</p> <p>a) FOREST RESOURCES; Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.</p> <p>b) WATER RESOURCES : Use and over-utilization of surface and ground water, floods, drought,. Conflicts over water, dams benefits and problems.</p> <p>c) MINERAL RESOURCES : Use and exploitation, environmental effects of extracting and using mineral resources, Case studies. d) FOOD RESOURCES : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer pesticide problems, water logging salinity, case studies.</p> <p>e) ENERGY RESOURCES : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies.</p> <p>f) LAND RESOURCES : Land as a resource. Land degradation, man</p> | 15 | CO2 |

| | | | |
|-----------|--|-----------|------------|
| | <p>induced landslides, soil erosion and desertification.</p> <p>2.4 Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyles.</p> | | |
| 3 | <p>MODULE – III</p> <p>3.1 Ecosystems, Concept of ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids.</p> <p>3.2 Introduction, types characteristic features, structure and function of the following ecosystems:</p> <p>3.3 Forest ecosystem Grassland ecosystem Desert ecosystem Aquatic ecosystems (Ponds. Streams, Lakes. Rivers, Oceans. Estuaries)</p> | 15 | CO3 |
| 4 | <p>MODULE – IV</p> <p>4.1 Biodiversity and its conservation.</p> <p>4.2 Introduction : Definition: genetic, species and ecosystem diversity, Biogeographical classification of India.</p> <p>4.3 Value of biodiversity: Consumptive use, productive use, social, ethical, aesthetic and option values.</p> | 15 | CO4 |
| | <p>4.4 Biodiversity at global, national and local levels, India as a mega-diversity nation</p> <p>4.5 Hotspots of biodiversity, Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts.</p> <p>4.6 Endangered and endemic species of India. Conservation of biodiversity: In situ and Ex situ conservation of biodiversity.</p> | | |
| 5 | <p>MODULE – V</p> <p>5.1 Environmental Pollution, Definition Causes, effects and control measures of:</p> <p>Air pollution, Water Pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards.</p> <p>5.2 Solid waste management: causes, effects and control measures of urban and industrial wastes.</p> <p>5.3 Role of an individual in prevention of pollution, Pollution case studies, Disaster management: floods, earthquakes, cyclones and landslides.</p> | 15 | CO5 |
| 6. | <p>MODULE-VI</p> <p>6.1 Social Issues and the Environment, From unsustainable to sustainable development - Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns, Case studies.</p> <p>6.2 Environmental ethics: Issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation.</p> <p>6.3 Consumerism and waste products, Environment protection Act, Air (Prevention and control of pollution) Act, Water (Prevention and control of</p> | 15 | CO6 |

| | | | |
|----|---|----|-----|
| | pollution) Act, Wildlife protection Act. Forest Conservation Act, Issues involved in enforcement of environmental legislation,Public awareness. | | |
| 7. | MODULE –VII 7.1 Human Population and the Environment, Population growth, variation among nations, Population explosion – Family Welfare programme, Environment and human health, Human Rights. 7.2 Value Education, HIV/ AIDS, Women and Child welfare 7.3 Role of information Technology in Environment and human health, Case studies. | 15 | CO7 |
| 8 | MODULE -VIII FIELD WORK 8.1 Visit to a local area to document environmental assets – river / forest/ grassland / hill/ mountain. 8.2 Visit to a local polluted site – Urban/Rural/ Industrial/ Agricultural. Study of common plants, insects, birds. 8.3 Study of simple ecosystems – pond ,river, hill slopes, etc. | 15 | CO8 |

TEXT BOOKS:

1. Sarita Kumar (2018). *Fundamentals of Environmental Studies*, Sultan Chand & Sons Pvt. Ltd.
2. Erach Bharucha (2013). *Textbook of Environmental Studies for Undergraduate Courses*, Orient BlackSwan.

REFERENCE BOOKS:

1. Benny Joseph (2017). *Environmental Studies*, McGraw Hill Education.
2. R. Rajagopalan (2015). *Environmental Studies*, Oxford University Press.

WEBSITES:

1. <http://www.yourarticlelibrary.com/environment/environmental-studies-meaning-objectives-scope-and-importance-of-environmental-studies/12295>
2. https://www.tutorialspoint.com/environmental_studies/environmental_studies_environment.htm
3. <https://study.com/academy/lesson/what-is-environmental-studies-definition-topics.html>

SEMESTER IV

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|--|----------|---|---|---|---|---------|
| | PLANT MORPHOLOGY, TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY | | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|--------|----------|-----|-----|------------|
| Second | Fourth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand various Angiosperms plant habits, their vegetative and reproductive structural features. The student understands the systems of classification of angiosperms, principles involved in naming and identification of angiosperm plants. They will be able to identify members of major angiosperm families by observing key characters and economic importance of the families studied. The last part of the course will enable the students to know the economically important plant products and their utilization.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|--|---|
| CO1 | Recall the Plant Morphology terminologies. | K1, K2, K3, K4, K5 |
| CO2 | Understand the Principles of classification and nomenclature and Collect, identify and preserve plants | K1, K2, K3, K4, K5 |
| CO3 | Identify members of the families in Polypetalae and Gamopetalae by observing diagnostic features and economic importance | K1, K2, K3, K4, K5 |
| CO4 | Identify members of the families in Monochlamydae and Monocots by observing diagnostic features and economic importance | K1, K2, K3, K4, K5, K6 |
| CO5 | Discuss the Cultivation methods and uses of some economically important plants | K1, K2, K3, K4, K5, K6 |

K1 - Remember
K4 - Analyze

K2 - Understand
K-5 - Evaluate

K3 - Apply
K-6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PS O | PO | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 1 | 3 | 3 | 3 | 1 | 1 |
| CO2 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 3 | 3 | 2 | 3 | 1 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | 3 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|---|------|-----|
| 1 | <p>MODULE – I PLANT MORPHOLOGY 1.1 Root system – Modifications of tap and fibrous root system. 1.2 Shoot system – Modifications of Stem – Aerial, Subaerial and underground stem. 1.3 Leaf - Simple and Compound – Modifications (Phyllode, Pitcher) tendrils, stipules. 1.4 Inflorescence types – Racemose, Cymose, and Special types. 1.5 Flower – Parts and their detailed description – aestivation, placentation; 1.6 Fruits - Simple, aggregate and Multiple fruits.</p> | 18 | CO1 |
| 2 | <p>MODULE – II TAXONOMY CLASSIFICATION, NOMENCLATURE AND HERBARIA 2.1 Types of Classification – Artificial (Linnaeus), Natural (Bentham and Hooker), Phylogenetic (Engler & Prantl) Merits and Demerits & Outline of Angiosperm Phylogeny Group (APG). 2.2 Plant Nomenclature: Binomial, ICBN – Typification, Effective and Valid Publication, Author Citation; 2.3 Herbarium Techniques: Collection, Pressing, Drying, Poisoning, Mounting, and Preservation of Plant Specimens. Important herbaria and Botanical gardens.</p> | 18 | CO2 |
| 3 | <p>MODULE – III A DETAILED STUDY OF THE SALIENT FEATURES AND ECONOMIC IMPORTANCE OF THE FOLLOWING: 3.1 Polypetalae - Annonaceae, Malvaceae, Fabaceae and Cucurbitaceae 3.2 Gamopetalae - Rubiaceae and Apocynaceae</p> | 18 | CO3 |

| | | | |
|---|--|----|-----|
| 4 | MODULE – IV A DETAILED STUDY OF THE SALIENT FEATURES AND ECONOMIC IMPORTANCE OF THE FOLLOWING: 4.1 Gamopetalae - Solanaceae, and Bignoniaceae 4.2 Monochlamydeae – Euphorbiaceae 4.3 Monocotyledones - Poaceae | 18 | CO4 |
| 5 | MODULE – V ECONOMIC BOTANY 5.1 A Brief Study of the Morphology, Processing and Uses of the following: Beverages (Tea), Sugar (Sugarcane) 5.2 Botanical name, Common name, Family, Morphology of useful part and Uses of Cereals(wheat and rice), Millets (sorghum and finger millet) Fibre yielding plants (cotton and hemp) and dye yielding plants (<i>Indigofera tinctoria</i> , and <i>Haematoxylum campechianum</i>) 5.3 Botanical name, Common name, Family, Morphology of useful part, and Uses of Oil yielding plants(mustard, sesame, and coconut) 5.4 Medicinal plants (<i>Asparagus racemosus</i> , <i>Catharanthus roseus</i> and <i>Withania somnifera</i>) 5.5 Spices and condiments (Pepper, Coriander and Bay leaves) 5.6 Fumitories and Masticatories (Tobacco, Areca Nut, and Betel Leaf) | 18 | CO5 |

TEXT BOOKS:

- Pandey, B.P. (2013). *Taxonomy of Angiosperms*. S. Chand & Co .Ltd., New Delhi
- Sharma, O.P. (2011). *Plant Taxonomy*, Tata McGraw Hill Education, New Delhi
- Kochar, S.L. (2010). *Economic Botany in the tropical (4th Ed.)* . MacMillian Publishers, India Ltd., New Delhi.
- Narayanaswami, R.V., K.N.Rao and A. Raman (2000), *Outlines of Botany*, S.Viswanathan Printers and Publishers, Chennai.
- Vasishta, P.C. (1992). *Taxonomy of Angiosperms*, R. Chand and Co.Ltd., New Delhi
- Pandey, B.P. (1992). *Economic Botany*, S. Chand & Co .Ltd., New Delhi
- Singh,V. and K. Jain. (1991). *Taxonomy of Angiosperms*, Rastogi Publications, Meerut.
- Ventakeswarlu, V (1982). *External Morphology of Angiosperms*, S. Chand & Co .Ltd., New Delhi
- Heywood, V.K., (1967). *Plant Taxonomy*. Edward Arnold Pub. Ltd. London.
- Lawerence, G.H.M. (1951). *Taxonomy of Vascular Plants*. The McMillian Co., New York.

REFERENCE BOOKS:

- Simpson, M.G. (2010). *Plant Systematics, Second Edition*, Academic Press.
- Simpson, B.B and Ogorzaly, M.C. (2001). *Economic Botany: Plants in our World*, (3rd Ed), McGraw-Hill Higher Education. New York.
- Albert, F. Hill, P.P. Sharma, (1996). *Hill's Economic Botany*, Tata McGraw Hill. New Delhi.
- Hill, A.F. (1982). *Economic Botany*, McGraw Hill, New York.

5. Davis, P.H. and Heywood, V.H. (1967). *Principles of Angiosperm Taxonomy*. Oliver and Boyd, Edinburgh.

WEBSITES:

1. <https://www.askiitians.com/revision-notes/biology/morphology-of-flowering-plants/>
2. <http://www.biologydiscussion.com/plant-taxonomy/plant-taxonomy-history-classification-and-plant-kingdom/41749>

**MORPHOLOGY, TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY
PRACTICAL – IV**

| L | T | P | Cr |
|----------|----------|----------|-----------|
| 0 | 0 | 3 | 2 |

MORPHOLOGY, TAXONOMY OF ANGIOSPERMS

1. Study of different types of roots, stem, leaves, Inflorescence, flowers and fruits.
2. Derivation of family(Family Identification – General)
3. Technical description of the range of vegetative and floral characters of plants belonging to the families mentioned in the theory.
4. Field note book and 10 Herbarium sheets of common Angiosperms are to be prepared and submitted at the time of Practical Examination.
5. Spot identification (Binomial, Family) of plants included in the theory.

ECONOMIC BOTANY

1. Economic Importance of plant studied in Economic botany.

THIRD YEAR

SEMESTER - V

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|---------------------------------------|----------|---|---|---|---|---------|
| | PLANT ECOLOGY AND BIODIVERSITY | | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Fifth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand the fundamentals of ecology and learn various components of ecosystem and their degradation. The student will be able to learn the biodiversity and its components and also their conservation. The last part of the course will enable the students to know about the principles of Biodiversity.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Explore Knowledge on various factors influencing vegetation | K1,K2,K3 &K4 |
| CO2 | Summarize the components and Recognize the pattern of interactions among living organisms | K2,K3,K4&K5 |
| CO3 | Explain Vegetation and succession of plants | K2,K3,K4 &K5 |
| CO4 | List Biodiversity hotspots in the World. | K3,K4,K5&K6 |
| CO5 | Elaborate the methods and practices in Biodiversity conservation & management | K3,K4,K5&K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K-5 - Evaluate

K-6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PS O | PO | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 1 | 2 |
| CO2 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 2 | 2 | 1 | 3 | 2 | 2 | 1 | 2 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 2 | 3 | 3 | 3 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | 3 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|---|------|-----|
| 1 | MODULE – I 1.1 Introduction to ecology and ecosystem, biosphere and biomes. 1.2 Autecology – definition and its various aspects. 1.3 Synecology – definition, Community composition and Ecotone. 1.4 Climatic factors: Light – Importance of light to plants, temperature. 1.5 Edaphic factors – Soil profile. Biotic factor: interactions – positive and negative. | 18 | CO1 |
| 2 | MODULE – II 2.1 Ecosystem: Concepts – types, Structure and function –Kinds of ecosystems: pond ecosystem and grass land ecosystem. 2.2 Productivity and energy flow – food chains, food web and ecological Pyramids. 2.3 Plant Adaptations: Morphological and Anatomical adaptations of Hydrophytes, Mesophytes, Xerophytes and Epiphytes | 18 | CO2 |
| 3 | MODULE – III 3.1 Vegetation: Units of vegetation – Formation, Association, Faciations, Consociation, Societies and Clans. 3.2 Development of vegetation: Migration- ecesis, colonization. Methods of study of vegetation: Quadrats and line transect. 3.3 Ecological Succession: Causes and kinds of succession; Hydrosere and Xerosere. | 18 | CO3 |

| | | | |
|---|---|----|-----|
| 4 | <p>MODULE – IV</p> <p>BIODIVERSITY</p> <p>4.1 Introduction, Definition, Genetic, species and Ecosystem diversity. Value of biodiversity: consumptive, productive and Indirect use.</p> <p>4.2 Endemism, Keystone species, Hotspots and Megadiversity.</p> <p>4.3 India Is a mega-diversity nation Biodiversity at global, National and local levels.</p> <p>4.4 IUCN-threat categories. Red data book. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, Invasive and Alien species.</p> <p>4.5 Endangered and endemic species of India.</p> | 18 | C04 |
| 5 | <p>MODULE – V</p> <p>5.1 Conservation Principles – The need for Conservation, Conservation of Species - Captive breeding programmes, Re-introductions.</p> <p>5.2 Conservation of Ecosystems – Wetlands. Social approaches to Conservation – Sacred groves, Sthalavrikshas.</p> <p>5.3 Conservation strategies; <i>In situ</i> approach, biosphere reserves, reserve forests, parks and sanctuaries. <i>Ex situ</i> approach: Gene bank, seed bank and cryopreservation.</p> | 18 | C05 |

TEXT BOOKS:

1. Shukla R.S & Chandel P.S. (2021). *A Textbook of Plant Ecology*. S.Chand & Company, New Delhi. ISBN: 9788121905480.
2. Krishnamurthy K.V. (2018). *An advanced text books on Biodiversity – Principle and Practice*, Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi, ISBN: 9788120416062
3. Michael P.N. (2016). *Ecology*, CBS Publishers, New Delhi. ISBN: 9788123929224

REFERENCE BOOKS:

1. Chapman J.L.& Reiss M.J., (2005). *Ecology : Principles And Applications (2nd Ed)*, Cambridge University Press.
2. Melchias G. (2001). *Biodiversity and Conservation*. Science Publishers Inc. USA.

WEBSITES:

1. <https://www.intechopen.com/books/plant-ecology-traditional-approaches-to-recent-trends/introductory-chapter-plant-ecology>
2. <http://www.biologydiscussion.com/ecology/phytogeography-climate-vegetation-and-botanical-zones-of-india/6925>

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|-------------------------------------|----------|---|---|---|---|---------|
| | PLANT ANATOMY AND EMBRYOLOGY | | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Fifth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand various tissues and internal structures of root stem and leaves. They can be able to understand the secondary and anomalous growth of both monocot and dicot plants. This course also enables the students to understand the embryology of angiospermic plants.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Discuss the Basic organization of various types of tissues | K1.K2.K3.K4.K5& K6 |
| CO2 | Understand the anatomy of Primary & Secondary growths in Stem & Roots | K1,K2,K3&K4 |
| CO3 | Explain the Knowledge on Anomalous Secondary growth in Dicot & Monocot Plants | K1,K2,K3,K4& K5 |
| CO4 | Discuss the structure and development of male and female gametophytes in plants | K1,K2,K3,K4& K5 |
| CO5 | Compare the structure and development of dicot and monocot embryos | K1,K2,K3,K4& K5 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K5 - Evaluate

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 3 | 3 | 2 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 2 | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 3 | 2 | 1 |
| CO4 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 3 | 3 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 | 2 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED - 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|---|------|-----|
| 1 | MODULE – I PLANT ANATOMY 1.1 Tissues – Definition, Types of tissues . 1.2 Simple permanent – Parenchyma, Collenchyma, sclerenchyma. 1.3 Complex permanent tissues – Xylem and Phloem. 1.4 Meristem- Classification – Position, development and origin. 1.5 Theories of shoot apex and root apex organization. | 18 | CO1 |
| 2 | MODULE – II 2.1 Epidermal tissue system – Important functions. 2.2 Stomata – Types of stomata 2.3 Trichomes – Glandular & Non glandular. 2.4 Some special epidermal cells – silica, cork, crystal- containing and bulliform cells. 2.5 Vascular tissue system. Types of vascular bundles. | 18 | CO2 |
| 3 | MODULE – III 3.1 Primary anatomical structure of dicot and monocot stem. 3.2 Secondary growth in dicot stem. 3.3 Anomalous secondary growth in Nyctanthes and Dracena. 3.4 Anatomy of Dicot and Monocot leaf. 3.5 Primary anatomical structure of dicot and monocot roots. | 18 | CO3 |
| 4 | MODULE – IV EMBRYOLOGY 4.1 Structure of Microsporangium 4.3 Structure of Megasporangium 4.4. Different types of Ovules. (Orthotropous, Anatropous, Amphitropous, Hemianatropous, Campylotropous, Circinotropous) | 18 | CO4 |
| 5 | MODULE – V 5.1 Development of dicot embryo – Capsella. 5.2 Endosperm – definition and types. Free cellular , cellular, helobial. Endosperm haustoria. 5.3 Development of Monocot embryo – Najas. 5.4 Different types of polyembryony. 5.5 Parthenogenesis and Parthenocarpy, 5.6 Double fertilization. | 18 | CO5 |

TEXT BOOKS:

1. B.P. Pandey (2001). *Plant Anatomy*, S. Chand & Company Ltd, New Delhi. ISBN-10 : 8121901456
2. S.N. Pandey, A. Chadha, *Plant Anatomy & Embryology* (1997). Vikas Publication House Pvt Ltd. ISBN-10 8125902406
3. Bhojwani and Bhatnagar, (1994). *Embryology of Angiosperms*, Vikas Publishing House Pvt. Ltd, ISBN-13. 978-9325981294

REFERENCE BOOKS:

1. Esau. K, (2006). *Anatomy of seed plants (2nd Ed.)* – John Willey.
2. Fahn. A (1990). *Plant Anatomy (4th Ed.)* Butterworth-Heinemann Ltd.
3. Swamy. B.G.L and Krishnamoorthy. K. V, (1990). *From Flower to Fruits*, Tata McGraw Hill Publishing Co. Ltd.

WEBSITES:

1. <https://www.encyclopedia.com/social-sciences/applied-and-social-sciences-magazines/plant-anatomy>
2. <http://www.biologydiscussion.com/embryology/top-16-stages-of-embryology-in-plants-with-diagram/34153>

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|---|----------|---|---|---|---|---------|
| | PLANT BIOTECHNOLOGY & PLANT BREEDING | | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Fifth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

The student will be able to understand general concepts of Biotechnology and its applications in various areas. The student will be able to understand the process of Plant Tissue culture, use of bio products for environment protection, production of various products through biotechnology. The student will be able to understand the breeding techniques.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Define biotechnology and evaluate its applications | K1,K2&K3 |
| CO2 | Understand Genetic Engineering. | K1,K2,K3&K4 |
| CO3 | Apply plant tissue culture techniques in bringing out successful plant varieties. Recall various procedures to save the environment | K1,K2,K3,K4 &K5 |
| CO4 | Discuss industrial applications of microbes and utilization of enzymes for improvement of plants | K3,K4,K5,&K6 |
| CO5 | Evaluate various practices for crop improvement | K3,K4, K5&K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K5 - Evaluate

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 1 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 2 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 2 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|----------|---|-----------|------------|
| 1 | <p>MODULE – I Plant Biotechnology 1.1 Biotechnology – definition, history and scope. Rise of Modern Biotechnology. 1.2 Applications of Plant Biotechnology in various fields. Role in Agriculture. Biofertilizers – Merits and Demerits. Application of Microbial Enzymes. 1.3 Environmental Biotechnology: Production of Biogas – biological treatment of sewage – Biological processing of industrial wastes; Dairy and tannery – microbial leaching. 1.4 Introduction to bioremediation – types of bioremediation – factors influencing bioremediation.</p> | 18 | CO1 |
| 2 | <p>MODULE – II 2.1 Tools and Techniques of Genetic engineering of plants. Transgenic plants against weeds, pests, fungi and virus resistances. 2.2 Gene silencing & Gene editing and its applications. Gene therapy. BT crops and plant – Merits and Demerits. 2.3 Medicine – Antibiotics (Penicillin) Recombinant vaccines, insulin and interferon.</p> | 18 | CO2 |
| 3 | <p>MODULE – III 3.1 Plant Cell and tissue culture- Totipotency, nutrient medium (MS and B5), root and shoot culture and its uses. 3.2 Protoplast culture – Isolation, purification, fusion (somatic hybrids), regeneration and advantages of protoplast fusion. 3.3 Isolation and purification of Single cell protein and their nutritional value. 3.4 Biofuels from plants (Jatropha). Bioethics IPR, Patenting and biosafety. 3.5 Metabolite production from microbes- Primary and secondary.</p> | 18 | CO3 |

| | | | |
|----------|--|-----------|------------|
| | 3.6 Enzymes from microbes and their application – amylase, Proteases, Renin, Pectinase and glucose oxidase – Improvement of Plants: alkaloid production, luminescent plants. | | |
| 4 | MODULE – IV 4.1 Biotechnological applications in enhancement of Food Quality Unit Operation in Food Processing Quality Factors in Preprocessed Food 4.2 Food Deterioration and its Control Rheology of Food Products Microbial role in food products Yeast, Bacterial and other Microorganisms based process and products Modern Biotechnological Regulatory Aspects in Food Industries Biotechnology and Food - Social Appraisal. | 18 | CO4 |
| 5 | MODULE – V Plant Breeding 5.1 Principles involved in plant breeding and its importance with reference to wheat, rice, sugarcane, maize and cotton. 5.2 Methods of crop improvement: Selection (pure line, mass and clonal), hybridization, introduction and acclimatization. Heterosis- causes and effects. 5.3 Polyploidy in plant breeding. Breeding for disease resistance. UPOV, plant breeders rights (PBRs); essentially derived varieties and farmers rights (FRs); protection of plant varieties and farmers rights act (PPV & FRA) 2001; terminator and traitor techniques (v-GURT and t-GURT); biodiversity act 2002; 5.4 Geographical indications act 1999; Amendments to patent act 1970. | 18 | CO5 |

TEXT BOOKS:

1. Gupta PK. (2015). *Plant Biotechnology*. Rastogi Publications. Uttar Pradesh.
2. Dubey RC.,(2014). *A Textbook of Biotechnology*. S.Chand Publications, New Delhi.
3. Dipak Kumar Kar and Soma Halder. (2010). *Plant Breeding, Biometry, Biotechnology*. New Central Book Agency, Kolkata.
4. Gupta PK.,(2009). *Elements of Biotechnology*. Rastogi Publications.Uttar Pradesh.
5. Satyanarayana U.,(2008). *Biotechnology*. Books & Allied Ltd, Kolkata.
6. Ignacimuthu, S., (1996). *Basic Biotechnology*, Tata Mc Graw Hill publishing Co., Ltd., New Delhi.

REFERENCE BOOKS:

1. Jogdand,SN, (1997). *Gene Biotechnology*, Himalaya Publishing House, New Delhi.
2. Kumar H.D., (1993). *A Text book of Biotechnology*, East West Affiliated Press Ltd., New Delhi.
3. Dixon,R.A. (1985). *Plant cell culture – A Practical Approach*. IRL press, Oxford.
4. Butcher, D.N., and D.S.Ingram, (1982) *Plant Tissue Culture* . Oxford.
5. Allard.R.W.(1960), *Principles of Plant breeding*, John Wiley & sons, INC., NewYork.

WEBSITES:

1. <https://nifa.usda.gov/plant-biotechnology>
2. <http://biovegen.org/en/page.cfm?id=49&title=plant-biotechnology-and-itsimportance#.XeAMvIMzbIU>
3. <https://archive.bio.org/articles/background-information-plant-biotechnology>

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|---|----------|---|---|---|---|---------|
| | GENETICS, CELL BIOLOGY AND MOLECULAR BIOLOGY | | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Fifth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

After completion of this course, students will be able to understand the mendelian and non mendelian genetics. The student will be able to understand the sex determination in plants and abnormalities arising due to genetic disorders and list the distinctive features and importance of cell organelles. The student will also be able to distinguish between the structure of DNA and RNA.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|--|---|
| CO1 | Role of genetics and genes in biotic community | K1,K2, K3, K4, K5 |
| CO2 | Summarize the concepts of heredity, their role in determining gender in plants and factors that causes abnormality of genes. | K1,K2, K3, K4, K5 |
| CO3 | Identify two different cell types and its functions. | K1,K2, K3, K4, K5 |
| CO4 | Explain the cell cycle and List the structure and functions of various cell organelles. | K1,K2, K3, K4, K5, K6 |
| CO5 | Discuss Protein synthesis and PCR. | K1,K2, K3, K4, K5, K6 |

K1 - Remember

K4 - Analyze

K2 - Understand

K5 - Evaluate

K3 - Apply

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PS O | PO | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | MODULE – I Genetics 1.1 Mendelian Genetics – Laws of Mendel, Monohybrid, Dihybrid, Reciprocal cross, Back and test cross. 1.2 Pre and post Mendelian Genetics. Deviation from Mendelian genetics (Allelic gene interactions)- Co-dominance and Incomplete dominance. 1.3 Non-allelic gene interactions - Complementary gene interaction, Supplementary, Epistasis , Duplicate 1.4 Extranuclear inheritance – cytoplasmic (Male sterility in corn) 1.5 Linkage and Crossing over. 1.5 Gene Mapping. | 18 | CO1 |
| 2 | 2.1 Sex determination in plants 2.2 Mutation – Types and significance; Mutagens – Physical and Chemical. 2.3 Biochemical mutations in <i>Neurospora</i> . 2.4 Evidence for DNA as genetic material. 2.5 Population genetics: Hardy – Weinberg law, factors affecting equilibrium, Genetic drift, Inbreeding, balanced polymorphism and Founder effects. Bottle neck effect. | 18 | CO2 |
| 3 | MODULE – III Cell Biology 3.1 Prokaryotic and Eukaryotic cells. 3.2 Ultra structure of plant cell. 3.2 Plasma membrane – Properties, Origin, Chemistry, Structure (Fluid mosaic model) and Functions. 3.3 Cell inclusions - Ergastic substances. | 18 | CO3 |

| | | | |
|----------|---|-----------|------------|
| | 3.4 Structure, Origin, Chemistry and function of cytoplasmic organelles - Endoplasmic reticulum – Peroxisomes –Lysosomes – Ribosome – Golgi apparatus- Mitochondria – Chloroplast –Nucleus. 3.5 Structure and types of chromosome –Euchromatin – Heterochromatin. 3.6 Special types of chromosome – Lampbrush and Polytene. | | |
| 4 | MODULE – IV 4.1 Cell cycle 4.2 Cell Division – Amitosis, Mitosis and Meiosis - Significance. 4.2 Structure and functions of Nucleic acids: Nucleosides & Nucleotides, purines and pyrimidines. 4.3 DNA molecular structure (Watson and Crick model) and functions. 4.4 Types of DNA (A, B, Z, Supercoiled and relaxed DNA) 4.5 Denaturation and Renaturation of DNA & melting temperature (T _m). 4.6 RNA – Structure, types (mRNA, rRNA & tRNA) and functions. | 18 | CO4 |
| 5 | MODULE – V Molecular Biology 5.1 Properties of Genetic Code, and Wobble hypothesis. 5.2 Fine structure of Prokaryotic genes. 5.3 Regulation of gene expression in Bacteria: <i>lac</i> operon concept. 5.4 DNA- Replication models (Semiconservative, Conservative and Dispersive) and Prokaryotic DNA replication 5.5 Transcription in Prokaryotes with <i>E. Coli</i> as model system 5.6 Protein synthesis in Prokaryotes. 5.7 RFLP and PCR - Principle, structure and applications. | 18 | CO5 |

TEXT BOOKS:

1. Verma PS and Agarwal VK., (2010). *Genetics*, S. Chand Publications, New Delhi. ISBN : 9788121931144.
2. Verma. P.S and Agarwal. V. K, (2006), *Cell Biology*, S Chand Publishing, New Delhi. ISBN :9789385676147.
3. David Freifelder, (2004). *Molecular Biology*, Narosa Publications, New Delhi. ISBN : 8185198349

REFERENCE BOOKS:

1. Klug, Cummings and Spencer. (2016). *Concepts of Genetics*, Pearson Education India.
2. Benjamin Lewin (2007). *Genes- IX*, Jones and Bartlett Publishers.
3. Harvey Lodish, Arnold Berk, Chris A. Kaiser and Monty Krieger, (2007). *Molecular Cell Biology*, W. H. Freeman, USA.

WEBSITES:

1. <https://www.britannica.com/science/genetics>
2. <https://www.microscopemaster.com/cell-biology.html>
3. <https://plato.stanford.edu/entries/molecular-biology/>

MAJOR PRACTICAL- V

| L | T | P | Cr |
|---|---|---|----|
| 0 | 0 | 3 | 2 |

PLANT ECOLOGY AND BIODIVERSITY

1. Study of morphological and Anatomical adaptations of locally available Hydrophytes, Mesophytes, Xerophytes and Epiphytes.
2. Identify and write notes of interest of some ecological tools
 - a) GPS
 - b) Altimeter
 - c) Anemometer
 - d) Thermometers
 - e) Plant Press
 - f) Flagging tape
 - g) Hand counters

PLANT ANATOMY AND EMBRYOLOGY

- 1.Types of Simple and complex tissue.
2. Types of stomata, trichomes and special epidermal cells.
3. Internal structure of Dicot and Monocot stem
- 4.Internal structure of Dicot, Monocot root and aerial root.
- 5.Internal structure of Dicot and Monocot leaf.
6. Anomalous secondary growth in *Nyctanthes* and *Dracaena* stem.
7. T.S. of young and mature anther, pollinia, types of ovule, types of endosperm.
8. Stages in the development of embryo of *Capsella* and *Najas*.

PLANT BIOTECHNOLOGY & PLANT BREEDING

1. Preparation of Stock Solutions.
2. Preparation of MS Medium.
3. Aseptic Transfer Technique, Surface Sterilization
4. Inoculation for Callus Culture
5. Protoplasm isolation (Demonstration).
6. Plant Hybridisation Techniques – Emasculation and Bagging.
7. Identify and comment on Plant Breeding tools.
8. Spotters pertaining to theory.

GENETICS

1.Problems: Chromosome Mapping

CELL AND MOLECULAR BIOLOGY

1. Smear preparation of anthers to show the stages of meiosis.
2. Study of cell inclusions – Starch grain from banana.
3. Study of cell inclusions - Raphides (Pothos leaf)
4. Identification of cell organelles - Endoplasmic reticulum – Peroxisomes –Lysosomes – Ribosome – Golgi apparatus- Mitochondria – Chloroplast –Nucleus.
5. Identification of special types of chromosomes - Lampbrush and Polytene chromosomes.

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|--------------------------------------|--------------------------------|---|---|---|---|---------|
| | FORESTRY & PHYTOGEOGRAPHY | Core Elective Paper : 1 | 4 | | | | 5 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Fifth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand the forest and forest types of India and Tamilnadu. They gain the basic knowledge on Silviculture and importance of Social and Agro forestry. The last part of the course will enable the students to know about the principles of plant geography

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Understand the principles and importance of Forestry | K1,K2, K3, K4, K5 |
| CO2 | Acquire Knowledge about silviculture and Social forestry | K1,K2, K3, K4, K5 |
| CO3 | Understand the concept of forest management and forest products | K1,K2, K3, K4, K5 |
| CO4 | Understand the basic concepts of Plant geography | K1,K2, K3, K4, K5, K6 |
| CO5 | Acquire knowledge about some floristic regions of India | K1,K2, K3, K4, K5, K6 |

K1 - Remember

K4 - Analyze

K2 - Understand

K5 - Evaluate

K3 - Apply

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 2 | 3 | 3 | 3 | 1 | 3 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 2 | 2 |

STRONGLY CORRELATED -3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|----------|--|-----------|------------|
| 1 | FORESTRY MODULE - I 1.1 Forest – Definition and Importance 1.2 Major Types of Forests: Tropical Forest, Sub-tropical Forest, Temperate Forest, Coniferous Forest, Montane Forest 1.3 Major Types of Forests with special reference to Tamil Nadu: - Tropical wet evergreen, semi evergreen, moist deciduous, Littoral and swamp, dry deciduous, thorn, dry evergreen. | 18 | CO1 |
| 2 | MODULE – II 2.1 Forest Conservation – Importance, Reserve Forests, Sanctuaries, National parks and Biosphere reserves. 2.2 Forest protection: Forest enemies, Poaching, Encroachment, Improper management, Damages by animals, Birds, Parasitic Plants and Climatic factors 2.3 Introduction to silviculture, General silvicultural principles, natural and artificial regeneration of forests. 2.4 Social forestry- Scope and Importance. | 18 | CO2 |
| 3 | MODULE –III 3.1 Forest management: principles and techniques -Forest inventory; Aerial survey and Remote-sensing techniques. 3.2 Forest utilisation: Logging and extraction techniques; transport, storage and sale of non-timber and major forest product 3.3 Minor and Major Forest products: Definition and scope. Collection, processing and disposal of forest products. 3.4 Role of tribals in forest preservation 3.5 Forest laws; necessity; general principles; Indian Forest Act, 1927; Forest Conservation Act, 1980; Wild-life (Protection) Act, 1972. | 18 | CO3 |
| 4 | PHYTOGEOGRAPHY MODULE – IV 4.1 Principles of Plant geography. | 18 | CO4 |

| | | | |
|---|---|----|-----|
| | 4.2 Distribution – Wides, Endemics, Discontinuous species. 4.3 Theories of Discontinuous distribution- Theory of Land Bridge, Theory of Continental drift. 4.4 Factors influencing Plant distribution - Migration, Ecological amplitude. | | |
| 5 | MODULE – V 5.1 Phytogeographical regions of India 5.2 Introduction to Climate change – Definition and Importance 5.3 Effects of Climate Changes - On flora, mangroves and sea grass beds 5.4 Global Warming and Green House Gases 5.5 Endangered flora of India - Red Data Book | 18 | CO5 |

TEXT BOOKS:

1. McManus B. Collins and Fred M White, (1981). *Elementary Forestry*. Reston Publishing Company, Inc., Reston, Virginia.
2. MacDonald, G.(2003). *Biogeography: Introduction to Space, Time and Life*. John Wiley & Sons, Inc.
3. Sagreiya, K.P., (1967). *Forests and Forestry*. National Book Trust, India.
4. Krishnamurthy K.V. (2003). *An advanced text books on Biodiversity – Principle and practice*. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.

REFERENCE BOOKS:

1. Longman, K.A. and Jenik, J., (1987). *Tropical forest and its Environment: ELBS, 2nd edn*. London.
2. Dwivedi, A.P., (1993). *A Text Book of Silviculture*. International Book Distributors, Dehra Dun.
3. Lal, J.B., (2003). *Tropical Silviculture: New Imperatives: New Systems*, International Book Distributors, Dehra Dun.
4. Shanmughavel, P., (2003). *Techniques in Forestry*, Pointer, Jaipur.
5. Simmons, I. G. (1979). *Biogeography: Natural and Cultural*. Edward Arnold Ltd.
6. Tiwari, K.M. and Singh, R.V., (1984). *Social Forestry Plantations*. Oxford & IBH Publishing Co., New Delhi.
7. Melchias G. (2001). *Biodiversity and Conservation*. Science Publishers Inc. USA.

WEBSITES

1. <https://www.intechopen.com/books/plant-ecology-traditional-approaches-to-recent-trends/introductory-chapter-plant-ecology>
2. <http://www.biologydiscussion.com/ecology/phytogeography-climate-vegetation-and-botanical-zones-of-india/6925>

SEMESTER VI

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|---|----------|---|---|---|---|---------|
| | BASICS IN MICROBIOLOGY AND PLANT PATHOLOGY | | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Sixth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

The course explains the basic concepts, history and development of microbiology. The course content focuses on the classification and biology of microbes - bacteria, viruses, fungi and algae. Elaborate the significance of beneficial microbes and methods for the control of pathogenic microbes.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|--|---|
| CO1 | Evaluate the existence of various microbes and their importance | K1,K2, K3, K4, K5 |
| CO2 | Demonstrate usage of various glassware's and ways of microbial isolation | K1,K2, K3, K4, K5 |
| CO3 | List out the important usage of microbial products | K1,K2, K3, K4, K5 |
| CO4 | Identify various plant pathogens and their positive and negative aspects | K1,K2, K3, K4, K5, K6 |
| CO5 | List out various plant diseases and their remedial measures | K1,K2, K3, K4, K5, K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K5 - Evaluate

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PS O | PO | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 2 |
| CO2 | 1 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 3 | 2 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 3 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | <p>MODULE – I BASICS IN MICROBIOLOGY 1.1 Scope and History of Microbiology 1.2 Contribution of Anton van Leeuwenhoek, Louis Pasteur, Robert Koch and Edward Jenner. 1.3 Microbial classification of Whittaker. 1.4 Ultrastructure of Bacteria and Reproduction 1.5 Virus – Structure and reproduction. TMV and T4 phage 1.6 General characters of Mycoplasma. 1.7 Economic importance of Microbes.</p> | 18 | CO1 |
| 2 | <p>MODULE – II 2.1 Cleaning and Sterilization of Glasswares; Sterilization methods – Physical and Chemical methods. 2.2 Media - Types of Media – solid, liquid, selective and enrichment. 2.3 Staining techniques – Simple and Differential Staining. 2.4 Isolation methods – Pour plate – Streak plate – Spread plate & Serial dilution.</p> | 18 | CO2 |
| 3 | <p>MODULE – III 3.1 Microbiology of Air 3.2 Microbiology of Soil 3.3 Microbiology of Potable Water – MPN Techniques. 3.4 Food microflora- Milk and Dairy products 3.5 Microbial spoilage of food 3.6 Food preservation methods 3.7 Fermentation – Principle, Types and applications.</p> | 18 | CO3 |

| | | | |
|----------|---|-----------|------------|
| | 3.8 Antibiotic production – Streptomycin. | | |
| 4 | MODULE – IV 4.1 A brief history of Plant Pathology. 4.2 Principles of plant pathology, Symptomatology- Study of infection – entry of fungal, viral and bacterial pathogen. 4.3 Host defence mechanism (Structural & Biochemical) 4.4 Role of toxins (wild fire & Victorin) and enzymes (Cellulases, Pectinases & Chitinases) in plant pathogenesis. 4.5 Biological control (<i>Trichoderma</i> & <i>Pseudomonas</i>). | 18 | CO4 |
| 5 | MODULE – V Name the causative Organisms, Symptoms and control measures of the following diseases: 5.1 Blast of Paddy 5.2 Citrus canker 5.3 Red Rot of Sugarcane 5.4 Tikka disease of groundnut 5.5 Little leaf of Brinjal 5.6 Bunchy top of Banana 5.7 Leaf curl of Papaya | 18 | CO5 |

TEXT BOOKS:

1. Maheshwari D. K and Dubey R.C. (2022). *A Textbook of Microbiology*. S. Chand & Company. New Delhi. ISBN :9788121926201.
2. Mehrotra, R.S. (2017). *Plant Pathology*. Tata McGraw Hill Publishing Company Ltd, New Delhi. ISBN : 9789352607051.

REFERENCE BOOKS:

1. Michael Pelczar, Jr. (2001). *Microbiology*. McGraw Hill Education, New Delhi.
2. Singh, R.S. (1980). *Introduction to Principles of Plant Pathology (3rd Ed.)* Oxford. IBM. Publishing Co. Pvt. Ltd, New Delhi.

WEBSITES

1. <https://www.britannica.com/science/microbiology>
2. <https://microbiologyonline.org/about-microbiology>
3. <https://phytopath.ca/education/what-is-plant-pathology/>
4. http://ceventura.ucanr.edu/Environmental_Horticulture/Landscape/Problems/Pathology/

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|-------------------------|----------|---|---|---|---|---------|
| | PLANT PHYSIOLOGY | | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Sixth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

The student will be able to understand water relations and their mechanisms. The student will be able to understand concept of photosynthesis, respiration, hormones required for growth and development of plants.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|--|--|
| CO1 | Define Osmosis and Diffusion and Evaluate Physiological process and its significance | K1,K2, K3, K4, K5 |
| CO2 | Explain the importance of Nitrogen fixation. | K1,K2, K3, K4, K5 |
| CO3 | Discuss the entire process of Photosynthesis | K1,K2, K3, K4, K5 |
| CO4 | Distinguish aerobic and anaerobic respiration | K1,K2, K3, K4, K5, K6 |
| CO5 | Identify reasons for plant growth and development. | K1,K2, K3, K4, K5, K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K5 - Evaluate

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 1 | 2 |
| CO2 | 3 | 3 | 2 | 1 | 1 | 3 | 1 | 2 | 2 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 1 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 3 | 2 | 3 | 3 | 2 | 2 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|----------|---|-----------|------------|
| 1 | <p>MODULE – I</p> <p>1.1 Water Relations - Diffusion, Permeability, Osmosis,-Water potential and its Components.</p> <p>1.2 Absorption of water – Symplast- Apoplast pathway.</p> <p>1.3 Mechanism of water Absorption – Active and Pasive transport.</p> <p>1.4 Transpiration – Types and significance – Factors affecting transpiration. Significance of transpiration.</p> <p>1.5 Mechanism of stomatal movement.</p> | 18 | CO1 |
| 2 | <p>MODULE – II</p> <p>2.1 Nitrogen metabolism - Importance of nitrogen in plant life</p> <p>2.2 Modes of Nitrogen fixation - Conversion of nitrate to ammonia by plants- biological nitrogen fixation.</p> <p>2.3 Nitrogen fixing organisms- Biochemistry of nitrogen fixation-nif genes-nod genes- hup gene. Legume – Rhizobium Symbiosis.</p> | 18 | CO2 |
| 3 | <p>MODULE – III</p> <p>3.1 Photosynthesis - Radiant energy- Emerson's enhancement effect-pigment systems- absorption spectrum- action spectrum-</p> <p>3.2 Light reactions- Non-cyclic and Cyclic Photophosphorylation- Dark reactions - Calvin cycle - Hatch and Slack pathway.</p> <p>3.3 Significance of Photosynthesis.</p> | 18 | CO3 |
| 4 | <p>MODULE – IV</p> <p>4.1 Respiration – anaerobic - aerobic - Glycolysis - Kreb's cycle- Electron transport system</p> <p>4.2 Respiratory Quotient and Factors affecting respiration.</p> <p>4.3 Significance of respiration.</p> | 18 | CO4 |

| | | | |
|----------|--|-----------|------------|
| 5 | MODULE – V 5.1 Plant Growth and Development – Occurrence, Chemical nature and Physiological effects of Plant growth regulators (Auxins, Gibberellins, Cytokinins, Ethylene and Abscissic acid). 5.2 Photomorphogenesis – Photoperiodism- Long day, Short day and Day Neutral plants. 5.3 Vernalization – Definition, Mechanism and Importance. 5.4 Dormancy (Seed and Bud) 5.5 Phytochromes 5.6 Biological Clock. | 18 | CO5 |
|----------|--|-----------|------------|

TEXT BOOKS:

1. Kochhar S. L. (2021). *Plant Physiology: Theory and Applications*. Cambridge University Press. ISBN : 9781108707718.
2. Jain,V.K., (2017). *Fundamentals of Plant Physiology*, S.Chand & Company, New Delhi. ISBN :978-9352533343.

REFERENCE BOOKS:

1. Salisbury F.B and Ross,C.N. (1995). *Plant Physiology*.CBS Publishers, New Delhi.
2. Noggle and Fritz, (1976). *Introductory Plant Physiology*, Prentice Hall, New Delhi

WEBSITES:

1. <http://www.plantphysiol.org/>
2. <https://www.nature.com/subjects/plant-physiology>
3. <https://basicbiology.net/plants/physiology>

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|---|----------|---|---|---|---|---------|
| | PLANT BIOCHEMISTRY, BIOINFORMATICS AND BIOSTATISTICS | | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Sixth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

After completion of this course, The student will be able to understand chemical composition of plants with the role of enzymes, various aspects of Bioinformatics and will be able to calculate bio statistical problems.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Explain the concepts of plant biochemistry | K1,K2, K3, K4, K5 |
| CO2 | Classify Carbohydrates, Lipids, Proteins and Amino Acids. | K1,K2, K3, K4, K5 |
| CO3 | Explain the databases through computational biology | K1,K2, K3, K4, K5 |
| CO4 | Discuss Phylogenetic analysis. | K1,K2, K3, K4, K5,K6 |
| CO5 | Solve the various biostatistical problems. | K1,K2, K3, K4, K5, K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K5 - Evaluate

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PS O | PO | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 2 | 3 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO3 | 2 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 2 |
| CO5 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | MODULE – I Plant Biochemistry 1.1 Importance of biochemistry in agriculture 1.2 Structure and significance of water in biochemistry 1.3 Acid-base concept, buffers, pH and pK 1.4 hydrogen bonding; hydrophobic, electrostatic and Van der Waals forces. | 18 | CO1 |
| 2 | MODULE – II 2.1 Properties, structure and classification of Carbohydrates, Lipids, Proteins and Amino Acids. 2.2 Elementary concept of bioenergetics – Entropy and free energy. 2.3 Enzymes: properties, nomenclature and classification as per ECIUB (Enzyme Commission of the International Union of Biochemistry), cofactor, co-enzymes and mode of action, factors. 2.4 Chromatographic techniques: Principle and applications – Column - thin layer - paper and gas chromatography - Gel filtration - Ion exchange and High performance liquid chromatography. | 18 | CO2 |
| 3 | MODULE – III Bioinformatics 3.1 Database- GENBANK, Pubmed, PDB. 3.2 Tools - FASTA, BLAST, BLAT, RASMOL. 3.3 Submission of Sequences. 3.4 Molecular Docking with reference to Autodock, Scrodinger and Discovery Studio. | 18 | CO3 |
| 4 | MODULE – IV 4.1 Phylogenetic analysis:-Evolution, elements of phylogeny, methods of phylogenetic analysis, Phylogenetic tree of life, comparison of genetic sequence of organisms 4.2 Phylogenetic analysis tools-Phylip, ClustalW. | 18 | CO4 |

| | | | |
|----------|--|-----------|------------|
| 5 | MODULE – V Biostatistics 5.1 Measures of central tendency – mean, median and mode and measures of dispersion. 5.2 Standard deviation, mean deviation. 5.3 Testing of hypothesis. Simple definition of Null hypothesis, t- test, chi-square test. | 18 | CO5 |
|----------|--|-----------|------------|

TEXT BOOKS:

1. U Satyanarayana. (2021). *Biochemistry (6 Ed)*. Elsevier India. ISBN : 978-8131264355
2. Jain JL, Sunjay Jain, et al., (2016). *Fundamentals of Biochemistry*. S.Chand & Company, New Delhi. ISBN:9789352838301.

REFERENCE BOOKS:

1. David L. Nelson and Michael Cox , (2017). *Lehninger :Principles of Biochemistry (7th ed.)* W.H Freeman. USA.
2. Hans-Walter Heldt and Birgit Piechulla. (2010). *Plant Biochemistry (4 ed)*. Academic Press, USA.
3. Salisbury F.B and Ross,C.N. (1995). *Plant Physiology*.CBS Publishers, New Delhi.
4. Noggle and Fritz, (1976). *Introductory Plant Physiology*,Prentice Hall, New Delhi

WEBSITES:

1. <http://www.plantphysiol.org/>
2. <https://www.nature.com/subjects/plant-physiology>
3. <https://basicbiology.net/plants/physiology>

MAJOR PRACTICAL- VI

| L | T | P | Cr |
|---|---|---|----|
| 0 | 0 | 3 | 2 |

BASICS IN MICROBIOLOGY

1. Cleaning and Sterilization of Glasswares
2. Preparation of Culture media
3. Isolation of pure culture – Streaking, spread and pour plate method
4. Staining of bacteria : Simple and Gram staining
5. Potability of drinking water – MPN
6. MBRT of Milk
7. Isolation of microbes from spoiled food items

PLANT PATHOLOGY

1. Study of the diseases included in theory
2. Section – Tikka diseases of Groundnut
3. Section - Citrus Canker
4. Section – Leaf curl of Papaya
5. Spotters - Biological pesticides – *Trichoderma*, *Bacillus thurengiensis*, Neem cake and oil.

PLANT PHYSIOLOGY

1. Determination of O.P. of Cell Sap by plasmolytic method.
2. Effect of temperature on membrane permeability.
3. Effect of chemicals on membrane permeability.
4. Separation of photosynthetic pigments by paper chromatography and calculating the Rf value.
5. Study of relative rates of transpiration in different plants.
6. Study of the rate of photosynthesis under different light filters [Wilmot's Bubbler].
7. Determination of percentage of viability of seeds with Tetrazolium chloride.

Demonstration Experiments

1. Demonstration of stomatal movement.
2. Demonstration of Phototropism.
3. Spotters - Plant growth regulators – Auxins, Gibberellins, Cytokinins, Ethylene and Abscissic acid.

PLANT BIOCHEMISTRY

1. Qualitative Analysis of Carbohydrate, Protein and Lipids.
2. TLC – Demonstration.
3. Soxhlet Apparatus – Demonstration.

BIOINFORMATICS

1. Bioinformatics tools and techniques pertaining to theory.

BIOSTATISTICS

1. Biostatistics Problems.

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|---|-------------------------------|---|---|---|---|---------|
| | AGRICULTURE & HERBAL SCIENCE | Core Elective paper :2 | 4 | | | | 5 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Sixth | 40 | 60 | 03 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand the basic aspects of Agriculture in India with relation to soil types, climatic conditions etc. They can be able to differentiate a crop and a weed in the later part. The students will have a basic knowledge on herbal medicine and usage of herbal drugs in Indian systems of medicine.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Understand different basic concepts of Agriculture and soil types | K1,K2, K3, K4, K5 |
| CO2 | Acquire Knowledge about agriculture practices and cultivation | K1,K2, K3, K4, K5 |
| CO3 | Understand the concept of weeds and different methods of control | K1,K2, K3, K4, K5 |
| CO4 | Understand the basic concepts of herbal medicine | K1,K2, K3, K4, K5, K6 |
| CO5 | Acquire knowledge about some medicinal plants and their uses | K1,K2, K3, K4, K5, K6 |

K1 - Remember

K2 - Understand

K3 - Apply

K4 - Analyze

K5 - Evaluate

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 3 | 3 | 3 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 3 | 1 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 1 | 2 |
| CO5 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 3 |

STRONGLY CORRELATED -3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|-------|--|------|-----|
| 1 | AGRICULTURE MODUE -I 1.1 Introduction to Agriculture 1.2 Green revolution and its Impact 1.3 Modern methods of cultivation. 1.4 Climatic elements as factors of crop growth – Rainfall, temperature 1.5 Classification of Indian soils - Mineral and organic constituents of soils. | 18 | CO1 |
| 2 | MODULE -II 2.1 Agricultural Practices - Implements, Seed bed preparation, ploughing, harrowing, sowing, weeding, levelling, transplantation. 2.2 Inter-cultivation, Crop rotation, harvesting, Post- harvest methods 2.3 Types of crops: Kharif – Paddy, Rabi - Wheat 2.4 Irrigation: Types of Irrigation – Surface, Sprinkler and Drip | 18 | CO2 |
| 3 | MODULE -III 3.1 Weeds –Definition 3.2 Weed characteristics and dissemination 3.3 Cultural, biological and chemical control of weeds. 3.4 Insect Pests control measures- biological control & Chemical Control 3.5 Use of fertilizer. Role of Nitrogen and phosphorus based fertilizers | 18 | CO3 |
| 4 | MODULE – IV HERBAL SCIENCE: 4.1 Historical Background and importance 4.2 Usage of herbal drugs in Indian systems of Medicine - Siddha, Ayurveda, Homeopathy and Unani. 4.3 Classification of Crude drugs – Morphological & Pharmacological Classification 4.4 Natural food for human welfare – Antioxidants 4.5 Herbs to prevent and control Diabetes & Blood Pressure | 18 | CO4 |

| | | | |
|---|--|----|-----|
| 5 | MODULE – V 5.1 Study of some plants having medicinal values – Binomial, Common name and Medicinal Uses. <i>Acalypha indica, Acorus calamus, Aloe vera, Azadirachta indica, Allium cepa, Andrographis paniculata, Eclipta alba, Emblica officinalis, Hemidesmus indicus, Ocimum santum, Phyllanthus amarus, Catharanthus rosea, Terminalia arjuna, and Zingiber officinale</i> | 18 | CO5 |
|---|--|----|-----|

TEXT BOOKS:

1. Sreenivas, Y.S. (2009). *Advances in Agricultural Research in India*, Oxford Book Company. Jaipur.
2. Shovan Ray (Ed). (2007). *Handbook of Agriculture in India*. Oxford University Press. New Delhi.
3. Kumar Arvind, (2006). *Concepts of Tropical Agriculture*. Eastern Books Corporation. India.

REFERENCE BOOKS:

1. Rajendra Reddy and J.P. Abhay Shankar. (2007). *Encyclopaedia of Agriculture*. Commonwealth Pub., New Delhi.
2. Wallis, T. E. (2005). *Text book of Pharmacognosy (5th Ed.)*, CBS Publishers, New Delhi.

WEBSITES:

1. <http://abc.herbalgram.org/site/PageServer?pagename=Terminology>
2. <https://www.intechopen.com/books/herbal-medicine/introductory-chapter-introduction-to-herbal-medicine>
3. <http://botanicaldimensions.org/what-is-ethnobotany/>

| Course Code | Course Title | Category | L | T | P | S | Credits |
|-------------|-------------------------------|--------------------------------|---|---|---|---|---------|
| | ENTREPRENEURIAL BOTANY | Core Elective Paper : 3 | 0 | 0 | 0 | 0 | 3 |

| Year | Semester | CIA | ESE | Exam Hours |
|-------|----------|-----|-----|------------|
| Third | Sixth | 50 | 50 | 03 |

LEARNING OBJECTIVES:

After completion of this course, student will be able to become successful Entrepreneurs. They will be able to start up their own Business.

COURSE OUTCOMES

At the end of the Course, the Student will be able to:

| | Course Outcome | Knowledge Level (According to Bloom's Taxonomy) |
|------------|---|---|
| CO1 | Identify the Techniques and start up their Business | K1,K2, K3, K4, K5 |
| CO2 | Understand the flowering technique | K1,K2, K3, K4, K5 |
| CO3 | Apply the Earthworm culture to form compost | K1,K2, K3, K4, K5 |
| CO4 | Discuss the methods of Mushroom cultivation | K1,K2, K3, K4, K5, K6 |
| CO5 | Explain organic farming and herbal products | K1,K2, K3, K4, K5,K6 |

K1 - Remember

K4 - Analyze

K2 - Understand

K5 - Evaluate

K3 - Apply

K6 - Create

MAPPING OF COURSE OUTCOMES TO PO/PSO:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 2 | 3 | 1 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 2 | 2 | 1 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 3 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO5 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 3 |

STRONGLY CORRELATED -3; MODERATELY CORRELATED – 2; WEAKLY CORRELATED -1

| S. NO | CONTENTS OF MODULE | Hrs. | COs |
|----------|--|-----------|------------|
| 1 | <p>MODULE – I Entrepreneurship & Nursery Management 1.1. Entrepreneur qualities 1.2. How to get financial aid from banks. 1.3. Training Institutes (MSME), Self-help groups, Microenterprises, Marketing. 1.4. Preparation of nursery — selection of site, selection of soil, types of nursery bed, soil mixtures, containers for propagation and growing young plants. 1.5. Potting- Mixture, Procedure, repotting, pot bound condition, tools for nursery work.</p> | 18 | CO1 |
| 2 | <p>MODULE – II Flower arrangement & Garden 2.1. Eastern, western and modern types. Types of Holders, Best out of waste of flowers 2.2. Floral decorations like Bouquet making, packaging and maintaining their nature, Display, Projects — Card and albums. 2.3. Types, Bonsai, Cultivation of Medicinal (<i>Catharanthus rosea</i>) and Aromatic plants (<i>Cymbopogon</i>). Terrarium. 2.4. Organic manure, Preparation, components, preparation of lawn, seedling. 2.5. Garden, Irrigation, Pruning, Insect & Pest management.</p> | 18 | CO2 |

| | | | |
|---|--|----|-----|
| 3 | <p>MODULE – III Vermitechnology 3.1.Introduction, Definition and Concept of Vermiculture. 3.2. Influence of soil organisms in Vermitechnology- bacteria, earthworms, entomofauna mites. Litter degradation and decomposition. 3.3 . Vermicomposting materials, methods (raised bed method and pot method), Establishment of Vermiculture unit, materials required and maintenance of vermiculture unit. 3.4. Harvesting of vermicompost, quality, properties and advantages over chemical fertilizers, packing and marketing, cost benefit analysis. 3.5. Natural enemies of earthworms.</p> | 18 | CO3 |
| 4 | <p>MODULE – IV Mushroom Cultivation and Farming 4.1. Importance, Nutrition value and Health Benefits. 4.2. Types - Button, Straw and Oyster, 4.3. Spawn preparation and Storage. 4.4. Growth of Mushrooms on various surfaces. Growing mushroom houses. Insect and Pest management. 4.5. Marketing.</p> | 18 | CO4 |
| 5 | <p>MODULE – V Organic Farming & Herbal Products 5.1. Organic manures - Organic residue, Chemical nature of organic manure, green manure, crops of green manure, importance of green manure, crops of green manure, oil cake. 5.2. Plant growth promoters- Rhizobacter, Panchagavya, Auxin, Giberillin. 5.3. Biopesticides preparation (Neem and Pongamia). 5.4.. Herbal Hair Oil preparation using <i>Eclipta alba</i>, <i>Murraya koenigii</i>, <i>Lawsonia inermis</i>, <i>Trigonella foenum- graecum</i> and its benefits. 5.5. Herbal Soap - Preparation and tools for soap making, curing, Ingredients used, Types- Plain Coconut oil soap, Fragrance soap, Marketing.</p> | 18 | CO5 |

TEXT BOOKS:

1. Harshit Lad. (2022). *A-Z Oyster Mushroom cultivation Training Book: Oyster Mushroom Cultivation*. Notion Press. ISBN :1636693091.
2. Pradeep Sachdeva and Vidya Tongbram. (2020). *A Naturalist's Guide to the Garden Flowers of India*. Prakash Books. ISBN : 9389178436.
3. Palaniappan S.P. & Annadurai K. (2010). *Organic Farming: Theory and Practice*. Scientific Publishers Journals Dept. ISBN : 8172335377

REFERENCE BOOKS:

1. Lawrence Millman and Amy Jean Porter (2019). *Fungipedia: A Brief Compendium of Mushroom Lore: 2 (Pedia Books)*. Princeton University Press. ISBN : 0691194726.
2. M. Joshi. (2016). *New Vistas of Organic Farming, 2nd Ed.* ISBN 9788172339562.

WEBSITES:

1. <https://krishijagran.com/agripedia/a-complete-guide-to-profitable-mushroom-farming-in-india-read-composting-harvesting-techniques/>
2. <https://www.mushroomcouncil.com/growing-mushrooms/six-steps-to-mushroom-farming/>
3. https://agritech.tnau.ac.in/org_farm/orgfarm_introduction.html
4. <https://www.diynatural.com/herbal-soap/>

**DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE
(AUTONOMOUS)**

College with Potential for Excellence
Linguistic Minority Institution, Affiliated to University of Madras

DEPARTMENT OF PHYSICS (SHIFT II)

OUTCOME BASED EDUCATION SYLLABUS

M.Sc. (PHYSICS)

2021–2022 BATCH onwards



**“Gokulbagh” 833, E.V.R. PERIYAR HIGH ROAD,
ARUMBAKKAM, CHENNAI – 600106, TAMILNADU.
Ph: 2363 5101, E-mail: www.dgvaishnavcollege.edu.in**

| CONTENTS | PAGE NO. |
|---|-----------------|
| 1. Vision, Mission and Program Educational Objectives (PEO) | 3 5 |
| 2. Program Outcomes (PO) with Graduate Attributes | 6 |
| 3. Mapping of POs with PEOs | 7 |
| SCHEME | |
| 4. Scheme of First Semester | 10 |
| 5. Scheme of Second Semester | 11 |
| 6. Scheme of Third Semester | 12 |
| 7. Scheme of Fourth Semester | 13 |
| SYLLABUS | |
| 8. Syllabus of First Semester: | |
| a) Paper 1 – Mathematical Physics I | 14 |
| b) Paper 2 – Classical Mechanics | 18 |
| c) Paper 3 – Electromagnetic Theory | 22 |
| d) Paper 4 – Advanced Electronic Circuits | 25 |
| 9. Syllabus of Second Semester: | |
| a) Paper 7 – Mathematical Physics II | 28 |
| b) Paper 8 – Quantum Mechanics I | 32 |
| c) Paper 5 – Practical I | 35 |
| d) Paper 6 – Practical II | 37 |
| e) Paper 9 – General Relativity/Group Theory/Spectroscopy | 39 46 |
| f) Paper 10 – Introduction to Microprocessor 8085 and Microcontroller 8051 | 47 |
| 10. Syllabus of Third Semester: | |
| a) Paper 11 – Statistical Mechanics | 50 |
| b) Paper 12 – Quantum Mechanics II | 53 |
| c) Paper 15 – Medical Physics/Relativistic Quantum Mechanics/Laser & Non-linear Optics | 56 60 |
| d) Paper 16 – Materials Synthesis and Characterization | 61 |
| 11. Syllabus of Fourth Semester: | |
| a) Paper 17 – Condensed Matter Physics | 65 |
| b) Paper 18 – Nuclear & Particle Physics | 69 |
| c) Paper 13 – Practical III | 72 |
| d) Paper 14 – Practical IV | 75 |
| e) Paper 19 – Computational Methods and C programming | 78 |
| Appendix A Outcome Based Education | 81 |
| Appendix B Graduate Attributes | 82 |
| Appendix C Bloom’s Taxonomy | 83 |

Institution

VISION

To impart knowledge by escalating to active learning from rote learning that

- ❖ Ignites Wisdom
- ❖ Challenges Status Quo
- ❖ Strengthens Social Equality
- ❖ Elevates Human Values and Universal Oneness
- ❖ Recognizes Indian Tradition and Culture

MISSION

- ❖ Curriculum that makes student competent to contribute economically and intellectually
- ❖ Offer an environment of learning that encourages innovation and excellence
- ❖ Promote research and development
- ❖ Best of facilities with the best of technology
- ❖ Provide an environment for all round growth of the student
- ❖ Quality in every activity undertaken by the student and the faculty
- ❖ Instilling pride in serving the society and in being the citizen of this country

DEPARTMENT OF PHYSICS (SHIFT II)

VISION

The vision of the Physics Department is to provide in-depth understanding of principles and concept of Physics, proficiency both in theoretical and experimental Physics. The Department aims to enhance the students' knowledge in basic and Applied Physics. To inculcate aptitude for a research career in academia or industry by introducing advanced ideas and techniques that are applicable while emphasizing the underlying concepts of Physics

MISSION

| | |
|----|---|
| M1 | To impart quality education in Physics such that they aim to become Scientists in reputed Research Organisations. To make the students effectively disseminate their knowledge in Physics to coming generations. |
| M2 | Develop the capacity and know-how to apply principles/laws of Physics to solve problems. The ability to do and interpret the data obtained in experiments. To become a center of excellence and extend research facilities. |
| M3 | Apply the Physics knowledge for sustainable development useful for society. Assume responsibility and always practice ethical principles. To function effectively as individual as well as in a team. |

PROGRAM EDUCATION OBJECTIVES (PEOs)

| | |
|-------------|--|
| PEO1 | The students' knowledge of fundamental laws and principles in a variety of areas of Physics along with their applications strengthened. |
| PEO2 | The research skills which advanced laboratory techniques, numerical techniques, and computer interfacing will be developed. |
| PEO3 | The graduates will become an effective researcher with the ability to provide lucid summation of the scientific literature on a given topic of study. |
| PEO4 | To create a further interest in Physics so as students can enjoy and develop themselves through self-study. Communicate effectively, to demonstrate the knowledge in Physics by doing projects and to continue a lifelong learning of Physics. |
| PEO5 | The graduates will develop the skill of responsibility and succeed in every aspect of their life. |

PEO TO MISSION STATEMENT MAPPING

| MISSION STATEMENTS | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 |
|--------------------|------|------|------|------|------|
| M1 | 3 | 3 | 3 | 3 | 3 |
| M2 | 3 | 3 | 3 | 3 | 3 |
| M3 | 3 | 3 | 3 | 2 | 2 |

CORRELATION: 3 STRONG 2 MEDIUM 1 LOW

**PROGRAM OUTCOMES (PO) IN RELATION TO GRADUATE ATTRIBUTES
PROGRAMME OUTCOMES**

At the completion of the M.Sc. Physics program, the students of our Department will be able to:

| | | |
|-------------|--|--|
| PO 1 | Distinctive Academic curriculum: | Mathematical Physics, Classical Mechanics, Advanced Electromagnetic Theory, Electronics, Atomic and Molecular Physics, Quantum Mechanics, Solid State Physics, Nuclear Physics, Numerical Methods and Computer Programming, and project-based learning have acquired knowledge and skill in problem solving. |
| PO 2 | Qualified and Competent Faculty Members: | Become professionally trained. |
| PO 3 | Transfer of Knowledge through Scholarly Activities: | Demonstrate highest standards of academic excellence. |
| PO 4 | Interdisciplinary Project-based Learning: | Excel in the research related to Physics and Materials characterization. |
| PO 5 | State-of-the-Art Laboratories: | Become professionally competent in the area of electronics, and microcontrollers. |
| PO 6 | Exceptional Computational Facilities: | Develop a knowledge in C programming and critical computing skills. |
| PO 7 | Internship Program: | Industry interaction, secure good references and recommendations. |
| PO 8 | Mentorship: | Build a strong resume, help guide career goals, abroad opportunities. |
| PO 9 | Soft Skill: | Interpersonal and communication skills as well as a commitment to life-long learning. |

| | | |
|--------------|---|---|
| PO 10 | Electives, Extra Disciplinary Paper: | Acquire specific and in-depth knowledge to present and publish research findings. |
|--------------|---|---|

Mapping of POs TO PEOs

| PEO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 |
|--------------|------|------|------|------|------|------|------|------|------|------|
| PEO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 |
| PEO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 |
| PEO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 |
| PEO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 |
| PEO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 |

3 Strong Correlation 2 Medium Correlation 1 Low Correlation

PROGRAM SPECIFIC OUTCOMES

- PSO 1** Apply theoretical knowledge of principles and concepts of Physics to practical problems.
- PSO 2** Use mathematical techniques and interpret mathematical models of physical behaviour.
- PSO 3** The methodology required for planning and execution of experiments. The analysis and interpretation of experimental results.
- PSO 4** Demonstrate the ability to plan, undertake, and report on a project of original work.
- PSO 5** Develop communication skills, both written and oral, for specialized and non-specialized audiences.

DEPARTMENT OF PHYSICS (SHIFT II)

ELIGIBILITY FOR ADMISSION

B.Sc. Physics with Mathematics as ancillary subject (or) B.Sc. Triple major with Physics, Chemistry and Mathematics (or) B.Sc. (Applied Science/Applied Physics) with Mathematics as ancillary subject and Physics as major. Candidates should have a B.Sc. Degree with Physics, and Mathematics with a minimum of 60% marks.

DURATION OF THE COURSE

M.Sc. in Physics course is completed in 2 years. It has a semester system that is distributed annually and the course is divided into 4 semesters and each semester comprises of 90 days.

M.Sc. PHYSICS CURRICULUM

A Postgraduate Degree in Physics involves in-depth study of Mathematical Methods, Classical Mechanics, Quantum Mechanics Solid State Physics, Nuclear Physics, Electrodynamics, Optics, Statistical Mechanics Group Theory, Spectroscopy etc., The course gives students a scope of developing their problem solving, mathematical, communication skills and critical thinking, which further broadens into interpreting scientific data that is essential for scientific research. The course aims at also strengthening the knowledge on fundamental principles of Physics. The mode of delivery includes lectures, seminars, workshops and practical lab work. Students will be required to undergo two to three weeks of practical training in an industry or engage in doing a small project or training in leading intuitions of research as part of internship the end of the second semester. They are required to submit a comprehensive report about the training received. In the fourth semester the student will carry out an independent research project. The final result for the course includes the evaluation, assignments given in class, examinations held at the end of the semester, internships, and project reports.

PROJECT

Project work has five hours per week. Students are allocated the faculty of Department to be the Internal Guide. The project can be carried out either in the Department or in other institutions with the support of the Internal Guide. The project report will be evaluated by the supervising Internal guide and project report should be submitted in advance for evaluation. Project evaluation consists of a Viva-Voce examination by the External Examiner. The format for project report is Introduction, Experimental techniques, Results and Discussion, Bibliography. A copy of the project is submitted to the Department for permanent record. Each student is advised to present/ publish a paper on his/her project.

ELIGIBILITY FOR THE AWARD OF DEGREE

A candidate shall be eligible for the award of the degree only if he/she has undergone prescribed course of study for a period of not less than two academic years, passed the examination of all the four semesters prescribed earning a minimum of 92 credits.

SCHEME OF EXAMINATION

As per the University Regulations the following split up of marks for Theory, practical and project are to be followed.

(i) SPLIT UP FOR INTERNAL AND EXTERNAL MARKS OF THEORY & PRACTICAL:

| Sl. No. | Paper | Internal | External | Total |
|---------|-----------|----------|----------|-------|
| 1. | Theory | 40 | 60 | 100 |
| 2. | Practical | 40 | 60 | 100 |

(ii) SPLIT UP FOR INTERNAL ASSESSMENT MARKS (40) FOR THEORY:

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | Tests | Attendance | Choice of department | Choice of department |
|-------------------|-------|------------|----------------------|----------------------|
| Marks (out of 50) | 20 | 5 | 5 | 10 |
| Remember | | | 5 | |
| Understand | | 5 | | |
| Apply | 10 | | | 10 |
| Analyze | 5 | | | |
| Evaluate | 5 | | | |
| Create | | | | |

ESE Semester End Examination (100 Marks; weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 20 |
| Understand | 20 |

| | |
|----------|----|
| Apply | 30 |
| Analyse | 15 |
| Evaluate | 10 |
| Create | 5 |

SCHEME OF SEMESTER I
M.Sc. PHYSICS PROGRAM

| Sl. No | Course Category | Course Code | Course | Credit Distribution | | | | Overall Credits | Total Contact Hours/Week | Marks | | |
|--------------|-----------------|-------------|--|---------------------|---|---|---|---|--------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CIA | ESE | Total |
| 1 | | | Paper 1 – Mathematical Physics I | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 2 | | | Paper 2 – Classical Mechanics | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 3 | | | Paper 3 – Electromagnetic Theory | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 4 | | | Paper 4 – Advanced Electronic Circuits | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 5 | | | Paper 5 Practical I | 0 | 0 | 3 | 0 | Practical examination at the end of Semester II (6 hours) | | | | |
| 6 | | | Paper 6 Practical II | 0 | 0 | 3 | 0 | | | | | |
| 7 | | | Soft Skill I | | | | | 2 | | 25 | 25 | 50 |
| Total | | | | | | | | 18 | 30 | 185 | 265 | 450 |

SCHEME OF SEMESTER II

M.Sc. PHYSICS PROGRAM

| Sl. NO | Course category | Course Code | Course | Credit Distributio n | | | | Over all Credit s | Total Cont act Hour s/We ek | Marks | | |
|--------------|--------------------|----------------|--|----------------------------|---|---|--------------------------------------|----------------------------|--|------------|------------|------------|
| | | | | L | T | P | S | | | CI E | SEE | Tota l |
| | | | | 1 | | | Paper 7 – Mathematical Physics II | | | 6 | 0 | 0 |
| 2 | | | Paper 8 – Quantum Mechanics I | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 3 | | | Paper 5 – Practical I | 0 | 0 | 3 | 0 | 4 | 3 | 40 | 60 | 100 |
| 4 | | | Paper 6 – Practical II | 0 | 0 | 3 | 0 | 4 | 3 | 40 | 60 | 100 |
| 5 | | | Paper 9 – General Relativity/Group Theory/Spectroscopy | 6 | 0 | 0 | 0 | 5 | 6 | 40 | 60 | 100 |
| 6 | | | Paper 10 – Introduction to Microprocessor 8085 and Microcontroller 8051 | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 7 | | | Soft Skill II | | | | | 2 | | 40 | 60 | 100 |
| Total | | | | | | | | 27 | 30 | 280 | 420 | 700 |

SCHEME OF SEMESTER III
M.Sc. PHYSICS PROGRAM

| Sl. NO | Course category | Course Code | Course | Credit Distribution | | | | Over all Credits | Total Contact Hours/Week | Marks | | |
|--------|-----------------|-------------|---|---------------------|---|---|---|---|--------------------------|-------|-----|-------|
| | | | | L | T | P | S | | | CIE | SEE | Total |
| 1 | | | Paper 11 – Statistical Mechanics | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 2 | | | Paper 12 – Quantum Mechanics II | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 3 | | | Paper 13 – Practical III | 0 | 0 | 3 | 0 | Practical examination at the end of Semester IV (6 hours) | | | | |
| 4 | | | Paper 14 – Practical IV | 0 | 0 | 3 | 0 | | | | | |
| 5 | | | Paper 15 – Relativistic Quantum Mechanics/Laser & Non-linear Optics/Medical Physics | 6 | 0 | 0 | 0 | 5 | 6 | 40 | 60 | 100 |
| 6 | | | Paper 16 – Materials Synthesis and Characterization | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 7 | | | Soft Skill III | | | | | 2 | | 40 | 60 | 100 |
| | | | Industrial/Academic Internship (not less than 4 weeks) | | | | | 2 | | | | |

| | | | | | |
|--------------|-----------|-----------|------------|------------|------------|
| Total | 21 | 30 | 200 | 300 | 500 |
|--------------|-----------|-----------|------------|------------|------------|

**SCHEME OF SEMESTER IV
M.Sc. PHYSICS PROGRAM**

| Sl. NO | Course category | Course Code | Course | Credit Distribution | | | | Over all Credits | Total Contact Hours/Week | Marks | | |
|--------------|-----------------|-------------|--|---------------------|---|---|---|------------------|--------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CI E | SEE | Total |
| 1 | | | Paper 17 – Condensed Matter Physics | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 2 | | | Paper 18 – Nuclear & Particle Physics | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 3 | | | Paper 13 – Practical III | 0 | 0 | 3 | 0 | 4 | 3 | 40 | 60 | 100 |
| 4 | | | Paper 14 – Practical IV | 0 | 0 | 3 | 0 | 4 | 3 | 40 | 60 | 100 |
| 5 | | | Paper 19 – Computational Methods and C programming | 6 | 0 | 0 | 0 | 5 | 6 | 40 | 60 | 100 |
| 6 | | | Soft Skill IV | | | | | 2 | | 40 | 60 | 100 |
| 7 | | | Paper 20 Project | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| Total | | | | | | | | 27 | 30 | 280 | 420 | 700 |

PAPER 1 – MATHEMATICAL PHYSICS I

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The objective of the course on Mathematical Physics I is to equip the M.Sc. students with the mathematical techniques that he/she needs for understanding theoretical treatment in different courses taught in the M.Sc. course and for developing a strong background if he/she chooses to pursue research in Physics as a career. The course begins with basic concepts of Vector analysis followed by Vector spaces, elaborates on the types of matrices, characteristics of matrices, rank, determinant, Eigen values and Eigen vectors and properties of a linear transformation are dealt in detail, leading to the technique of solving Linear Differential Equations and highlighting how special functions are used to solve the Physics problems. Lastly an introduction to tensors is dealt so that it will come handy during the later part of the course.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Comprehend the concept of Vector analysis along with Applications of Vectors. |
| CO2 | Conceptualize Vector space and study of Dirac Delta Function and Applications. |
| CO3 | Analyze characteristics of matrices and its different types and also solve linear equations. |
| CO4 | Solve Linear Differential equations and discuss the properties of special functions. |
| CO5 | Realize the basics of Tensor Analysis and its applications. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|----------------------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |

| | | | | | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | Cos |
|--------------|---|------------|------------|
| 1 | <p>Vector Analysis & Vector spaces</p> <p>1.1 Scalar field, vector field, gradient, divergence, curl, Laplacian</p> <p>1.2 Expression for gradient, divergence, curl, Laplacian in orthogonal curvilinear coordinates, spherical coordinates and cylindrical coordinates</p> <p>1.3 Line, surface and volume integrals of vectors</p> <p>1.4 Problems and applications</p> <p>1.5 Stoke's theorem</p> <p>1.6 Green's theorem</p> <p>1.7 Green's theorem in a plane</p> <p>1.8 Vector integration</p> <p>1.9 Application of vectors: equation of continuity, Euler's equation of motion, Bernoulli's theorem, Torricelli theorem.</p> <p>Vectors in n-dimensions</p> <p>1.10 Matrix representations of vectors and operators in a basis</p> <p>1.11 Linear independence, dimension</p> <p>1.13 Inner product</p> <p>1.14 Schwartz inequality</p> <p>1.15 Orthonormal basis</p> <p>1.16 Gram-Schmidt process</p> <p>1.17 Eigen values and Eigen functions of operators</p> | 18 | CO1 |
| 2 | <p>Matrices</p> <p>3.1 Basic concepts of matrix algebra</p> <p>3.2 Types of matrices and their properties</p> <p>3.3 Conjugate of a matrix</p> <p>3.4 Adjoint of a matrix</p> <p>3.5 Inverse of a matrix</p> <p>3.6 Trace of a matrix</p> | 18 | CO2 |

| | | | |
|----------|---|-----------|------------|
| | <p>3.7 Transformation of matrices</p> <p>3.8 Characteristic equation</p> <p>3.9 Eigen values and Eigen vectors – their nature</p> <p>3.10 Cayley–Hamilton theorem</p> <p>3.11 Diagonalization of matrix</p> <p>3.12 Application of matrices: solution of linear equations using matrices</p> <p>3.13 Cramer’s rule-problems</p> | | |
| 3 | <p>Linear Differential Equations and Special Functions</p> <p>3.1 Second order linear differential equations</p> <p>3.2 Solution by power series method (Frobenius method), Legendre, Laguerre and Hermite differential equations</p> <p>3.3 Expansion of polynomials</p> <p>3.4 Bessel’s functions</p> <p>3.5 Beta functions</p> <p>3.6 Gamma functions and their application</p> | 18 | CO3 |
| 4 | <p>Partial Differential Equations and Green’s Function.</p> <p>4.1 PDEs and their types</p> <p>4.2 Solutions of Laplace’s equation in Cartesian, Cylindrical and polar coordinates</p> <p>4.3 Solution of two- and three-dimensional Diffusion and wave equations using separation of variable method</p> <p>4.4 Solving simple practical problems in PDE</p> <p>4.5 Dirac-delta function – Definition, properties and problems</p> <p>4.6 One-dimensional Green’s function – Eigen function expansion of the Green’s function</p> <p>4.7 Sturm–Liouville type equations in one dimension and their Green’s functions.</p> | 18 | CO4 |
| 5 | <p>Tensor Analysis</p> <p>5.1 Definition of tensors in three dimensions: scalars, vectors</p> <p>5.2 Tensors in Minkowski world</p> <p>5.3 Rank of a tensor</p> <p>5.4 Covariant, contravariant and mixed tensors-symmetric and anti-symmetric tensors</p> <p>5.5 Fundamental rules of tensor analysis: addition, subtraction, direct product, quotient rule</p> <p>5.6 Index notation and summation conventions</p> <p>5.7 Invariant tensor</p> | 18 | CO5 |

| | | |
|--|--|--|
| 5.8 Christoffel's symbols of I and II kind | | |
| 5.9 Properties | | |
| 5.10 Transformation laws | | |
| 5.11 Application of tensors analysis to dynamics of a particle (Lagrange's equation) | | |

TEXT BOOKS:

1. Sathyaprakash (2014). *Mathematical Physics* (6th edn), Sultan Chand & Co., ISBN no: 9788180549281
2. B.D. Gupta (2009) *Mathematical Physics* (4th edn), Vikas Publishing House Reprint, ISBN no: 9788125930969
3. P.K. Chattopadhyay (2013) *Mathematical Physics* (2nd edn), New Age, New Delhi, ISBN no: 9788122434408

REFERENCE BOOKS:

4. E. Butkov (1968). *Mathematical Physics* (Facsimile edition) Pearson, ISBN no: 9780201007275
5. Arfken, Weber (2005). *Mathematical Methods for Physicists* (7th edn), Elsevier Publication, ISBN no: 9789381269558
6. Potter, Goldberg (2000). *Mathematical Methods* (2nd edn), Prentice-Hall, India, ISBN no: 9788120305502

E-RESOURCES

1. www.khanacademy.org
2. https://youtu.be/BnE_MJaU8BQ – Group Axioms
3. https://youtu.be/LZnRIOA1_2I – HC Verma on Dirac Delta Function
4. <https://youtu.be/zkADn-9wEgc> – Introduction to Group Theory
5. Mathworld.wolfram.com – Special Function

PAPER 2 – CLASSICAL MECHANICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The aim and objective of the course on Classical Mechanics is to familiarize students to Lagrangian and Hamiltonian formalisms and that they are used in the modern branches of Physics such as Quantum Mechanics, Quantum Field Theory, Condensed Matter Physics, Astrophysics, etc. Generating function, canonical transformation and Poisson brackets are to be dealt in detail. An effort is to be made to illustrate the dynamics of a rigid body and non-inertial frames of reference. Formulate the concepts of coupled oscillators. In addition, the different analytical formulations like Lagrangian, Hamiltonian and Hamilton–Jacobi are to be accounted. Using these formulations, systems like Central Force Problem, Rigid Body Dynamics and Small Oscillations will be studied.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Understand the concepts of generalized coordinates and momenta and apply the D’Alembert’s principle to obtain equation of motion for a given system. |
| CO2 | Apply Lagrangian and Hamiltonian formulations for getting equations of motion for various mechanical system. |
| CO3 | Distinguish between single body system and many particle systems and simplify a two-body mechanical system into a single particle system. |
| CO4 | Understand essential features of a classical problem (like motion under central force, periodic motions), use them to set up and solve the appropriate physics problems. |
| CO5 | Apply the Euler’s equations of motion to solve problems involving rotations of rigid bodies. |

| | |
|------------|---|
| CO6 | Understand Canonical transformations and use Hamilton-Jacobi formalism to solve mechanical systems |
| CO7 | Distinguish different types of equilibrium. Solve coupled oscillator problems using theory of small oscillations and identify the normal modes. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 3 | 1 | 2 | 2 |
| CO2 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 3 | 1 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 2 | 2 |
| CO6 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 3 | 1 | 3 | 2 |
| CO7 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|----------|---|-----------|-----------------|
| 1 | Lagrangian and Hamiltonian Formulations 1.1 Generalized coordinates, principle of virtual work, D'Alembert's principle 1.2 Lagrange's equations from D'Alembert's principle □ conservation laws 1.3 Euler Lagrange equations from Principle of least action. 1.4 Cyclic coordinates, Hamiltonian's principle and Hamilton's canonical equation of motion 1.5 Applications of Lagrangian and Hamiltonian (Linear harmonic oscillator, simple pendulum, double pendulum) | 20 | CO1, CO2 |
| 2 | Central Force Problem 2.1 Equivalent one body problem, Central force and motion in plane | 25 | CO3, CO4 |

| | | | |
|----------|--|-----------|------------|
| | <p>2.2 Equations of Motion under Central Force and First integrals, Differential equation for an Orbit – Inverse Square Law force – Kepler’s Planetary Motion and their Deduction</p> <p>2.3 Stability of orbit under central force – Virial Theorem</p> <p>2.4 Scattering in Central Force field – Scattering Cross section – Scattering angle – Impact parameter – Rutherford Scattering Cross Section.</p> <p>2.5 Center of Mass and Lab Coordinates</p> | | |
| 3 | <p>Mechanics of Rigid Bodies</p> <p>3.1 Rigid body motion Kinematics – Euler’s angles – infinitesimal rotations</p> <p>3.2 Rate of change of a vector – Coriolis force – expression for Coriolis force</p> <p>3.3 Dynamics – angular momentum and kinetic energy – moment of inertia tensor</p> <p>3.4 Euler’s equations of motion – torque-free motion</p> <p>3.5 Symmetrical top – effective potential of symmetric top – introduction to types of motion of top – steady precession, nutation, fast top (no mathematical derivation)</p> | 20 | CO5 |
| 4 | <p>Canonical Transformation</p> <p>4.1 Canonical transformations and their generators – simple examples</p> <p>4.2 Poisson brackets – Properties of Poisson brackets – equations of motion in Poisson bracket formalism</p> <p>4.3 Symmetries and conservation laws – Noether’s Theorem.</p> <p>4.4 Hamilton–Jacobi theorem – application to harmonic oscillator problem</p> | 10 | CO6 |
| 5 | <p>Small Oscillations</p> <p>5.1 Types of equilibrium – Stable, unstable and neutral – potential energy curve – one dimensional oscillator</p> <p>5.2 Two coupled oscillator – solution – normal co-ordinates – frequencies of normal modes – kinetic and potential energy in normal co-ordinates</p> <p>5.3 General theory of small oscillations – secular equation – Eigen values – solution</p> <p>5.4 Applications – linear triatomic molecule</p> | 15 | CO7 |

TEXT BOOKS:

1. H. Goldstein (2002). *Classical Mechanics* (3rd edn), Pearson Education Asia, New Delhi, ISBN no: 9780321188977
2. C.R. Mondal (2008). *Classical Mechanics* (Revised edn), Prentice–Hall of India, New Delhi, ISBN no: 9788120335165
3. Gupta and Kumar Sharma (2019). *Classical Mechanics* (13th edn), Pragathi Prakashan, Uttar Pradesh, ISBN no: 9789350062371

REFERENCE BOOKS:

1. J.C. Upadhyaya (2019). *Classical Mechanics* (3rd edn), Himalaya Publishing Co., New Delhi, ISBN no: 9789353675356.
2. Rana and Joag (2003). *Classical Mechanics* (1st edn), Tata McGraw Hill, UttarPradesh, ISBN no: 9780074603154
3. T. W. Kibble, F.H. Berkshire (2004). *Classical Mechanics* (5th edn), Imperial College Press, New Delhi, ISBN no: 9781860944352

E-RESOURCES

1. <https://nptel.ac.in/courses/122/106/122106027/>
2. <https://ocw.mit.edu/courses/physics/8-09-classical-mechanics-iii-fall-2014/index.htm>
3. <https://nptel.ac.in/courses/115/103/115103115/>
4. <https://nptel.ac.in/courses/115/105/115105098/>
5. <https://nptel.ac.in/courses/115/106/115106123/>

PAPER 3 – ELECTROMAGNETIC THEORY

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

This course is used to make the student initially understand electric and magnetic fields and apply the principles of Coulomb's Law and Gauss's law to electric fields in various coordinate systems. Identify the electrostatic boundary-value problems by application of Poisson's and Laplace's equations. Review of electrostatics and magnetostatics in matter. Understand the depth of static and time-varying electromagnetic field as governed by Maxwell's equations. Study the laws governing the distribution and propagation of electromagnetic fields created by static and dynamic charge distributions and their interaction with matter and to understand unification of EM field which leads to Special Theory of Relativity. Students will have understanding of time-varying fields and Maxwell equations, various concepts of electromagnetic waves, radiation from localized time varying sources, and the charged particle dynamics.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Understand the foundations of electrostatics and learn to use various mathematical techniques to obtain electric field potential. |
| CO 2 | Understand the foundations of magnetostatics, properties and boundary conditions obeyed by magnetic field and vector potential. |
| CO 3 | Acquire knowledge to express Maxwell's equations in vector form using Faraday's laws and definition of Maxwell's displacement current and their applications. |
| CO 4 | Develop knowledge about Retarded Potential. Rendering insights into fields generated by oscillating sources, and their applications. |
| CO 5 | Demonstrate the ability to understand the connection between Special Theory of Relativity and Electrodynamics, and to express Electrodynamics (Maxwell's equations) in Tensor notation. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | Electrostatics 1.1 Electric field, Divergence and Curl of Electric field and Electric scalar potential 1.2 Field and Potential due to localized charge distributions 1.3 Boundary conditions 1.4 Uniqueness theorem, Method of images, 1.5 Laplace and Poisson's equations and their solutions, Method of separation of variables, Multipole expansion 1.6 Dielectrics, Polarization, Field due to dielectric sphere 1.7 Energy stored in charge distributions and dielectrics | 20 | CO1 |
| 2 | Magnetostatics 2.1 Lorentz force, Biot-Savart law, Magnetic field due to steady current 2.2 Divergence and Curl of Magnetic field 2.3 Magnetic vector potential 2.4 Boundary conditions, Local conservation of charge 2.4 Ampere's law, Magnetic vector potential, Field and Potential due to localized current distributions, Boundary conditions, Multipole expansion. 2.5 Force and Torque on current distribution placed in external magnetic field 2.6 Magnetisation and field due to uniformly charged magnetic sphere 2.7 Energy stored in magnetic field and in magnetic materials | 10 | CO2 |
| 3 | Maxwell's Equations and Electromagnetic Waves 3.1 Faraday's laws of EM Induction 3.2 Maxwell's correction to Ampere's law - Maxwell's displacement | 20 | CO3 |

| | | | |
|----------|--|-----------|------------|
| | current, 3.3 Maxwell's equations in vacuum 3.4 EM wave equations, Monochromatic plane waves, 3.5 Energy and Momentum of EM waves, Poynting's theorem 3.6 Scalar and Vector potentials, Gauge Invariance - Coulomb and Lorentz gauge | | |
| 4 | Electromagnetic Radiation 4.1 Electromagnetic waves in matter - Polarization, 4.2 Propagation of EM waves in linear media - Reflection and Transmission of EM waves (Normal and Oblique incidence) 4.3 EM waves in conductor, Reflection at conducting surface, Frequency dependence of permittivity 4.3 Wave guide – Rectangular wave guide 4.4 Retarded Potentials – EM Radiation due to Electric Dipole | 20 | CO4 |
| 5 | Special Theory of Relativity 5.1 Postulates of Special theory of relativity 5.2 Lorentz transformation, Lorentz Invariant, Minkowski space, World line, Structure of space time, Proper time and proper length 5.3 Relativistic Energy and Momentum, Relativistic kinematics and dynamics 5.4 Magnetism as relativistic phenomenon, Transformation of Electric and magnetic fields, Field Tensor, Electrodynamics in Tensor notation, Relativistic potentials | 20 | CO5 |

TEXT BOOKS:

1. D.J. Griffiths (2017). *Introduction to Electrodynamics* (4th edn), Cambridge University Press, New Delhi, ISBN no: 9781108420419
2. J.D. Jackson (2007). *Classical Electrodynamics* (3rd edn), Wiley Easter LTD, New Delhi, ISBN no: 9788126510948
3. Edward M. Purcell and David J. Morin (2013). *Electricity and Magnetism* (3rd edn), Cambridge University press, ISBN no: 9780070702141

REFERENCE BOOKS:

1. D. Halliday, R. Resnick and J. Walker (1997). *Fundamentals of Physics* (6th edn), Wiley, New York, ISBN no: 9780471360384
2. Jerrold Franklin (2017). *Classical Electromagnetism* (2nd edn), Dover Publications, ISBN no: 9780486813714
3. Walter Greiner (2006). *Classical Electrodynamics* (2nd edn), Springer Publications, ISBN no: 9788181284570

E-RESOURCES

1. <https://nptel.ac.in/courses/108/104/108104087/>

2. <https://nptel.ac.in/courses/115/101/115101005/>
3. <https://nptel.ac.in/courses/115/104/115104088/>
4. For the Love of Physics – Prof. Walter Lewin
5. Fundamentals of Physics – Prof. R. Shankar, Department of Physics, Yale University

PAPER 4 – ADVANCED ELECTRONIC CIRCUITS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

In this course a rigorous treatment on integrated circuit operational amplifiers is to be delivered. Linear and non-linear applications of op-amps are added to enhance their existing knowledge on the variety of circuits encompassing all major class of applications like Instrumentation amplifier, oscillators, comparators. To impart knowledge about a variety of specialized IC applications, focus is done on IC 555 Timer and its applications. An introduction to Phase locked loop , operating principle of PLL-565,application of PLL is to be taught and observe their applications in various branches of Physics and Engineering.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Understand the working and designing of active filters using op-amps. The filters studied are first, second order, band pass and all pass filter. |
| CO2 | Realize how operational amplifier is used to construct oscillators and comparators and also to analyze their shortcomings |
| CO3 | Acquire knowledge about the Semiconductor Optical Devices like solar cells, photodetectors: photodiode, PIN photodiode, Avalanche photodiode, light emitting diodes, laser diodes, Tunnel diode, IMPATT diode, Gunn diode. |
| CO4 | Understand the concepts of Voltage and Current Time Base Generators by studying Miller and bootstrap time base generators its basic principles, and construction of Transistor miller time base generator and how it is useful in the industry. |
| CO5 | Recognize of the multitude of applications that can be realized using TIMER 555 by understanding the working knowledge of monostable multivibrator, astable multivibrator. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS | PO | PSO |
|----------|----|-----|
|----------|----|-----|

| O | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
|-----|---|---|---|---|---|---|---|---|---|----|---|---|---|---|---|
| CO1 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S.No | Contents of Module | Hrs | COS |
|------|---|-----|-----|
| 1. | Active Filters 1.1 First order low-pass Butterworth filter: filter design, frequency scaling, 1.2 Second-order low- pass Butterworth filter. 1.3 First-order high-pass Butterworth filter, 1.4 Second-order high-pass Butterworth filter, 1.5 Band-pass filters: wide band-pass Filter, 1.6 Narrow Band-Pass Filter, 1.7 Band-reject filters: wide band-reject filter, narrow band-reject filter, 1.8 All-pass filter. | 18 | CO1 |
| 2 | Oscillators and Comparators 2.1 Oscillators: Oscillator principles, oscillator types. 2.2 Quadrature oscillator, sawtooth wave generator, voltage-controlled oscillator. 2.3 Comparators: basic comparator, zero-crossing detector. 2.4 Schmitt trigger, comparator characteristics. 2.5 Limitations of Op-Amp as comparators, voltage limiters. | 18 | CO2 |
| 3 | Semiconductor Optical Devices 3.1 Photon absorption coefficient, electron–hole pair generation rate 3.2 solar cells, the p-n junction solar cell, conversion efficiency and solar concentration 3.3 photodetectors: photodiode, PIN photodiode, Avalanche photodiode 3.4 light emitting diodes, laser diodes 3.5 Tunnel diode, IMPATT diode, Gunn diode. | 18 | CO3 |
| 4. | Voltage and Current Time Base Generators 4.1 Time-base generators, general features of a time-base signal | 18 | CO4 |

| | | | |
|---|--|----|-----|
| | 4.2 Exponential sweep circuit. 4.3 Miller and bootstrap time base generators – basic principles 4.4 Transistor miller time base generator 4.5 Transistor bootstrap time base generator, current time-base generators 4.6 A simple current sweep, linearity correction through adjustment of driving waveform 4.7 Transistor Current time base Generator | | |
| 5 | Specialized IC Applications 5.1 IC 555 Timer: IC 555 Timer as a monostable multivibrator and its applications. 5.2 IC 555 Timer as astable multivibrator and its applications. 5.3 Phase locked loop: operating principle of PLL-565, 5.4 Application of PLL -Frequency Multiplier 5.5 Exclusive-OR phase detector, monolithic phase detector, 5.6 Instrumentation amplifier and its applications 5.7 Transducer Bridge using Operational Amplifier | 18 | CO5 |

TEXT BOOKS:

1. Pulse, Digital and switching Waveforms, Second Edition - Jacob Millman, Herbert Tauband Mothiki S Prakash Rao (TMH Publication).
2. OP-Amps and Linear Integrated Circuits- Ramakant A. Gayakwad (PHI Publication).
3. Pulse,Switching, and Digital Circuits, David A. Bell, Oxford University Press
4. Pulse & Digital Circuits by K.Venkata Rao, K Rama Sudha& G Manmadha Rao, Pearson Education, 2010.
5. Semiconductor Devices – Physics and Technology – S.M. Sze, , Wiley, New York, 1985.
6. Integrated Electronics – Millman and Halkias, Tata McGraw Hill.
7. Electronic Devices and Circuits – Millman and Halkias, Tata McGraw Hill.

REFERENCE BOOKS:

1. OPAmps and Integrated Circuits – R.A. Gaekwad, EEE, 1994.
2. Digital Integrated Electronics – Taub and Shilling, McGraw-Hill, New Delhi, 1983.
3. Digital Electronics – Malvino and Leech, 5th Ed, Tata McGraw Hill.
4. Digital and Analog Circuits and Systems – J. Millman,, McGraw-Hill, London, 1979.
5. OP-Amps and Linear Integrated Circuits - Robert F. Coughlin, Frederick F. Driscoll (Pearson Education Publication).
6. Pulse and Digital Circuits by A. Anand Kumar, PH
7. Principles of Electronics – V.K. Mehta, S. Chand & Co. Ltd., 1999.

8. Electronic Devices and Circuit Theory – R.L. Boylestad and L. Nashelsky, 8th Ed, Pearson Education.
9. Introduction to Semiconductor Devices – M.S. Tyagi, Wiley, New York, 2004.

E-RESOURCES

1. https://www.technicalsymposium.com/alllecturenotes_ECE.html
2. https://www.tutorialspoint.com/pulse_circuits/pulse_circuits_multivibrator_overview.htm
3. <https://gradeup.co/sequential-circuits-2-study-notes>
4. <http://bistablewww.electronics-tutorials.ws/>
5. <https://www.machinedesign.com/automation-iiot/sensors/article/21831757/basics-of-rotary-encoders-overview-and-new-technologies>

PAPER 7 – MATHEMATICAL PHYSICS II

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

This course aims to explain various mathematical concepts like Complex Analysis, Fourier series, Fourier transforms and Curve fitting techniques and foundations of Group Theory which forms the backbone of all higher Physics. Know the method of contour integration to evaluate definite integrals of varying complexity. Gain ability to apply group theory to Physics problems, which is a pre-requisite for deeper understanding of crystallography, particle physics, quantum mechanics and energy bands in solids. The students will be able to use Fourier transforms as an aid for analyzing experimental data. To provide an understanding of Probability and to give the students an exposure about various curve fitting technique that is an essential requisite in computational techniques.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Understand the basics of complex algebra and evaluation of definite integrals |
| CO2 | Evaluation of coefficients of Fourier series and also its advantages |
| CO3 | Deriving Laplace transform, Inverse Laplace transform and also Fourier transform |
| CO4 | Learn the group axioms in group theory and symmetry operations along with applications. |

| | |
|------------|--|
| CO5 | Concept of Probability, Curve fitting technique. |
|------------|--|

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|----------------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|----------|---|-----------|------------|
| 1 | <p>Complex Variables and Integration</p> <p>1.1 Complex Numbers 1.2 Complex Algebra 1.3 Analytic functions 1.4 Cauchy Riemann conditions 1.5 Singular Points 1.6 Cauchy's theorem 1.7 Cauchy integral formula 1.8 Taylor's series 1.9 Liouville's theorem from Taylor's series 1.10 Laurent's series 1.11 Zeroes and singularities 1.12 Residue and poles 1.13 Residue theorem and its applications 1.14 Evaluation of definite integrals</p> | 18 | CO1 |
| 2 | <p>Fourier Series, Integrals and Transforms</p> <p>2.1 Basic definitions 2.2 Evaluation of coefficients of Fourier series 2.3 Problems 2.4 Advantages of Fourier series 2.5 Parseval's theorem 2.6 Application of Fourier series: analysis of periodic waveforms, full wave rectifier 2.7 Fourier integrals 2.8 Fourier transforms</p> | 18 | CO2 |

| | | | |
|----------|--|-----------|------------|
| | 2.9 Fourier integral 2.10 Introduction to Fourier sine and cosine transforms 2.11 Applications | | |
| 3 | Laplace Transforms 3.1 Laplace transform 3.2 Linearity, shifting, change of scale properties 3.3 Derivative of Laplace transform 3.4 Integration of Laplace transform 3.5 Inverse Laplace transform 3.6 Linearity property 3.7 Change of scale property 3.8 First and second translation property of Inverse Laplace transform 3.9 Convolution theorem 3.10 Applications of Laplace transform to differential equations and boundary value problems | 18 | CO3 |
| 4 | Group Theory 4.1 Group axioms – definition: subgroup, simple group, Abelian group, cyclic group, order of a group, class, isomorphism, homomorphism 4.2 Lagrange’s theorem statement and proof 4.3 Symmetry operations and respective symmetry elements: Identity, rotation, reflection, rotation reflection, inversion 4.4 Symmetry operations of a rectangle, equilateral triangle 4.5 Application: construction of group multiplication table (not character table) for groups of order 2, 3, cyclic group of order 4, noncyclic group of order 4 4.6 Definition of a point group 4.7 Symmetry operations of water 4.8 Symmetry operations of ammonia and $O(3)$ 4.9 Great orthogonality theorem (only statement) 4.10 Construction of character table for C_{2v} (water) and C_{3v} (ammonia) | 18 | CO4 |
| 5 | Probability and Curve Fitting 5.1 Probability 5.2 Dependent and independent events 5.3 Mutually exclusive events 5.4 Repeated and independent trials 5.5 Binomial law of probability 5.6 Multinomial law 5.7 Sample space and events 5.8 Random variables 5.9 Binomial, Poisson, normal (Gaussian) distributions | 18 | CO5 |

| | | | |
|--|---------------------------------|--|--|
| | 5.10 Standard deviations | | |
| | 5.11 Mean | | |
| | 5.12 Mode | | |
| | 5.13 Variance | | |
| | 5.14 Principle of least squares | | |
| | 5.15 Curve fitting | | |
| | 5.16 Central limit theorem | | |

TEXT BOOKS:

1. Sathyaprakash (2014). *Mathematical Physics* (6th edn), Sultan Chand & Co., ISBN no: 9788180549281
2. P.K. Chattopadhyay (2013) *Mathematical Physics* (2nd edn), New Age, New Delhi, ISBN no: 9788122434408
3. B.D. Gupta (1999). *Mathematical Physics* (4th edn), Vikas Publishing House Reprint, ISBN no: 9788125930969

REFERENCE BOOKS:

1. E. Butkov (1968). *Mathematical Physics* (Facsimile edition), Pearson, ISBN no: 9780201007275
2. Arfken, Weber (2005). *Mathematical Methods for Physicists* (6th edn), Elsevier Publication, ISBN no: 9789381269558
3. E. Kreyszig (1962). *Advanced Engineering Mathematics* (8th edn), Wiley, New York, ISBN no: 978-0471154969

E-RESOURCES

1. <https://youtu.be/ZF1yfCLpGOw> – Complex variable
2. NPTEL – Mathematics-Fourier series
3. NPTEL – Mathematics-Laplace Transforms
4. NPTEL – Probability and Random processes
5. Web.Math.Princeton.Edu

PAPER 8 – QUANTUM MECHANICS I

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

This course is designed to expose the students to understand the inconsistencies in Classical Physics. Define Heisenberg & Dirac formulation of quantum mechanics and explain their importance. Further to learn about the basic postulates of Quantum Mechanics. Solving the Schrödinger's equation to find solutions for many systems such as particle in a box, Hydrogen Atom and familiarize with different quantum numbers. Finally, to apply the formulation of Quantum Mechanics, through exactly solvable problems.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Understand the difference between Classical Mechanics and Old Quantum Theory |
| CO2 | Interpret the conditions and Evaluate problems in Schrödinger's Equation |
| CO3 | Compare the Schrödinger's, Heisenberg and Interaction pictures |
| CO4 | Solve and analyze problems in particle in a box, Square well potential, Barrier penetration and Simple Harmonic Oscillator |
| CO5 | Evaluate and solve problems in three dimensional Spherical Well and Harmonic Oscillator |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO5 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No. | CONTENTS OF MODULE | Hrs | COs |
|--------|--|-----|------------|
| 1 | <p>Review of Classical Mechanics and Old Quantum Theory</p> <p>1.1 Review of Principle of Least Action – Lagrangian and Hamiltonian Dynamics</p> <p>1.2 Photoelectric effect: Particle nature of radiation, photons</p> <p>1.3 Compton effect</p> <p>1.4 Scattering of radiation as particles – Diffraction of matter particles</p> <p>1.5 de-Broglie wavelength, Black body radiation</p> <p>1.6 Distribution of intensity, Planck's hypothesis</p> <p>1.7 Atomic spectra: Ritz combination principle, Balmer and other series</p> <p>1.8 Rutherford model</p> <p>1.9 Bohr model, Quantization of angular momentum</p> | 18 | CO1 |
| 2 | <p>Basic Formalism</p> <p>2.1 Interpretation and conditions on the wave functions</p> <p>2.2 Hermitian operators for dynamical variables – Eigen values – Eigen functions</p> <p>2.3 Postulates of Quantum mechanics</p> <p>2.4 Schrodinger equation</p> | 18 | CO2 |

| | | | |
|----------|--|-----------|------------|
| | 2.5 Normalization of wave function – Expectation value 2.6 Uncertainty principle –E quation of continuity 2.7 Ehrenfest’s theorem – Stationary states. | | |
| 3 | General Formalism 3.1 Linear vector space -Linear operators 3.2 Hilbert Space 3.3 Dirac Notation – Coordinate Representation – Momentum Representations 3.3 Time Evolution 3.4 Schrodinger, Heisenberg and Interaction Pictures 3.5 Symmetries and Conservation Laws 3.6 Unitary Transformations Associated with Translations 3.7 Unitary Transformations Associated with Rotations 3.8 Parity – Time Reversal | 18 | CO3 |
| 4 | One Dimensional Problems 4.1 Free Particle – Box Normalization 4.2 Particle in A Box 4.3 Square-Well Potential 4.4 Barrier Penetration 4.5 Simple Harmonic Oscillator(differential equation method – ladder operator method) 4.6 Coherent States, Properties and Its Applications 4.7 Attractive and Repulsive Dirac Delta Potentials | 18 | CO4 |
| 5 | Three Dimensional Problems 5.1 Orbital Angular Momentum 5.2 Spherical Harmonics 5.3 Free Particle in 3 Dimensions 5.4 Central Forces – Reduction of Two Body Problem 5.5 Particle in a Central Potential 5.6 Particle in a Spherical Well 5.7 Hydrogen Atom 5.8 Harmonic Oscillator In 3 Dimensions (Spherical Coordinates) | 18 | CO5 |

TEXT BOOKS:

1. W. Greiner (1984). *Quantum Mechanics* (1st edn), Springer, ISBN no: 9783540674580
2. P.M. Mathews and K. Venkatesan (2010). *A Text book of Quantum Mechanics* (2nd edn), McGraw Hill, New York, ISBN no: 9780070146174
3. G. Aruldas (2002). *Quantum Mechanics* (2nd edn), Prentice Hall of India, New Delhi, ISBN no: 978-8120336353

REFERENCE BOOKS:

1. V. Murugan (2014). *Quantum Mechanics* (1st edn), Pearson Education, India, ISBN no: 9788131773628

- Griffiths (2004). *Introduction to Quantum Mechanics* (2nd edn), Pearson Education, India, ISBN no: 9780131118928
- V. Devanathan (2005). *Quantum Mechanics* (2nd edn), Narosa Publishing House, New Delhi, ISBN no: 9781842656181

E-RESOURCES

- https://swayam.gov.in/nd1_noc20_ph05/preview
- <https://link.springer.com/book/10.1007/978-1-4612-1272-0>
- <https://physics.berkeley.edu/academics/courses/2014/fall/137a-quantum-mechanics>
- <https://nptel.ac.in/courses/115/106/115106066/>
- <http://www.infocobuild.com/education/audio-video-courses/physics/quantum-physics-iit-madras.html>

PAPER 5 – PRACTICAL I GENERAL

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 0:0:3:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Aim of General Physics Lab is to train the students for techniques in Physics so that they can investigate various relevant aspects and be confident to handle sophisticated instruments. To make the students to understand experimental physics is a natural extension of the theoretical concepts of Physics. Students will cherish that the laboratory experiments are set in consonance with the topics covered in theory like Lasers, Michelson interferometer, ultrasonic interferometer, Meyer's disc. P. Etalon using spectrometer, Arc spectrum, B-H curve, Geiger Muller counter etc. The purpose of doing laboratory experiments by the students is to afford an opportunity to familiarize themselves with various instruments, which they read in theory and to culture the habit of taking readings carefully, so as to get the results nearer to the already determined standard values with least error. The student is made to understand the physical principles underlying the experiment undertaken.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Comprehend the concept of the experiment. Evaluate theoretical calculations using experimental observations. |
| CO2 | Analyze the data and arrive at a valid conclusion. Apply computational thinking. |
| CO3 | Ability to analyze various spectra and identify the molecules by their spectra. Experimental skill development by performing basic spectroscopic measurements. |

| | |
|------------|---|
| CO4 | Students will have understanding of how to operate a GM counter. Method and formulae how to find the absorption coefficient of different materials and also get to know as to how to handle nuclear materials and nuclear safely management |
| CO5 | Determine the different laser parameters using the methods involved in Laser beam technique. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| CONTENTS OF MODULE | Hrs | COs |
|--|-----------|--|
| <p>Any FIFTEEN Experiments</p> <ol style="list-style-type: none"> Cornu's method – Young's modulus by elliptical fringes Young's modulus – Hyperbolic fringes. Band gap energy – Thermistor (using Post Office box) Hydrogen spectrum – Rydberg constant Thickness of the enamel coating on a wire – by diffraction. Lasers – study of laser beam parameters Laser experiments: (i) Diffraction at straight edge, (ii) Interference of laser beams – Lloyd's single mirror method, (iii) Interference using an optically plane glass plate, (iv) Diffraction at a straight wire and (v) Diffraction at a circular aperture. Determination of specific charge of an electron - L-G plate. Arc spectrum – copper Miscibility measurements using ultrasonic diffraction method. Viscosity of liquid – Meyer's disc. F. P. Etalon-Thickness of air film using spectrometer. Arc spectrum – Iron. Specific charge of an electron – Thomson's method. Determination of energy loss in a ferromagnetic material - B-H curve using CRO | 90 | CO1, CO2, CO3, CO4, CO5 |

| | | |
|--|--|--|
| 16. GM counter – Characteristics, inverse square law, absorption coefficient. | | |
| 17. Determination of Hall coefficient and charge carrier concentration of semiconductor material - Hall effect | | |
| 18. Susceptibility by Quincke's method | | |
| 19. Ultrasonics – Compressibility of a liquid | | |
| 20. Determination of particle size of Lycopodium powder using semiconductor laser. | | |

TEXT BOOK:

1. An Advanced Course in Practical Physics – D. Chattopadhyay, P.C. Rakshit, and B. Saha, 6th Ed, Books and Allied, Kolkata, 2002.

PAPER 6 PRACTICAL II ELECTRONICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 0:0:3:0 | CIA Marks : 40 |
| Exam Hours : 04 | ESE Marks : 60 |

LEARNING OBJECTIVES:

To develop an understanding of fundamentals of electronics in order to rehash the understanding of electronic devices that are part of the technologies that surround us. This course provides a comprehensive understanding of electronic devices and circuits. Students will have an understanding of various theoretical circuits being realized in real. Basic concepts of semiconductors, behavior of FETs and op-amps is emphasized. This course also helps to design simple circuits using op-amps, integrated circuits, know the principle in these methods and to inculcate strong laboratory skills to take up independent projects. To comprehend and compare the different characteristics of semiconductor devices and their various applications setting the base for research work. The students are trained to be confident to troubleshoot the circuit and apply a graphical analysis to the experimental data.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Construct circuits using Integrated circuits, op-amps |
| CO2 | Use the appropriate measuring device to record the data with precision |
| CO3 | To comprehend and compare the different characteristics of semiconductor devices and their various applications |
| CO4 | Understand the operation of several digital circuits both combinational and sequential |
| CO5 | Solve simultaneous equations, perform D/A conversion using Op-amp |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| CONTENTS OF MODULE | Hrs | COs |
|--|-----------|--|
| LIST OF EXPERIMENTS 1. Study of attenuation characteristics of Wien bridge network and Wien bridge oscillator using Op-Amp 2. Study of attenuation characteristics of phase shift network and phase shift oscillator using Op-Amp 3. Design of a Schmitt trigger circuit using IC 741 f or a given hysteresis 4. Design a square wave oscillator using IC 741 and Triangular wave oscillator 5. Construction of pulse generator using the IC 741 – Application as frequency divider 6. Study of R-S, clocked R-S, D flip-flops using NAND gates 7. Study of J-K, D and T flip-flops using IC 7473 8. IC 7490 as scalar and seven segment display using IC 7447 9. IC 7473/76 – shift register, ring counter & Johnson counter 10. Design of UJT relaxation oscillator for a frequency – Generation of | 90 | CO1, CO2, CO3, CO4, CO5 |

| | | |
|---|--|--|
| positive and negative triggering pulses 11. Solving simultaneous equations IC 741/IC LM324 12. Op-amp – 4-bit D/A converters using R-2R ladder network 13. Op-amp – 4-bit D/A converters using Binary Weighted resistor method 14. Op-amp – Active filters: Low pass, High pass and Band pass filters (Second Order Butterworth design) 15. Construction of square wave generator using IC 555 – study of VCO 16. Design of Schmitt trigger circuit using IC 555 for a given hysteresis 17. Construction of pulse generator using the IC 555 – Application as frequency divider 18. Binary UP/DOWN counter using JK Flip flops 19. Arithmetic operations using IC 7483 and IC 7486 | | |
|---|--|--|

TEXT BOOKS:

1. D. Chattopadhyay, P. C. Rakshit (2008). *Electronics Fundamentals and Applications* (1st edn), New Age International, ISBN no:9788122423792
2. V. Vijayendran (2015). *Introduction to Integrated Electronics* (1st edn), Viswanathan Printers and Publishers, Pvt. Ltd., ISBN no: 9788187156055
3. D. Chattopadhyay, P.C. Rakshit, and B. Saha (2002). *An Advanced Course in Practical Physics* (6th edn), Books and Allied, Kolkata, ISBN no: 978-8173810541

E-RESOURCE

1. <https://meet.google.com/linkredirect?authuser=1&dest=https%3A%2F%2Fyoutu.be%2FHJKFXmJVwaA-waveform>

**ELECTIVE I
PAPER 9 GENERAL RELATIVITY**

(Total: 90 hours)

LEARNING OBJECTIVES:

The students shall be familiar with the fundamental principles of the general theory of relativity. They shall know the meaning of basic concepts like the equivalence principles, inertial frames and how gravity is understood as a manifestation of a curved space-time. They shall also be familiar with some of the main contents of the theory: motion in the gravitational field, time dilation and frequency shifts, bending of light, gravitational waves and cosmological models with expanding space. The students shall master calculating with tensors and differential forms. They shall also be able to describe physical phenomena in different coordinate systems and to transform from one coordinate system to another.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Understand the basic principles of four vectors, relativistic particle motion and Lorentz |
|------------|---|

| | |
|------------|--|
| | Transformations. |
| CO2 | Explain the main concepts of Tensors such as Line Element, Reciprocal Basis, Change of basis, Transformation Law and Affine Connection. |
| CO3 | Acquire knowledge about Covariant Derivative, the Riemann Curvature Tensor, Second Covariant Derivative, Covariant Differentiation, Symmetry Properties of the Riemann Tensor, Bianchi Identities and the Einstein Tensor. |
| CO4 | Explain the Equivalence Principle, Local Freely Falling Frame, Spherically Symmetric Solution to Field Equations, Motion in Three-Dimensional Euclidian Space. |
| CO5 | Understand the Linearized Theory and Plane-wave solution to the Einstein Field Equations. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No. | CONTENTS OF MODULE | Hrs | COs |
|--------|---|-----|------------|
| 1 | Review of Special Theory of Relativity 1.1 Introduction to Basic Principles of Four-Vectors 1.2 Relativistic Particle Motion 1.3 Lorentz Transformations. | 18 | CO1 |
| 2 | Tensors – I 2.1 Line Element, Reciprocal Basis 2.2 Metric, Vectors, Tensors 2.4 Change of Basis 2.5 Transformation Law 2.6 Affine Connection with Example: Polar Coordinates. | 18 | CO2 |
| 3 | Tensors – II 3.1 Covariant Derivative 3.2 The Riemann Curvature Tensor | 18 | CO3 |

| | | | |
|----------|--|-----------|------------|
| | 3.3 Second Covariant Derivative 3.4 Covariant Differentiation 3.5 Symmetry Properties of the Riemann Tensor 3.6 Bianchi Identities 3.7 The Einstein Tensor, Example—Surface of a Sphere, Volume element with Rotations | | |
| 4 | General Relativity 4.1 Motion in Three-Dimensional Euclidian Space 4.2 Parallel Displacement, Einstein’s Theory 4.3 Newtonian Limit, the Equivalence Principle 4.4 Local Freely Falling Frame 4.5 Spherically Symmetric Solution to Field Equations 4.6 Solution in Vacuum, Interpretation of Schwarzschild Metric. | 18 | CO4 |
| 5 | Gravitational Radiation 5.1 Linearized Theory Auxiliary (Lorentz) Condition 5.2 Plane-Wave Solution to the Einstein Field Equations 5.3 Interpretation, Detection. | 18 | CO5 |

TEXT BOOKS:

1. J.D. Walecka (2007). *Introduction to General Relativity*, World Scientific(1st Edn), ISBN no: 978-9812705853
2. S. Weinberg (1972). *Gravitation and Cosmology*, John Wiley(1st Edn), ISBN no: 978-0-471-92567-5
3. Edwin F Taylor, JA Wheeler, E Bertschinger (2018). *Exploring Black Holes – Introduction to General Relativity* (2nd edn), ISBN no: 0-201-38423-X

REFERENCE BOOKS:

1. Edwin F. Taylor, J.A. Wheeler (1992). *Spacetime Physics* (2nd edn), W H Freeman and Co., ISBN no: 9780716723271.
2. T. Padmanabhan (2010). *Gravitation*, Cambridge University Press(1st Edn) ISBN no: 0521882230
3. Lewis Ryder,(2009) *Introduction to General Relativity*, Cambridge University Press(2nd Edn) ISBN NO: 9780511809033

E-RESOURCE

1. <https://archive.org/details/exploringblackholes>

PAPER 9 GROUP THEORY

(Total: 90 hours)

LEARNING OBJECTIVES:

The course gives an introduction to group theory that will allow a student to analyze symmetries and their implications in a systematic and unified way, including solving or simplifying various problems in atomic, molecular and solid-state physics for which symmetry plays a role. A more general learning outcome is that the unified discussion of symmetries will give a deeper understanding of the structure of quantum mechanics. To obtain proficiency in the study of symmetries of physical systems, and the use of groups to classify and quantify natural phenomenon.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Understand the concepts of Discrete Groups such as Multiplication Table, Conjugate Elements and Classes, Direct Product of Group, Isomorphism and Homomorphism, Permutation Groups and Distinct Groups of a Given Order. |
| CO2 | Explain the key points of the Representation Theory of Finite Groups. Learn about the Schur's Lemmas, the Orthogonality Theorem, Symmetrized Basis Functions for Irreducible Representations, Direct Product of Representations and Representations of a Direct Product Group. |
| CO3 | Understand Continuous Groups with examples. Learn about Isomorphism, one parameter groups, Structure Constants, and Linear Representation of Lie Groups. |
| CO4 | Explore the Applications of Group Theory in High Energy physics by learning about the Killing Form, the Structure of Simple Lie Algebras, and Representations of Quark Model. |
| CO5 | Understand the applications of Group Theory in Condensed Matter Physics by learning the problem of Electronic Structure of Crystals, Translation Group and the Reciprocal Lattice. Learn about the Irreducible Representations of a Space Group, Free Electron Energy Bands. . |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|-----------------------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No. | CONTENTS OF MODULE | Hrs | COs |
|--------|--|-----|-----|
| 1 | Discrete Groups 1.1 Concept of Groups and Multiplication Table 1.2 Conjugate Elements and Classes 1.3 Sub groups – Direct Product of Group 1.4 Isomorphism and Homomorphism 1.5 Permutation Groups – Distinct Groups of a Given Order | 18 | CO1 |
| 2 | Representation Theory of Finite Groups 2.1 Introduction to Invariant Subspaces 2.2 Reducible Representations 2.3 The Schur's Lemmas and the Orthogonality Theorem 2.4 Interpretation of the Orthogonality Theorem 2.5 Characters of a Representation – Example of C_{4v} 2.6 Regular Representation 2.7 Symmetrized Basis Functions for Irreducible Representations 2.8 Other Reducible Representations 2.9 Direct Product of Representations and Representations of a Direct Product Group, | 18 | CO2 |
| 3 | Continuous Groups 3.1 Lie Groups – Examples 3.2 Isomorphism 3.3 Subgroups – One Parameter Groups 3.4 Structure Constants 3.5 Lie Algebra – Structures 3.6 Linear Representations of Lie Groups 3.7 Irreducible representation | 18 | CO3 |
| 4 | Applications in High Energy Physics 4.1 SU(3) 4.2 The Killing Form 4.3 The Structure of Simple Lie Algebras 4.4 Representations 4.5 Quark Model | 18 | CO4 |

| | | | |
|----------|--|-----------|------------|
| 5 | Applications in Condensed Matter Physics 5.1 The Problem of the Electronic Structure of Crystals 5.2 Translation Group and the Reciprocal Lattice 5.3 Irreducible Representations of a Space Group 5.4 Free Electron Energy Bands: One- and Two-Dimensional Lattices 5.5 Energy Bands of Real Crystals.. | 18 | CO5 |
|----------|--|-----------|------------|

TEXT BOOKS:

1. A.W. Joshi (2018). *Elements of Group Theory for Physicists* (5th edn), New Age International, ISBN no: 978-8122409758
2. M. Hamermesh (1989). *Group Theory* (3rd edn), Dover Publications, ISBN no: 0486661814
3. Pichai Ramadevi and Varun Dubey (2019). *Group Theory for Physicists*, (1st Edn) Cambridge University Press, ISBN no: 9781108554862

REFERENCE BOOKS:

1. Robert N. Cahn (1984). *Semi-Simple Lie Algebras and Their Representations* (2nd edn), The Benjamin/Cummings Publishing Co., ISBN no:978-0-486-15031-4
2. Howard Georgi (2018). *Lie Algebra in Particle Physics* (1st Edn), CRC Press, ISBN no: 978-0738202334
3. Shah Sudesh Kumari, (2012), *Group Theory* (1st edn), Pearson Education, ISBN no: 9788131787632, 9788131787632

PAPER 9 SPECTROSCOPY

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 05 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

To understand the interaction of radiation with matter leading to the different type of spectroscopy. To comprehend the theory of Rotational and Vibrational spectroscopy. Working principles, outline device construction and applications of NMR, EQR and ERQ is detailed. The methods to interpret UV-Vis spectroscopy is explained. Apply the spectroscopic techniques for the qualitative and quantitative analysis of various chemical compounds. Realize the applications of spectroscopy in various fields.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Understand the concept of Microwave Spectroscopy and analyze the spectra of diatomic, Polyatomic Molecules and Symmetric Top molecules |
|------------|--|

| | |
|------------|---|
| CO2 | Infra-Red Spectroscopy and its Instrumentation technique |
| CO3 | Account of Raman activity by Classical and Quantum theory, The structure determination of N ₂ O and SO ₂ Raman Spectroscopy |
| CO4 | UV Spectroscopy, its origin, principle and measurement |
| CO5 | Resonance spectroscopy NMR, EQR and ESR. Principle behind Mossbauer spectroscopy is discussed |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO6 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | Contents of Module | Hrs | COS |
|-------|---|-----|-----|
| 1 | Microwave Spectroscopy 1.1 Rotational spectra of diatomic molecules - reduced mass – rotational constant 1.2 Effect of isotopic substitution 1.3 Non rigid rotator – centrifugal distortion constant 1.4 Polyatomic molecules – linear – symmetric top molecules 1.5 Hyperfine structure and quadrupole moment of linear molecules 1.6 Instrumentation techniques – block diagram 1.7 Information Derived from Rotational Spectra 1.8 Stark effect- 1.9 Problems. | 18 | CO1 |
| 2 | UV Spectroscopy 2.1 Origin of UV spectra Diatomic 2.2 Laws of absorption – Lambert Bouguer law – Lambert Beer law 2.3 molar absorptivity – transmittance and absorbance | 18 | CO2 |

| | | | |
|----|--|----|-----|
| | <p>2.4 Color in organic compounds- Absorption by organic Molecule Chromophores</p> <p>2.5 Effect of conjugation on chromophores</p> <p>2.6 Choice of Solvent and Solvent effect</p> <p>2.7 Absorption by inorganic systems</p> <p>2.8 Instrumentation - double beam UV-Spectrophotometer</p> <p>2.9 Simple applications</p> | | |
| 3 | <p>Infrared Spectroscopy</p> <p>3.1 Vibrations of simple harmonic oscillator – zero-point energy.</p> <p>3.2 Anharmonic oscillator – fundamentals and overtones.</p> <p>3.3 Diatomic Vibrating Rotator- PR branch – PQR branch.</p> <p>3.4 Fundamental modes of vibration of water – CO₂.</p> <p>3.5 Introduction to application of vibrational spectra.</p> <p>3.6 Instrumentation techniques – FTIR spectroscopy.</p> <p>3.7 Problems</p> <p>3.8 Interpretation of vibrational spectra - simple applications.</p> | 18 | CO3 |
| 4. | <p>Raman Spectroscopy</p> <p>4.1 Classical theory – molecular polarizability – polarizability ellipsoid</p> <p>4.2 Quantum theory of Raman effect</p> <p>4.3 rotational Raman spectra of linear molecule.</p> <p>4.4 symmetric top molecule – Stokes and antistokes line- SR branch</p> <p>4.5 Raman activity of water – CO₂</p> <p>4.6 Mutual exclusion principle- determination of N₂O structure</p> <p>4.7 Instrumentation technique and block diagram</p> <p>4.8 structure determination of planar and AB₃ molecule, SO₂ through IR and Raman spectroscopy.</p> <p>4.9 Single crystal Raman spectra</p> | 18 | CO4 |
| 5 | <p>Resonance Spectroscopy</p> <p>5.1 Nuclear and Electron spin-Interaction with magnetic field.</p> <p>5.2 Population of Energy levels.</p> <p>5.3 Larmor precession-NMR- NMR of Hydrogen nuclei.</p> <p>5.4 Chemical shift,</p> <p>5.5 Chemical shift, techniques and instrumentation for NMR spectroscopy</p> <p>5.6 Medical applications of NMR-ESR Spectroscopy.</p> <p>5.7 g factor-fine and hyperfine structure</p> <p>5.8 Double Resonance-Basic idea of Mossbauer spectroscopy</p> <p>5.9 Recoilless emission and absorption</p> | 18 | CO5 |

TEXT BOOKS:

1. C.N. Banwell and E.M. McCash (1994). *Fundamentals of Molecular Spectroscopy* (4th edn), TMH, New Delhi, ISBN no: 0077079760, 9780077079765
2. G. Aruldas (2001). *Molecular Structure and Spectroscopy*, (2nd edn), Prentice Hall of India Pvt. Ltd. New Delhi, ISBN no: 8120317491 9788120317499
3. D.N. Satyanarayana (2001). *Vibrational Spectroscopy and Applications* (1 st edn), New Age International Publication, ISBN no: 9788122409390

REFERENCE BOOKS:

1. B.K. Sharma (2015). *Spectroscopy*, Goel Publishing House Meerut,(1st edn) ISBN no: 978-8182836716
2. Yadav Lal Dhar Singh (2005). *Organic Spectroscopy*, (1st edn) Springer-Verlag, ISBN no: 9781402025747, 9781402025747
3. Attaur Rahman (1986). *Nuclear Magnetic Resonance*, (1st edn) Springer Verlag, ISBN no: 978-1-4612-4894-1

E-RESOURCES

1. <https://www.coursera.org/lecture/spectroscopy/introduction-3N5D5>
2. <https://www.coursera.org/lecture/spectroscopy/infrared-spectroscopy-8jEee>
3. <https://nptel.ac.in/content/storage2/courses/103108100/module5/module5.pdf>
4. https://onlinecourses.nptel.ac.in/noc20_cy08/preview
5. https://www.lkouniv.ac.in/site/writereaddata/siteContent/202004080628301734aksingh_MICROWAVE_SP ECTROSCOPY_2.pdf
6. <https://www.sciencedirect.com/science/article/pii/S2090536X15000477>
7. <https://www.coursera.org/lecture/spectroscopy/nmr-spectroscopy-introduction-XCWRu>

ADVANCED COURSE I – PAPER 10 – INTRODUCTION TO MICROPROCESSOR 8085 AND MICROCONTROLLER 8051

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

In this course architecture of 8085 Microprocessor is introduced. Instruction set of 8085 and Assembly language Programs are elucidated. This course also includes Architecture of 8051 Microcontroller along with 8051 Instruction Set and Assembly Language Programs. Lastly this course explains interfacing microcontroller 8051 with Peripheral systems

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Study the architecture of microprocessor 8085 |
|-------------|---|

| | |
|-------------|---|
| CO 2 | Learn Assembly language Programs using 8085 Microprocessor |
| CO 3 | Acquire knowledge about memory organization of microcontroller 8051 |
| CO 4 | Write programs in assembly language using microcontroller 8051 |
| CO 5 | Understand the operation of interfacing microcontroller with peripheral systems |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED–3, MODERATELY CORRELATED– 2, WEAKLY CORRELATED– 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|----------|---|-----------|-------------|
| 1 | 8085 Architecture 1.1. Intel 8085 microprocessor: Introduction 1.2. Architecture of 8085 1.3. Registers 1.4. Flags 1.5. ALU 1.6. Address and data bus 1.7. Demultiplexing address/data bus 1.8. Control and status signals 1.9. Control bus 1.10. Programmer's model of 8085 1.11. Pin functions of 8085 1.12. Memory Read cycle 1.13. Memory Write cycle | 10 | CO 1 |

| | | | |
|---|--|--|--|
| <p style="text-align: center;">2</p> | <p>Instruction set of 8085 and Assembly language Programs</p> <p>2.1. Instruction set: Data transfer instructions 2.2. Arithmetic instructions 2.3. Logic instructions 2.4. Addressing modes 2.5. Assembly language Programs Addition 2.6. Subtraction 2.7. Multiplication 2.8. Division 2.9. Ascending 2.10. Descending 2.11. Largest 2.12. Smallest 2.13. Square 2.14. Square Root 2.15. HEX To BCD 2.16. BCD To HEX</p> | <p style="text-align: center;">20</p> | <p style="text-align: center;">CO 2</p> |
| <p style="text-align: center;">3</p> | <p>Architecture of 8051 Microcontroller</p> <p>3.1. Introduction 3.2. Features of 8051 3.3. 8051 microcontroller hardware 3.4. Pin configuration 3.5. Internal RAM 3.6. Internal ROM 3.7. Register set of 8051 3.8. Memory organization of 8051 3.9. Input/output pins 3.10. Ports and circuits 3.11. External data memory 3.12. External program memory</p> | <p style="text-align: center;">20</p> | <p style="text-align: center;">CO 3</p> |
| <p style="text-align: center;">4</p> | <p>8051 Instruction Set and Assembly Language Programs</p> <p>4.1. Addressing modes 4.2. Data transfer instructions 4.3. Data exchange instructions 4.4. Logical instructions: byte and bit level 4.5. Logical operations, rotate and swap operations 4.6. Arithmetic instructions: Addition 4.7. Subtraction</p> | <p style="text-align: center;">20</p> | <p style="text-align: center;">CO 4</p> |

| | | | |
|----------|---|-----------|-------------|
| | 4.8. Multiplication 4.9. Division 4.10. Assembly language programming techniques: Addition 4.11. Subtraction 4.12. Multiplication 4.13. Division of 8 bit numbers | | |
| 5 | Interfacing Microcontroller 8051 with Peripheral systems 5.1. Interfacing keyboard: Simple keyboard interface 5.2. Interfacing displays: Interfacing seven segment LED displays 5.3. Interfacing DAC to 8051 5.4. Interfacing ADC to 8051 5.5. Interfacing sensors 5.6. Interfacing stepper motor. | 20 | CO 5 |

TEXT BOOKS:

1. R.S. Gaonkar (1992). *Microprocessor Architecture Programming and Application with 8085/8080A* (2nd edn), Wiley Eastern Ltd., ISBN no: 978-0852262979
2. V. Vijayendran (2003). *Fundamental of Microprocessor 8085*, S. Viswanathan Publishers, Chennai, ISBN no: 978-8187156284
3. B. Ram (1993). *Fundamentals of Microprocessors and Microcomputers* (1st edn), Dhanpat Rai Publication, ISBN no: 9788189928605

REFERENCE BOOKS:

1. Subrata Ghoshal (2010). *8051 Microcontroller: Internals, Instructions, Programming & Interfacing*, Dorling Kindersley (India) Pvt Ltd, ISBN no: 97881317314321
2. Kenneth J. Ayala (1996). *The 8051 Micro Controller Architecture, Programming and Applications* (3rd edn), Penram International, ISBN no: 9780314201881
3. *Microprocessors & Its Applications* – A.P. Godse and D.A. Godse, Technical Publications, Pune, 2008, ISBN no: 9788184314281

E-RESOURCES

1. https://www.tutorialspoint.com/microprocessor/microprocessor_8085_architecture.htm
2. <https://gpbarkot.org.in/download/file/ihoN4LIRHP.pdf>
3. <https://www.electronicshub.org/8051-microcontroller-memory-organization/>
4. <https://www.circuitstoday.com/8051-addressing-modes>
5. <https://www.tutorialspoint.com/interfacing-stepper-motor-with-8051microcontroller>

PAPER 11 STATISTICAL MECHANICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The aim and objective of the course on Statistical Mechanics is to equip the post-graduate students with the techniques of Ensemble theory to understand the macroscopic properties of the matter in terms of its microscopic constituents. In this process initially an understanding of equations of state and thermodynamic potentials for elementary systems of particles is planned. Modern aspects of equilibrium and non-equilibrium statistical Physics is followed. The features and examples of Classical Statistics and Quantum Statistics are described. In addition it develop an analytic ability to solve problems relevant to Statistical Mechanics.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Gain knowledge and become familiar with various thermodynamics processes. |
| CO2 | Correlate how the concept of ensembles formalism forms the basis of statistical mechanics |
| CO3 | Understand the concepts of Maxwell-Boltzmann statistics, Bose Einstein statistics, Fermi Dirac statistics and realize the classical and quantum statistics which describes the state of a system made of microscopic particles |
| CO4 | Realize the applications of statistical mechanics by studying specific examples like Bose Einstein Condensation, Black body radiation, Liquid Helium and its properties |
| CO5 | Value of the phase transitions and extend these ideas to quantum world. To understand phase transition arising in Ising model |

Mapping Of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|-----------------------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| CO3 | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| CO4 | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| CO5 | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| CO6 | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 | 2 | 1 |

STRONGLY CORRELATED - 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED - 1

| S. NO | CONTENTS OF MODULE | Hrs | Cos |
|------------------|---------------------------|------------|------------|
|------------------|---------------------------|------------|------------|

| | | | |
|---|--|----|-----|
| 1 | <p>Unit 1: EQUILIBRIUM THERMODYNAMICS</p> <p>1.1 Introduction to Thermodynamics – Ideal gas – Heat and Work 1.2 Laws of thermodynamics 1.3 Carnot Engine 1.4 Entropy – Entropy of Ideal gas 1.5 Thermodynamic potentials - Properties of thermodynamic potentials 1.6 Clausius Clayperon equation 1.7 Maxwell’s thermodynamical equations- 1.8 Thermodynamic probability 1.9 Gibb’s phase rule.</p> | 18 | CO1 |
| 2 | <p>Unit 2: ENSEMBLES</p> <p>2.1 Phase space 2.2 Probability Distribution functions - Ergodic hypothesis 2.3 Liouville’s theorem 2.4 Introduction to Ensembles – Microcanonical ensemble 2.5 Principle of a Priori probability 2.6 Law of equipartition of energy 2.7 Canonical and grand canonical ensembles 2.8 Definition of partition function in the ensembles 2.9 Determination of thermodynamic quantities from Partition function 2.10 Classical ideal gas in microcanonical, canonical and grand canonical ensemble 2.11 Entropy of mixing and Gibb’s paradox 2.12 Linear harmonic oscillator in canonical ensemble 2.13 Demonstration of equipartition of energy through canonical distribution.</p> | 18 | CO2 |
| 3 | <p>Unit 3: Classical and Quantum Statistics</p> <p>3.1 Statistics of distinguishable and indistinguishable particles 3.2 Maxwell-Boltzmann statistics 3.3 Bose Einstein statistics 3.4 Fermi Dirac statistics 3.5 Calculating the partition function for Bosons and Fermions 3.6 Derivation of Bose-Einstein and Fermi-Dirac distributions through microcanonical and grand canonical ensembles</p> | 18 | CO3 |
| 4 | <p>Unit 4: Applications</p> | 18 | CO4 |

| | | | |
|----------|--|-----------|------------|
| | 4.1 Ideal Fermi gas: Internal energy, Equation of state, Completely degenerate Fermi gas 4.2 Ideal Bose gas: Internal energy, Equation of state 4.3 Bose Einstein Condensation and its critical conditions 4.4 Bose-Einstein condensation in ultra-cold atomic gases ,its detection and thermodynamic properties 4.5 Black body radiation - Planck's distribution law 4.6 Liquid Helium and its properties. | | |
| 5 | Unit 5: Phase transition, Fluctuations: 5.1 First and second order phase transition 5.2 Ehrenfest's classification of phase transition 5.3 Landau's order parameter theory of phase transition 5.4 Diamagnetism – Paramagnetism – Ferromagnetism 5.5 Random walk - Brownian motion 5.6 Ising model in one dimension. | 18 | CO5 |

TEXT BOOKS:

1. S.K. Sinha (1990). *Statistical Mechanics*. Tata McGraw–Hill, New Delhi, ISBN no: 8173197172
2. B.K. Agarwal and M. Eisner (1998). *Statistical Mechanics* (2nd edn), New Age International, New Delhi, ISBN no: 8122411576.
3. F. Reif (1965). *Fundamentals of Statistical and Thermal Physics*, Mac Graw-Hill, New York. ISBN no: 0070518009

REFERENCE BOOKS:

1. C. Kittel (1987). *Thermal Physics* (2nd edn), CBS Publication, New Delhi, ISBN no: 978- 8185015712.
2. M. K. Zemansky (1968). *Heat and Thermodynamics* (5th edn), McGraw-Hill New York.
3. R. K. Pathria (1996). *Statistical Mechanics* (2nd edn), Butter Worth-Heinmann, New Delhi.

E-RESOURCES

1. https://itp.uni-frankfurt.de/~gros/Vorlesungen/TD/5_Thermodynamic_potentials.pdf
2. https://itp.uni-frankfurt.de/~gros/Vorlesungen/TD/10_Grand_canonical_ensemble.pdf
3. <https://www.d.umn.edu/~vvanchur/2014PHYS4031/Chapter7.pdf>
4. <http://userhome.brooklyn.cuny.edu/kshum/documents/Ch13n1d2d3dwF-Ddistribution.pdf>
5. <https://web.stanford.edu/~peastman/statmech/phasetransitions.html>

PAPER 12 – QUANTUM MECHANICS II

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The aim and objective of the course on Quantum Mechanics II is to introduce the students of M.Sc. class to the formal structure of the subject and to equip them with the techniques of angular momentum, perturbation theory, and scattering theory so that they can use these in various branches of physics as per their requirement. The aim of this course is to expose students to solve problems in quantum systems using approximation methods, and to formulate quantum theory of scattering. To understand time dependent perturbation theory and to learn the basics of relativistic quantum mechanics.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Better understanding of the mathematical foundations of angular momentum of a system of particles. |
| CO2 | Apply the perturbation theory to scattering matrix and partial wave analysis. Compare and analyze the different approximation methods |
| CO3 | Applications of various approximation methods in solving the Schrodinger equation. |
| CO4 | Understand the concept of Scattering cross-section, scattering amplitude of Born approximation and partial wave analysis method |
| CO5 | Grasp the central concept and principles of relativistic Quantum Mechanics and solve problems. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS | PO | | | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. | CONTENTS OF MODULE | Hrs | COs |
|----|--------------------|-----|-----|
|----|--------------------|-----|-----|

| No. | | | |
|-----|---|----|-----|
| 1 | Angular Momentum and Identical Particles 1.1 Eigen Value Spectrum from Angular Momentum Algebra 1.2 Matrix Representation 1.3 Spin Angular Momentum 1.4 Addition of Angular Momenta 1.5 Clebsch–Gordan Coefficients 1.6 Identical Particles 1.7 Symmetry and Anti-Symmetry of Wave Functions 1.8 Spin and Statistics Pauli Matrices | 18 | CO1 |
| 2 | Approximation Methods 2.1 Time-Independent Perturbation Theory for Non-Degenerate Level 2.2 Time-Independent Perturbation Theory for Degenerate Levels 2.3 Stark Effect 2.4 Variation Method 2.5 Ground State Energy Of Helium Atom 2.6 JWKB Approximation 2.7 Application to Simple Harmonic Oscillator 2.8 Connection Formula (No Derivation) 2.9 WKB quantization rule and it's applications | 18 | CO2 |
| 3 | Perturbation Theory 3.1 Time Dependent Perturbation Theory 3.2 Fermi Golden Rule 3.3 Harmonic Perturbation 3.4 Transition Probabilities 3.5 Emission and Absorption Of Radiation 3.6 Einstein's Co-efficient Of Spontaneous Emission, Stimulated Emission 3.7 Adiabatic Approximation 3.8 Sudden Approximation | 18 | CO3 |
| 4 | Scattering Theory 4.1 Scattering Amplitude – Differential Scattering Cross Section 4.2 Relation Between Scattering Amplitude and Scattering Cross Section 4.3 First Born Approximation 4.4 Expression for Scattering Amplitude 4.5 Partial Wave Analysis 4.6 Scattering Amplitude 4.7 Optical Theorem 4.8 Effective Range Theory For S-Wave Scattering | 18 | CO4 |

| | | | |
|----------|---|-----------|------------|
| | 4.9 Scattering of Identical Particles. | | |
| 5 | Relativistic Quantum Mechanics 5.1 Klein–Gordon Equation – Probability and Current Densities 5.2 Equation of Continuity 5.3 Drawbacks Of K–G Equation 5.4 Dirac Equation 5.5 Properties Of α and β Matrices 5.6 Plane-Wave Solution of Dirac Equation– Equation of Continuity 5.7 Interpretation of Negative Energy States – Probability and Current Densities | 18 | CO5 |

TEXT BOOKS:

1. J.D. Bjorken and S.D. Drell (1964). *Relativistic Quantum Mechanics* (1st edn), MacGraw-Hill, New York, ISBN no: 0070054940
2. V. Devanathan (2005). *Quantum Mechanics* (2nd edn), Narosa Publishing House, New Delhi, ISBN no: 184265618X
3. G. Aruldhas (2002). *Quantum Mechanics*, Prentice-Hall of India, New Delhi, ISBN no: 9788120336353

REFERENCE BOOKS:

1. W. Greiner (1984). *Quantum Mechanics* (2nd edn), Springer, ISBN no: 978-3-642-56826-8
2. P.M. Mathews and K. Venkatesan (1976). *A Text book of Quantum Mechanics* (2nd edn), Tata McGraw-Hill, New Delhi, ISBN no: 0070965102
3. L.I. Schiff (1968). *Quantum Mechanics* (3rd edn), International Student Edition, McGraw-Hill Kogakusha, Tokyo, ISBN no: 0070856435

E-RESOURCES

1. <https://ocw.mit.edu/courses/physics/8-05-quantum-physics-ii-fall-2013>
2. [https://www.researchgate.net/publication/331074510 QUANTUM MECHANICS](https://www.researchgate.net/publication/331074510_QUANTUM_MECHANICS) II Course by E Kogan
3. <https://ww2.odu.edu/~skuhn/PHYS621/721.html>
4. <https://www.springer.com/gp/book/9789462391147>

ELECTIVE II PAPER 15 MEDICAL PHYSICS

| | |
|----------------------|---------------------|
| Course Code : | Credits : 05 |
|----------------------|---------------------|

L:T:P:S : 6:0:0:0
Exam Hours : 03

CIA Marks : 40
ESE Marks : 60

LEARNING OBJECTIVES:

The objective of the course is to understand the major application of Physics to Medicine. To study the aid of different medical devices such as X-ray machines, gamma camera, accelerator and nuclear magnetic resonance. To outline the principles of Physics of different medical radiation devices and their modern advances, especially in medical radiation therapy and different applications in medical physics. Medical physics forms a good base for further studies like research.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Learn about bioelectric signals, electrodes, needle and micro electrodes, biosensors and pulse sensors. |
| CO2 | Explain the main concepts of transducers such as thermistors, photo-electric type transducer, photo emissive cells, detectors and optical fibers. |
| CO3 | Understand the basics of blood pressure measurements. Learn about sphygmomanometer, measurement of heart rate, basic principles of EGC, basic principles of electroneurography (ENG) and basic principles of MRI. |
| CO4 | Learn the fundamentals, production and applications of X-rays. Familiarize with the basic principles of X-rays. |
| CO5 | Learn the concepts of thermography, infrared thermography, liquid crystal thermography, microwave thermography and the basic principles of ultrasonography. Explore the applications of lasers in medicine. |

Unit 1: Bioelectric Signals and Electrodes

Types of bioelectric signal and their characteristics – electrodes: surface, needle and microelectrodes – biosensors – pulse sensors.

Unit 2: Transducers

Thermistors – photo electric transducers: photo voltaic cells, photo emissive cells, photoconductive cells; piezoelectric transducer – diode – detectors – optical fibers.

Unit 3: Blood Pressure Measurements

Introduction sphygmomanometer: measurement of heart rate – basic principles of electrocardiogram (ECG) – basic principles of electroneurography (ENG) – basic principles of magnetic resonance imaging (MRI).

Unit 4: X-rays

Basic of X-ray – production of X-ray – X-ray image – applications of X-ray examinations – basic principles of X-ray tomography.

Unit 5: Thermography

Endoscopes: principle and types; thermography: principles and types infrared thermography, liquid crystal thermography – microwave thermography; basic principles of ultrasonography; laser: uses of lasers in medicine.

TEXT BOOKS:

1. D. J. Dewhurst (2014). *An Introduction to Biomedical Instrumentation* (1st edn), Elsevier Science, ISBN no:9781483187525,1483187527
2. R.S. Khandpur (2005). *Hand Book of Biomedical Instrumentations* (1st edn), TMG, New Delhi, ISBN no: 9789339205430
3. K. Venkata Ram (2001). *Bio-Medical Electronics and Instrumentation* (1st edn), Galgotia Publications, New Delhi, ISBN no: 978-8175156012

REFERENCE BOOKS:

1. Muhammad Maqboo (2017). *An Introduction to Medical Physics* (1st edn), Springer International Publishing, ISBN no: 9783319615400, 3319615408
2. Daniel Jiráč, František Vitek (2018). *Basics of Medical Physics* (1st edn), Charles University, Karolinum Press, ISBN no: 9788024638102, 802463810X
3. Anders Brahme (2014). *Comprehensive Biomedical Physics, Volume 1* (1st edn), Elsevier Science, ISBN no: 9780444536334, 0444536337

PAPER 15 RELATIVISTIC QUANTUM MECHANICS

(Total: 90 hours)

LEARNING OBJECTIVES:

The course is to give an understanding of the effects of special relativity in quantum mechanics and to give an introduction into quantum field theory. The course covers relativistic quantum mechanics, expressed by the Dirac equation, including Lorentz covariance of the equation and the existence of antiparticles. The course also covers quantization of the Klein-Gordon field, the Dirac field and the photon field. The course forms the basis for more advanced studies of field theory and for understanding relativistic effects in atomic physics.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Understand the Special Theory of Relativity by learning Lorentz Transformations, Space-time Diagrams, Simultaneity, Causality, Time Dilation Length Contraction, Addition of Velocities and the Geometry of Space-time. |
| CO2 | Explain the main concepts in Relativistic Quantum Mechanics. Understand the Klein-Gordon equation, probability and current densities, equation of continuity, Dirac equation and the solution for the same. |
| CO3 | Understand the covariant form of Dirac Equation, properties of gamma matrices, relativistic invariance of Dirac equation and Feynman's theory of positron. |
| CO4 | Explore the field functions, quantization procedure for particles, Lagrangian density, and Euler-Lagrange equation for classical field to understand the concept of Second Quantization in detail. |

CO5

Learn about the Quantization of EM Field, Generation and detection of Fock states of the Radiation field, coherent Photon States, and properties of Coherent States.

Unit 1: Review of Special Theory of Relativity

Lorentz Transformations – Space-time Diagrams – Simultaneity; Causality Time Dilation – Length Contraction – Addition of Velocities The Geometry of Space-time The Lorentz Group –Kinematics – Particle Physics – The Lorentz Group as $SL(2,C)$ – Spinors.

Unit 2: Relativistic Quantum Mechanics

Klein–Gordon equation – probability and current densities – equation of continuity – Drawbacks of K–G equation – Dirac equation – properties of α and β matrices – plane-wave solution of Dirac equation – equation of continuity – interpretation of negative energy states – probability and current densities.

Unit 3: Dirac Equation

Covariant form of Dirac equation – properties of the gamma matrices – traces – relativistic invariance of Dirac equation – probability density – current four vector – bilinear co-variants – Feynman’s theory of positron (elementary ideas only without propagation formalism).

Unit 4: Second Quantization

Field function — quantization procedure for particles – Lagrangian density – Euler–Lagrange equation for classical field – Hamiltonian density – second quantization of real scalar field (Klein-Gordon field) – creation, annihilation and number operators – commutation relations.

Unit 5: Quantization of EM field

Introduction – Quantization of field inside cavity of length L – Generation and detection of Fock states of the Radiation field – The coherent Photon States – Properties of Coherent states.

TEXT BOOKS:

1. W. Greiner (2000). *Relativistic Quantum Mechanics* (1st edn), Springer Publications, ISBN no: 978-3-662-04275-5
2. J. J. Sakurai (1967). *Advanced Quantum Mechanics*, (1st edn), Pearson Education, ISBN no: 9788177589160
3. R. Parthasarathy (2010). *Relativistic Quantum Mechanics* (1st edn), Alpha Science International, ISBN no: 978-1842655733

REFERENCE BOOKS:

1. J.D. Bjorken and S.D. Drell (1964). *Relativistic Quantum Mechanics* (3rd edn), McGraw-Hill, ISBN no: 07-005493-2
2. P.A.M. Dirac (1981). *The Principles of Quantum Mechanics* (4th edn), International Series of Monographs on Physics, ISBN no: 0198520115
3. Wachter, Armin (2011), *Relativistic Quantum Mechanics* (1st edn) Springer, ISBN no: 978-90-481-3645-2

PAPER 15 LASERS AND NON-LINEAR OPTICS

(Total: 90 hours)

LEARNING OBJECTIVES:

This course will help the students to understand the origin of nonlinear susceptibilities and their properties, predict the frequencies generated by a nonlinear optical process, solve nonlinear wave equations in simple problems and apply phase matching to enhance nonlinearity and explain the origin of spatial and temporal solitons. It will also help them to understand stimulated Raman and Brillouin scattering and estimate the upper bound of optical power in silica fiber due to nonlinearity.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Learn about conventional lasers, the differences between spontaneous and stimulated emission, Einstein coefficients, the different levels of laser action and solid-state lasers. |
| CO2 | Explain the main concepts used to develop advanced lasers such as Q-switching, electro-optic shutter, mechanical and saturable absorber shutters and peak power emitted during the pulse. |
| CO3 | Understand the basics of nonlinear optics by learning about wave propagation in an anisotropic crystal, polarization response of materials to light, harmonic generation, second harmonic generation, phase matching and third harmonic generation. |
| CO4 | Learn the fundamentals of multi-quantum photoelectric effect, theory of two photon process, experimental evidences of 2PA materials, stimulated Raman scattering and photorefractive effect. |
| CO5 | Explore the applications of laser materials processing with lasers. Learn about the principle of holography, laser range finders and communication by lasers. |

Unit 1: Conventional Lasers

Spontaneous and stimulated emission – Einstein coefficients – levels of laser action: two level – three level – four level lasers – types of lasers (outline only) – solid state lasers: Ruby laser and Nd:YAG laser – gas lasers: He-Ne laser and CO₂ laser – liquid laser: dye laser – liquid Eu³⁺ laser – semiconductor laser.

Unit 2: Advanced Lasers

General description of Q-switching – production of Q-switching: electro-optic shutter (Kerr effect and Pockels effect) – mechanical and saturable absorber shutters – peak power emitted during the pulse – theory of giant pulse dynamics – laser amplifiers – mode locking – ultrafast lasers – fiber optic lasers.

Unit 3: Basics of Nonlinear Optics

Wave propagation in an anisotropic crystal – polarization response of materials to light – harmonic generation – second harmonic generation – sum and difference frequency generation – phase matching – third harmonic generation – terahertz – bi-stability.

Unit 4: Nonlinear Absorption and Refraction

Fundamentals of multi-quantum photoelectric effect – theory of two photon process – experiment evidences of 2PA materials – multi and three photon process – stimulated Raman scattering – intensity dependent refractive index – self-focusing of light – phase conjugated optics – photorefractive effect.

Unit 5: Applications of Laser Materials Processing with Lasers

Drilling, cutting, and welding with lasers – nuclear fusing with lasers – communication by lasers – principle of holography – laser range finders – LASIK – optical computing.

TEXT BOOKS:

1. Richard L. Sutherland (2003). *Handbook of Nonlinear Optics*,(1st edn) Marcel Decker Inc, New York, ISBN no: 9780824742430
2. K.R. Nambiar (2014),*Lasers: Principles, Types and Applications* (1st edn) New Age International Publishers Ltd, New Delhi, ISBN no: 9788122414929
3. B.B. Laud (2011). *Lasers and Nonlinear Optics* (3rd edn), New Age International Pvt. Ltd., New Delhi, ISBN no:9788122430561

REFERENCE BOOKS:

1. R.W. Boyd (2003). *Nonlinear Optics* (2nd edn), Academic Press, New York, ISBN no: 9780121216825, 9780080479750
2. W.T. Silfvast (2003). *Laser Fundamentals* (2nd edn), Cambridge University Press, Cambridge, ISBN no: 0 521 83345 0
3. Y.R. Shen (2003), *The Principles of Nonlinear Optics* (1 st edn), Wiley & Sons, New Jersey, ISBN No: 978-0471430803

ADVANCED COURSE II – PAPER 16-MATERIALS SYNTHESIS AND CHARACTERIZATION

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |

LEARNING OBJECTIVES:

The aim and objective of the course on Materials synthesis and characterization is to familiarize the students to the various aspects related to preparation, characterization and study of different properties of the materials (crystals, nanomaterials, thin films) so that they can pursue this emerging research field as career. Various types crystals system and their growth technique is outlined. Students will not only learn theoretical aspects but also acquainted with latest trends in the experimental techniques as well. Knowledge of functioning and construction of nanoscale materials would cater the need to keep them updated with recent technologies in the field. Outline the thermodynamics of thin films, illustrate the mechanism of thin film formation, explain various techniques of thin film formation and summarize various properties of thin films. It also elaborates on the effectiveness of characterization methods.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Acquire knowledge of basic approaches to Crystal growth like Solution growth technique, Gel growth technique, Melt technique, Bridgman technique ,Czochralski technique etc. |
| CO 2 | Demonstrate the stages of thin film formation and can outline the conditions for the formation of amorphous, crystalline and epitaxial films. |
| CO 3 | Acquire an insight into the synthesis of nano materials. |
| CO 4 | Understand the construction, types, physical and chemical properties of nanotubes. |
| CO 5 | Assimilate the principle, construction and working knowledge of spectroscopic techniques like UV-VIS spectroscopy, luminescence techniques, dielectric spectroscopy, NLO studies. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|---------|
| 1 | Nucleation and Growth Techniques 1.1 Concept of crystal growth 1.2 Crystal growth theory 1.3 Classical theory – Gibbs–Thomson equation 1.4 Nucleation theories 1.5 Growth techniques 1.6 Solution growth technique 1.7 Gel growth technique 1.8 Melt technique – Bridgman technique – Czochralski technique 1.9 Vapour technique: physical vapour deposition – chemical vapour deposition (CVD) – chemical vapour transport | 20 | CO 1 |
| 2 | Thin Film Deposition Techniques 2.1 Thin films 2.2 Introduction to vacuum technology 2.3 Deposition techniques 2.4 Physical methods 2.5 Resistive heating 2.6 Electron beam gun 2.7 Laser gun evaporation 2.8 Sputtering: Reactive sputtering, radio frequency sputtering 2.9 Chemical methods 2.10 Spray pyrolysis – preparation of transparent conducting oxides | 20 | CO 2 |
| 3 | Synthesis of Nanomaterials 3.1 Synthesis of nanomaterials (bottom up approach) by physical techniques 3.2 Introduction to vacuum techniques (pumps, gauges, materials) 3.3 Physical vapour deposition 3.4 Electron beam evaporation 3.5 Sputter deposition 3.6 Laser ablation 3.7 Ion beam mixing 3.8 Plasma deposition | 20 | CO 3 |
| 4 | Nano Tubes 4.1 Types of nanotubes 4.2 Formation of nanotubes | 20 | CO 4 |

| | | | |
|---|---|----|---------|
| | 4.3 Methods and reactants – arcing in the presence of cobalt 4.4 Laser methods 4.5 Ball milling 4.6 Chemical vapor deposition methods 4.7 Properties of nano tubes 4.8 Plasma arcing 4.9 Electro deposition 4.10 Pyrolytic synthesis 4.11 Zeolites and templated powders layered silicates | | |
| 5 | Analysis Techniques 5.1 Working principle and Instrumentation 5.2 X-ray Diffraction (XRD) 5.3 Powder and Single crystal 5.4 UV-Vis-NIR spectrometer 5.5 Photo Luminescence techniques 5.6 Dielectric studies 5.7 TG – DTA /DSC 5.8 Vickers Micro hardness 5.8 Chemical etching 5.9 NLO studies (SHG) | 10 | CO 5 |

TEXT BOOKS:

1. J.C.Brice (1973). *The growth of crystals from liquids* (1st edn), North-Holland Publishing Co, Amsterdam, London, ISBN no : 0444104690
2. Keshra Sengwal (2018). *Nucleation and Crystal growth : Metastability of Solution Melts*, Wiley Online Library (1st edn), John Wiley& Sons, Inc., New Jersey, ISBN no: 9781119461579
3. L.I. Maissel and R. Clang (1970). *Hand Book of Thin Films Technology* (1st edn), Mc Graw Hill, NewYark, ISBN no: 10-0070397422
4. Charles P. Poole, Frank J. Owens (2003). *Introduction to Nanotechnology* (1st edn), Wiley Interscience, New Jersey, ISBN no: 9780471079354.

REFERENCE BOOKS:

1. J.C. Brice (1986). *Crystal Growth Process* (1st edn), Wiley Publications, New York, ISBN no: 0470202688
2. J.L. Vossen and W. Kern (1978). *Thin Films Process* (1st edn), Academic Press, US, ISBN no: 9780127282503.
3. M. Ohring (2001). *The Materials Science of Thin Films* (2nd edn), Academic Press, US, ISBN no: 9780080491783
4. Mick Wilson, Kamali Kannagara, Geoff Smith, Michelle Simmons and Burkhard Raguse (2002). *Nanotechnology: Basic Science and Emerging Technologies* (1st edn), Overseas Press, New Delhi, India, ISBN no: 9781584883395.

5. A. Inoue, K. Hashimoto (2001). *Amorphous and Nanocrystalline Materials: Preparation, Properties and Applications* (1st edn), Springer, Berlin, ISBN no: 9783540672715
6. Hobard H. Willard, Lynne L. Merritt, John A. Dean and Frank A. Settle (2018). *Instrumental Methods of Analysis* (7th edn), CBS Publishers, New Delhi, India, ISBN no: 9789388327008.

E-RESOURCES

1. <https://microbenotes.com/x-ray-spectroscopy-principle-instrumentation-and-applications>
2. <https://nptel.ac.in/courses/118/102/118102003/>
3. <https://nptel.ac.in/courses/113/106/113106093/>
5. <https://nptel.ac.in/content/storage2/courses/103108100/module5/module5.pdf>
6. http://umich.edu/~jphgroup/XAS_Course/Harbin/Lecture1.pdf
7. http://www.issp.ac.ru/ebooks/books/open/X-Ray_Spectroscopy.pdf

PAPER 17 CONDENSED MATTER PHYSICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |

LEARNING OBJECTIVES:

The aim and objective of the course on Condensed Matter Physics is to expose the students of M.Sc. class to the topics like elastic constants, lattice vibrations, energy band theory and transport theory so that they are equipped with the techniques used in investigating these aspects of the matter in condensed phase. Describe the lattice dynamics of simple lattice structures in terms of dispersion relations. The course aims to correlate the influence of lattice vibration on thermal behavior. To become familiar with the different types of magnetism and magnetism-based phenomenon. To get familiarized with the different parameters associated with superconductivity and the theory of superconductivity and its applications.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Arrive at the basic elements of crystal structure of condensed matter. |
| CO2 | Conclude on the accurate description of lattice dynamics and thermal properties of crystalline solids. Derive cohesive energy of ionic crystals. |
| CO3 | Perceive origin of energy bands in solids with focus on semiconductors |
| CO4 | Able to explain various magnetic phenomena and describe the different types of magnetic ordering (Diamagnetism, Paramagnetism, Ferromagnetism) based on the exchange interaction. |
| CO5 | Differentiate between type-I and type-II superconductors and score on the theoretical explanation of super conductivity viz Cooper pairs and BCS theory. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|----------|--------------------|-----|-----|
|----------|--------------------|-----|-----|

| | | | |
|---|--|----|-----|
| 1 | <p>Crystal Physics</p> <p>1.1 Crystal Structure : Types of lattices</p> <p>1.2 Miller indices</p> <p>1.3 Wigner-Seitz cell</p> <p>1.4 Simple symmetry operation</p> <p>1.5 Bravais lattice</p> <p>1.6 Miller plane and spacing</p> <p>1.7 Simple crystal structures</p> <p>1.8 Structure of Diamond, ZnS and NaCl.</p> <p>1.9 Diffraction</p> <p>1.10 Bragg's law, Laue's equation</p> <p>1.11 X ray diffraction methods – Laue's method</p> <p>1.12 Reciprocal lattice (sc, bcc, fcc)</p> <p>1.13 Diffraction conditions</p> <p>1.14 Atomic packing factor</p> <p>1.15 Scattered wave amplitude</p> <p>1.16 Reciprocal lattice (sc, bcc, fcc)</p> <p>1.17 Diffraction conditions – Brillouin zone</p> <p>1.18 Structure factor – atomic scattering factor.</p> <p>1.19 Crystal binding : Inert gas crystals</p> <p>1.20 Cohesive energy of ionic crystals - Madelung constant</p> <p>1.21 Types of crystal binding (general ideas).</p> | 18 | CO1 |
| 2 | <p>Lattice Dynamics</p> <p>2.1 Theory of elastic vibration of one dimensional monoatomic and diatomic lattice</p> <p>2.2 Group and phase velocities - Phonon momentum</p> <p>2.3 Inelastic scattering by phonons.</p> <p>2.4 Heat Capacity: Classical Theory of lattice heat capacity</p> <p>2.5 Einstein's theory of lattice heat capacity</p> <p>2.6 Debye's theory of lattice heat capacity.</p> <p>2.7 Anharmonic Effect: Explanation for thermal expansion</p> <p>2.8 Thermal conductivity - Umklapp processes.</p> | 18 | CO2 |

| | | | |
|---|--|----|-----|
| 3 | <p>3.1 Free electron theory: Density of states and Fermi Dirac distribution (review)</p> <p>3.2 Free electron gas in three dimensions</p> <p>3.3 Heat capacity of electron gas</p> <p>3.4 Electrical and thermal conductivity</p> <p>3.5 Wiedemann-Franz law - Lorentz number</p> <p>3.6 Motion in a magnetic field - Hall effect.</p> <p>3.7 Energy band theory : Origin of energy gaps</p> <p>3.8 Wave in periodic potential - Bloch theorem</p> <p>3.9 Kronig-Penney model</p> <p>3.10 Semiconductors</p> <p>3.11 Intrinsic carrier concentration</p> <p>3.12 Temperature dependence - mobility</p> <p>3.13 Impurity conductivity - impurity states.</p> <p>3.14 Fermi surface: Fermi surfaces and construction</p> <p>3.15 Experimental methods in Fermi surface studies</p> <p>3.16 de Hass-van Alphen effect.</p> | 18 | CO3 |
| 4 | <p>Magnetism</p> <p>4.1 Diamagnetism – quantum theory of Paramagnetism</p> <p>4.2 Rare earth ion – Hund’s rule</p> <p>4.3 Quenching of orbital angular momentum</p> <p>4.4 Adiabatic demagnetization – quantum theory of ferromagnetism</p> <p>4.5 Curie point – exchange integral</p> <p>4.6 Heisenberg’s interpretation of Weiss field</p> <p>4.7 Ferromagnetic domains</p> <p>4.8 Bloch wall – spin waves – quantization</p> <p>4.9 Curie temperature and susceptibility of ferrimagnets</p> <p>4.10 Theory of antiferromagnetism – Neel temperature</p> | 18 | CO4 |
| 5 | <p>Superconductivity</p> <p>5.1 Experimental facts: Occurrence</p> <p>5.2 Effect of magnetic fields – Meissner effect</p> <p>5.3 Critical field – critical current – entropy and heat capacity</p> <p>5.4 Energy gap – microwave and infrared properties</p> <p>5.5 Type I and Type II superconductors.</p> <p>5.6 Theoretical Explanation: Thermodynamics of superconducting transition</p> <p>5.7 London equation – coherence length – isotope effect – Cooper pairs</p> <p>5.8 BCS theory – single particle tunneling – Josephson tunneling</p> <p>5.9 DC and AC Josephson effects – high temperature</p> | 18 | CO5 |

| | | |
|-----------------------------|--|--|
| superconductors – SQUIDS | | |
|-----------------------------|--|--|

TEXT BOOKS:

1. C. Kittel (1996). *Introduction to Solid State Physics* (7th edn), Wiley, New York, ISBN no : 9780471415268 .
2. M. Ali Omar (2009). *Elementary Solid State Physics - Principles and Applications* (6th edn), Dorling Kindersley Pvt. Ltd. New Delhi, India, Issn no : 9788177583779.
3. H.P. Myers (1998). *Introductory Solid State Physics* (2nd edn), Viva Book, New Delhi, Issn no : 9780748406609.
4. R.K Puri and V.K.Babber (1997). *Solid State Physics* (3rd edn), S.Chand & Company Pvt.Ltd, NewDelhi, ISSN no : 9788121914765.
5. P G De Gennes (1966). *Superconductivity and alloys* (1st edn), CRC Press, New York, ISSN no: 10534873

REFERENCE BOOKS:

1. N.W. Aschroftand and N.D. Mermin (1976). *Solid State Physics* (1st Ed), Rhinehart and Winton Publisher, New York, ISBN-13: 978-0030839931.
2. J.S. Blakemore (1974). *Solid State Physics* (2nd Ed), W.B. Saunder Company, Philadelphia, ISBN-10: 721617018.
3. A.J. Dekker (2013). *Solid State Physics*, (1st Ed), Macmillan India Publisher, New Delhi, ISBN: 0333918339
4. H.M. Rosenburg (1993). *The Solid State*, (3rd Ed), Oxford University Press, Oxford, ISBN-10: 9780198518709
5. S.O. Pillai (1994). *Problems and Solutions in Solid State Physics*, (1st Ed), New Age International, New Delhi, ISBN: 81-224-0658-0
6. J.M. Ziman (1971). *Principles of the Theory of Solids* (2nd Ed), Cambridge University Press, London, ISBN-10: 0521083826

E-RESOURCES

1. <https://www.youtube.com/playlist?list=PLbMVogVj5nJRjLrXp3kMtrIO8kZI1D1Jp>
2. <https://www.youtube.com/playlist?list=PLFW61RTa1g83HGEihgwcY7KeTLUuBu3WF>
3. <https://www.youtube.com/playlist?list=PLADLRin7kNjG1Dlna9MDA53CMKFHPSi9m>
4. https://www.youtube.com/playlist?list=PLXHedI-xbyr8xIl_KQFs_R_oky3Yd1Emw

PAPER 18 NUCLEAR AND PARTICLE PHYSICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The course gives an overview of fundamental concepts on different nuclear models, nuclear interactions, nuclear reactions, nuclear decay, radioactivity to elaborate the knowledge regarding the fundamental and basics of Nucleus and its models. Discuss the two-body problem, thereby formulating the concept of nuclear force. To acquire knowledge about the nucleus by the study of scattering of particles. Attain a good understanding of interaction of charged particles with matter. To have an idea of elementary particles and their classification.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Acquire knowledge of nuclear models along with their defining features and drawbacks. |
| CO2 | Concept and nature of nuclear force. Attain the knowledge in nuclear interactions |
| CO3 | Derive nuclear reaction kinematics, identify types of reactions and conservation laws |
| CO4 | Remember the concepts of nuclear decay |
| CO5 | Understand the nature, interaction etc. of the elementary particles. |

Mapping Of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 1 | 1 | 3 | 1 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 1 |
| CO2 | 3 | 1 | 1 | 3 | 1 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 1 |
| CO3 | 3 | 1 | 1 | 3 | 1 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 1 |
| CO4 | 3 | 1 | 1 | 3 | 1 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 1 |
| CO5 | 3 | 1 | 1 | 3 | 1 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 1 |

STRONGLY CORRELATED - 3, MODERATELY CORRELATED – 2, WEAKLY
CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | Cos |
|----------|--|-----------|------------|
| 1 | Unit 1: Nuclear Models 1.1 Liquid drop model 1.2 Bohr–Wheeler theory of fission 1.3 Binding energy of nucleus – semi empirical mass formula (Bethe-weizsacker formula) 1.4 Experimental evidence for shell effects 1.5 Shell model 1.6 Spin-orbit coupling 1.7 Magic numbers 1.8 Angular momenta and parities of nuclear ground states 1.9 Qualitative discussion and estimate of transition rates 1.10 Magnetic moments and SCHMIDT lines 1.11 Collective model of Bohr and Mottelson | 18 | CO1 |
| 2 | Unit 2: Two body problem and Nuclear Forces 2.1 Nucleon-nucleon interaction 2.2 Ground state of deuteron 2.3 Tensor forces 2.4 Exchange Forces 2.5 Meson theory of nuclear forces 2.6 Yukawa potential 2.7 Neutron proton scattering 2.8 Effective range theory 2.9 Spin dependence of nuclear forces 2.10 Charge independence and charge symmetry of nuclear forces 2.11 Saturation of nuclear forces 2.12 Isospin formalism | 18 | CO2 |
| 3 | Unit 3: Nuclear Reactions 3.1 Types of reactions and conservation laws 3.2 Nuclear reaction kinematics 3.3 Compound nucleus reactions 3.4 Direct reactions 3.5 Scattering and reaction cross sections 3.6 Partial wave analysis of Nuclear cross section 3.7 Resonance scattering – Breit–Wigner one level formula. | 18 | CO3 |
| 4 | Unit 4: Nuclear Decay 4.1 Alpha decay and barrier penetration – Gamow’s theory of alpha decay 4.2 Beta decay – Fermi theory of beta decay – shape of the beta spectrum – total decay rate 4.3 Mass of the neutrino | 18 | CO4 |

| | | | |
|---|--|----|-----|
| | 4.4 Angular momentum and parity selection rules- allowed and forbidden decays 4.5 Comparative half-lives 4.6 Neutrino physics 4.7 Non-conservation of parity 4.8 Gamma decay 4.9 Multipole transitions in nuclei 4.10 Angular momentum and parity selection rules 4.11 Internal conversion 4.12 Nuclear isomerism | | |
| 5 | Unit 5: Elementary Particle Physics 5.1 Classification of elementary particles 5.2 Hadrons and leptons 5.3 Types of interaction between elementary particles 5.4 Symmetries and conservation laws 5.5 Elementary ideas of CP and CPT invariance 5.6 Classification of hadrons 5.7 SU(2) and SU(3) multiplets 5.8 Quark model and quark composition of mesons and baryons – Color and Flavor 5.9 Gell–Mann–Okubo mass formula for octet and decuplet hadrons – Charm, bottom and top quarks | 18 | CO5 |

TEXT BOOKS:

1. K.S. Krane (1987). Introductory Nuclear Physics, Wiley, New York, ISBN no: 9780471805533
2. Devanathan (2016). Nuclear Physics, Narosa Publishing House, New Delhi, ISBN no: 9788184871043
3. D. Griffiths (1987). Introduction to Elementary Particle Physics, Harper & Row, ISBN no: 9788122434101

REFERENCE BOOKS:

1. R.R. Roy and B.P. Nigam (2008). Nuclear Physics (1st edn), New Age Intl., New Delhi, ISBN no: 9789350978306
2. D.C .Tayal (1988). Nuclear Physics, Himalaya Publishing House, Mumbai, ISBN no: 9788121904131
3. Y.R. Waghmare (1981). Introductory Nuclear Physics, Oxford-IBH, New Delhi, ISBN no: 9788185015897

E- RESOURCES

1. <http://www.umich.edu/~ners311/CourseLibrary/bookchapter12.pdf>
2. http://labman.phys.utk.edu/phys222core/modules/m12/nuclear_models.html
3. <http://abyss.uoregon.edu/~js/ast123/lectures/lec07.html>
4. <http://oregonstate.edu/instruct/ch374/ch418518/Chapter%2010%20NUCLEAR%20REACTIONS.pdf>

5. <https://www.eolss.net/Sample-Chapters/C08/E3-06-01-02.pdf>

**PAPER 13 PRACTICAL III MICROPROCESSOR 8085 AND MICROCONTROLLER
8051**

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 0:0:3:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

This course helps to expose the students about the operation of microprocessor 8085 and microcontroller 8051 trainer kit. Understanding micro-controller programming for software driven electronic circuits. Developing skills of presenting the programs in written form as well as implementing it practically. Interfacing electronics circuits the outside world. Working in a group, inculcating team spirit and promoting peer learning. The theoretical background relevant to the program should be discussed during practical session. The course prepares students to solve the given problem by developing different programs and to ascertain the quality of the result obtained.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Write programs using the assembly language, instruction set of 8085 microprocessors |
| CO2 | Set up programming strategies and select proper mnemonics and run their program on the trainer kits |
| CO3 | Practice different types of programs for the same problem and verify the results |
| CO4 | Analyze the basic concepts and programming of 8051 microcontroller |
| CO5 | Understand the interfacing circuits for various applications of 8051 microcontroller and providing solutions to real world problems. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|---------------|
| 1 | <p>Microprocessor 8085</p> <p>1.Addition and subtraction of 8 bit numbers</p> <p>2 Addition and subtraction of 16 bit numbers</p> <p>3 Multiplication of 8 and 16 bit numbers and division of 8 bit number</p> <p>4 Picking up the largest and smallest number in an array and sorting in ascending and descending order.</p> <p>5 Sum of set of N data (8 bit numbers)</p> <p>6 Square & square root of 8- & 16-bit numbers</p> <p>7 Code conversion (8- & 16- bit numbers):</p> <p>a) Binary to BCD</p> <p>b) BCD to binary</p> <p>8 Clock program – 12/24 hrs</p> <p>9 LED interface – single LED on/off, binary, BCD, ring and twisted ring counters</p> <p>10 DAC 0800 interface & waveform generation</p> <p>11 Hex keyboard interface</p> <p>12 Interfacing of DC stepper motor – Clockwise, anti-clockwise, angular movement and Wiper action</p> <p>13 Interfacing of seven segment display – 8085 Microprocessor</p> <p>14 Interfacing of seven segment display – 8085 Microprocessor</p> | 60 | CO1, CO2, CO3 |

| | | | |
|---|--|----|----------------------|
| | 15 ADC 0809 interface 16 Traffic signal using 8085 Microprocessor | | |
| 2 | Microcontroller 8051 Experiments 1 Addition & subtraction 2 Multiplication & division 3 Sorting in ascending & descending order 4 LED interface 5 Stepper motor interface 6 Water level detector – 8051 Microcontroller 7 LIGHT activated morning ALARM using LDR Module 8 Temperature activated FIRE ALARM using temperature sensor LM35 9 Darkness activated garden light using LDR module 10 LPG gas leakage detector using MQ2 sensor 11 LCD rolling message display 12 Range/ Distance measurement using ultrasonic sensor | 30 | CO2, CO3, CO4,CO5 |

TEXT BOOKS:

1. Gaonkar R.S. (1992) *Microprocessor Architecture Programming and Application with 8085/8080* (5th edn), Wiley Eastern Ltd, ISBN no: 0852262973
2. Vijayendran V. (2003). *Fundamental of Microprocessor 8085 Architecture Programming, and Interfacing* (1st edn), Viswanathan, S., Printers & Publishers Pvt Ltd, ISBN no: 8187156139
3. Ram B (1993). *Fundamentals of Microprocessors and Microcomputers* (1st edn), Dhanpat Rai Publications, ISBN no: 8189928600

REFERENCE BOOKS:

1. Vijayendran V (2003). *Fundamentals of Microprocessor – 8086 Architecture, Programming (MASM) and Interfacing* (1st edn), Viswanathan, S Printers & Publishers Pvt Ltd, ISBN no: 8187156139
2. Douglas V. Hall (2005). *Microprocessors and Interfacing Programming and Hardware* (2nd edn), McGraw Hill Book Company, ISBN no: 9780070601673
3. Triebel W.A, Avatar Singh (2013). *The 8086/8088 Microprocessors – Programming, Software, Hardware and Application* (1st edn), Pearson, ISBN no: 0132483378

E-RESOURCE

1. <https://circuitdigest.com/microcontroller-projects/stepper-motor-interfacing-with-8051>
<https://www.tutorialspoint.com/8085-program-to-sim>

**PAPER 14 – PRACTICAL IV – COMPUTATIONAL METHODS AND C
PROGRAMMING**

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 0:0:3:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Students will have understanding of various computational methods like Euler, Newton-Raphson and Ranga-Kutta useful to solve research problems. The course is designed to enable students identify the suitable iteration method that will lead to an accurate result in a short time. Once the method is identified the student is trained to write programs using C language effectively to solve the task. Introduction to algorithm, Flow charts, Problem solving methods, Need of programming languages. C character set, Identifiers and keywords, Data types, Declarations, Statement and symbolic constants, Input-output statements, Preprocessor commands, Operators, expressions and library functions, Control statements: Conditional, Unconditional, Bidirectional, Multi-directional and loop control structures, Functions, Arrays, Strings, Introduction to Pointers, Structure and union, Files.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Learn to solve simultaneous linear equations using C program |
| CO2 | Solve differential equations using C program |
| CO3 | Apply computational methods to solve problems in physics, including data analysis such as linear and nonlinear fits to data sets |
| CO4 | Solve interpolation using C program |
| CO5 | Integrate functions using Euler and Runge-Kutta Methods with the help of C program |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-------------------------|
| 1 | 1. Lagrange interpolation with Algorithm, Flow-chart, C PROGRAM and output 2. Newton forward interpolation with Algorithm, Flow-chart, C PROGRAM and output 3. Newton backward interpolation with Algorithm, Flow-chart, C PROGRAM and output. 4. Fitting a Straight line with Algorithm, Flow-chart, C PROGRAM and output 5. Fitting a curve $y = ax^b$ with Algorithm, Flow-chart, C PROGRAM and output 6. Fitting an exponential curve $y = ae^{bx}$ with Algorithm, Flow-chart, C PROGRAM and output 7. Fitting an parabola with Algorithm, Flow-chart, C PROGRAM and output | 40 | CO1, CO2, CO3, CO4 |
| 2 | 1. Numerical integration by the trapezoidal rule, with Algorithm, Flow-chart, C PROGRAM and output 2. Numerical integration by Simpson's 1/3 rule, with Algorithm, Flow-chart, C PROGRAM and output 3. Numerical integration by Simpson's 3/8 rule, with Algorithm, Flow-chart, C PROGRAM and output 4. Numerical solution of ordinary first-order differential equations by Simple Eulers method, with Algorithm, Flow-chart, C PROGRAM and output 5. Numerical solution of ordinary first-order differential equations | 50 | CO1, CO2, CO3, CO4, CO5 |

| | | | |
|--|---|--|--|
| | by Improved Euler method 6 Numerical solution of ordinary first-order differential equations by Modified Euler method 7 Numerical solution of ordinary first-order differential equations by the Runge–Kutta method II with Algorithm, Flow-chart, C PROGRAM and output 8 Numerical solution of ordinary first-order differential equations by the Runge–Kutta method IV with Algorithm, Flow-chart, C PROGRAM and output | | |
|--|---|--|--|

TEXT BOOKS:

1. Rajaraman V. (1993). *Computer Oriented Numerical Methods* (3rd edn), Prentice-Hall of India Pvt. Ltd, ISBN no: 8120307860
2. Jain M.K, Iyengar S.R., Jain R.K. (1995). *Numerical Methods for Scientific and Engineering Computation* (3rd edn), New Age International (P) Limited, ISBN no: 8122420012
3. Sastry S.S. (2012). *Introductory Methods of Numerical Analysis* (5th edn), PHI Learning Private Ltd, ISBN no: 9788120345928

REFERENCE BOOKS:

1. Scheid F (1998). *Numerical Analysis* (2nd edn), Schaum’s Series, McGraw Hill, New York, ISBN no: 0070552215
2. Nathi Singh (2016). *Computational Methods for Physics and Mathematics: With Fortran and C Programmes* (1st edn), Alpha Science International Ltd, ISBN no: 1783322128
3. Press W.H, Teukolsky S.A, Vetterling W.T, Flannery B.P. (1992). *Numerical Recipes in C* (2nd edn), Cambridge University Press, ISBN no: 9780521431088

E-RESOURCES

1. <https://www.codewithc.com/c-program-for-lagrange-interpolation/>
2. <https://www.codewithc.com/trapezoidal-method-algorithm-flowchart/>

ELECTIVE III: PAPER 19 COMPUTATIONAL METHODS AND C PROGRAMMING

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 0:0:3:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The idea behind the course is to teach students to solve problem in Physics through C programming language. Train them by solving problems related to systems of linear equations. Teach them the concept of interpolation. Instruct them to calculate integrals and differentials using different numerical methods. It also involves a lab component which is designed to provide hands-on experience with the concepts.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Acquire knowledge and apply it to solve simultaneous linear equations |
| CO 2 | Formulate an equation to fit a straight line. Enrich a given set of data points using interpolation methods like Newton’s forward interpolation, etc. |
| CO 3 | Demonstrate the methods to solve differential equations |
| CO 4 | Acquire knowledge on C programming |
| CO 5 | Write, Compile, Execute and Troubleshoot programs using C |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 |
| CO 2 | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 |
| CO 3 | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 |
| CO 4 | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 |
| CO 5 | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 |

STRONGLY CORRELATED–3, MODERATELY CORRELATED–2, WEAKLY
CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----------|-------------|
| 1 | Linear Systems 1.1. Solution of simultaneous linear equations 1.2. Gaussian elimination 1.3. Matrix inversion 1.4. Eigen values | 10 | CO 1 |

| | | | |
|----------|---|-----------|-------------|
| | 1.5. Eigen vectors of matrices 1.6. Power and Jacobi methods | | |
| 2 | Interpolation and Curve Fitting 1.1. Interpolation with equally spaced and unevenly spaced points (Newton forward and backward interpolations) 1.2. Lagrange's interpolation 1.3. Curve fitting – Fitting a Straight line 1.4. Fitting an exponential curve of the form $y=ae^{bx}$ 1.5. Fitting a curve of the form $y = ax^b$ | 20 | CO 2 |
| 3 | Numerical Differentiation and Integration 2.1. Numerical solution of ordinary differential equations – Euler's Method 2.2. Improved Euler's method 2.3. Modified Euler's method 2.4. Runge-Kutta method of Second Order 2.5. Runge-Kutta method of Fourth order 2.6. Numerical integration –Trapezoidal rule 2.7. Simpson's 1/3 rule 2.8. Simpson's 3/8 rule | 20 | CO 3 |
| 4 | Basis of C programming 3.1. Flow-charts 3.2. Integer and floating point 3.3. Arithmetic expressions 3.4. Built-in functions 3.5. Executable and non-executable statements 3.6. Subroutines and functions 3.7. Constants and variables and their declarations 3.8. Loops: for, while and do while 3.9. if statement – if... else Statement – Break statements | 20 | CO 4 |
| 5 | C – Programming 4.1. Newton forward and backward interpolation 4.2. Lagrange's interpolation 4.3. Trapezoidal rule 4.4. Simpson's 1/3 rule 4.5. Simpson's 3/8 rule 4.6. Solution of first order differential equations by Euler's method 4.7. Improved Euler's method 4.8. Modified Euler's method 4.9. Runge-Kutta method of Second Order 4.10. Runge-Kutta method of Fourth order 4.11. Fitting a straight line | 20 | CO 5 |

| | | | |
|-------|--|--|--|
| 4.12. | Fitting an exponential curve of the form= ae^{bx} | | |
| 4.13. | Fitting a curve of the form $y= ax^b$ | | |
| 4.14. | Fitting a parabola | | |

TEXT BOOKS:

1. Rajaraman V. (1993). *Computer Oriented Numerical Methods* (3rd edn), Prentice-Hall of India Pvt. Ltd, ISBN no: 8120307860
2. Jain M.K, Iyengar S.R., Jain R.K. (1995). *Numerical Methods for Scientific and Engineering Computation* (3rd edn), New Age International (P) Limited, ISBN no: 8122420012
3. Sastry S.S. (2012). *Introductory Methods of Numerical Analysis* (5th edn), PHI Learning Private Ltd, ISBN no: 9788120345928

REFERENCE BOOKS:

1. V.N Vedamurthy, N. Iyengar (1998). *Numerical Methods* (2nd edn), Vikas Publishing House Pvt Ltd. ISBN no: 8125906304
2. Nathi Singh (2016). *Computational Methods for Physics and Mathematics: With Fortran and C Programmes* (1st edn), Alpha Science International Ltd, ISBN no: 1783322128
3. Press W.H, Teukolsky S.A, Vetterling W.T, Flannery B.P. (1992). *Numerical Recipes in C* (2nd edn), Cambridge University Press, ISBN no: 9780521431088

E-RESOURCES

1. http://www.math4all.in/public_html/linear%20algebra/chapter2.2.html
2. <https://www.slideshare.net/SamuelOseiAsare/32interpolation-lagrange>
3. <https://nptel.ac.in/content/storage2/courses/122104018/node120.html>
4. <http://www.mathcs.emory.edu/~cheung/Courses/561/Syllabus/2-C/subroutine.html>
5. <https://www.geeksforgeeks.org/program-simpsons-13-rule/>

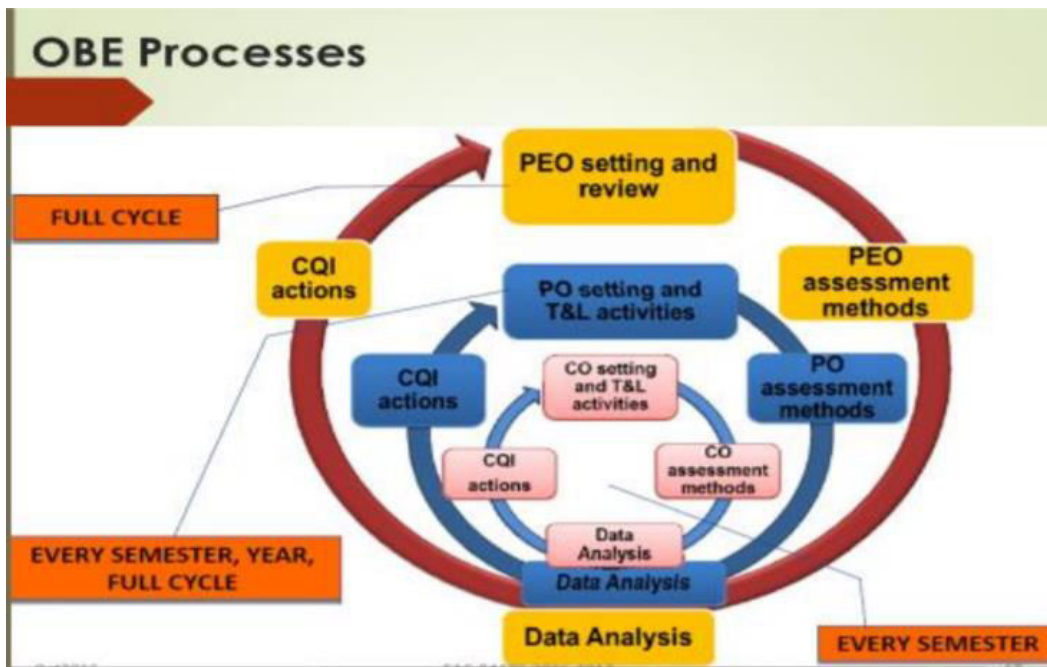
APPENDIX A

Outcome Based Education (OBE)

Outcome-based education means starting with a clear picture of what is important for students to be able to do, then organizing the curriculum, instruction and assessment to make sure that this learning ultimately happens

OBE means clearly focusing and organizing an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences.

Students need to achieve by gaining Knowledge, Skill and Ability. For this to happen it is necessary to organize the curriculum, instruction, and assessment and make sure the learning ultimately happens.



APPENDIX B

Graduate Attributes

Graduate Attributes are the qualities, skills and understandings that the students should develop during their time with the Institution. These generic graduate attributes outline the overarching capabilities that will be developed by students. These qualities are intended to equip graduates to be global citizens, and effective members of society.

Intellectual rigour: a commitment to excellence in all scholarly and intellectual activities, including critical judgement.

Knowledge of the discipline: command of a discipline to enable a smooth transition and contribution to professional and community settings.

Communication and social skills: the ability to communicate and collaborate with individuals, and within teams, in professional and community settings.

Lifelong learning: the ability to be responsive to change, to be inquiring and reflective in practice, through information literacy and autonomous, self-managed learning.

Ethical practice: a commitment to sustainability and high ethical standards in social and professional practices.

Creativity: an ability to develop creative and effective responses to intellectual, professional and social challenges.

Cultural competence: an ability to engage with diverse cultural and Indigenous perspectives in both global and local settings.

APPENDIX C

Bloom's Taxonomy

REMEMBERING: recall of information

arrange; cite; collect; define; describe; duplicate; enumerate; find; identify; locate; memorize; record; recognize; match; relate; select; name; label; list; order; quote; recall; repeat; reproduce; select; show; state

UNDERSTANDING: demonstration of comprehension

associate; classify; compare; contrast; convert; describe; estimate; explain; extend; generalize; give examples; identify; interpret; justify; locate; outline; paraphrase; predict; recognize; report; restate; review; select; summarize; trace; translate

APPLYING: applying knowledge in a new context

apply; calculate; chart; choose; classify; complete; compute; construct; contribute; develop; discover; dramatize; employ; experiment; extend; illustrate; implement; instruct; interpret; modify; operate; participate; practice; predict; show; solve; teach; text; use

ANALYZING: supporting assertions through the use of evidence and arguments identifying causes and patterns

advertise; analyze; break down; categorize; classify; collect; compare; connect; contrast; correlate; criticize; diagram; differentiate; distinguish; divide; establish; explain; identify; illustrate; infer; investigate; order; outline; prioritize; question; select; separate; verify

EVALUATING: coming to a judgement on the value of information or the validity of arguments

appraise; argue; assess; choose; conclude; convince; criticize; critique; debate; decide, defend; determine; discriminate; evaluate; grade; integrate; interpret; judge; justify; predict; prioritize; rate; recommend; reframe; score; select; support; value

CREATING: combining or grouping knowledge to come to new conclusions

adapt; anticipate; arrange; assemble; collect; combine; compile; construct; decide; design; develop; facilitate; formulate; generate; generalize; imagine; incorporate; individualize; integrate; invent; modify; negotiate; organize; plan; propose; rearrange; reconstruct; reorganize; revise; select; structure; substitute; validate

[Verbs correlating to Bloom's Taxonomy drawn
from <http://www.coun.uvic.ca/learn/program/hndouts/bloom.html>]

PG Department of Computer Science

M.Sc. Computer Science - CBCS

OUTCOME BASED SYLLABUS

ACADEMIC YEAR 2021 - 2022



DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE

(AUTONOMOUS)

COLLEGE WITH POTENTIAL FOR EXCELLENCE

LINGUISTIC MINORITY INSTITUTION AFFILIATED TO UNIVERSITY OF MADRAS

E.V.R. PERIYAR HIGH ROAD,

ARUMBAKKAM, CHENNAI – 600106, TAMILNADU.

| S.No | CONTENTS | PAGE NO |
|-------------|--|----------------|
| 1 | Vision, Mission and Program Educational Objectives (PEO) | 1 |
| 2 | Program Outcomes (PO) with Graduate Attributes | 3 |
| 3 | Mapping of POs with PEOs | 3 |
| | SCHEME | |
| 4 | Scheme of First Semester | 8 |
| 5 | Scheme of Second Semester | 9 |
| 6 | Scheme of Third Semester | 10 |
| 7 | Scheme of Fourth Semester | 11 |
| | SYLLABUS | |
| 8 | Syllabus of First Semester : | |
| | a Design and Analysis of Algorithms | 12 |
| | b Python for Data analytics | 14 |
| | c Computer networks | 16 |
| | d Javascript Programming | 18 |
| | e Object Oriented Software Engineering/Unified Modelling Language/OOAD | 21 |
| | f Practical - I : Python for Data analytics lab | 27 |
| | g Practical - II : Javascript Programming lab | 29 |
| | h Spoken Tutorial : PYTHON | 31 |
| 9 | Syllabus of Second Semester : | |
| | a Digital Image Processing | 32 |
| | b Advanced Database Management Systems | 34 |
| | c Enterprise Computing | 36 |
| | d Data mining techniques | 38 |
| | e Artificial Intelligence/High Speed Networks / Web Technology | 40 |
| | f Practical - III : Enterprise Computing Lab | 46 |
| | g Practical - IV : Data mining Lab - using Python | 48 |
| | h Spoken Tutorial : LINUX | 50 |
| 10 | Syllabus of Third Semester : | |
| | a Soft Computing | 51 |
| | b Internet Technology | 53 |
| | c Cloud Computing | 55 |
| | d Big Data Analytics | 58 |
| | e Cryptography/ Information security/ Internet Security And Computer Forensics | 61 |
| | f Practical - V : Internet Technology Lab | 67 |
| | g Practical - VI : Big Data Analytics Lab | 69 |
| | h Spoken Tutorial : JAVA | 71 |

| | | | |
|----|--------------------------------------|-------------------------|-----------|
| | | | |
| 11 | Syllabus of Fourth Semester : | | |
| | a | Project & Viva-Voce | 72 |
| | b | Spoken Tutorial : LaTeX | 73 |
| | | | |
| | Appendix A | Outcome Based Education | 75 |
| | Appendix B | Graduate Attributes | 77 |
| | Appendix C | Bloom's Taxonomy | 78 |
| | | | |

Institution

VISION

To emerge as an institute of eminence in the fields of engineering, technology and management in serving the industry and the nation by empowering students with a high degree of technical, managerial and practical competence.

MISSION

| | |
|----|---|
| M1 | To strengthen the theoretical, practical and ethical dimensions of the learning process by fostering a culture of research and innovation among faculty members and students. |
| M2 | To encourage long-term interaction between the academia and industry through the involvement of the industry in the design of the curriculum and its hands-on implementation. |
| M3 | To strengthen and mould students in professional, ethical, social and environmental dimensions by encouraging participation in co-curricular and extracurricular activities. |

PG DEPARTMENT OF COMPUTER SCIENCE

M.Sc. COMPUTER SCIENCE

VISION

To impart the Post Graduates with strong knowledge of advancement in Computer Science and technology in industries, business and research. To promote globally competent graduates with highly sought intellectual, analytical and practical skills.

MISSION

| | |
|----|--|
| M1 | To make them aware of and adapt to technological advances through active participation in life-long learning. |
| M2 | Encourage them to independently design and develop computer software systems and products based on the theoretical principles and software development skills acquired throughout the program. |
| M3 | To inculcate the foundation of research insights among students and make them employable. |

PROGRAM EDUCATION OBJECTIVES (PEOs)

| | |
|-------------|--|
| PEO1 | To motivate the progression of the post graduates into a professional by inculcating knowledge relating to the field of Computer Science. |
| PEO2 | Develop strong skills in systematic planning, developing algorithms and providing solutions for computer based systems which helps in employability. |
| PEO3 | To continue lifelong professional development in computing that benefits personality and societal growth. |
| PEO4 | Able to draw upon foundational knowledge, learn, adapt and successfully bring to bear analytical and computational approaches on changing societal and technological challenges. |
| PEO5 | To keep abreast with latest technologies & research in Computer Science and its applications in all allied areas. |

PEO TO MISSION STATEMENT MAPPING

| MISSION STATEMENTS | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 |
|---------------------------|-------------|-------------|-------------|-------------|-------------|
| M1 | 3 | 3 | 3 | 3 | 3 |
| M2 | 2 | 3 | 3 | 3 | 2 |
| M3 | 2 | 2 | 2 | 2 | 3 |

CORRELATION: 3- STRONG

2- MEDIUM 1- LOW

PROGRAM OUTCOMES (PO) IN RELATION TO GRADUATE ATTRIBUTES

PROGRAMME OUTCOMES

At the completion of the M.Sc. Computer Science program, the students of our Department will be able to:

| | |
|------------|---|
| PO1 | Apply the knowledge of technological fundamentals, and compute specialized solutions for complex problems. |
| PO2 | Develop and conduct appropriate experimentation, analyse and interpret data, and use scientific judgment to draw accurate inferences. |
| PO3 | Develop strong reasoning skills to enable them to take successful decisions in problem solving areas. |
| PO4 | Create, select, and apply appropriate techniques, resources, and IT tools to model complex computing activities. |
| PO5 | Communicate effectively in order to design, implement and evaluate a computational system to meet desired needs within realistic constraints. |
| PO6 | Recognize the need, prepare and engage in independent and life-long learning in the broadest context of technological change. |
| PO7 | Apply ethical principles and commit to professional ethics and responsibilities and norms of the computer science society. |
| PO8 | Perform effectively as an individual, or leader in diverse teams, and in multidisciplinary settings to accomplish a goal. |

Mapping of POs TO PEOs

| PEO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| PEO 1 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| PEO 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 |
| PEO 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| PEO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| PEO 5 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

PROGRAM SPECIFIC OUTCOMES

| | |
|--------------|---|
| PSO 1 | To Gain an understanding of the basic knowledge of computer science to appreciate, develop and implement the solutions to problems in Real Time applications. |
| PSO 2 | To Inculcate Skills to analyse a problem and to identify and define the logical modelling of solutions |
| PSO 3 | Ability to apply the theoretical concepts and practical knowledge of Computer Science in analysis, design, development and management of computer based systems and applications in the interdisciplinary domain. |
| PSO 4 | To Demonstrate skills to use modern tools, software and equipment for problem solving in new and emerging disciplines. |
| PSO 5 | Develop workable solutions for problems drawn either from social context or from research corpus. |

PG DEPARTMENT OF COMPUTER SCIENCE

M.Sc. COMPUTER SCIENCE

ELIGIBILITY FOR ADMISSION

Candidate who has passed the under-mentioned degree examinations of this University or an examination of other institution recognized by this University as equivalent thereto provided they have undergone the course under 10+2+3 or 11+1+3 or 11+2+2 pattern or under the Open University System, shall be eligible for admission to the M.Sc. Degree Course

(a) BCA / B.Sc in Computer Science

DURATION OF THE COURSE

The Course duration shall be Two years consisting of four semesters. In order to be eligible for the award of the degree the candidate shall successfully complete the course in a maximum period of five years reckoned from the date of enrolment for the first semester of the course.

M.Sc. COMPUTER SCIENCE CURRICULUM

This is a full time course comprising two years (Four Semesters). Through its infrastructure well developed over last 22 years, department offers instructions in wide areas of Computer Science such as Design and Analysis of Algorithms, Programming in Python, Computer networks, Programming in PHP, Object Oriented Software Engineering, Digital Image Processing, Advanced Database Management Systems, Enterprise Computing, Data warehousing and Data mining, WAP and XML, Soft Computing, Internet Technology, Cloud Computing, Big Data Analytics, Cryptography/ Information security; which is effectively facilitated by well-balanced curriculum consisting of 12 different core papers, 3 elective papers and 6 practical courses. The students should take an internship at the end of the first year for a minimum of 15 days to maximum of 20 days and 2 credits will be awarded. Broad based curriculum of the department makes it possible to meet the requirements of various national / international research institutes and industries.

DISSERTATION

Semester IV consists of a project and dissertation for 100 marks. Students are allocated individually to dissertation with the faculty of the department. The format for

dissertations is similar to the thesis style incorporating introduction, methodology, analysis, design, implementation, testing, results, discussion and bibliography. The dissertation is submitted in a typewritten and bound form and a copy of each dissertation is submitted to the Department for permanent record. Project work shall be carried out individually in an R&D section of any Industry. The Project Work/Dissertation report shall be submitted through the guides/supervisors to the Head of the Department and then to the Controller of Examinations not later than 31st May/31st December.

ELIGIBILITY FOR THE AWARD OF DEGREE

If he/she fails to submit the Project Work/Dissertation within the stipulated date for a particular semester, he/she may be permitted with the approval of the Head of the Department to submit the Project Work/Dissertation report during the succeeding semesters, within the maximum period of FIVE years from the date of admission to the first semester Project/Dissertation evaluation and Viva-Voce shall be conducted by one external examiner and one internal examiner who shall normally be the project guide. A candidate shall be eligible for the award of the degree only if he/she has undergone prescribed course of study for a period of not less than two academic years, passed the examination of all the four semesters prescribed earning 100 credits and fulfilled such conditions as have been prescribed there for.

SCHEME OF EXAMINATIONS

The duration of External examination for theory and practical subjects shall be 3 hours. The maximum mark for each theory is 100 with 40 for Internal Assessment (IA) and 60 for External Examination (EE). The distribution of internal marks for theory papers shall be: CIE test - 25 marks, Attendance - 5 marks, and Third Component - 10 marks. The maximum mark for each practical is 100 with 40 for Internal Assessment (IA) and 60 for External Examination (EE). The distribution of internal marks for practical papers shall be: Practical tests- 20 marks, Attendance - 5 marks, and Record - 15 marks.

i. SPLIT UP FOR INTERNAL AND EXTERNAL MARKS FOR THEORY AND PRATICAL PAPER:

| Sl. No. | Paper | Interna l | Externa l | Total |
|----------------|--------------|------------------|------------------|--------------|
| 1. | Theory | 40 | 60 | 100 |

| | | | | |
|----|---------------|----|----|-----|
| | | | | |
| 2. | Practica 1 | 40 | 60 | 100 |
| | | | | |

PATTERN OF QUESTION PAPER (THEORY)

Time: 3 hours

Max Marks: 100

Part – A: TEN Questions. (10 x 2 = 20 Marks)

At least two questions from each unit and not more than two questions from each unit.

Part –B: FIVE questions (Internal Choice). (5 x 7 = 35 Marks)

One question from each unit. (Either or type).

Part –C: Three questions (Internal Choice). (3 x 15 = 45 Marks)

One question from each unit. (Either or type).

PATTERN OF QUESTION PAPER (PRACTICAL)

Time: 3 Hours

Max Marks: 60

One compulsory problem (may contain subdivisions) to be solved within 3 hours.

ii. SPLIT UP FOR INTERNAL ASSESSMENT MARKS (40) FOR THEORY: CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | Tests | Attendance | Choice of department |
|-------------------|-------|------------|----------------------|
| Marks (out of 40) | 25 | 5 | 10 |
| Remember | | | 5 |
| Understand | 8 | | |
| Apply | 5 | | |
| Analyze | 5 | | |
| Evaluate | 2 | | 5 |
| Create | 5 | | |

ESE- Semester End Examination (100 Marks; weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 20 |
| Understand | 20 |
| Apply | 30 |
| Analyse | 15 |
| Evaluate | 10 |
| Create | 5 |

SCHEME OF I SEMESTER M.Sc. COMPUTER SCIENCE PROGRAM

| S. No | Course Category | Course Code | Course | Hour Distribution | Overall Credits | Total Contact Hours / Week | Marks | | | | | | | |
|--------------|-----------------|-------------|---|-------------------|-----------------|----------------------------|-------|---|---|------------|---|----|------|------|
| | | | | | | | L | T | P | S | | | CI A | ES E |
| 1 | Core Paper I | | Design and Analysis of Algorithms | | | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Core Paper II | | Python for Data analytics | | | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Core Paper III | | Computer networks | | | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Core Paper IV | | Javascript Programming | | | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | Elective I | | Object Oriented Software Engineering/Unified Modeling Language/OOAD | | | 4 | 0 | 0 | 0 | 3 | 4 | 40 | 60 | 100 |
| 6 | Core Paper V | | Practical - I : Python for Data analytics lab | | | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 7 | Core Paper VI | | Practical - II : Javascript Programming lab | | | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 8 | Spoken Tutorial | | Python | | | 0 | 0 | 0 | 0 | 1 | - | - | - | - |
| 9 | Soft Skills | | Effective Communication in English I | | | 2 | 0 | 0 | 0 | 2 | - | 50 | 50 | 100 |
| Total | 26 | 30 | 330 | 470 | | | | | | 800 | | | | |

SCHEME OF II SEMESTER M.Sc. COMPUTER SCIENCE PROGRAM

| S. No | Course Category | Course Code | Course | Hour Distribution | | | | Over all Credits | Total Contact Hours/Week | Marks | | |
|--------------|-----------------|-------------|--|-------------------|---|---|---|------------------|--------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CI E | ES E | Total |
| 1 | Core Paper VII | | Digital Image Processing | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Core Paper VIII | | Advanced Database Management Systems | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Core Paper IX | | Enterprise Computing | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Core Paper X | | Data mining techniques | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | Elective II | | Artificial Intelligence/ High Speed Networks/ Web Technology | 4 | 0 | 0 | 0 | 3 | 4 | 40 | 60 | 100 |
| 6 | Core Paper XI | | Practical - III : Enterprise Computing Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 7 | Core Paper XII | | Practical - IV : Data mining Lab - using Python | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 8 | Spoken Tutorial | | LINUX | 0 | 0 | 0 | 0 | 1 | - | - | - | - |
| 9 | Soft Skills | | English for Competitive Exams | 0 | 0 | 0 | 0 | 2 | - | 50 | 50 | 100 |
| 10 | Internship - I | | Summer Internship | 0 | 0 | 0 | 0 | 2 | 3-4 Weeks | | | |
| Total | | | | | | | | 28 | 30 | 330 | 470 | 800 |

SCHEME OF III SEMESTER M.Sc. COMPUTER SCIENCE PROGRAM

| S. No | Course Category | Course Code | Course | Hour Distribution | | | | Over all Credits | Total Contact Hours/Week | Marks | | |
|--------------|------------------|-------------|--|-------------------|---|---|---|------------------|--------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CI E | ES E | To tal |
| 1 | Core Paper XIII | | Soft Computing | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Core Paper XIV | | Internet Technology | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Core Paper XV | | Cloud Computing | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Core Paper XVI | | Big Data Analytics | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | Elective III | | Cryptography/ Information security/ Internet Security And Computer Forensics | 4 | 0 | 0 | 0 | 3 | 4 | 40 | 60 | 100 |
| 6 | Core Paper XVII | | Practical - V : Internet Technology Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 7 | Core Paper XVIII | | Practical - VI : Big Data Analytics Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 8 | Spoken Tutorial | | JAVA | 0 | 0 | 0 | 0 | 1 | - | - | - | - |
| 9 | Soft Skills | | Personality Development | 0 | 0 | 0 | 0 | 2 | - | 50 | 50 | 100 |
| Total | | | | | | | | 26 | 30 | 330 | 470 | 800 |

SCHEME OF IV SEMESTER M.Sc. COMPUTER SCIENCE PROGRAM

| S. No | Course category | Course Code | Course | Hour Distribution | | | | Over all Credits | Total Contact Hours/Week | Marks | | |
|--------------|--------------------|-------------|---------------------------------|-------------------|---|---|---|------------------|--------------------------|-----------|------------|------------|
| | | | | L | T | P | S | | | C I E | E S E | T ot al |
| 1 | Core Paper XIX | | Project & Viva-Voce | 0 | 0 | 0 | 0 | 15 | - | 40 | 60 | 100 |
| 2 | Spoken Tutorial | | LaTeX | 0 | 0 | 0 | 0 | 1 | - | - | - | - |
| 3 | Soft Skills | | Presentation | 0 | 0 | 0 | 0 | 2 | - | 50 | 50 | 100 |
| 4 | Certificate Course | | MOOC Certificate Course (NPTEL) | 0 | 0 | 0 | 0 | 2 | - | - | - | - |
| Total | | | | | | | | 20 | - | 90 | 110 | 200 |

Project & Viva-Voce will be conducted in fourth semester, Soft Skill and Spoken Tutorial Certificate course will be conducted. Summer Internship and one MOOC certificate course will be conducted for the entire course.

Spoken Tutorial Courses Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India, Online Examination will be conducted and qualified students (Minimum passing 40%) will be issued certificate by IIT, Mumbai. Students will submit a copy of the certificate as a proof of qualifying the online test to the COE office.

Soft Skill Syllabus framed and approved by English Department.

Certificate Courses offered by NPTEL. Students should complete any one certificate course within the duration of the course (on or before the completion of the final semester). Students will submit a copy of the certificate issued by NPTEL after qualifying, as a proof to the COE's office.

FIRST SEMESTER (SYLLABUS)

Course Title: DESIGN AND ANALYSIS OF ALGORITHMS

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to understand the fundamental approaches in the design of algorithms and the impact of algorithm design in practice, to analyze the asymptotic performance of algorithm, to analyze different computational models (e.g., divide-and-conquer), order notation and various complexity measures (e.g., running time, disk space), to analyze and design the complexity/performance of different algorithms, to apply important algorithmic design paradigms and methods of analysis, to learn insights of lower bound theory problems and NP-hard and NP-complete problems.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Know the essentials of algorithms. Analyze the asymptotic performance of algorithms. Gain insights of basic elementary data structures. |
| CO2 | Describe the divide-and-conquer and greedy paradigm. Explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and-conquer, greedy algorithms and analyse them. |
| CO3 | Discuss the dynamic-programming paradigm and implementation of dynamic programming in various algorithmic design and analyze them. |
| CO4 | Define the design of backtracking, branch and bound paradigm. Describe the algorithms using this paradigm. Synthesize and analyze them. |
| CO5 | Know the concepts of non-deterministic algorithms, Lower bounds theory problems and the classes NP-hard and NP-complete problems. |
| CO6 | Synthesize appropriate algorithm for a design situation |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO 4 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |

| | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|----------|
| 1 | UNIT I: Introduction: Definition of Algorithm – pseudo code conventions – recursive algorithms – Time and Space Complexity – Asymptotic Notations (O, Ω , Θ). Elementary Data Structures: Stacks and Queues – Trees – Graphs | 10 | CO1 |
| 2 | UNIT II: Divide and conquer: General Method Quick sort, Selection sort – Finding maximum and minimum – merge sort. Greedy Method: General Method – knapsack problem – Tree vertex splitting – Job sequencing with deadline – Optimal storage on tapes. | 14 | CO2 |
| 3 | UNIT III: Dynamic Programming: General Method – multistage graphs – all pairs shortest paths – single source shortest paths – Search techniques for graphs – DFS-BFS-connected components – biconnected components. | 12 | CO3 |
| 4 | UNIT IV: Back Tracking: General Method – 8-queens – Sum of subsets – Graph Coloring – Hamiltonian cycles. Branch and Bound: General Method – Traveling Salesperson problem. | 12 | CO4 |
| 5 | UNIT V: Lower Bound Theory: Comparison trees – Oracles and advisory arguments. NP-Hard and NP Complete Problems: Non-deterministic Algorithms-The classes of NP-Hard and NP-Complete. NP Hard Problem: Clique Decision Problem (CDP) | 12 | CO5, CO6 |

TEXT BOOKS:

1. E Horowitz, S Sahni and S Rajasekaran (2008). *Computer Algorithms* (2001 edition), Galgotia Publishers, ISBN 81-7515-257-5
2. G Brassard and P Bratley (1997). *Fundamentals of Algorithms* (1st Edition), Prentice Hall India Learning Private Limited, ISBN 8120311310
3. Rajesh K. Shukla (2015). *Analysis and Design of Algorithms: A Beginners's Approach* (1st Edition), Wiley, ISBN 978-8126554775

REFERENCE BOOKS:

1. Cormen Thomas H, Charles S. Leiserson, Ronald L. Rivest, Clifford Stein (2012). *Introduction to Algorithms* (3rd edition), MIT Press Ltd, ISBN 9780262033848
2. Anany Levitin (2017). *Introduction to the Design and Analysis of Algorithms* (3rd edition) Pearson, ISBN 978-0132316811
3. Jon Kleinberg, Eva Tardos (2006). *Algorithm Design* (3rd edition revised), Pearson Education, ISBN 9780132131087

E- REFERENCES:

1. <https://nptel.ac.in/courses/106/106/106106131/>
2. <https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-cs27>
3. <https://www.cs.duke.edu/courses/fall08/cps230/Book.pdf>

Course Title: PYTHON FOR DATA ANALYTICS

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

To introduce Python programming language through its core language basics and program design techniques suitable for modern applications. To understand the data structures available in python, to work with databases and data visualization and exploration. To utilize high-performance programming constructs available in Python to develop solutions in real life scenarios.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Examine Python syntax and semantics and be fluent in the use of Python input output functions. |
| CO2 | Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions. |
| CO3 | Interpret/Evaluate the concepts of Object-Oriented Programming using Python. |
| CO4 | Demonstrate proficiency in handling Strings and File Systems. |
| CO5 | Discover the capabilities of numpy, scipy and matplotlib for scientific programming. |
| CO6 | Implement exemplary applications related to Pandas and DataFrames in Python. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 1 | 1 | 3 | 1 | 3 | 1 | 1 | 3 | 3 | 2 | 1 | 3 |
| CO 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 4 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 1 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-------------|
| 1 | UNIT I : Introduction to Python – Installing in various Operating Systems - Executing Python Programs - Basic Programming concepts - Variables, expressions and statements - Input/Output – Operators. – Conditional statements –loops | 12 | CO1 |
| 2 | UNIT II: Functions - Arguments - Return values – keyword argument function – function with default values - Lambda function - Data Structures –Strings - Lists - Dictionaries - Tuples - Sets Sequences - Modules and Packages | 12 | CO2 |
| 3 | UNIT III : File Handling - Regular Expressions - Text handling - Object Oriented Programming-Classes - Objects - Inheritance - Overloading - Polymorphism – exception handling - Interacting with Databases - -Introduction to MySQL -Interacting with MySQL - Building an address book with add/edit/delete/search features. | 12 | CO3, CO4 |
| 4 | UNIT IV: Scientific Programming using NumPy/SciPy and Matplotlib – Array – type of arrays – array operations - 2D numpy arrays, Basic Statistics ,ScipyLinalg, scipy Optimize. Matplotlib – Introduction, Simple plots, Figures and Subplots – saving plots | 12 | CO5 |
| 5 | UNIT V: Introduction to Pandas-Creation of Series- Operations- Creation of Dataframes-Operations-Import/Export of different types of Files-Slicing - Filtering- groupby-Aggregation-Simple plot using pandas- to check for missing values, outliers and imbalance in dataset – case study :real time dataset analysis | 12 | CO6 |

TEXT BOOKS:

1. Allen B Downey (2012) *Think Python: How to Think Like a Computer Scientist* (1st Edition), O’Reilly.
2. Vamsi Kurama, *Python Programming: A Modern Approach*, Pearson Education.
3. R. Nageswara Rao, *Core Python Programming*, 2nd Edition, Dreamtech.

REFERENCE BOOKS:

1. Mark Lutz, *Learning Python*, Orielly.
2. W.Chun, *Core Python Programming*, Pearson.
3. Kenneth A. Lambert, *Introduction to Python*, Cengage.
4. Pooja Sharma, (2017). *Programming in Python*, BPB Publications.
5. A. Martelli, A. Ravenscroft, S. Holden, *Python in a Nutshell*, OREILLY.

E- REFERENCES:

1. <https://nptel.ac.in/courses/106/106/106106182/>
2. <https://nptel.ac.in/courses/106/106/106106145/>
3. <https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-cs36/>
4. <https://www.tutorialspoint.com/python/>
5. <https://www.udacity.com/course/introduction-to-python>

Course Title: COMPUTER NETWORKS

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand the concepts and fundamentals of data communication and computer networks, to familiarize with the basic taxonomy and terminology of the computer networking area and to experience the designing and managing of communication protocols while getting a good exposure to the TCP/IP protocol suite.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Have knowledge of the basic principles, concepts of computer networks and the design of OSI layers. |
| CO2 | To get insights into the Data Link Layer protocols |
| CO3 | To provide overview of the Protocols of Medium Access sub layer |
| CO4 | To identify the design issues and solutions in the Network Layer |
| CO5 | To have basic knowledge of TCP protocol |
| CO6 | Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/ PSO | PO | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|----------|
| 1 | UNIT I: Introduction: Network Hardware – Software – Reference Models – OSI and TCP/IP models – Physical layer: Transmission media–Wireless Transmission–Narrowband ISDN. | 9 | CO1 |
| 2 | UNIT II: Telephones structure –local loop– trunks and multiplexing, switching. Data link layer: Design issues – error detection and correction, Elementary data link protocols – Sliding window protocols. | 99 | CO2 |
| 3 | UNIT III: Medium Access Sub Layer: Channel Allocation Problem – Multiple Access Protocols: ALOHA– Carrier Sense Multiple Access Protocols – Collision Free Protocols – Limited Contention Protocols Bridges – Transparent Bridges – Spanning Tree Bridges – Source Routing Bridges. | 9 | CO3 |
| 4 | UNIT IV: Network layer – design issues – Routing Algorithms: Shortest Path Routing – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing Congestion control algorithms: General Principles – Congestion Control in Virtual Circuit Subnets – Choke Packets – Load Shedding – Jitter Control– IP protocol – IP Address –Subnets – Internet Control Protocol. | 9 | CO4, CO6 |
| 5 | UNIT V: Transport layer –Elements– Connection management – Addressing, Establishing & Releasing a connection – Transport Control Protocol: TCP Protocol – TCP segment Header– Connection Management –Application Layer - Network Security-Traditional Cryptography - DNS-DNS Name Space -Electronic Mail - Message Formats. | 9 | CO5, CO6 |

TEXT BOOKS:

1. A.S.Tanenbaum (2013). *Computer Networks* (5th Edition), Pearson Education, ISBN-13 : 978-8131770221

REFERENCE BOOKS:

1. B Forouzan (1998). *Introduction to Data Communications in Networking*, Tata McGraw Hill.
2. Halsall (1995). *Data Communications, Computer Networks and Open Systems* (20th edition), Addison Wesley.

E- REFERENCES:

1. www.technolamp.co.in/2010/08/computer-networks-tanenbaum-powerpoint.html
2. <https://www.ece.rutgers.edu/~marsic/books/CN/>

Course Title: JAVASCRIPT

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to develop a basic understanding of how JavaScript works and to learn basic syntax, variable types, Creating conditional structures, Looping Statements , storing data in arrays and learn how to design using JavaScript built-in functions and creating recursive functions. Understanding the concept of Form validation and JavaScript Events. To develop the skills of designing JavaScript redirect, ImageMap and cookies.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Develop the knowledge JavaScript Structure, Variables, data types, different types of operators and Control Structures in JavaScript. |
| CO2 | Implementation of arrays, Looping Structures, Functions in JavaScript. |
| CO3 | Learn the concepts of JavaScript Form Validation and JavaScript Events. |
| CO4 | Gain the Knowledge of JavaScript Exception Handling-OOPS concept. |
| CO5 | Implementation of JavaScript redirect, JavaScript ImageMap. Learning the concepts of DOM. |
| CO6 | Implementation of JavaScript Dialog Boxes and Cookies. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

| | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|----------|
| 1 | UNIT-I: Introduction to Scripting: Introduction - Java Script Structure - Java Script Variables – Global variable - Data types - Java Script Operators – Java Script Control Statements – Java Script Looping statements - Java script Arrays - array literal – creating instance of Array directly- using an array constructor- JavaScript Array methods. | 9 | CO1 |
| 2 | UNIT-II: JavaScript Functions- JavaScript Function Arguments – Function with Return Value – JavaScript Function Object – JavaScript Function methods – Passing arrays to functions – recursion – java script global functions - JavaScript String methods – JavaScript Number methods- Java Script Get date function- Java Script Set date function - JavaScript Regular Expression- Quantifiers – Literal Characters – Meta characters-Modifiers–Regular Expression Properties –Regular Expression methods. | 9 | CO2 |
| 3 | UNIT-III: JavaScript Validation - JavaScript Form Validation- JavaScript Retype Password Validation - JavaScript Number Validation- JavaScript Validation with image - JavaScript email validation- JavaScript Events- JavaScript addEventListener() - JavaScript onclick event -, JavaScript dblclick event - JavaScript onload event - JavaScript onresize event. JavaScript Set Object- JavaScript Set Methods | 9 | CO3 |
| 4 | UNIT-IV: JavaScript Exception Handling –OOPs-JaJavaScript try-catch- JavaScript vaScript Class –JavaScript Object- JavaScript prototype – JavaScript Constructor method- JavaScript static method – JavaScript Encapsulation – JavaScript Inheritance- JavaScript Polymorphism – JavaScript abstraction - JavaScript redirect - JavaScript Image Map. | 9 | CO4 |
| 5 | UNIT-V: JavaScript DOM- Properties of document object- Methods of document object- Accessing field value by document object- JavaScript Dialog Boxes –Alert Dialog Box – Confirmation Dialog Box – Prompt Dialog Box. JavaScript Cookies- Cookie Attributes- Cookie with multiple name-deleting Cookies. Intro to JSON JSON syntax, Need of JSON in real web sites, JSON object, JSON array, Complex JSON objects, Reading JSON objects using jQuery. | 9 | CO5, CO6 |

TEXT BOOKS:

1. Mark Myers,(2014). A Smater Way to learn JavaScript (1st edition), Lightning Source Inc Publishers,ISBN-10:1497408180
2. David Flanagan ,(2011). JavaScript : The Definitive Guide(7thh edition), O'Reilly publishers,ISBN-10-05-0596805527
3. Marjin Haverbeke,(2018). Eloquent JavaScript A Modern Intoduction to Programming (3rd edition), Finest in Geek Entertainment Publishers.

REFERENCE BOOKS:

1. Ivelin Demirov,(2014).Learn JavaScript with Interactive Exercises Visually, (3rd Edition), Sams publishers.

REFERENCES:

1. <https://www.tutorialspoint.com/javascript/index.htm>
2. <https://www.javatpoint.com/javascript-tutorial>
3. <https://www.guru99.com/interactive-javascript-tutorials.html>
4. <https://www.tutorialrepublic.com/javascript-tutorial/>
5. <https://www.javascript.com/try>

Course Title: OBJECT ORIENTED SOFTWARE ENGINEERING

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 03 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to Develop the knowledge and practical skills needed to successfully participate in the analysis, design and development of large software systems, using object-oriented approaches, they can Apply team dynamics by working in teams, Focus on object-oriented approaches and project management techniques Communicate the science and Development of graphical user interfaces, and quality assurance.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Knows the reason about the basic Software life cycle models Importance of various kinds of Project Management methods, Tracking Software Quality, Quality Standards and Metrics. |
| CO2 | Develop System Concepts for Object Modelling Design and implement a software design concepts to meet desired needs and Requirements. Design the UML concepts like sequential, Use cases and Activity diagram |
| CO3 | Concepts of Use cases, actors, and common modelling techniques. Implement the concept use cases, business actors , Significance of identifying the subsystems and business requirements |
| CO4 | Explain Design Workflow and System Design Concept Create Mapping Object Model to Database Schema Testing and verification process |
| CO5 | Usage of Software Configuration Management Define maintenance and its types. Build Reverse and re-engineering process. |
| CO6 | Build Reverse and re-engineering process. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |

| | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|-------------|---|------------|------------|
| 1 | Software life cycle models: Waterfall, RAD, and Spiral model Process metric – Product metrics – Estimation – LOC, FP, COCOMO models – Project Management – Planning, Scheduling and Tracking Software Quality – Quality Standards, Quality Metrics. | 10 | CO1 |
| 2 | System Concepts for Object Modeling – Abstraction, Inheritance, Polymorphism, Encapsulation, Message Sending, Association, Aggregation – Requirement Workflow Functional, Non-functional – Characteristics of Requirements – Requirement Elicitation Techniques – Requirement Documentation – Use case specification, Activity Diagram. | 10 | CO2 |
| 3 | Use-Case Modeling – Actors, Use Cases, Use Case Relationships. The Process of Requirements Use-Case – Identify Business Actors, Identify Business Requirements, Use Cases, Construct, Use Case Model Diagram – Class Diagrams and Object Diagrams – Package Diagrams – Sequence and Collaboration diagrams, State chart diagram. | 10 | CO3 |
| 4 | Design Workflow: System Design Concept – Coupling and Cohesion – Architectural Styles – Identifying Subsystems and Interfaces – Design Patterns Implementation Workflow – Mapping models to Code – Mapping Object Model to Database Schema Testing – Formal Technical Reviews – Walkthrough and Inspection. | 5 | CO4 |
| 5 | Software Configuration Management – Managing and controlling Changes – Managing and controlling versions Maintenance – Types of maintenance – Maintenance Log and defect reports – Reverse and re-engineering. | 5 | CO5, CO6 |

TEXT BOOKS:

1. Roger Pressman, (2005). *Software Engineering*, (Sixth Edition), TMH. ISBN no: 13:978-007-126782-3.
2. Bahrami, (2008). *Object Oriented Systems Development*, (Second edition), TMH. ISBNno: 13 978-0070265127.
3. Bernd Bruegge, (2004). *Object oriented software engineering*, (Second Edition), Pearson Education. ISBN no: 13 978-93332518681.

REFERENCE BOOKS:

1. Stephan R Schach, (2007). *Object oriented software engineering*, (Second edition), TMH. ISBN no: 9780071259415

- Timothy C Lethbridge, Robert Laganriere (2004). *Object-Oriented Software Engineering Practical software development using UML and Java*, (Second edition), TMH.

E- REFERENCES:

- <https://nptel.ac.in/courses/106/105/106105224/>
- <https://nptel.ac.in/courses/106/101/106101061/>
- <https://www.edutechlearners.com/oose-notes/>
- https://www.youtube.com/watch?v=BqVqjJq7_vI&list=PLrjkTql3jnm_kpRxNK6la_gHuKQ3WI_dL

Course Title: UNIFIED MODELING LANGUAGE

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 03 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to understand the importance of various basic concepts of object modeling Gain the knowledge about various basic structural modeling along with their applicability contexts. The students can Analyze various basic Behavioral modeling of object-oriented software design (UML) and review the concepts of Advance Behavioral modeling.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Analyse the basic concepts of object modeling. |
| CO2 | Demonstrate various Basic Structural Modeling using the appropriate notation |
| CO3 | Demonstrate various Basic Behavioral Modeling using the appropriate notation |
| CO4 | Analyse various Advanced Behavioral Modeling using the appropriate notation |
| CO5 | Analyse Architectural Modeling using the appropriate notation |
| CO6 | Apply various uml diagrams for software development. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO 2 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 |
| CO 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO 4 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO 5 | | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |

| | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | | | | | | | | | | | | |
| CO 6 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|----------|
| 1 | Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture | 9 | CO1 |
| 2 | Basic Structural Modeling: Classes, Relationships, common and Mechanisms, diagrams. Interfaces, Types and Roles, Packages. Class & Object Diagrams: Terms, Concepts, modeling techniques for Class & Object Diagrams. | 9 | CO2 |
| 3 | Basic Behavioral Modeling: Interactions, Interaction diagrams. Use cases, Use case Diagrams, Activity Diagrams. | 9 | CO3 |
| 4 | Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams. | 9 | CO4 |
| 5 | Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams. | 9 | CO5, C06 |

TEXT BOOKS:

- Grady Booch, James Rumbaugh, Ivar Jacobson (2005). *The Unified Modeling Language User Guide*, (Second Edition), Pearson Education, ISBN no:0-201-57168-4
- Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado (2003). *UML Toolkit*, (Second Edition), WILEY-Dreamtech India Pvt. Ltd, ISBN no:13-978-81-265-0466-4
- Grady Booch (2007). *Object Oriented Analysis and Design*, (Third Edition), Addison Wesley, ISBN no :0-8053-5340-2

REFERENCE BOOKS:

- Pascal Roques, Modeling (2007). *Software Systems Using UML2*, (Fourth Edition), WILEY-Dreamtech India Pvt. Ltd. ISBN no :13-978-81-265-0505-0
- AtulKahate, (2000). *Object Oriented Analysis & Design*, Tata McGraw-Hill. ISBN no: 0-07-058376-5
- Ali Bahrami, (1999). *Object Oriented Systems Development*, McGraw Hill. ISBN no:13-978-0-07-026512-7

E- REFERENCES:

- www.uml-tutorials.trireme.com
- www.smartdraw.com/resources/tutorials/uml-diagrams

Course Title: OBJECT ORIENTED ANALYSIS AND DESIGN

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 03 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to understand the concept of object-oriented development, and create a static object model and a dynamic behavioral model and a functional model of the system. They can easily understand the approaches to system design and object design, and the techniques of translating design to implementation.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyze object basics and UML. |
| CO2 | Gain knowledge about attributes and relationship. |
| CO3 | Interpret axioms and do a case study. |
| CO4 | Detailed study about Micro level process. |
| CO5 | Digital signatures. |
| CO6 | Gain knowledge about various testing strategies. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO 2 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 |
| CO 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO 4 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO 5 | | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |

| | | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| | 3 | | | | | | | | | | | | | |
| CO 6 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1 | System development - object basics - development life cycle - methodologies - patterns - frameworks - unified approach - UML. | 10 | CO1 |
| 2 | Use Case models - object analysis - object relations - attributes - methods, class and object responsibilities - case studies | 10 | CO2 |
| 3 | Design processes - design axioms - class design - object storage - object interoperability - case studies. | 10 | CO3 |
| 4 | User interface design - view layer classes - micro - level processes - view layer interface - case studies. | 10 | CO4 |
| 5 | Quality assurance tests - testing strategies - object orientation on testing - test cases - test plans. | 5 | CO5 |

TEXT BOOKS:

1. Ali Bahrami, (1999). *Object Oriented Systems Development*, McGraw Hill. ISBN no:13-978-0-07-026512-7
2. Grady Booch (2007). *Object Oriented Analysis and Design*, (Third Edition), Addison Wesley, ISBN no :0-8053-5340-2
3. Bernd Bruegge, (2004). *Object oriented software engineering*, (Second Edition), Pearson Education. ISBN no: 13 978-93332518681.

REFERENCE BOOKS:

1. James Rumbaugh, Michael R. Blaha, (2004). *Object-Oriented Modeling and Design with UML* , (Second Edition),Prentice Hall ISBN no: 978-81-317-1106-4
2. AtulKahate, (2000). *Object Oriented Analysis &Design*, Tata McGraw-Hill. ISBN no: 0-07-058376-5
3. Roger Pressman, (2005). *Software Engineering*, (Sixth Edition), TMH. ISBN no: 13:978-007-126782-3.

E- REFERENCES:

1. <http://www.exforsys.com/tutorials/ooad/ooad-introduction.html>
2. <http://www.devshed.com/c/a/Practices/Introducing-UMLObjectOriented-Analysis-and-Design>

Course Title: PRACTICAL I - PYTHON FOR DATA ANALYTICS LAB

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 02 |
| L:T:P:S : 0:0:5:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to interpret the programming language and implement the various programs in handling data, strings, files, graphics, and data exploration.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Interpret the programming task logically and make the pseudo code. |
| CO2 | Understand the IDE and write, execute and debug. |
| CO3 | Implement the basic string functions. |
| CO4 | Apply the concept of pygtk. |
| CO5 | Understand the concept of interpret data exploration and data munging. |
| CO6 | Understand and apply the knowledge on data science. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 1 | 1 | 3 | 1 | 3 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 2 | 2 | 2 | 3 |
| CO 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 4 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 1 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1 | a) Simple calculator to do all the arithmetic operations. b) Programs to use control flow tools like if. c) Programs to use for loop. | 5 | CO1 |
| 2 | a) Data structures <ul style="list-style-type: none"> ● Use list as stack ● Use list as queue ● Tuple, sequence b) New module for mathematical operations and use in your program. c) Programs to read and write files, create and delete directories. | 5 | CO2 |
| 3 | a) Programs with exception handling. b) Programs using classes and objects. c) Connect with MYSQL and create an address book and do the operations. <ul style="list-style-type: none"> ● Insert, read, update and delete | 7 | CO3 |
| 4 | A) GUI program using PYGTK. b) programs Using Numpy. c) Programs Using scipy. | 8 | CO4 |
| 5 | a) Programs using series and data frames. b) Programs using charts/graphs. | 10 | CO5 |
| 6 | a) Programs using statistics. b) Programs for data exploration. | 10 | CO6 |

Course Title: PRACTICAL II - PHP PROGRAMMING LAB

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 02 |
| L:T:P:S : 0:0:5:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to develop simple applications using control flow and loops, create arrays and perform various array functions and perform form validations, using different form events and design applications using object oriented concept and Cookies and to acquire knowledge about designing DOM.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Develop application using Control structures and Looping statements. |
| CO2 | Develop application using array functions, string functions, date functions. |
| CO3 | Develop applications using user defined functions and file operations |
| CO4 | Build and implement application using Object oriented programming concept. |
| CO5 | Build and develop application using Cookies |
| CO6 | Develop Application using Form Validation |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|-------------|--|------------|-------------|
| 1 | Create application using Control Structures such as IF-Statement – IF-Else, IF-Else IF – Nested IF, Switch Statement ,Built in application using Looping Statements such as For ,While, Do-While Statement | 9 | CO1 |
| 2 | Create Application using array, Develop programs using String and Date Functions | 9 | CO2 |
| 3 | Design application using Form Events and Validate the Forms | 9 | CO3 |
| 4 | Design application using Exception handling and Develop application using OOPs Concept | 9 | CO4 |
| 5 | Develop Application JavaScript redirect –Image Map, Implementation of DOM and Cookies Concept | 9 | CO5, CO6 |

Course Title: SPOKEN TUTORIAL - PYTHON

| S.No | CONTENTS OF MODULE |
|------|---|
| 1 | Getting started with python – Using the plot command interactively – Embellishing a plot – Saving plots – Multiple plots – Additional features of Python – loading data from files – Plotting the data – Other types of plots – Getting started with sage notebook – Getting started with symbolic – Using Sage – Using sage to teach – Getting started with lists – Getting started with for – Getting started with strings – Getting started with files – Parsing data – Statistics – Getting started with arrays – Accessing parts of arrays – Matrices – Least square fit – Basic data types and operators – I/O – conditionals – Loops – Manipulating lists – Manipulating strings – Getting started with tuples – Dictionaries – Sets – Getting started with functions – Advanced features of functions – Using python modules – Writing python scripts – Testing and debugging |

Note:

Courses Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India. At the end of the course Online Examination will be conducted for 45 minutes and qualified students (Minimum passing 40%) will be issued certificate by IIT, Mumbai.

SECOND SEMESTER (SYLLABUS)

Course Title: DIGITAL IMAGE PROCESSING

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to understand digital image processing fundamentals, to compare and contrast the classification of image Enhancement techniques in detail, to identify and analyze the concepts of image restoration and degradation, to get good understanding of image segmentation and image compression techniques, to apply the knowledge in research.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Describe the fundamentals of image processing and its applications. |
| CO2 | Gain adequate knowledge of Image enhancement techniques in spatial domain |
| CO3 | Detailed classification of Image enhancement techniques in frequency domain and compare with spatial domain techniques |
| CO4 | Analyze the Image restoration and degradation concepts Identify the fundamentals techniques in image segmentation |
| CO5 | Acquire a good knowledge of Image compression techniques |
| CO6 | Interpret Image segmentation, restoration and compression techniques |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 |
| CO 3 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO 4 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|----------|
| 1 | UNIT I: Introduction–Origin of Digital Image Processing- steps in image processing – Components of Image Processing System - Image acquisition, representation, sampling and quantization, relationship between pixels. | 9 | CO1 |
| 2 | UNIT II: Image enhancement in spatial domain – some basic gray level transformations – histogram processing – enhancement using arithmetic, logic operations – basics of spatial filtering and smoothing | 9 | CO2 |
| 3 | UNIT III: Image enhancement in Frequency domain – Introduction to Fourier transform: 1-D, 2-D DFT and its inverse transform, smoothing frequency domain filters – Ideal low pass filters, Butterworth Low-pass filter, Gaussian Low-pass filters sharpening frequency domain filters – Ideal High pass filter, Butterworth high pass filter, Gaussian High Pass filter | 9 | CO3 |
| 4 | UNIT IV: Image restoration: Model of degradation and restoration process – noise models – restoration in the presence of noise – periodic noise reduction. Image segmentation: Detection of Discontinuities -Point Detection - Line Detection – Edge Detection- Thresholding : Basic Global and Adaptive Thresholding - Region-based segmentation. | 9 | CO4 |
| 5 | UNIT V: Image compression: Fundamentals – models – error free compression – Lossy compression: Lossy predictive coding, Transform coding, Wavelet coding. | 9 | CO5, CO6 |

TEXT BOOKS:

1. RC Gonzalez, RE Woods (2018). *Digital Image processing* (4th Edition), Pearson Education, ISBN 0201180758
2. RC Gonzalez (2020). *Digital Image Processing using MATLAB* (3rd edition), GP Publishers, ISBN 978-0070702622
3. Maria Petrou, Costas Petrou (2010). *Image Processing: The Fundamentals* (2nd edition), Wiley, ISBN 978-0470745861

REFERENCE BOOKS:

1. Chris Solomon. *Fundamentals of Digital Image Processing* (1st edition), Wiley, ISBN 978-0470844731.
2. Anil. K. Jain (1988). *Fundamentals of Digital Image Processing* (1st edition), Pearson ISBN 978-0133361650.
3. P. K. Sinha (2012). *Image Acquisition and preprocessing for machine vision systems* (1st edition), SPIE Press, ISBN 978-0819482020.

E- REFERENCES:

1. www.nptel.iitm.ac.in/video.php?subjectId=117105079
2. <http://www.library.cornell.edu/preservation/tutorial/contents.html>

3. <https://freevidelectures.com/course/2316/digital-image-processing-iit-kharagpur>

Course Title: ADVANCED DATA BASE MANAGEMENT SYSTEM

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to understand the role of a database management system in an organization and the basic concepts and terminology related to DBMS, evaluate the normality of a logical data model, and correct any anomalies, understand the Object model and Object Relational database management system, understand the basics of data warehousing and Distributed Databases, and emerging database technologies.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Describe the characteristics of Database Management Systems and about the concepts and models of database. |
| CO2 | Design ER-models to represent simple database application scenarios. |
| CO3 | Convert the ER-model to relational tables, populate relational database. Improve the database design by normalization. |
| CO4 | Describe the fundamental elements of Object and Object relational database management systems. |
| CO5 | Get the knowledge of Data Warehousing And Distributed DBMS |
| CO6 | Analyse and describe the Management issues of Mobile databases and Multimedia Databases |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 | |
| CO 1 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO 4 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 |
| CO 5 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|---------|
| 1 | UNIT I: Database System Concepts And Architectures: Data Models – Schemas – Instances – Three Schema Architecture – Data Independence – Database Languages. E-R Model and EER Model: Entity Types – Entity Sets – Attributes – Key – Relationship Types – Relationship Sets – Weak Entity Types – ER Diagram – Naming Conventions – Subclasses – Super classes – Inheritance – Specialization And Generalization – Constraints and Characteristics Of Specialization and Generalization Hierarchies. | 9 | CO1,CO2 |
| 2 | UNIT II: Normalization: Basic Definitions – Functional Dependencies – Types of FD – Introduction to Normalization – Decomposition – Dependency Preservation – First, Second, Third Normal Forms – BCNF – Multivalued Dependencies and Fourth Normal Form – Join Dependency and Fifth Normal Form. | 10 | CO3 |
| 3 | UNIT III: Object And Object Relational Databases – Concepts for Object Databases: Object Identity – Object structure – Type Constructors – Encapsulation of Operations – Methods – Persistence – Type and Class Hierarchies – Inheritance – Complex Objects Object Database Standards and Languages: Overview of ODMG Model – ODL – OQL. | 8 | CO4 |
| 4 | UNIT IV Data Warehousing And Distributed DBMS – Data Warehousing – Characteristics Of Data Warehouses – Data Modeling For Data Warehouses – Typical Functionality Of A Data Warehouse – Distributed DBMS – Features – Factors Encouraging DDBMS – Advantages Of Distributed Data Bases – Distributed DBMS Architecture – Types Of Distributed Data Bases. | 9 | CO5 |
| 5 | UNIT V: Emerging Technologies – Mobile Databases – Architecture and Data Management Issues – Multimedia Databases – Nature of Data, Data Management Issues and Applications. | 9 | CO6 |

TEXT BOOKS:

1. R Elmasri, SB Navathe (2017). *Fundamentals of Database Systems* (7th Edition), Pearson Education/Addison Wesley.

REFERENCE BOOKS:

1. Henry F Korth, Abraham Silberschatz, S Sudharshan (2013). *Database System Concepts* (6th Edition), TMH.
2. CJ Date, A Kannan and S Swamynathan (2006). *An Introduction to Database Systems* (8th Edition), Pearson Education.

E- REFERENCES:

1. www.cse.iitb.ac.in/dbms/Data/Courses/CS632/
2. www.nptel.iitm.ac.in/video.php?subjectId=106106093
3. www.tutorialspoint.com/distributed_dbms/distributed_dbms_tutorial.pdf

Course Title: ENTERPRISE COMPUTING

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to understand the various concepts of Enterprise programming, developing RMI Application, Servlet and session management and learn data manipulation using JDBC, develop web applications using JSP, implement Javamail API and familiarize the students with the concepts of reusable classes using JavaBeans, Hibernate and Spring Framework applications.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Understand various concepts of Enterprise programming, analyze and implement the RMI Architecture for the necessary applications. |
| CO2 | Implement Session management using Servlet and implement JDBC for the database connectivity. |
| CO3 | Develop Web applications using JSP and JSP error pages. |
| CO4 | Design an application that sends and receives email with attachments. |
| CO5 | Implement Database connectivity through Hibernate Framework and also build web applications using Spring MVC. |
| CO6 | Study and use modern tools for rapidly building enterprise applications. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO 4 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 |
| CO 5 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1 | Need for Enterprise Programming – J2EE Advantage – Enterprise Architecture types– Architecture of J2EE – J2EE Components – | 9 | CO1 |

| | | | |
|---|---|----|----------|
| | J2EE Containers – Introducing RMI – RMI Architecture – Application Development with RMI – RMI over IIOP. | | |
| 2 | Introduction to Servlets – Servlet Life Cycle – Servlet API Basics – HTTP Redirects –Cookies –State and Session Management –Hidden Fields – URL rewriting –Session Management with the Servlet API –Inter Servlet Communication – Server Side Includes and Request Forwarding –Data Base Access with JDBC. | 9 | CO2 |
| 3 | JSP: Introduction JSP –Examining MVC and JSP –JSP scripting elements &directives –Working with variables scopes –Error Pages –using Java Beans in JSP. | 6 | CO3 |
| 4 | Javamail: Working with Java Mail –Understanding Protocols for Javamail –Components –Javamail API –Understanding Java Messaging Services: JMS Components EJB Fundamentals – EJB Architecture – EJB Roles –Introduction to Session Beans, Entity Beans & Message Driven Beans. | 9 | CO4 |
| 5 | Hibernate: Overview of Hibernate, Hibernate Architecture, Hibernate Mapping Types, Hibernate O/R Mapping, Hibernate Annotation, Hibernate Query Language –Spring MVC –Overview of Spring, Spring Architecture, bean life cycle, XML Configuration on Spring, Aspect – oriented Spring, Managing Database, and Managing Transaction. | 12 | CO5, CO6 |

TEXT BOOKS:

1. Jason hunter, William Crawford (2011). *Java Server Programming* (2nd Edition), O'Reilly Media, Inc., ISBN: 9780596000400.
2. J McGovern, R Adatia, Y Fain (2003). *J2EE 1.4 Bible*, Wiley-dreamtech India Pvt Ltd.
3. H.Schildt (2002). *Java 2 Complete Reference* (5th Edition), TMH.

REFERENCE BOOKS:

1. K Moss (1999). *Java Servlets* (Second Edition), TMH.
2. Joseph O'Neil (1998) *Java Beans from the Ground Up*, TMH.
3. TomValesky (2000) *Enterprise JavaBeans*, Addison Wesley.
4. Cay S Horstmann & Gary Cornell (2002). *Core Java Vol II Advanced Features* (8thEdition), Addison Wesley.

E- REFERENCES:

1. <https://www.tutorialspoint.com/servlets/servlets-first-example.htm>
2. <http://www.servlets.com/jservlet2/examples/>
3. http://www.j2eetutorials.50webs.com/JSP_example1.html
4. <http://hibernate.org/>
5. <https://slideplayer.com/slide/7362666/>

Course Title: DATA MINING TECHNIQUES

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand and implement classical models and algorithms in data warehousing and data mining, analyze the data, identify the problems, and choose the relevant algorithms for the chosen dataset, compare and contrast different conceptions of data mining, to characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Appreciate the basic principles, concepts and applications of data warehousing and data mining |
| CO2 | Have a good knowledge of the preprocessing techniques |
| CO3 | Perform Data Mining using association rules |
| CO4 | Get insights from data using classification and prediction techniques |
| CO5 | Acquire knowledge of clustering techniques and outliers |
| CO6 | Apply data mining techniques to real world data by cleaning the data, integrating the data from different sources, predicting a model to group the data tuples into classes, discovering patterns using association rule mining and grouping the data set into clusters. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1 | UNIT I: What is Data Mining – What Kinds of Data can be mined- Kinds of Patterns that can be mined - Technologies used - Issues in Data Mining – Data Objects and Attribute Types- Basic Statistical Description of Data- Data Visualization. | 9 | CO1 |
| 2 | UNIT II: Data Preprocessing: Why preprocess the data – Data | 9 | CO2 |

| | | | |
|---|--|---|----------|
| | cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization. Data Warehouse: Basic concepts-Data Warehouse Modelling;Data Cube and OLAP | | |
| 3 | UNIT III: Data Mining Techniques: Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining. | 9 | CO3 |
| 4 | UNIT IV: Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy. | 9 | CO4, CO6 |
| 5 | UNIT V: Clustering Techniques: cluster Analysis – Clustering Methods – Similarity and Distance Measures – Hierarchical Methods – Partitional Methods – Outlier Analysis | 9 | CO5, CO6 |

TEXT BOOKS:

1. Jiawei Han, Micheline Kamber, Jian Pei (2008). *Data Mining: Concepts and Techniques* (2nd edition), Morgan Kaufmann, ISBN- 9780123814791

REFERENCE BOOKS:

1. Dunham MH, (2003). *Data Mining: Introductory and Advanced Topics*, Pearson Education.
2. Paulraj Ponnaiah, (2001). *Data Warehousing Fundamentals*, Wiley Publishers.
3. SN Sivananda and S Sumathi, (2006). *Data Mining*, Thomsan Learning, Chennai

E- REFERENCES:

1. https://onlinecourses.nptel.ac.in/noc21_cs06/preview/
2. <https://www.udemy.com/fundamentals-of-data-mining/>
3. <https://www.coursera.org/specializations/data-mining/>
4. <https://www.classcentral.com/subject/data-mining/>

Course Title: ARTIFICIAL INTELLIGENCE

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 03 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to learn the basic concepts of AI algorithms that can improve computational thinking. AI concepts are used to impart artificial intelligence goals and techniques to students. They can acquire the basic knowledge of problem solving, and learning methods for solving real world problems. The students will be able to develop intelligent systems by assembling solutions to Heuristic Problems and also they can understand Natural Language Processing (NLP).

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Understand the various characteristics of Intelligent agents Evaluate Artificial Intelligence (AI) methods and describe their foundations. |
| CO2 | Analyze and illustrate how search algorithms play vital role in problem solving |
| CO3 | Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation and learning. |
| CO4 | Illustrate the construction of learning and Informed search |
| CO5 | Know about the various applications of adversarial search in AI. |
| CO6 | understand the different types of Hill Climbing Algorithm , Discuss current scope and limitations of AI and societal implications |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 1 | 1 | 3 | 2 | 1 | 3 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 1 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 1 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1 | UNIT I: Artificial Intelligence(AI) –Introduction-Goals of artificial intelligence, Pros and Cons of artificial intelligence- Types of Artificial intelligence- Type-1, Type2- Agents in artificial intelligence: Intelligent agents-Rational agent- Types of AI Agents | 9 | CO1 |
| 2 | UNIT II: Searching Algorithms: - Terminologies- Types of Search algorithms: uninformed search algorithm-Breadth First Search- Depth First Search- Depth Limited Search-Iterative Deepening Depth First Search-Uniform cost search-Bidirectional search | 9 | CO2 |
| 3 | UNIT III: Informed search algorithm: Pure Heuristic search-Best | 9 | CO3 |

| | | | |
|---|---|---|-------------|
| | first search algorithm (Greedy Search)-A* search algorithm-Natural Language Processing (NLP) : Applications of NLP-Phases of NLP. | | |
| 4 | UNIT IV: Hill Climbing Algorithm-Features-state space diagram-Types of Hill Climbing Algorithm – Simple –Steepest-ascend – stochastic hill climbing- Means Ends Analysis algorithm- example. | 9 | CO4 |
| 5 | UNIT V: Adversarial search: Game Tree- Mini max algorithm- Example-alpha Beta Pruning-base theorem in AI- Bayesian Belief Network in AI | 9 | CO5, CO6 |

TEXT BOOKS:

1. S.J. Russell, Peter Norvik (2015). *Artificial Intelligence A Modern Approach*, (3rd Edition), Pearson Education, ISBN 10- 292-02420-8.
2. Patterson, (2015). *Introduction to Artificial Intelligence*, (1st Edition), Pearson Education, ISBN 978-93-325-51-94.

REFERENCE BOOKS:

1. Elaine Rich Shivashankar B. Nair (2017). *Artificial Intelligence*, (3rd Edition) McGraw Hill Education, ISBN 10-9780070087705.
2. Alpaydin E, (2010). *Introduction to Machine Learning*, 2nd edition, MIT Press.
3. Michael Negnevitsky (2020). *Artificial Intelligence: A Guide to Intelligent Systems*, (3rd Edition) Pearson Education, ISBN 10-9353946794.

E- REFERENCES:

1. <https://www.javatpoint.com/artificial-intelligence-tutorial>
2. <https://www.coursera.org/learn/machine-learning>
3. <https://nptel.ac.in/courses/106/105/106105077/>

Course Title: HIGH SPEED NETWORKS

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 03 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to Understand evolution of communication and networking, also to enhance future networks and principles of operation, Provide the various high speed digital access and broadband technologies, Performance issues and quality of service required for better performance of high speed networks, Develop an in-depth understanding, in terms of architecture, protocols and applications, of major high-speed networking technologies and Discusses logical, routing, Addressing, addressing, protocols and about ATM.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Identify the existing communication networks, understand the algorithm and technologies involved in internet and associated networks. |
| CO2 | Develop specialized knowledge related to the building blocks and operation of high speed networking technology. |
| CO3 | Demonstrate the knowledge of network planning and optimization |
| CO4 | Apply the concepts to optimize and troubleshoot high speed network. |
| CO5 | Use and assist in network design and implementation. |
| CO6 | Select the ATM over other available transfer modes in network designs |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1 | UNIT I: High Speed Networks Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, ATM logical Connection, ATM Cell – ATM Service Categories – AAL High Speed LAN's: Fast Ethernet, Gigabit Ethernet, Fibre Channel – Wireless LAN's: applications, requirements – Architecture of 802.11 | 9 | CO1 |
| 2 | UNIT II: Congestion And Traffic Management Queuing Analysis – | 99 | CO2 |

| | | | |
|---|--|---|-------------|
| | Queuing Models – Single Server Queues – Effects of Congestion – Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control. | | |
| 3 | UNIT III: TCP And ATM Congestion Control TCP Flow control – TCP Congestion Control – Retransmission – Timer Management – Exponential RTO backoff – KARN’s Algorithm – Window management – Performance of TCP over ATM Traffic and Congestion control in ATM – Requirements – Attributes – Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate control, RM cell formats, ABR Capacity allocations – GFR traffic management. | 9 | CO3 |
| 4 | UNIT IV: Integrated And Differentiated Services: Integrated Services Architecture – Approach, Components, Services- Queuing Discipline, FQ, PS, BRFQ, GPS, WFQ – Random Early Detection, Differentiated Services. | 9 | CO4, CO6 |
| 5 | UNIT V: Protocols For Qos Support – RSVP – Goals & Characteristics, Data Flow, RSVP operations, Protocol Mechanisms – Multiprotocol Label Switching – Operations, Label Stacking, Protocol details – RTP – Protocol Architecture, Data Transfer Protocol, RTCP. | 9 | CO5, CO6 |

TEXT BOOKS:

1. William Stallings (2002). *High Speed Networks and Internet* (2nd Edition), Pearson Education, ISBN- 978-8177585698.

REFERENCE BOOKS:

1. Warland, Pravin Varaiya (2001). *High Performance Communication Networks* (2nd Edition), Jean Harcourt Asia Pvt Ltd.
2. Irvan Pepelnjk, Jim Guichard and Jeff Aparcar (2003). *MPLS and VPN Architecture*, Cisco Press.

E- REFERENCES:

1. <http://www.sterbenz.org/jpgs/tutorials/hsn/>
2. <https://www.slideshare.net/ayyakathir/unit1-29753217>
3. <http://pages.cpsc.ucalgary.ca/~carey/CPSC641/archive/Sept2005/>

Course Title: WEB TECHNOLOGY

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 03 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to exhibit the knowledge about various tags in html and style sheets and to impart knowledge in designing form using scripting language

and acquire knowledge about document objects and xml and style sheets to attain the cognizance of Wireless Scripting languages and Implement the XML Schema for acquiring the knowledge of user databases, to study the concepts of XML XSLT applications.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Develop knowledge of basic Web development, Web publishing , Web contents, Dynamic Web contents. |
| CO2 | Have a good knowledge of HTML tags. |
| CO3 | Gain the knowledge of DHTML, XHTML, Construct the Cascading Style Sheets. |
| CO4 | Gain the knowledge of XML applications and Preparing style sheets. |
| CO5 | Implementation of XSLT. |
| CO6 | Compare accepted standards and guidelines to select appropriate applications of XML to meet specified performance requirements. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| CO 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 |
| CO 4 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 5 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1 | Introduction to the Web : History and Evolution, Web development cycle , Web publishing , Web contents, Dynamic Web contents | 9 | CO1 |
| 2 | Introduction to HTML: HTML Fundamentals , HTML Browsers, HTML tags, Elements and Attributes , Structure of HTML code, Ordered List , Unordered List , Definition List, Nesting List, Block Level Tags, Text Level Tags. Inserting graphics, Scaling images, Frameset, Forms. | 9 | CO2 |
| 3 | An introduction to DHTML: Document Object Model (DOM) , Scripts, XHTML, Cascading Style Sheets (CSS):The usefulness of style sheets , Creating style sheets. | 9 | CO3 |

| | | | |
|---|--|---|-------------|
| 4 | XML introduction – XML life cycle – XML tree – XML syntax – elements – attributes – XML tags – XML Parser – X query – X Path – Link – DTD – XML schema- Applications of XML – XML for XML – XML Examples – Preparing a style sheet for Document Display. | 9 | CO4 |
| 5 | XSLT: introduction – XSL language – XSLT Transform – XSLT <template> – XSLT<value of> – XSLT<For each> - XSLT<if> – XSLT<sort> – XSLT<choose> – XSLT edit XML – XSLT examples. | 9 | CO5, CO6 |

TEXT BOOKS:

1. Thomas A. Powel, (2001). *HTML:The complete reference* (Third Edition), Osborne/McGraw-Hill, ISBN 0072129514, 9780072129519 .
2. Norman E. smith, *HTML Examples* , BPB publications, ISBN: 817029939-X.
3. Charles Arehart et. al (2000). *Professional WAP with WML, WML script, ASP, JSP, XML, XSLT, WTA, Push and Voice XML*, Shroff Publishers and Distributors Pvt Ltd., ISBN no :1-861004-0-44.
4. Elliotte Rusty Harold (2003). *XML™ Bible* (Third Edition), IDG Books India (P) Ltd., ISBN no:0-7645-4986-3.

REFERENCE BOOKS:

1. David Hunter, Jeff Rafter, Joe Fawcett, Andrew Watt, Linda McKinnon (2007). *Beginning XML*, (Fourth Edition), Wrox Press publishers. ISBN:978-0764570773.
2. P Nicopolitidis, Mohammad S Obaidat, Georgios I Papadimitriou(2003). *Wireless Networks*, Wiley publishers, ISBN:978-0470845295.
3. Ramesh Bangia (2007). *Multimedia & Web Technology* (First Edition), Laxmi Publications, ISBN-13 : 978-8131800287.

E- REFERENCES:

1. <https://www.w3schools.com/xml/default.asp>
2. http://www.tutorialspoint.com/xml/xml_tutorial.pdf
3. <https://www.coursera.org/projects/html-css-single-page>
4. <https://www.mooc-list.com/course/http-web-servers-udacity>

Course Title: PRACTICAL III - ENTERPRISE COMPUTING LAB

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 02 |
| L:T:P:S : 0:0:5:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to equip the students with the advanced feature of contemporary java, to enable them in handling complex programs relating to managing data and processes over the network, to provide a sound foundation on the concepts, precepts and practices, in a field that is of immense concern to the industry and business.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Invoke the remote methods in an application using Remote Method Invocation, Access database through Java programs, using Java Data Base Connectivity. |
| CO2 | Manage sessions within an application and communication between sessions. |
| CO3 | Implement and manage web sessions using Servlet and JSP. Handling Errors and Exceptions in any web application |
| CO4 | Understanding Java Messaging Services done through javamail API. |
| CO5 | Develop applications with hibernate framework. |
| CO6 | Develop spring applications with spring framework. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO 2 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 |
| CO 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1 | a) Develop an RMI Application for arithmetic operations b) Simple Servlet Application with login page. | 5 | CO1 |
| 2 | a) Design Web application using HTML and java servlet for session tracking and management using cookies, Hidden form field, URL rewriting, HTTP session. b) Display session details of any web application. | 9 | CO2 |
| 3 | a) Implementation of JSP: student scoring system b) Implement exception handling using Error pages in JSP. c) Design web page using JSP and implement the | 6 | CO3 |

| | | | |
|---|---|----|-----|
| | concept of Java Bean in JSP d) Design web page using HTML and java servlet pages for the implementation of inter servlet communication using Request Dispatcher. e) MYSQL database connectivity using JDBC. | | |
| 4 | a) Design a web page with options for sending email using Javamail API. | 7 | CO4 |
| 5 | a) Implementation of database manipulation using ORM Mapping in Hibernate. | 7 | CO5 |
| 6 | a) Design Simple application using spring framework. b) Web application for connecting database in spring. | 11 | CO6 |

Course Title: PRACTICAL IV - DATA MINING LAB USING PYTHON

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 02 |
| L:T:P:S : 0:0:5:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to create a DataFrame, load a dataset and perform data cleaning operations, to integrate data from different sources, to select the relevant data and remove the irrelevant data, to perform classification using classification algorithms and apply clustering algorithms to cluster the data.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Perform Data Cleaning, Data Integration |
| CO2 | Perform Data Transformation |
| CO3 | Remove Outliers |
| CO4 | Perform Association Mining |
| CO5 | Do Classification using Classification algorithms |
| CO6 | Perform Clustering using Clustering algorithms |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S. No | CONTENTS OF MODULE | Hrs | COs |
|--------------|---|------------|------------|
| 1 | Data Preprocessing and Data Integration | 9 | CO1 |
| 2 | Programs using Min max Normalization, Zscore Normalization | 9 | CO2 |
| 3 | Programs to remove Outliers | 9 | CO3 |
| 4 | Programs using Association Mining | 9 | CO4 |
| 5 | Programs using Naïve Bayes Classification, Decision Tree Classification, Clustering using Kmeans and Agglomerative. | 9 | CO5, CO6 |

Course Title: SPOKEN TUTORIAL - LINUX

| S.No | CONTENTS OF MODULE |
|-------------|--|
| 1 | Ubuntu Desktop- Desktop Customization- Synaptic Package Manager- Ubuntu Software Center- Basic Commands- General Purpose Utilities in Linux- File System- Working with Regular Files- File Attributes- Redirection Pipes- Working with Linux Process- The Linux Environment- Basics of System Administration- Simple filters- The grep command- More on grep command- The sed command- More on sed command- Basics of AWK. |

Note:

Courses Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India. At the end of the course Online Examination will be conducted for 45 minutes and qualified students (Minimum passing 40%) will be issued certificate by IIT, Mumbai.

THIRD SEMESTER (SYLLABUS)

Course Title: SOFT COMPUTING

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to gain a basic understanding of neural network theory and fuzzy logic theory, to identify different neural network architectures, algorithms, applications and their limitations, Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory, Analyze appropriate learning rules for each of the architectures and learn several neural network paradigms and its applications, Develop the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic, Basic knowledge of Genetic algorithm and operators.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Gain basic knowledge of Artificial Neural Network, Fuzzy logic and Genetic algorithms |
| CO2 | Analyse different neural network architectures |
| CO3 | Get insight into classical sets and fuzzy sets |
| CO4 | Develop the concepts of fuzzy relations and fuzzy propositions |
| CO5 | Gain knowledge of Genetic algorithms and the various operators |
| CO6 | Gain knowledge of various Algorithms |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|------------|
| 1 | Introduction: Neural Networks – Fuzzy Logic – Genetic Algorithms – Hybrid Systems. Artificial Neural Network – Fundamental Concept – Basic Models of Neural Network – Important Terminologies of ANN – McCulloch-Pitts Neuron – Linear Separability – Hebb Network. | 9 | CO1 |
| 2 | Supervised Learning Network – Perceptron Networks – Adaptive Linear Neuron – Back-Propagation Network – Radial Basis Function Network. Associative Memory Networks : BiDirectional Associative Memory – Hopfield Networks. | 9 | CO2 |
| 3 | Introduction to Classical Sets and Fuzzy Sets: Classical Sets – Fuzzy Sets. Classical Relations and fuzzy Relations: Cartesian Product of Relation – Classical Relation – Fuzzy Relations. Membership Functions: Features of the Membership functions – Fuzzification – Methods of Membership Value Assignments. | 9 | CO3 |
| 4 | Defuzzification – Lamda – Cuts for Fuzzy sets and Fuzzy Relation – Fuzzy Arithmetic and Fuzzy Measures – Fuzzy Rule Base and Arithmetic Reasoning: Truth values and Tables in Fuzzy logic – | 9 | CO4 |

| | | | |
|---|---|---|-------------|
| | Fuzzy Propositions – Formation of Rules – Decomposition and Aggregation of rules – Fuzzy reasoning – Fuzzy Inference Systems. | | |
| 5 | Genetic Algorithm -Introduction – Basic Operators and Terminologies in GAs – Traditional Algorithm vs. Genetic Algorithm – Simple GA – General Genetic Algorithm – The Scheme Theorem – Classification of Genetic Algorithm – Holland Classifier Systems – Genetic Programming. | 9 | CO5, CO6 |

TEXT BOOKS:

1. SN Sivanandan and SN Deepa (2007). *Principles of Soft Computing*, Wiley India.

REFERENCE BOOKS:

1. S Rajasekaran and GAV Pai (2003), *Neural Networks, Fuzzy Logic and Genetic Algorithms*, PHI.
2. Timothy J Ross (1997). *Fuzzy Logic with Engineering Applications*, McGraw-Hill.
3. JSR Jang, CT Sun and E Mizutani (2004). *Neuro-Fuzzy and Soft Computing* (Pearson Education), PHI.

E- REFERENCES:

1. <http://www.nptel.iitm.ac.in/video.php?subjectId=117105084>
2. www.nptel.iitm.ac.in/syllabus/111106049
3. www.iitg.ac.in/rkbc/CE602/GA.pdf

Course Title: INTERNET TECHNOLOGY

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to gain knowledge on concepts of .NET environment and C# basics, to create console application in C# using object-oriented concepts, to integrate C# and ASP.NET in developing web application, to build a web application using database connectivity, to construct a web application with enhanced Add-on services which includes web services, cookies and session

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Acquire the knowledge of .NET environment. Expertise the fundamental concepts in developing the basics of C# programming |
| CO2 | Develop, compile and execute console application in C# using object-oriented concepts. Construct console application in C# program using delegates and events |

| | |
|------------|--|
| CO3 | Build a web application in ASP.NET using webserver controls |
| CO4 | Demonstrate web application with database connectivity |
| CO5 | Integrate web application using cookies, sessions and web services |
| CO6 | Create a complete web Application for real-time situations |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |
| CO 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO 3 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|----------|
| 1 | UNIT I: Introduction to .NET – Overview of C#, Literals, Variables, Data Types, Operators and Expressions, Branching, Looping, Methods, Arrays and Structures, Enumerations. | 9 | CO1 |
| 2 | UNIT II: Classes, Objects, Inheritance, Interfaces, Delegates, Events, Errors and Exceptions. | 9 | CO2 |
| 3 | UNIT III: Programming Web Applications with Web Forms – Standard Web server Controls – Label, Textbox, Button, Link Button, Image, Image map, Links, Check & Radio button. Rich controls – Calendar, Ad Rotator – List Controls – Check box list, Radio button list, Drop down list, List box, Data controls – Data grid, Repeater – Validation Controls. | 9 | CO3 |
| 4 | UNIT IV: Working with Data – OLEDB connection class, command class, data adaptor class, data reader – data set class – Web services. | 9 | CO4 |
| 5 | UNIT V: Session & Application Object: Application Object – global.asa file, Webconfig files – creating & reading application variables, Session object – introduction, storing session-information, contents & identifying session, controlling when session ends, creating & reading cookies. | 9 | CO5, CO6 |

TEXT BOOKS:

1. E Balagurusamy (2004). *Programming in C#* (3rd edition), Tata McGraw-Hill India. ISBN 9780070702073
2. Stephen Walter (2006). *Asp.net 2.0 Unleashed*, (1st edition), Pearson Education, ISBN 978-8131703236
3. Greg Buczek (2010). *ASP.NET Developer's guide* (1st edition), Tata McGraw-Hill India, ISBN 978-0070499171

REFERENCE BOOKS:

1. Herbert Schildt (2010). *The Complete Reference: C#4.0*, Tata McGraw-Hill Education India ISBN: 9780070703681.
2. Mathew Macdonald (2017). *ASP.NET: The Complete Reference*, McGraw Hill Education, ISBN 978-0070495364
3. Bill Evjen, Scott Hanselman, Devin Rader (2008). *Professional ASP.NET 3.5 In C# and VB* (Pap/Psc edition), Wrox publishers, ISBN 978-0470187579
4. Dino Sposito (2019). *Programming ASP.NET Core*, PHI learning | Microsoft Press, ISBN 978-9388028431

E- REFERENCES:

1. <http://www.csharp-station.com/tutorial.aspx>
2. <http://www.tutorialspoint.com/csharp>
3. <http://asp.net-tutorials.com>
4. <http://www.aspnetbook.com>

Course Title: CLOUD COMPUTING

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to assess fundamental ideas behind cloud computing, the evolution of the paradigm, its applicability and benefits. Public, private and hybrid cloud deployment models and various cloud computing services such as Saas, Paas and Iaas. Understand the purpose of Collaboration of cloud with other applications such as calendars, events, projects and social networks. Know the key concepts of Virtualization and its types and outline their roles. Gain the core issues of cloud computing such as security and privacy problems and how they are addressed.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Articulate the main concepts, key technologies, strengths, and limitations, the current and future challenges of cloud computing. Analyse various cloud deployment models and their issues on the cloud. |
| CO2 | Identify the architecture and infrastructure of various cloud services including SaaS, PaaS, and IaaS and apply them to develop a applications. |

| | |
|------------|--|
| CO3 | Analyse the implications of cloud collaboration with other applications. |
| CO4 | Design and develop various algorithms using tools for virtualization in cloud computing and acquire the knowledge of doing research. |
| CO5 | Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop secure cloud applications. |
| CO6 | Develop and deploy cloud applications using modern tools and techniques based on the organizational needs. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | 3 | 2 |
| CO 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO 4 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO 5 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO 6 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-------------|
| 1 | UNIT I: Cloud introduction – Cloud Computing Fundamentals: Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing , usage scenarios and Applications , Business models around Cloud – Major Players in Cloud Computing – Issues in Cloud – Eucalyptus – Nimbus – Open Nebula, CloudSim. | 9 | CO1 |
| 2 | UNIT II: Cloud services and file system: Types of Cloud services: Software as a Service – Platform as a Service – Infrastructure as a Service – Database as a Service – Monitoring as a Service – Communication as services. | 9 | CO2 |
| 3 | UNIT III: Collaborating with cloud: Collaborating on Calendars, Schedules and Task Management – Collaborating on Event Management, Contact Management, Project Management – Collaborating on Word Processing, Databases – Storing and Sharing Files – Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services Collaborating via Social Networks. | 9 | CO3 |
| 4 | UNIT IV: Virtualization for cloud: Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization – System VM, Process VM, Virtual Machine monitor – Virtual machine properties – Interpretation and binary translation. | 9 | CO4 |
| 5 | UNIT V: Security, Standards, and Applications: Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed | 9 | CO5, CO6 |

| | | | |
|--|--|--|--|
| | management Task Force – End user access to cloud computing, Mobile Internet devices and the cloud. | | |
|--|--|--|--|

TEXT BOOKS:

1. Bloor R, Kanfman M, Halper F. Judith Hurwitz (2010). *Cloud Computing for Dummies*, Wiley India Edition.
2. John Rittinghouse & James Ransome (2010). *Cloud Computing Implementation Management and Strategy*, CRC Press.
3. Anthoy T Velte (2009). *Cloud Computing a Practical Approach*, McGraw Hill Publications.

REFERENCE BOOKS:

1. Haley Beard (2008). *Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs*, Emereo Pty Limited.
2. Michael Miller (2008). *Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online*, Que Publishing.
3. James E Smith, Ravi Nair (2006). *Virtual Machines*, Morgan Kaufmann Publishers.

E- REFERENCES:

1. webpages.iust.ac.ir/hsalimi/.../89.../Cloud%20Common%20standards.ppt
opennebula.org
2. www.cloudbus.org/cloudsim/
3. <http://www.eucalyptus.com/>
4. http://hadoop.apache.org/docs/stable/hdfs_design.html
5. http://static.googleusercontent.com/external_content/untrusted_dlcp/research.google.com/en//archive/map_reduce-osdi04.pdf

Course Title: BIG DATA ANALYTICS

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to demonstrate the insight of an exciting growing field of Big Data analytics. They Gain analytical challenges traditional data mining algorithms face when analyzing Big Data, to prove the building initiative of Hadoop, NoSql, MapReduce, to Derive the coding to manage and analyze big data like Hadoop, NoSql, MapReduce. Also, they can exhibit the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability and validate the students to have skills that will help them to solve complex real-world problems in for decision support.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Knows the reason about the evolution of data science and its development. Study the basic of big data analytics and to develop the code. Importance of various kinds of data comparing the other language. |
| CO2 | Develop HDFS environment using NOSQL Implementing the queries. Aggregate the data using NOSQL |
| CO3 | Concept of basic Hadoop, data format and analysing the data in the HDFS environment. Implementing the concept Hadoop pipes and implementations and java interfaces Significance of various methods of compression, serialization |
| CO4 | Apply Mapreduce applications, unit test , MRUnit, |

| | |
|------------|--|
| | Create file using Mapreduce sorting and shuffling process. Creating input and output format of Mapreduce. |
| CO5 | Usage Hadoop related tools. Definition of hbase,Hbase clients, Cassandra, Pig, HiveQL Life Build data manipulation byHiveQL queries. |
| CO6 | Analyze Life Build data manipulation byHiveQL queries. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO 2 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 |
| CO 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO 4 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO 6 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-------------|
| 1 | Understanding big data: What is big data – why big data – convergence of key trends – unstructured data – industry examples of big data – web analytics – big data and marketing – fraud and big data – risk and big data – credit risk management – big data and algorithmic trading – big data and healthcare – big data in medicine. | 10 | CO1 |
| 2 | Nosql data management: Introduction to NoSQL – aggregate data models – aggregates – key-value and document data models – relationships – graph databases – schemaless databases – materialized views – distribution models – sharding – master-slave replication – peer-peer replication – sharding and replication – consistency – relaxing consistency – version stamps – map-reduce – partitioning and combining – composing map-reduce calculations. | 10 | CO2 |
| 3 | Basics of Hadoop: Data format – analyzing data with Hadoop – scaling out – Hadoop streaming – Hadoop pipes – design of Hadoop distributed file system (HDFS) – HDFS concepts – Java interface – data flow – Hadoop I/O – data integrity – compression – serialization – Avro – file-based data structures. | 10 | CO3 |
| 4 | Mapreduce applications: Mapreduce workflows – unit tests with MRUnit – test data and local tests – anatomy of MapReduce job run – classic Map-reduce – YARN – failures in classic Map-reduce and YARN – job scheduling – shuffle and sort – task execution – MapReduce types – input formats – output formats. | 10 | CO4 |
| 5 | Hadoop related tools: hbase – data model and implementations – Hbase clients – Hbase examples – praxis.Cassandra – cassandra data | 5 | CO5, CO6 |

| | | |
|--|--|--|
| model – cassandra examples – cassandra clients. Hadoop integration. Pig – Grunt – pig data model – Pig Latin – developing and testing Pig Latin scripts. Hive – data types and file formats – HiveQL data definition – HiveQL data manipulation – HiveQL queries. | | |
|--|--|--|

TEXT BOOKS:

1. Minelli, M., Chambers, M., & Dhiraj, A. (2013). *Big data, big analytics: emerging business intelligence and analytic trends for today's businesses*. John Wiley & Sons. Michael, ISBN no: 9781118-14760-354995
2. Sadalage, P. J., & Fowler, M. (2013). *NoSQL distilled: a brief guide to the emerging world of polyglot persistence*. Pearson Education. ISBN no: 13:978-0-321-82662-6
3. Tom White, (2012). *Hadoop: The Definitive Guide*, (Third Edition), O'Reilley. ISBN no: 978-1-491-90163-2
4. Eric Sammer, (2012). *Hadoop Operations*, (First Edition) O'Reilley., ISBN no: 978-1149327057
5. Alan Gates, (2011). *Programming Pig*, (First Edition), O'Reilley. ISBN no: 978-1-449-302641
6. Alex Holmes, (2012). *Hadoop in Practice*, Manning Publ. ISBN no: 9781617292224
7. ECapriolo, D Wampler, and JRutherglen, (2012), *Programming Hive*, O'Reilley.

REFERENCE BOOKS:

1. Lars George, (2011). *HBase: The Definitive Guide*, (First Edition) O'Reilley. ISBN no:10 144396100
2. Eben Hewitt, (2010). *Cassandra: The Definitive Guide*, (First Edition) O'Reilley. ISBN no :9781491933664

E- REFERENCES:

1. Hadoop: <http://hadoop.apache.org/>,
2. Hadoop: <https://www.edureka.co/blog/hadoop-tutorial>
3. Hive: <https://cwiki.apache.org/confluence/display/Hive/Home>
4. Piglatin: <http://pig.apache.org/docs/r0.7.0/tutorial.html>
5. https://www.tutorialspoint.com/apache_pig/apache_pig_grunt_shell.htm

Course Title: CRYPTOGRAPHY

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to understand the mathematics behind cryptography, security concepts, vulnerabilities, different types of cryptosystems and attacks on various cryptosystems.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Gain knowledge about Conventional encryption model |
| CO2 | Analyse Euclidean Algorithm and Number theory |
| CO3 | Understanding Key exchanges. |
| CO4 | Detailed representation of Hashing functions. |
| CO5 | Describe the various Digital signatures logic. |
| CO6 | Apply different encryption and decryption techniques |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 1 | 3 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 1 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 1 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|----------|
| 1 | UNIT I: Conventional encryption model –Security Concepts- Substitution and Transposition Ciphers- DES algorithm –AES algorithm - Random number generation. | 7 | CO1 |
| 2 | UNIT II: Number Theory: Modular arithmetic – Euler’s theorem – Euclid’s algorithm – Extended Euclidean Algorithm and its applications- Chinese remainder theorem – Prime numbers and factorization –Discrete Logarithms. | 15 | CO2, CO3 |
| 3 | UNIT III: Principles of Public key Cryptography– RSA algorithm – Key Management- Diffie – Hellman key exchange | 8 | CO4 |
| 4 | UNIT IV: Message Authentication and Hash functions: Authentication requirements –Authentication function- Message Authentication codes-Hash functions-Secure Hash Algorithm. | 8 | CO5 |
| 5 | UNIT V: Digital Signature and Authentication Protocols: Digital Signature Authentication Protocols –Digital Signature Standard. | 7 | CO6 |

TEXT BOOKS:

1. Stallings. W (2013). *Cryptography and Network Security, Principles and Practice*, Pearson Education, Delhi,ISBN:9788131761663.

REFERENCE BOOKS:

1. Charlie Kaufman, Radia Perlman, Mike specimen (2016). *Network Security Private Communication in a public world*, Prentice Hall PTR, ISBN: 9789332586000.
2. Michael Welsehenbach (2013). *Cryptography in C & C++*, Apress, ISBN:9781430250999.

E- REFERENCES:

1. <http://www.webopedia.com/TERM/C/cryptography.html>
2. <http://www.sagemath.org/pdf/en/reference/cryptography/cryptography.pdf>
3. <http://www.fretechbooks.com/lecture-notes-on-cryptography-t565.html>
4. <https://nptel.ac.in/courses/106105031/>
5. <https://nptel.ac.in/courses/106105162/>

Course Title: INFORMATION SECURITY

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 03 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand and revise the common threats faced today, To understand the foundational theory behind information security and analyze What are the basic principles and techniques when designing a secure system, to apply attacks and defenses work in practice and how to assess threats for their significance and how to gauge the protections and limitations provided by today's technology.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Understand Information Security Principles such as security attacks and services. |
| CO2 | Design Terms, concepts related to public key cryptography and digital signatures. |
| CO3 | Apply the Concepts of various privacy methods. |
| CO4 | Analyse Typical Network Attacks and Threats from the Internet. |
| CO5 | Create SNMP, Firewall design Principles and Intrusion detection system. |

| | |
|------------|---|
| CO6 | Create the protections and limitations provided by internet security technology |
|------------|---|

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-------------|
| 1 | UNIT I: Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms. | 9 | CO1 |
| 2 | UNIT II: Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos,X.509 Directory Authentication Service | 9 | CO2 |
| 3 | UNIT III: Email privacy: Pretty Good Privacy (PGP) and S/MIME.P Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management | 9 | CO3 |
| 4 | UNIT IV: Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET | 9 | CO4 |
| 5 | UNIT V: Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3, Intruders, Viruses and related threats Firewall Design principles, Trusted Systems, Intrusion Detection Systems | 9 | CO5, CO6 |

TEXT BOOKS:

- 1 William Stallings (2008). *Network Security Essentials (Applications and Standards)*, Pearson Education.
- 2 Chris McNab(2016). *Network Security* (3rd edition), O'Reilly Media.
- 3 Joseph Migga Kizza (2014). *Computer Network Security*, Springer International Publishing.

REFERENCE BOOKS:

- 1 Eric Maiwald(2004). *Fundamentals of Network Security*, Dreamtech press.
- 2 CharlieKaufman, Radia Perlman and Mike Speciner. *Network Security – Private Communication in a Public World* (Second Edition), Pearson/PHI.

E- REFERENCES:

- 1 <http://www.freetechbooks.com/an-introduction-to-computer-security-the-nist-handbook-t725.html>
- 2 <http://www.freetechbooks.com/fundamentals-of-cryptology-t801.html>

Course Title: INTERNET SECURITY AND COMPUTER FORENSICS

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 03 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to understand the main issues related to security in modern networked computer systems, the underlying concepts and foundations of computer security, basic knowledge about security-relevant decisions in designing IT infrastructures, understand Computer forensics fundamental, understand collecting, investigating, preserving, and presenting evidence of cybercrime left in digital storage devices, analyze various computer forensics technologies and to identify methods for data recovery.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Gain a good understanding of the concepts and foundations of computer security, and identify vulnerabilities of IT systems |
| CO2 | Analyse basic security tools to enhance system security and can develop basic security enhancements in stand-alone applications |
| CO3 | Identify some of the factors driving the need for network security and analyse various computer forensics systems |
| CO4 | Analyse and summarize duplication and preservation of digital evidence |
| CO5 | Illustrate the methods for data recovery, evidence collection and data seizure. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 1 | 3 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 1 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 1 | 3 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1 | UNIT I - NETWORK LAYER SECURITY & TRANSPORT LAYER SECURITY IPSec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPSec . Transport layer Security: SSL protocol, Cryptographic Computations - TLS Protocol. 189 CS-Engg&Tech-SRM-2013 | 8 | CO1 |
| 2 | UNIT II - E-MAIL SECURITY & FIREWALLS PGP - S/MIME - Internet Firewalls for Trusted System: Roles of Firewalls - Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions. | 10 | CO2 |
| 3 | UNIT III - INTRODUCTION TO COMPUTER FORENSICS (9 hours) Computer Forensics Fundamentals – Types of Computer Forensics – Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition | 9 | CO3 |
| 4 | UNIT IV - EVIDENCE COLLECTION AND FORENSICS TOOLS Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools. | 9 | CO4 |
| 5 | UNIT V - ANALYSIS AND VALIDATION Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics | 9 | CO5 |

TEXT BOOKS:

1. Man Young Rhee (2003). *Internet Security: Cryptographic Principles, Algorithms and Protocols*, Wiley Publications.

REFERENCE BOOKS:

1. Nelson, Phillips, Enfinger, Stuart (2014). *A Guide to Computer Forensics and Investigations* Cengage Learning, ISBN: 9781305176089.
2. John R.Vacca (2002). *Computer Forensics*, Firewall Media, ISBN: 1584503890.
3. Richard E.Smith (2008). *Internet Cryptography* (3rd Edition), Pearson Education, ISBN: 8131704122.
4. MarjieT.Britz (2013), *Computer Forensics and Cyber Crime: An Introduction* (1st Edition), Pearson Education, ISBN: 0132677717.

E- REFERENCES:

1. <https://www.geeksforgeeks.org/information-security-and-computer-forensics/>
2. <https://nptel.ac.in/courses/106106178/>

Course Title: PRACTICAL-V: INTERNET TECHNOLOGY LAB

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 02 |
| L:T:P:S : 0:0:5:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to develop simple console applications using control flow, loops, arrays, to create console application using strings, delegates and events, to design and develop console applications using object-oriented concepts, to create simple web page using ASP.NET, to design a website utilizing database and connect to the database from ASP.NET, to develop web application using cookies, sessions and Web services.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Design the algorithm |
| CO2 | Develop console application using C# |
| CO3 | Build and develop web-application using ASP.NET controls and validations |
| CO4 | Develop web application using ASP.NET incorporating database connection |
| CO5 | Develop web application using ASP.NET using cookies and session |

| | |
|------------|--|
| CO6 | Synthesize console and web application based on requirements |
|------------|--|

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 3 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----------------------------|
| 1 | <u>C#</u> 1. Creating a simple Console application 2. Programs using Array and Array List 3. Programs using string 4. Create a console application containing classes and Inheritance 5. Programs using Interface 6. Programs using Structures and Enumerations 7. Create a console application to implement delegates 8. Create a console application for exception handling | 23 | CO1, CO2, CO6 |
| 2 | 1. Create a Website containing various standard controls 2. Create a Webform that demonstrate using Validator controls 3. Create a Website that contains AdRotator and Calendar controls. 4. Create a Web application using Data Base Connections 5. Create a Web application using web services | 22 | CO3, CO4, CO5, CO6 |

Course Title: PRACTICAL-VI: BIG DATA ANALYTICS LAB

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 02 |
| L:T:P:S : 0:0:5:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to demonstrate the insight of an exciting growing field of Big Data analytics. They can derive the scripts of Hadoop, NoSql, MapReduce to develop the knowledge of data science. To derive the coding, manage and analyze big data like Hadoop, No Sql, MapReduce. Practice big data analytics and machine learning approaches, which include the study of modern computing big data technologies.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Derive the steps of algorithms for every exercise. |
| CO2 | Scaling up machine learning techniques focusing on industry applications. |
| CO3 | Exhibit the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability. |
| CO4 | Implementation of big data analytics |

| | |
|------------|--|
| CO5 | Practice bigdata tools Pig, Hive etc. |
| CO6 | Validate the students to have skills that will help them to solve complex real-world problems in for decision support. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 2 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|------------|
| 1 | Perform setting up and Installing Hadoop in its three operating modes: Standalone, Pseudo distributed, fully distributed Use web based tools to monitor your Hadoop setup. | 9 | CO1 |
| 2 | Implement the following file management tasks in Hadoop: a) Adding files and directories b) Retrieving files Deleting files Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities. | 9 | CO2 |
| 3 | Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm. | 9 | CO3 |
| 4 | Write a Map Reduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented. | 9 | CO4 |
| 5 | Implement Matrix Multiplication with Hadoop Map Reduce | 9 | CO5 |
| 6 | Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data. | 5 | CO6 |
| 7 | Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and indexes. | 4 | CO6 |

Course Title: SPOKEN TUTORIAL - JAVA

| S.No | CONTENTS OF MODULE |
|-------------|---|
| 1 | Getting started java Installation – First Java Program – Installing Eclipse – Getting started Eclipse-Hello World Program in Eclipse – Errors and Debugging in Eclipse – Programming features Eclipse – Numerical Datatypes – Arithmetic Operations – Strings – Primitive type conversions – Relational Operations – Logical Operations – if else – Nested if – switch case – while loop – For loop – do while – introduction to Array – Array operations – creating class – creating object – instance fields – Methods – Default constructor – Parameterized constructors – using this keyword – Non static block – Constructor overloading – Method overloading – userinput – subclassing and method overriding – Calling methods of the superclass – Using final keyword – Polymorphism – Abstract Classes – Java Interfaces – Static Variables – Static Methods – Static Blocks. |

Note:

Courses Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India. At the end of the course Online Examination will be conducted

for 45 minutes and qualified students (Minimum passing 40%) will be issued certificate by IIT, Mumbai.

FOURTH SEMESTER (SYLLABUS)

Course Title: PROJECT & VIVA-VOCE

| | | |
|--------------------------|------------------|-------------|
| Course Code: | Credits | : 15 |
| L:T:P:S : 0:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to Implement the solution for the chosen problem using the concepts and the techniques learnt in the curriculum, Identify, formulate and implement computing solutions, Design and conduct experiments, analyze and interpret data, Record the result, demonstrate skills to use modern tools, software and equipments to analyse the chosen problem.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Demonstrate a depth of knowledge of modern technology. |
| CO2 | Complete an independent research project, resulting in dissertation. |
| CO3 | Communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms. |
| CO4 | Self-study, reflect on their learning and take appropriate actions to improve it. |

Mapping of Course Outcomes to Program Outcomes:

| | | |
|------------------|-----------|------------|
| CO/PO/PSO | PO | PSO |
|------------------|-----------|------------|

| | | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

PROCEDURE

- The final semester will be entirely assigned for the student to carry out their project work.
- The Head of the Department will assign an Internal Guide for each student.
- The students should submit the contact details of the organization to their guide.
- During regular intervals, student should report his/her progress of the project work.
- After the submission of the final report, an external examiner will evaluate the project document and conduct the viva voce examination.

Course Title: SPOKEN TUTORIAL - LATEX

| S.No | CONTENTS OF MODULE |
|-------------|---|
| 1 | Beamer – Bibliography – Equations – Inside Story of Bibliography – Latex on Windows using Texworks – Letter-Writing – Mathematical Typesetting – Report Writing – Tables and Figures. |

Note:

Courses Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India. At the end of the course Online Examination will be conducted for 45 minutes and qualified students (Minimum passing 40%) will be issued certificate by IIT, Mumbai.

APPENDIX

APPENDIX A: OUTCOME-BASED EDUCATION (OBE)

Outcome-Based Education (OBE) is a student-centric teaching and learning methodology in which the course delivery, assessment are planned to achieve stated objectives and outcomes. It focuses on measuring student performance i.e. outcomes at different levels.

Outcome-based education (OBE) is an educational theory that bases each part of an educational system around goals (outcomes). By the end of the educational experience each student should have achieved the goal. There is no specified style of teaching or assessment in OBE; instead classes, opportunities, and assessments should all help students achieve the specified outcomes.

There are three educational Outcomes as defined by the National Board of Accreditation.

Program Educational Objectives (PEOs)

The Program Educational Objectives of a program are the statements that describe the expected achievements of graduates in their career, and also in particular, what the graduates are expected to perform and achieve during the first few years after graduation

Program Outcomes (POs)

Program outcomes are finer statements that designate what students are expected to be

able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes.

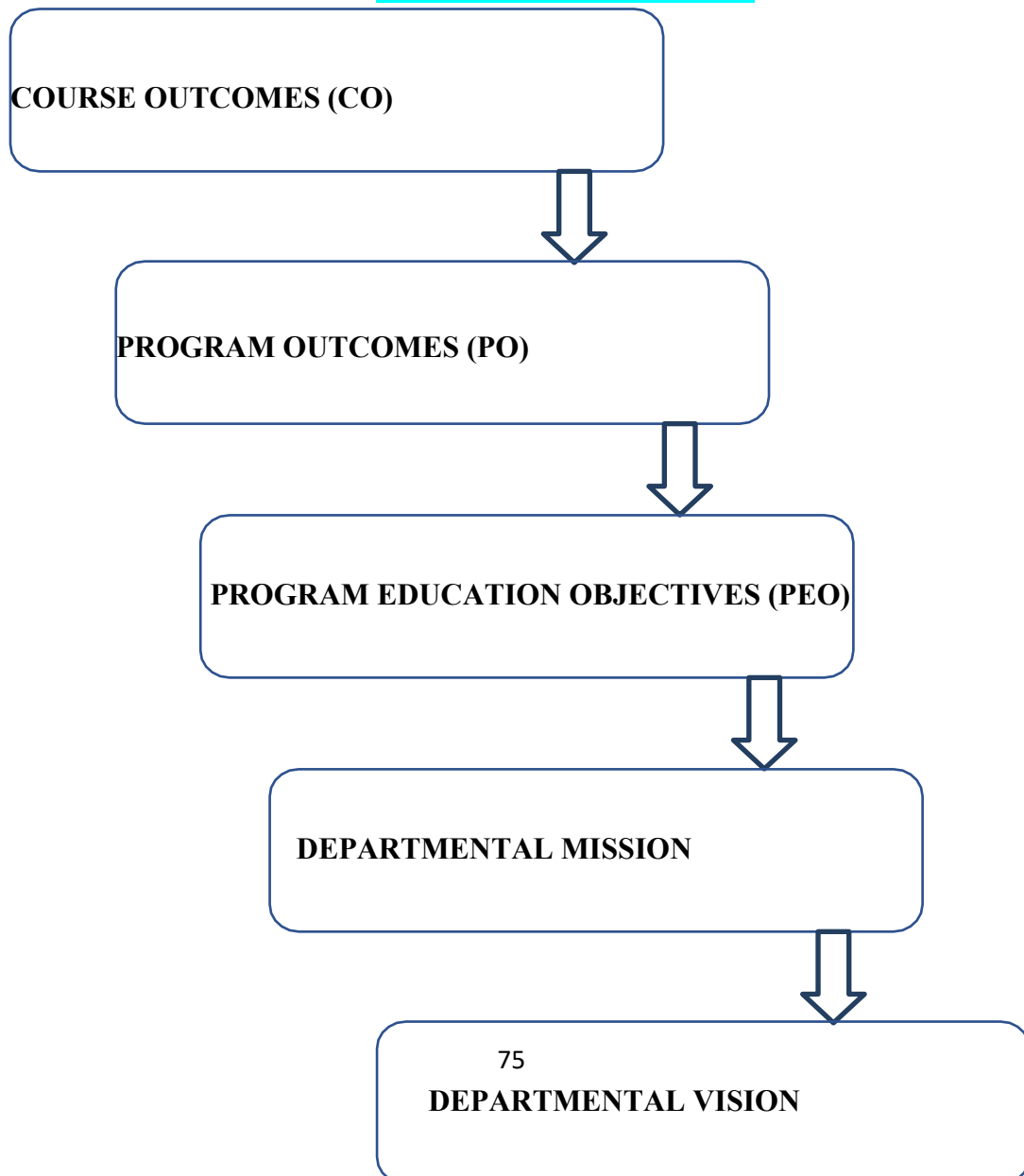
Program Specific Outcomes (PSO)

Program Specific Outcomes are what the students should be able to do at the time of graduation with reference to a specific discipline.

Course Outcome (CO)

Course outcomes are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course.

MAPPING OF OUTCOMES



APPENDIX B: PROGRAM OUTCOMES IN RELATION TO GRADUATE ATTRIBUTES

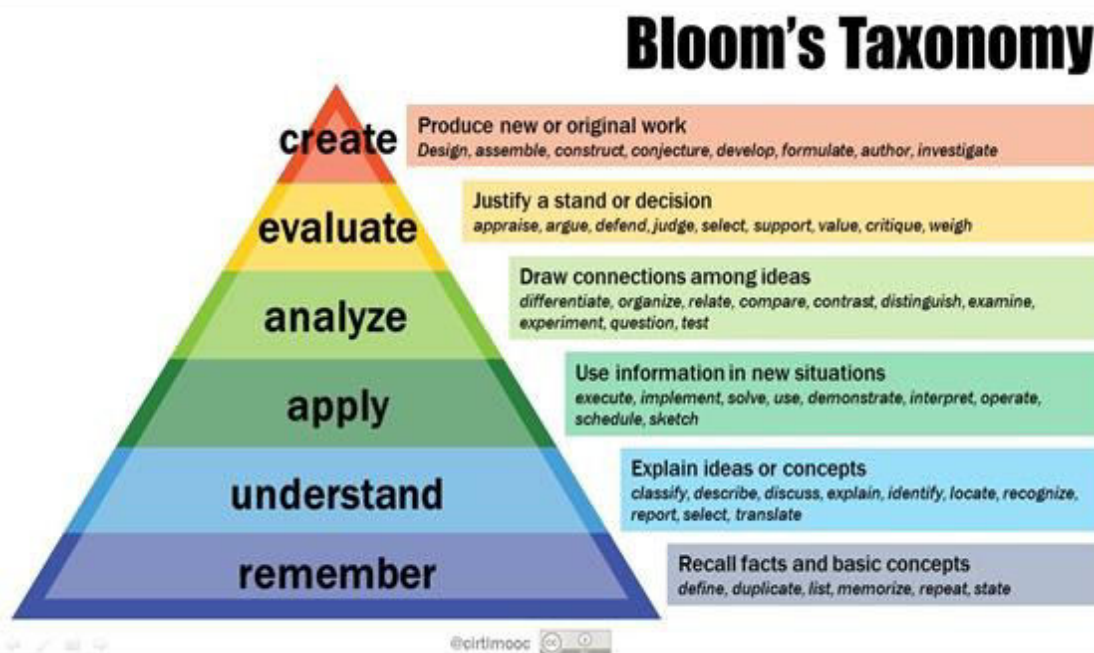
| S.No | GRADUATE ATTRIBUTES | PROGRAMME OUTCOMES |
|------|------------------------------|---|
| 1. | Knowledge | Capability of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an postgraduate programme of study |
| 2. | Critical Thinking | Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development. |
| 3. | Problem Solving | Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations. |
| 4. | Usage of modern tools | Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data. |
| 5. | Communication | Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups. |
| 6. | Life-long Learning | Ability to acquire knowledge and skills, including 'learning how to learn', that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling. |

| | | |
|----|--|---|
| 7. | Ethical Practices and Social Responsibility | Ability to embrace moral/ethical values in conducting one’s life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. |
| 8. | Independent and Reflective Learning | Critical sensibility to lived experiences, with self-awareness and reflexivity of both self and society |

APPENDIX C: BLOOM’S TAXONOMY

Bloom’s taxonomy is a classification system used to define and distinguish different levels of human cognition—i.e., thinking, learning, and understanding. Educators have typically used Bloom’s taxonomy to inform or guide the development of assessments (tests and other evaluations of student learning), curriculum (units, lessons, projects, and other learning activities), and instructional methods such as questioning strategies. [eduglosarry.org]

Knowledge levels for assessment of Outcomes based on Blooms Taxonomy



| Level | Parameter | Description |
|-------|---------------|---|
| K1 | Knowledge | It is the ability to remember the previously learned material/information |
| K2 | Comprehension | It is the ability to grasp the meaning of material |
| K3 | Application | It is the ability to use learned material in new and concrete situations |

| | | |
|----|------------|--|
| K4 | Analysis | It is the ability to break down material/concept into its component parts/subsections so that its organizational structure may be understood |
| K5 | Synthesis | It is the ability to put parts/subsections together to form a new whole material/idea/concept/information |
| K6 | Evaluation | It is the ability to judge the value of material/concept/statement/creative material /research report) for a given purpose |

PG DEPARTMENT OF COMPUTER SCIENCE

M.Sc. INFORMATION TECHNOLOGY - CBCS

OUTCOME BASED SYLLABUS

ACADEMIC YEAR 2021 - 2022



DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE

(AUTONOMOUS)

COLLEGE WITH POTENTIAL FOR EXCELLENCE

LINGUISTIC MINORITY INSTITUTION AFFILIATED TO UNIVERSITY OF MADRAS

E.V.R. PERIYAR HIGH ROAD,

ARUMBAKKAM, CHENNAI – 600106, TAMILNADU.

| CONTENTS | PAGENO. |
|---|----------------|
| 1. Vision, Mission and Program Educational Objectives (PEO) | 1 |
| 2. Program Outcomes (PO) with Graduate Attributes | 2 |
| 3. Mapping of POs with PEOs | 2 |

SCHEME

| | |
|------------------------------|----|
| 4. Scheme of First Semester | 7 |
| 5. Scheme of Second Semester | 8 |
| 6. Scheme of Third Semester | 9 |
| 7. Scheme of Fourth Semester | 10 |

SYLLABUS

| | |
|---|----|
| 8. Syllabus of First Semester: | |
| a) Operating System | 11 |
| b) Computer Organization and Architecture | 13 |
| c) Database Management Systems | 15 |
| d) Multimedia | 17 |
| e) Core Elective 1 | |
| • Object Oriented Software Engineering | 20 |
| • Unified Modelling Language | 22 |
| • OOAD | 24 |
| f) OSLab | 26 |
| g) MYSQLLab | 28 |
| h) Spoken Tutorial : Linux | 30 |
| 9. Syllabus of Second Semester: | |
| a) Data Structures and Algorithms | 31 |
| b) Computer Networks | 33 |
| c) Java Programming | 35 |
| d) Java Script | 37 |
| e) Core Elective 2 | |
| • Introduction to Cloud Computing | 40 |
| • Fundamentals of IoT | 42 |

| | |
|---|----|
| • Introduction to Grid Computing | 44 |
| f) Java Programming Lab | 46 |
| g) Java Script Lab | 48 |
| h) Spoken Tutorial: Java | 50 |
| 10. Syllabus of Third Semester: | |
| a) EnterpriseComputing | 51 |
| b) Programming in Python | 53 |
| c) Data Warehousing andData Mining | 56 |
| d) SoftwareTesting | 58 |
| e) Core Elective3 | |
| • Cryptography | 60 |
| • InformationSecurity | 62 |
| • Internet Security and ComputerForensics | 64 |
| f) EnterpriseComputingLab | 66 |
| g) PythonLab | 68 |
| h) Spoken Tutorial :PHPandMYSQL | 70 |
| 11. Syllabus of Fourth Semester: | |
| a) ProjectWork | 71 |
| b) Spoken Tutorial:LaTeX | 72 |
| c) MOOC CertificateCourse | 73 |

AppendixA Outcome
BasedEducation **AppendixB**
Graduate Attributes
AppendixC Bloom'sTaxonomy

INSTITUTION

VISION

To emerge as an institute of eminence in the fields of engineering, technology and management in serving the industry and the nation by empowering students with a high degree of technical, managerial and practical competence.

MISSION

| | |
|-----------|---|
| M1 | To strengthen the theoretical, practical and ethical dimensions of the learning process by fostering a culture of research and innovation among faculty members and students. |
| M2 | To encourage long-term interaction between the academia and industry through the involvement of the industry in the design of the curriculum and its hands-on implementation. |
| M3 | To strengthen and mould students in professional, ethical, social and environmental dimensions by encouraging participation in co-curricular and extracurricular activities. |

M.Sc. INFORMATION TECHNOLOGY

VISION

To impart technical knowledge and skills to work on real challenges of the industries and societal needs in the field of Information Technology. To expose Students to the current trends in computing which will enable them to become leaders in the IT field.

MISSION

| | |
|-----------|--|
| M1 | Encourage them to independently design and develop computer software systems and products based on the theoretical principles and software development skills acquired throughout the program. |
| M2 | To make them aware of and adapt to technological advances through active participation in life-long learning. |
| M3 | To inculcate the foundation of research insights among students and make them employable. |

PROGRAMME EDUCATION OBJECTIVES (PEOs)

| | |
|--------------|--|
| PEO 1 | To motivate the progression of the post graduates into a professional by inculcating knowledge relating to the field of Information Technology. |
| PEO 2 | Develop strong skills in systematic planning, developing algorithms and providing solutions for Information Technology based systems which helps in employability. |
| PEO3 | To continue lifelong professional development in computing that benefit personality and societal growth. |
| PEO4 | Able to draw upon foundational knowledge, learn, adapt and successfully bring to bear analytical and computational approaches on changing societal and technological challenges. |
| PEO5 | To keep abreast with latest area & research in Computer Science and Engineering and its applications in all allied areas. |

PEO TO MISSION STATEMENT MAPPING

| MISSION STATEMENTS | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 |
|---------------------------|-------------|-------------|-------------|-------------|-------------|
| M1 | 2 | 3 | 3 | 3 | 2 |
| M2 | 3 | 3 | 3 | 3 | 3 |
| M3 | 2 | 2 | 2 | 2 | 3 |

CORRELATION: 3-STRONG

2-MEDIUM

1-LOW

PROGRAM OUTCOMES (PO) IN RELATION TO GRADUATE ATTRIBUTE

S PROGRAMME OUTCOMES

At the completion of the M.Sc. Information Technology program, the students of our Department will be able to:

| | |
|------------|---|
| PO1 | Apply the knowledge of technological fundamentals and compute specialized solutions for complex problems. |
| PO2 | An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use scientific judgment to draw accurate inferences. |
| PO3 | Develop strong reasoning skills to enable them to take successful decisions in problem solving areas. |
| PO4 | Create, select, and apply appropriate techniques, resources, and IT tools to model complex computing activities. |
| PO5 | Communicate effectively in order to design, implement and evaluate a computational system to meet desired needs within realistic constraints. |
| PO6 | Ensure professional development growth through contextual, reflective and lifelong learning. |
| PO7 | Apply ethical principles and commit to professional ethics and responsibilities and norms of the Computer sciences society. |
| PO8 | Perform effectively as an individual, or leader in diverse teams, and in multidisciplinary settings to accomplish a goal. |

Mapping of POs TO PEOs

| PEO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| PEO 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| PEO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| PEO 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| PEO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| PEO 5 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc INFORMATION TECHNOLOGY

| | |
|--------------|---|
| PSO1: | Understanding the theoretical foundations in technological and computingsystems. |
| PSO2: | Ability to apply the theoretical concepts and practical knowledge of information technology in analysis, design, development and management of information processing systems and applications in the interdisciplinary domain. |
| PSO3: | An ability to use appropriate techniques, skills, and tools necessary for computing practice. |
| PSO4: | To motivate students to accept new challenges for multi-disciplinary projects. |
| PSO5: | Develop workable solutions for problems drawn either from social context or from technological areas. |

M.Sc. INFORMATION TECHNOLOGY

ELIGIBILITY FOR ADMISSION

The candidate shall be admitted to the course provided he/she has passed the bachelor's degree in B.C.A/B.E.S/B.Sc. in Computer Science/Mathematics/Physics/ Statistics / Applied Sciences OR (b) B.Com / Bachelor of Bank Management/B.B.A/B.L.M/B.A Corporate Secretary-ship / B.A. Economics/ any other Bachelor's Degree in any discipline with Business Mathematics and Statistics or Mathematics/Statistics in Main/Allied level OR (c) B.Sc. Chemistry with Mathematics and Physics as allied subjects OR (d) B.E/B.Tech./M.B.A OR (e) A Bachelor's Degree in any discipline with Mathematics as one of the subjects at the Higher Secondary level (i.e. in +2 level of the 10+2 pattern)

Candidate shall be admitted to the examination only if he/she has taken the qualified degree in science/any subjects as mentioned after having completed the prescribed courses consisting of 12 years of study and has passed the qualifying examination.

DURATION OF THE COURSE

The duration of the course for two academic years consisting of four semesters and each semester comprises of 90 days. In order to be eligible for the award of the degree the candidate shall successfully complete the course in a maximum period of five years reckoned from the date of enrolment for the first semester of the course.

M.Sc. INFORMATION TECHNOLOGY CURRICULUM

This is a full time course comprising of two years (Four Semesters). Through its infrastructure well developed over last 19 years, department offers instructions in wide areas of Information Technology such as Operating System, Computer Organization and Architecture, Database Management Systems, Principles of Programming Languages, Linux System Administration, Data Structures and Algorithms, Computer Networks, Microprocessor and Microcontroller, Programming in PHP, Object Oriented Software Engineering, Enterprise Computing, Programming in Python, Data Warehousing and Data mining, Software Testing and Cryptography which is effectively facilitated by well-balanced curriculum consisting of 12 different core papers, 3 elective papers and 6 practical courses. The students should take an internship/ minor project at the end of the first year for minimum of 15 days to maximum of 20 days and 2 credits will be awarded. Broad based curriculum of department makes it possible to meet the requirement of various national / international research institutes and industries.

DISSERTATION

Semester IV consists of project and dissertation for 100 marks. Students are allocated individually to dissertation with the faculty of department. The format for dissertations is similar to the thesis style incorporating introduction, methodology, analysis, design, implementation,

testing, results, coding and bibliography. The dissertation is submitted in a type written and bound form and a copy of each dissertation is submitted to the Department for permanent record.

| | |
|---|----------|
| Internal Two out of three presentations | 20 marks |
| Project report | 60marks |
| Viva-voce | 20 marks |

ELIGIBILITY FOR THE AWARD OF DEGREE

A candidate shall be eligible for the award of the degree only if he/she has undergone prescribed course of study for a period of not less than two academic years, passed the examination of all the four semesters prescribed earning 100 credits fulfilled such conditions as have been prescribed there for.

SCHEME OF EXAMINATIONS

As per the University Regulation the following split up of marks for Theory, practical and project are to be followed.

i. SPLIT UP FOR INTERNAL AND EXTERNAL MARKS FOR THEORY AND PRACTICAL PAPER:

| Sl. No. | Paper | Internal | External | Total |
|---------|-----------|----------|----------|-------|
| 1. | Theory | 40 | 60 | 100 |
| 2. | Practical | 40 | 60 | 100 |

PATTERN OF QUESTION PAPER (THEORY)

Time 3 hours

Max Marks 100

Part – A: TEN Questions . (10 x 2 = 20 Marks)

At least two question from each unit and not more than two questions from each unit.

Part –B: FIVE questions (Internal Choice). (5 x 7 = 35 Marks)

One question from each unit. (Either or type).

Part –B: Three questions (Internal Choice). (3 x 15 = 45 Marks)

One question from each unit. (Either or type).

PATTERN OF QUESTION PAPER (PRACTICAL)

Time 3 Hours

Max Marks 60

One compulsory problem (may contain subdivisions) to be solved within 3 hours.

ii. **SPLIT UP FOR INTERNAL ASSESSMENT MARKS (40)**
FORTHEORY: CIA- Continuous Internal Assessment (40Marks)

| Bloom's Category | Tests | Attendance | Choice of department |
|--------------------------|--------------|-------------------|-----------------------------|
| Marks (out of 40) | 25 | 5 | 10 |
| Remember | 3 | | 2 |
| Understand | 5 | | 2 |
| Apply | 5 | | 2 |
| Analyze | 4 | | 2 |
| Evaluate | 3 | | |
| Create | 5 | | 2 |

ESE- Semester End Examination (100 Marks; weightage 60%)

| Bloom's Category | Weightage% |
|-------------------------|-------------------|
| Remember | 20 |
| Understand | 20 |
| Apply | 30 |
| Analyse | 15 |
| Evaluate | 10 |
| Create | 5 |

SCHEMA OF I SEMESTER M.Sc INFORMATION TECHNOLOGY COURSE

| S. No | Course Category | Course Code | Course | Hours Distribution | | | | Overall credits | Total Contact Hours/Week | Marks | | |
|--------------|------------------------|-------------|---|--------------------|---|---|---|-----------------|--------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CIA | ESE | TOT |
| 1 | Core Theory-1 | | Operating System. | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Core Theory-2 | | Computer Organization and Architecture. | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Core Theory-3 | | Database Management Systems. | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Core Theory-4 | | Multimedia | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | Core Theory Elective-1 | | Object Oriented Software Engineering/Unified Modeling Language/OOAD | 4 | 0 | 0 | 0 | 3 | 4 | 40 | 60 | 100 |
| 6 | Practical-1 | | Practical – I: OS Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 7 | Practical-2 | | Practical – II : MYSQL Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 8 | Soft Skill | | Effective Communication in English I. | 0 | 0 | 0 | 0 | 2 | - | 50 | 50 | 100 |
| 9 | ST** | | LINUX | 0 | 0 | 0 | 0 | 1 | - | - | - | - |
| Total | | | | | | | | 26 | 30 | 330 | 470 | 800 |

SCHEMA OF II SEMESTER M.Sc INFORMATION TECHNOLOGY COURSE

| S. No | Course Category | Course Code | Course | Hours Distribution | | | | Overall credits | Total Contact Hours/Week | Marks | | |
|--------------|------------------------|-------------|--|--------------------|---|---|---|-----------------|--------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CIA | ESE | TOT |
| 1 | Core Theory-5 | | Data Structures and Algorithms | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Core Theory-6 | | Computer Networks | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Core Theory-7 | | Java Programming | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Core Theory-8 | | Java Script | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | Core Theory Elective-2 | | Introduction to Cloud Computing/Fundamentals of IoT/Introduction to Grid computing | 3 | 0 | 0 | 0 | 3 | 4 | 40 | 60 | 100 |
| 6 | Practical-3 | | Practical – III: Java Programming lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 7 | Practical-4 | | Practical – IV: Java Script lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 8 | Soft Skill | | English for Competitive Exams | 0 | 0 | 0 | 0 | 2 | - | 50 | 50 | 100 |
| 9 | ST** | | Java | 0 | 0 | 0 | 0 | 1 | - | - | - | - |
| 10 | ---- | | Summer Internship | 0 | 0 | 0 | 0 | 2 | 3-4 weeks | - | - | - |
| Total | | | | | | | | 28 | 30 | 330 | 470 | 800 |

SCHEMA OF III SEMESTER M.Sc INFORMATION TECHNOLOGY COURSE

| S. No | Course Category | Course Code | Course | Hours Distribution | | | | Overall credits | Total Contact Hours/Week | Marks | | |
|--------------|------------------------|-------------|---|--------------------|---|---|---|-----------------|--------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CIA | ESE | TOT |
| 1 | Core Theory-9 | | Enterprise Computing | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Core Theory-10 | | Programming in Python | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Core Theory-11 | | Data Warehousing and Data Mining | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Core Theory-12 | | Software Testing | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | Core Theory Elective-3 | | Cryptography/Information Security /Internet Security and Computer Forensics | 4 | 0 | 0 | 0 | 3 | 4 | 40 | 60 | 100 |
| 6 | Practical-5 | | Practical – V: Enterprise Computing Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 7 | Practical-6 | | Practical–VI:Python Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 8 | Soft Skill | | Personality Development | 0 | 0 | 0 | 0 | 2 | 0 | 50 | 50 | 100 |
| 9 | ST** | | PHP and MYSQL | 0 | 0 | 0 | 0 | 1 | - | - | - | - |
| Total | | | | | | | | 26 | 30 | 330 | 470 | 800 |

SCHEMA OF IV SEMESTER M.Sc INFORMATION TECHNOLOGY COURSE

| S. No | Course Category | Course Code | Course | Hours Distribution | | | | Overall credits | Total Contact Hours/Week | Marks | | |
|------------------------------------|-----------------------|-------------|--------------------------------|--------------------|---|---|---|-----------------|--------------------------|-----------|------------|------------|
| | | | | L | T | P | S | | | CIA | ESE | TOT |
| 1 | Core | | Project & Viva-Voce | 0 | 0 | 0 | 0 | 15 | - | 40 | 60 | 100 |
| 2 | Soft Skill | | Presentation Skills | 0 | 0 | 0 | 0 | 2 | - | 50 | 50 | 100 |
| 3 | ST** | | LaTeX | 0 | 0 | 0 | 0 | 1 | - | - | - | - |
| 4 | Certificate Course*** | | MOOC Certificate Course(NPTEL) | 0 | 0 | 0 | 0 | 2 | - | - | - | - |
| Total | | | | | | | | 20 | - | 90 | 110 | 200 |
| Total Credits of the Course | | | | | | | | 100 | | | | |

Project & Viva-Voce will be conducted in fourth semester, Soft Skill and Spoken Tutorial Certificate course will be conducted. Summer Internship and one MOOC certificate course will be conducted for the entire course.

Spoken Tutorial Courses (ST)** Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India, Online Examination will be conducted and qualified students (Minimum passing 40%) will be issued certificate by IIT, Mumbai. Students will submit a copy of the certificate as a proof of qualifying the online test to the COE office.

Soft Skill Syllabus framed and approved by English Department.

Certificate Course**** offered by NPTEL. Students should complete any one certificate course within the duration of the course (on or before the completion of the final semester). Students will submit a copy of the certificate issued by NPTEL after qualifying, as a proof to the COE's office.

**FIRST
SEMESTER(SYLLABUS)**

Course Title: CORE THEORY 1 - OPERATING SYSTEM

.....

...

| | | |
|-------------------------|-----------------|-----------|
| CourseCode: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIAMarks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

*On taking this course the student will be able to gain the knowledge about main components of an Operating system and Process Management and Scheduling, to analyse the mechanisms of OS to handle Processes and Threads and their Communication, to gain knowledge on Distributed Operating System concepts that includes Architecture, Mutual Exclusion Algorithms, Deadlock Detection Algorithms, to discuss the mechanisms involved in Memory Management Policies and Virtual Memory, to gain the knowledge about Paging and various Page Replacement Algorithms, to compile the working of an Files and Directory Structure in OS. **Course outcomes: At the end of course, the student will be able to***

| | |
|-----|--|
| CO1 | Basic concepts of operating system, process management, Threads - Interprocess Communication. CPU Scheduling |
| CO2 | Discuss various Process Synchronization problems, critical region and monitors |
| CO3 | Discuss about Deadlock Characterization, Methods for handling Deadlocks, Prevention, Avoidance, and Detection of Deadlock and Recovery from deadlock. Analyse the Memory Management and its allocation policies. |
| CO4 | Evaluate the various Page Replacement Algorithms handled by Operating System. Analyse the Virtual memory and Thrashing concepts. |
| CO5 | Interpret the mechanisms adopted for File Sharing in Distributed Applications. |
| CO6 | Demonstrate the basic concepts of operating system |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |

3- StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENT OF MODULE | Hrs | COs |
|------|--|-----|---------|
| 1 | UNIT I: Introduction: Views –Goals –Types of system – OS Structure –Components – Services – System Calls. Process Management: Process - Process Scheduling – Cooperating Process –Threads - Interposes Communication. CPU Scheduling: CPU Schedulers – Scheduling criteria – Scheduling Algorithms. | 9 | CO1 |
| 2 | UNIT II: Process Synchronization: Critical-Section problem - Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Critical Region – Monitors. | 9 | CO2 |
| 3 | UNIT III: Deadlock: Characterization – Methods for handling Deadlocks – Prevention, Avoidance, and Detection of Deadlock - Recovery from deadlock. Memory Management: Address Binding – Dynamic Loading and Linking – Overlays – Logical and Physical Address Space - Contiguous Allocation – Internal & External Fragmentation. Non Contiguous Allocation: | 9 | CO3 |
| 4 | UNIT IV: Paging and Segmentation schemes –Implementation – Hardware Protection – Sharing - Fragmentation. Virtual Memory: Demand Paging – Page Replacement - Page Replacement Algorithms – Thrashing. | 9 | CO4 |
| 5 | UNIT V: File System: Concepts – Access methods – Directory Structure - Allocation methods. Secondary Storage Structures: Protection – Goals- Domain Access matrix. | 9 | CO5,CO6 |

TEXT BOOKS

1. Silberschatz A., Galvin P.B., Gange, (2003). *Operating System Principles*, (6th Edition), John Wiley & Sons.
2. Ashfaq A. Khan, (2001). *Practical Linux Programming*, (Revised Edition), Firewall Media.

REFERENCE BOOKS

1. Richard Petersen (2001). *The Complete Reference – Linux*, (6th Edition), TMH.

E- REFERENCES:

1. <http://www.freetechbooks.com/introduction-to-operating-systems-t340.html>
2. http://www.tutorialspoint.com/operating_system/index.htm
3. http://www.spoken_tutorial.org

FIRST SEMESTER**Course Title: CORE THEORY 2 –
COMPUTER ORGANIZATIONS AND
ARCHITECTURE**

| | | |
|-------------------------|-----------------|-----------|
| CourseCode: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIAMarks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

Conceptualize the basics of Organizational and Architectural issues of a digital Computer. Understanding the concepts of Boolean algebra, Logical Operations and various Adders. Learn various types of Flip-Flops and Data Transfer Techniques in Digital Computer and Articulate design issues in the development of Processor or other components that satisfy design requirements and objectives to explain different types of Addressing Modes and Memory Organization.

Course outcomes: At the end of course, the student will be able to

| COS | Content of module |
|------------|---|
| CO1 | Detailed representation about number systems and boolean algebra. |
| CO2 | Describe the various types of flip flops, registers and circuit system. |
| CO3 | Analyse the stack organization and identify the addressing modes. |
| CO4 | Interpret peripheral devices with memory access. |
| CO5 | Acquire a good knowledge about memory hierarchies and mapping. |
| CO6 | Gain knowledge about Virtual memory and data manipulation |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 1 | 3 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 1 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 1 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | HRS | COS |
|------|---|-----|-------------|
| 1 | UNIT I: Number System – Converting numbers from one base to– Complements – Binary Codes– Boolean algebra – Properties of Boolean algebra – Boolean functions. – Logical Operations – Logic gates - Adder – Subtractor. | 9 | CO1 |
| 2 | UNIT II: Decoders – Multiplexers- Flip Flops – Triggering of flip-flops – Analyzing a sequential circuit – State reduction – excitation tables – Design of sequential circuits – Counters. –shift registers. | 9 | CO2 |
| 3 | UNIT III: Central processing unit: General register and stack organizations, instruction formats - Addressing modes, Data transfer and manipulation - program control,RISC. | 9 | CO3 |
| 4 | UNIT IV: Input-output organization - peripheral devices, I/O interface, modes of transfer- Interrupt, Direct memory access, I/O processor. | 9 | CO4 |
| 5 | UNIT V: Memory Organization - Memory Hierarchy- Main memory- Auxiliary memory-Associative memory and its mapping techniques - Cache memory-cache memory mapping techniques- Virtual Memory. | 9 | CO5, CO6 |

TEXT BOOKS

1. M.MorrisMano (2007). *Computer SystemArchitecture*(3rdEdition), PHI,ISBN: 9789332585607.
2. D. P. Leach and A. P. Malvino(2002). *Digital Principles and Applications* (5th Edition), TMH, ISBN:9780070141704.

REFERENCE BOOKS

1. WilliamStallings(2015).*ComputerOrganizationandArchitecture*(10thEdition),Pearson Education, ISBN:9780134101613.
2. M.MorrisMano(2007). *Digital Logic and Computer Design*(3rdEdition),Pearson Education,ISBN:817758409X
3. V.C. Hamacher, G. Vranesic, S. G. Zaky (2000). *Computer Organization* (Revised Edition), TMH, ISBN:0471467405.

E-REFERENCES

1. <http://www.freetechbooks.com/computer-organization-and-design-fundamentals-t347.html>
2. <http://www.nptel.iitm.ac.in/video.php?subjectId=106102062>
3. <https://freevideolectures.com/course/2277/computer-organization>
4. <http://www.infocobuild.com/education/audio-video-courses/computer-science/ComputerOrganizationArchitecture-IIT-Madras>

FIRST SEMESTER

Course Title: CORE THEORY 3 - DATABASE MANAGEMENT SYSTEMS

.....

.....

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to assess the applications of DBMS, difference between File Systems vs. DBMS, identify the data models and understand the DBMS structure and identifies the Entity, Attribute and Entity Relationship Diagrams. Understand the Relational Algebra concepts, selection, projection, relational calculus which helps in understanding queries. Study the concepts of functional dependencies and the need of normalization and Normal forms I, II, III, IV BCNF and know the properties of transaction management and the recovery management. Compile various file organization methods and access methods to store the data.

Course outcomes: At the end of course, the student will be able to

| | |
|-----|--|
| CO1 | Describe a database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS. Design ER-models to represent simple database application scenarios. |
| CO2 | Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data for current needs. Develop applications using DDL, DML queries. |
| CO3 | Identifies the Functional dependencies, decompositions, lossless join, and dependency preserving decomposition. Classify the various normalization techniques and improve the database design by applying it. |
| CO4 | Use the concept of a transaction and design the database using some tools which satisfies the ACID properties when concurrent transaction occurs in a database. Evaluate the sophisticated access protocols to control access to the database. |
| CO5 | Identifies the suitable File organization methods and access methods and design the database for storing the data. |
| CO6 | Develop and evaluate a real database application using a database management system. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|----------|
| 1 | UNIT- I Introduction to DBMS and ER Model-Advantage of DBMS approach, various view of data, data independence, schema and sub-schema, primary concepts of data models, Database languages, Database administrator and users, data dictionary, overall system Architecture. Basic concepts of ER, mapping constraint, keys, ER diagram, weak and strong entity sets, specialization and generalization, aggregation. | 9 | CO1 |
| 2 | UNIT- I Domains, Relations and Keys, Relational Algebra & SQL- Domains, Relations, kind of relations, relational database, various types of keys-candidate, primary, alternate and foreign key. Relational algebra, SQL- set operations, aggregate functions, null values, nested sub queries, views, join relations, DDL in SQL. | 9 | CO2 |
| 3 | UNIT- III Functional Dependencies and Normalization-Basic definitions, trivial and non-trivial dependencies, introduction to normalization, non-loss decomposition, FD diagram, first, second, third Normal forms, dependency preservation, BCNF, multivalued dependencies and fourth normal form, Join dependency and fifth normal form. | 9 | CO3 |
| 4 | UNIT- IV Transaction, concurrency and Recovery-Basic concepts of Transaction, ACID properties, Transaction states, implementation of atomicity and durability, concurrent executions, basic idea of serializability, concurrency control-two phase locking and deadlock handling, Recovery system-Failure Classification, Storage Structure ,Recovery and Atomicity , Log-Based Recovery, Shadow Paging. | 9 | CO4 |
| 5 | UNIT- V Storage structure and file organizations-Overview of physical storage media, magnetic disks-performance and optimizations, basic idea of RAID, file organizations, organization of records in files, basic concepts of indexing, ordered indices, basic idea of B-tree and B+-tree organization. | 9 | CO5, CO6 |

TEXT BOOK

1. Henry Forth, Abraham Silberschatz, S. Sudharshan (2006). *Database System Concepts* (5th Edition), McGraw Hill Publications.
2. R. Elmasri, S.B. Navathe (2007). *Fundamentals of Database Systems* (5th Edition), Pearson Education.

REFERENCE BOOKS

1. Raghu Ramakrishnan, Johannes Gehrke (2014) , *Database Management Systems* (3rd Edition), McGraw Hill Publications.
2. J. Date, A. Kannan and S. Swamynathan, (2009). *An Introduction to Database Systems* (8th Edition), Pearson Education.

E- REFERENCES:

1. <https://www.coursera.org/course/datasci>
2. <http://www.nptel.iitm.ac.in/video.php?subjectId=106106093>
3. <https://gateoverflow.in/47124/which-video-lecture-will-be-the-best-for-dbms>

FIRST SEMESTER

Course Title: CORE THEORY 4 - MULTIMEDIA

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

To learn the basics and Fundamentals of Multimedia. To understand the principles of how different types of media can be processed and presented by computers. To understand multimedia in respect to many applications. To Understand Virtual reality concepts and the hardware involved. To introduce the augmented and mixed reality methods and applications.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Gain knowledge on basics of multimedia and the different nature of multimedia data their principles and format. |
| CO2 | Identify the hardware, software and authoring systems needed for designing a multimedia application. |
| CO3 | Gain knowledge on the three dimensional concepts, transformation and viewing. |
| CO4 | Understand the concepts of virtual reality, the Virtual environment and the hardware interfaces involved in any virtual reality application. |
| CO5 | Find the difference between AR and VR, its challenges and functionality. |
| CO6 | Analyze and enhance the interactivity in AR environment and evaluating it. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 1 | 2 | 3 | 1 | 1 | 2 | 3 | 3 | 1 | 1 | 2 | 2 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 1 | 3 |
| CO 3 | 3 | 1 | 3 | 3 | 2 | 1 | 2 | 3 | 3 | 1 | 1 | 1 | 2 |
| CO 4 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 3 | 3 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|----------|
| 1 | UNIT I : What is Multimedia? : Definitions – Where to use multimedia – Delivering Multimedia, Text: The Power of Meaning – Using text in multimedia – Hypermedia and Hypertext , Images: Making Still Images-Image File Formats, Sound: The power of Sound-Multimedia System Sounds-Audio File Formats- Adding sound to your Multimedia Project, Animation: The Power of Motion – Principles of Animation-Animation by Computer | 9 | CO1 |
| 2 | UNIT II :Video: How Video works and is displayed – Digital video Containers – Shooting and Editing Video, Making Multimedia: – What you need: The Intangibles - What you need: Hardware - What you need: Software - What you need: Authoring Systems, Designing for the World Wide Web: Developing for the web- Text for the web – Images for the web – sound for the web – Animation for the web – video for the web. | 9 | CO2 |
| 3 | UNIT III :Three dimensional concepts: Three dimensional object representations – Polygon surfaces- Polygon tables- Plane equations – Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces. Transformation and viewing: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods. | 9 | CO3 |
| 4 | UNIT IV:Introduction to Virtual Reality: Introduction, Fundamental Concept and Components of Virtual Reality. Primary Featuresand Present Development on Virtual Reality. Real time computer graphics,Flight Simulation, Virtual environment requirement, benefits of virtual reality, Historicaldevelopment of VR. Hardware technologies for 3d user interfaces: Visual Displays AuditoryDisplays, Haptic Displays, Choosing Output Devices for 3D User Interfaces. | 9 | CO4 |
| 5 | UNIT V: Augmented and Mixed Reality : Taxonomy, technology and features of augmented reality, difference between AR and VR, Challenges with AR, AR systems and functionality, Augmented reality methods, visualization techniques for augmented reality, wireless displays in educational augmented reality applications, mobile projection interfaces, marker-less tracking for augmented reality, enhancing interactivity in AR environments, evaluating AR systems. | 9 | CO5, CO6 |

TEXT BOOKS:

1. Vaughan, Tay, “*Multimedia: Making it Work*”, 2010, 8thed, New York: McGraw-Hill.
2. Donald Hearn and Pauline Baker M, “*Computer Graphics*”, 2007, Prentice Hall, New Delhi.
3. John Vince, “*Virtual Reality Systems* “, 2007, Pearson Education Asia.
4. Alan B. Craig, “*Understanding Augmented Reality, Concepts and Applications*”, 2013, Morgan Kaufmann.

REFERENCE BOOKS:

1. Shirley, Peter, Michael Ashikhmin, Steve Marschner, “*Fundamentals of Computer Graphics*”, 2009, 3rd ed., A K Peters/CRC Press, ISBN: 9781568814698.
2. John F. Hughes, Andries Van Dam, Morgan McGuire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley, “*Computer Graphics: Principles and Practice*”, 2013, 3rd Edition, Addison- Wesley Professional.
3. Sherman, William R. and Alan B. Craig, “*Understanding Virtual Reality – Interface, Application, and Design*”, 2002, Morgan Kaufmann.

EREFERENCES:

1. [https://www.academia.edu/5750589/Computer Graphics C Version by Donald Hearn and M Pauline Baker II Edition](https://www.academia.edu/5750589/Computer_Graphics_C_Version_by_Donald_Hearn_and_M_Pauline_Baker_II_Edition)
2. <http://vr.cs.uiuc.edu/vrbookbig.pdf>
3. <https://nptel.ac.in/courses/106/106/106106138/>
4. https://onlinecourses.swayam2.ac.in/nou21_cs04/preview
5. <https://www.coursera.org/learn/xr-introduction>
6. <https://www.coursera.org/learn/intro-augmented-virtual-mixed-extended-reality-technologies-applications-issues>

FIRST SEMESTER

Course Title: ELECTIVE 1 - OBJECT ORIENTED SOFTWARE ENGINEERING

| | |
|---------------------------------|------------------------|
| CourseCode: | Credits 03 |
| L:T:P:S : 4:0:0:0 | CIAMarks :40 |
| Exam Hours : 03 | ESEMarks :60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to Develop the knowledge and practical skills needed to successfully participate in the analysis, design and development of large software systems, using object-oriented approaches, they can Apply team dynamics by working in teams, focus on object-oriented approaches and project management techniques Communicate the science and Development of graphical user interfaces, and quality assurance.

Course outcomes: At the end of course, the student will be able to

| | |
|------------|---|
| CO1 | Knows the reason about the basic Software life cycle models Importance of various kinds of Project Management methods, Tracking Software Quality, Quality Standards and Metrics. |
| CO2 | Develop System Concepts for Object Modeling Design and implement a software design concept to meet desired needs and Requirements. Design the UML concepts like sequential, Use cases and Activity diagram |
| CO3 | Concepts of Use cases, actors, and common modeling techniques. Implementing the concept use cases, business actors, Significance of identifying the subsystems and business requirements |
| CO4 | Explain Design Workflow and System Design Concept Create Mapping Object Model to Database Schema Testing and verification process Creation. |
| CO5 | Usage of Software Configuration Management Definition and Types of maintenance Life Build Reverse and re-engineering process. |

Mapping of Course Outcomes to Program Outcomes:

| C0/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO6 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | Hrs | Cos |
|------|--------------------|-----|-----|
|------|--------------------|-----|-----|

| | | | |
|---|---|---|----------|
| 1 | Software lifecycle models: Waterfall, RAD, and Spiral model Process metric – Product metrics – Estimation – LOC, FP, COCOMO models – Project Management – Planning, Scheduling and Tracking Software Quality – Quality Standards, Quality Metrics. | 9 | CO1 |
| 2 | System Concepts for Object Modeling – Abstraction, Inheritance, Polymorphism, Encapsulation, Message Sending, Association, Aggregation – Requirement Workflow Functional, Non-functional – Characteristics of Requirements – Requirement Elicitation Techniques – Requirement Documentation – Use case specification, Activity Diagram. | 9 | CO2 |
| 3 | Use-Case Modeling – Actors, Use Cases, Use Case Relationships. The Process of Requirements Use-Case – Identify Business Actors, Identify Business Requirements, Use Cases, Construct, Use Case Model Diagram – Class Diagrams and Object Diagrams – Package Diagrams – Sequence and Collaboration diagrams, State chart diagram. | 9 | CO3 |
| 4 | Design Workflow: System Design Concept – Coupling and Cohesion – Architectural Styles – Identifying Subsystems and Interfaces – Design Patterns Implementation Workflow – Mapping models to Code – Mapping Object Model to Database Schema Testing – Formal Technical Reviews – Walkthrough and Inspection. | 9 | CO4 |
| 5 | Software Configuration Management – Managing and controlling Changes – Managing and controlling versions Maintenance- Types of maintenance – Maintenance Log and defect reports – Reverse and re-engineering. | 9 | CO5, CO6 |

TEXT BOOKS:

1. Roger Pressman, (2005). *Software Engineering*, (Sixth Edition), TMH. ISBN no: 13:978- 007-126782-3.
2. Bahrami, (2008). *Object Oriented Systems Development*, (Second edition), TMH, ISBN no: 13978-0070265127.
3. Bernd Bruegge, (2004). *Object oriented software engineering*, (Second Edition), Pearson Education. ISBN no: 13978-93332518681

REFERENCE BOOKS:

1. Stephan R Schach, (2007). *Object oriented software engineering*, (Second edition), TMH. ISBN no:9780071259415
2. Timothy C Lethbridge, Robert Laganier (2004). *Object-Oriented Software Engineering Practical software development using UML and Java*, (Second edition), TMH.

E- REFERENCES:

1. <https://nptel.ac.in/courses/106/105/106105224/>
2. <https://nptel.ac.in/courses/106/101/106101061/>
3. <https://www.edutechlearners.com/oose-notes/>
4. https://www.youtube.com/watch?v=BqVqjJq7_vI&list=PLrjkTq13jnm_kpRxNK6la_gHuKQ3WI_dL

FIRST SEMESTER

Course Title: ELECTIVE 1 - UNIFIED MODELING LANGUAGE

| | | |
|--------------------------|-----------------|------------|
| CourseCode: | Credits | 03 |
| L:T:P:S : 4:0:0:0 | CIAMarks | :40 |
| Exam Hours : 03 | ESEMarks | :60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to understand the importance of various basic concepts of object modeling Gain the knowledge about various basic structural modeling along with their applicability contexts. The students can Analyze various basic Behavioral modeling of object-oriented software design (UML) and Review the concepts of Advance Behavioral modeling.

Course outcomes: At the end of course, the student will be able to

| | |
|-----|--|
| CO1 | Analyze the basic concepts of object modeling. |
| CO2 | Demonstrate various Basic Structural Modeling using the appropriate notation |
| CO3 | Demonstrate various Basic Behavioral Modeling using the appropriate notation |
| CO4 | Analyze various Advanced Behavioral Modeling using the appropriate notation |
| CO5 | Analyze Architectural Modeling using the appropriate notation |
| CO6 | Apply various UML diagrams for software development. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO4 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO5 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| C06 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | Hrs | Cos |
|------|---|-----|----------|
| 1 | Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML,Architecture | 9 | CO1 |
| 2 | Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams. Interfaces, Types and Roles, Packages. Class & Object Diagrams: Terms, Concepts, modeling techniques for Class & Object Diagrams. | 9 | CO2 |
| 3 | Basic Behavioral Modeling: Interactions, Interaction diagrams. Use cases, Use case Diagrams, Activity Diagrams. | 9 | CO3 |
| 4 | Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chartdiagrams. | 9 | CO4 |
| 5 | Architectural Modeling: Component, Deployment, Component diagrams and Deploymentdiagrams. | 9 | CO5, CO6 |

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson (2005). *The Unified Modeling Language User Guide*, (Second Edition), Pearson Education, ISBN no:0-201-57168-4
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado (2003).*UML Toolkit*, (Second Edition), WILEY-Dreamtech India Pvt. Ltd, ISBN no: 13:978-81-265-0466-4
3. Grady Booch (2007). *Object Oriented Analysis and Design*, (Third Edition), Addison Wesley, ISBN no:0-8053-5340-2

REFERENCE BOOKS:

1. Pascal Roques,Modeling (2007). *Software Systems Using UML2*, (Fourth Edition), WILEY-Dreamtech India Pvt. Ltd. ISBN no:13-978-81-265-0505-0
2. AtulKahate, (2000). *Object Oriented Analysis &Design*, Tata McGraw-Hill. ISBN no: 0- 07-058376-5
3. Ali Bahrami, (1999). *Object Oriented Systems Development*, McGraw Hill. ISBN no:13- 978-0-07-026512-7

E-REFERENCES:

1. www.uml-tutorials.trireme.com
2. www.smartdraw.com/resources/tutorials/uml-diagrams

FIRST SEMESTER**Course Title: ELECTIVE 1 - OBJECT ORIENTED ANALYSIS AND DESIGN**

| | | |
|-------------------------|-----------------|------------|
| CourseCode: | Credits | 03 |
| L:T:P:S :4:0:0:0 | CIAMarks | :40 |
| Exam Hours :03 | ESEMarks | :60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to understand the concept of object-oriented development, and create a static object model and a dynamic behavioral model and a functional model of the system. They can easily understand the approaches to system design and object design, and the techniques of translating design to implementation.

Course outcomes: At the end of course, the student will be able to

| | |
|------------|---|
| CO1 | Analyze object basics and UML |
| CO2 | Gain knowledge about attributes and relationship. |
| CO3 | Interpret axioms and do a case study |
| CO4 | Detailed study about Micro level process |
| CO5 | Digital signatures |
| CO6 | Gain knowledge about various testing strategies. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO4 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO5 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO6 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|----------|
| 1 | System development - object basics - development life cycle - methodologies - patterns - frameworks - unified approach - UML. | 9 | CO1 |
| 2 | Use Case models - object analysis - object relations - attributes - methods, class and object responsibilities - case studies | 9 | CO2 |
| 3 | Design processes - design axioms - class design – object storage - object interoperability - case studies. | 9 | CO3 |
| 4 | User interface design - view layer classes - micro - level processes - view layer interface - case studies. | 9 | CO4 |
| 5 | Quality assurance tests - testing strategies - object orientation on testing - test cases - test plans - continuous testing - debugging principles - system usability- measuring user satisfaction - case studies | 9 | CO5, CO6 |

TEXT BOOKS:

1. Ali Bahrami, (1999). *Object Oriented Systems Development*, McGraw Hill. ISBN no:13- 978-0-07-026512-7
2. Grady Booch (2007). *Object Oriented Analysis and Design*, (Third Edition), Addison Wesley, ISBN no:0-8053-5340-2
3. Bernd Bruegge, (2004). *Object oriented software engineering*, (Second Edition), Pearson Education. ISBN no: 13978-93332518681.

REFERENCE BOOKS:

1. James Rumbaugh, Michael R. Blaha, (2004). *Object-Oriented Modeling and Design with UML*, (Second Edition), Prentice Hall ISBN no:978-81-317-1106-4
2. AtulKahate, (2000). *Object Oriented Analysis & Design*, Tata McGraw-Hill. ISBN no: 0- 07-058376-5
3. Roger Pressman, (2005). *Software Engineering*, (Sixth Edition), TMH. ISBN no: 13:978- 007-126782-3.

E-REFERENCES:

1. <http://www.exforsys.com/tutorials/oad/oad-introduction.html>
2. <http://www.devshed.com/c/a/Practices/Introducing-UMLObjectOriented-Analysis-and-Design>

FIRST SEMESTER

Course Title: PRACTICAL I - OS LAB

| | | |
|-------------------------|-----------------|------------|
| CourseCode: | Credits | 02 |
| L:T:P:S :0:0:5:0 | CIAMarks | :40 |
| Exam Hours :03 | ESEMarks | :60 |

LEARNING OBJECTIVES

On taking this course the student will be able to demonstrate various file/directory handling commands, system administrative commands, Develop shell script to perform basic arithmetic and logical calculations, Demonstrate various shell script instructions such as sed, AWK, Develop shell script to perform various operations on given strings, Explore system variables such as PATH, HOME etc., Develop shell script to check various attributes of files and directories.

Course outcomes: At the end of course, the student will be able to

| | |
|-----|---|
| CO1 | Execute various basic and file/directory handling commands, Implement simple shell script for basic arithmetic and logical calculations, check various attributes of files and directories. |
| CO2 | Implement Shell scripts to perform various operations on given strings |
| CO3 | Execution of various system administrative commands |
| CO4 | Implement Shell scripts to explore system variables |
| CO5 | Implement Shell script to delete all the temporary files. |
| CO6 | Implement Shell scripts search an element from an array. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

PRACTICAL – I

| S. No | CONTENTS OF MODULE | Hrs | COs |
|--------------|---|------------|-------------|
| 1 | Execution of various file/directory handling commands, Simple shell script for basic arithmetic and logical calculations, Shell scripts to check various attributes of files and directories. | 9 | CO1 |
| 2 | Shell scripts to perform various operations on given strings, Shell scripts to explore system variables such as PATH, HOME etc., Shell scripts to check and list attributes of processes. | 9 | CO2 |
| 3 | Execution of various system administrative commands, AWK script that uses all of its features. | 9 | CO3 |
| 4 | Use sed instruction to process /etc/passwd file, Shell script to display list of users currently logged in | 9 | CO4 |
| 5 | Shell script to delete all the temporary files, Shell script to search an element from an array using binary searching. | 9 | CO5, CO6 |

FIRST SEMESTER

Course Title: PRACTICAL II - MYSQL LAB

| | |
|--------------------------------|----------------------------|
| CourseCode: | Credits 02 |
| L:T:P:S :0:0:5:0 | CIAMarks :40 |
| Exam Hours :03 | ESEMarks :60 |

LEARNING OBJECTIVES:

Design and implementation of relational databases. Describe basic concepts of how a database stores information via tables and Explore Updating and inserting data into existing tables. Explaining SQL syntax used with MySQL. Describe how to retrieve and manipulate data from one or more tables using joins. Describe how to filter data based upon multiple conditions. Explaining various functions such as string, date and time, aggregate functions. Describe the complex and various types of sub queries in SQL.

Course outcome: At the end of course, the student will be able to

| | |
|-----|---|
| CO1 | Design and implement a Database Systems by creating tables, views for an Applications. |
| CO2 | Populate and query a database by performing basic operations like CREATE, DELETE, UPDATE, SELECT, ALTER using SQL DDL and DML commands. |
| CO3 | Develop queries using SQL Operators and Functions. |
| CO4 | Declare and enforce Integrity Constraints on a database using SQL commands. |
| CO5 | Formulate queries by using set operations, join operations, functions, operators and sub queries. |
| CO6 | Show execution of SQL queries using MySQL for database tables using DCL and TCL commands. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

PRACTICAL – II

| S. No | CONTENTS OF MODULE | Hrs | COs |
|--------------|---|------------|-------------|
| 1 | DDL – Data Types, Create, Alter, Drop, Views. | 9 | CO1 |
| 2 | DML – Insert, delete and update commands. Integrity constraints. | 9 | CO2 |
| 3 | Select command with operators like arithmetic, comparison, logical, order by, group by etc. Set Operations – union, intersect and minus. | 9 | CO3 |
| 4 | SQL Functions – date, numeric, character, conversion, avg, max, min, sum, count. | 9 | CO4 |
| 5 | DCL & TCL – grant, revoke, rollback and commit. Join query concept – Inner, Left, Right, Outer joins. Complex and sub queries. | 9 | CO5, CO6 |

FIRST
SEMESTER
SPOKEN
TUTORIAL
SP01 - LINUX

| S.NO | CONTENTS |
|------|---|
| 1 | Ubuntu Desktop- Desktop Customization- Synaptic Package Manager- UbuntuSoftware Center- Basic Commands- General Purpose Utilities in Linux- FileSystem- Working with Regular Files- File Attributes- Redirection Pipes- Workingwith Linux Process- The Linux Environment- Basics of System Administration- Simple filters- The grep command- More on grep command- The sed command- More on sed command- Basics of AWK. |

Note:

Courses Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India. At the end of the course Online Examination will be conducted for 45 minutes and qualified students (Minimum passing 40%) will be issued certificate by IIT,Mumbai.

**SECOND
SEMESTER
SYLLABUS**

Course Title: CORE THEORY-5 DATA STRUCTURES AND ALGORITHMS

| | | | |
|--------------------|-----------------|------------------|-----------|
| CourseCode: | | Credits | 04 |
| L:T:P:S | :4:0:0:0 | CIA Marks | 40 |
| Exam Hours | :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

Develops skills in implementations and applications of data structures. Implements basic algorithms for sorting and searching. Implements basic data structures such as stacks, queues and trees. Applies algorithms and data structures in various real-life software problems.

Course outcomes: At the end of course, the student will be able

| | |
|-----|---|
| CO1 | Define data structures like array, stack, queues and linked list. |
| CO2 | Explain insertion, deletion and traversing operations on data structures. |
| CO3 | Identify the asymptotic notations to find the complexity of an algorithm. |
| CO4 | Compare various searching and sorting techniques. |
| CO5 | Choose appropriate data structure while designing the algorithms. |
| CO6 | Design advanced data structures using nonlinear data structures. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 2 | 3 | 3 | 1 | 3 | 2 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 1 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 1 |

3- StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | HRS | COS |
|------|---|-----|----------|
| 1 | UNIT I: Abstract data types asymptotic notations – complexity analysis – Arrays- representation of arrays – Linked lists: Singly linked list - Circular linked lists – Doubly linked lists – stacks –queues - circular queues – Postfix Notation. | 10 | CO1, CO2 |
| 2 | UNIT II: Trees – Binary Trees – Binary Tree Traversals – Binary Tree Representations – Binary Search Trees – Threaded Binary Trees -Introduction to AVL Trees-Red-Black Trees, Splay Trees, B-Trees. | 8 | CO3, CO4 |
| 3 | UNIT III: – Representation of Graphs – Graph Implementation – Graph Traversals- Minimum Cost Spanning Trees – Shortest Path Problem. | 9 | CO5 |
| 4 | UNIT IV: Divide and conquer – Quick sort, Merge sort – Greedy Method: General Method –knapsack problem. | 9 | CO6 |
| 5 | UNITV: Back Tracking: General Method – 8-queens - Branch and Bound: General Method - Traveling Salesperson problem. | 9 | CO2 |

TEXT BOOKS

1. E. Horowitz, S. Sahni and S. Rajasekaran (2001). Computer Algorithms, Galgotia publishers,ISBN:9788173716126
2. E.Horowitz, S. Sahni and Mehta(2000).Fundamentals of Data Structures in C++, Galgotiapublishers,ISBN:0929306376

REFERENCE BOOKS

1. G. L. Heileman(1999). Data Structures, Algorithms and Object Oriented Programming, Revised Edition, TMH, ISBN:0070278938.
2. A.V.Aho, J.D. Ullman, J.E. Hopcraft (1983). Data Structures and Algorithms, Revised Edition, Addison Wesley publishers, ISBN:0201000237.
3. A.V. Aho, J.E. Hopcroft, J.D. Ullmann (1974).The design and analysis of Computer Algorithms, Revised Edition, Addison Wesleypublishers,ISBN:0201000237.

E-REFERENCES

1. www.freetechbooks.com/a-practical-introduction-to-data-structures-and-algorithm-analysis-third-edition-c-version-t804.html
2. www.nptel.iitm.ac.in/courses/106101060
3. <http://www.nptel.iitm.ac.in/courses/106104019/>
4. <https://www.techiedelight.com/best-online-courses-data-structures-algorithms/>
5. <https://freevideolectures.com/course/2279/data-structures-and-algorithms/>

SECOND SEMESTER

Course Title: CORE THEORY 6 - COMPUTER NETWORKS

.....

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to assess the basic taxonomy and terminology of the Computer Networks and the layers of OSI model and TCP/IP model and various Transmission Medias. Understand the Telephone System Structure of Physical layer and Data link layer protocols. Describe data link layer and MAC layer concepts, design issues, and protocols. Gain core knowledge of Network layer Routing protocols and IP addressing. Discuss the Session layer design issues, Transport layer services, and protocols.

Course outcomes: At the end of course, the student will be able to

| | |
|-----|--|
| CO1 | Gain a basic knowledge of Networking and functions of each layer in OSI and TCP/IP model. Demonstrate the network topology. |
| CO2 | Diagnose the problems of a Current Multiplexing Techniques. |
| CO3 | Classify the various multiple access protocols and identify the deficiencies in existing protocols, and then go onto formulate new and better protocols. |
| CO4 | Apply the mathematical background of routing protocols. Analyze the collision occurred in current networks. Classify the classes of IP protocols and select the IP addresses for the given network. |
| CO5 | Describe the issues surrounding in Session layer and Transport layer and identify how to rectify. |
| CO6 | Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies. |

Mapping of Course Outcomes to Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO4 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO5 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO6 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| SNO | CONTENT OF MODULE | Hrs | COS |
|-----|--|-----|----------|
| 1 | UNIT I: Introduction: Network Hardware – Software – Reference Models – OSI and TCP/IP Models. Physical Layer: Transmission Media-Wireless Transmission-Narrow Band ISDN. | 9 | CO1 |
| 2 | UNIT II: Telephones Structure: Local Loops – Trunks, Multiplexing, and Switching. Data Link Layer: Design Issues – Error Detection and Correction - Elementary data link protocols - Sliding Window Protocols. | 9 | CO2 |
| 3 | UNIT III: Medium Access Sub Layer: Channel Allocation Problem. Multiple Access Protocols: ALOHA – Carrier Sense Multiple Access Protocols – Collision Free Protocols – Limited Contention Protocols. Bridges: Transparent Bridges – Spanning Tree Bridges – Source RoutingBridges. | 9 | CO3 |
| 4 | UNIT IV: Network layer - Design Issues. Routing Algorithms: Shortest Path Routing – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing. Congestion control algorithms: General Principles – Congestion Control in Virtual Circuit Subnets – Choke Packets – Load Shedding – Jitter Control. IP protocol: IP Address– Subnets - Internet Control Protocol. | 9 | CO4 |
| 5 | UNIT V: Transport layer: Elements – Connection management – Addressing, Establishing & Releasing a connection – Transport Control Protocol: TCP Protocol – TCP segment Header – Connection Management –Application Layer - Network Security-Traditional Cryptography - DNS-DNS Name Space -Electronic Mail - Message Formats. | 9 | CO5, CO6 |

TEXT BOOK

1. A.S.Tanenbaum (2003). *Computer Networks* (4th Edition), Pearson Education, Prentice hall of IndiaLtd.

REFERENCE BOOKS

1. B. Forouzan (1998). *Introduction to Data Communications in Networking*,TMH.
2. Fred Halsall (1995). *Data Communications, Computer Networks and OpenSystems*, AddisonWesley.

E-REFERENCES:

1. <http://www.technolamp.co.in/2010/08/computer-networks-tanenbaum-powerpoint.html>
2. <http://www.freotechbooks.com/computer-networks-performance-and-quality-of-service-t830.html>
3. <https://freevideolectures.com/course/3162/computer-networking-tutorial>
4. http://video.bilkent.edu.tr/course_videos.php?courseid=32

SECOND SEMESTER

Course title: **CORE THEORY 7 - JAVA PROGRAMMING**

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to enable the students to learn the basic concepts of Java programming. For increasing learning ability to use class and objects to create applications, students can have an overview of interfaces, packages, multithreading and exceptions and familiarize students with basic data structures and their use in AWT,I/O,and network interfaces

Course outcome: the end of course, the student will be able to

| COS | Content of module |
|------------|---|
| CO1 | Develop the knowledge of Hardware and Software requirements, Object Oriented Concepts , data types, different types of operators and Control Structures in JAVA |
| CO2 | Implementation of arrays, Looping Structures, Functions in JAVA |
| CO3 | Analyze the concepts of Package, interfaces, Creating a Thread ,File System. |
| CO4 | Gain the Knowledge for Managing Errors and Exceptions |
| CO5 | Implementation of Streams , and Learn the concepts of Network ,TCP/IP |
| C06 | Implementation of Applet and AWT classes |

Mapping of Course outcomes to program outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 |
| CO6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| SN O | CONTENT OF MODULE | Hrs | COS |
|---------|---|-----|-------------|
| 1 | UNIT I: Introduction to Java-Features of Java-Basic Concepts of Object Oriented Programming-Java Tokens-Java Statements-Constants-Variables-Data Types- Type Casting-Operators-Expressions-Control Statements: Branching and Looping Statements. | 9 | CO1 |
| 2 | UNIT II: Classes, Objects and Methods - Constructors - Methods Overloading-Inheritance-Overriding Methods- Finalizer and Abstract Methods-Visibility Control –Arrays, Strings and Vectors-String Buffer Class-Wrapper Classes | 9 | CO2 |
| 3 | UNIT III: Interfaces-Packages-Creating Packages-Accessing a Package-Multithreaded Programming-Creating Threads-Stopping and Blocking a Thread-Life Cycle of a Thread-Using Thread Methods-Thread Priority-Synchronization-Implementing the Runnable Interface | 9 | CO3 |
| 4 | UNIT IV: Managing Errors and Exceptions-Syntax of Exception Handling Code-Using Finally Statement-Throwing Our Own Exceptions-Managing Input/Output Files: Concept of Streams-Stream Classes-Byte Stream Classes-Character Stream Classes – Using Streams-Using the File Class-Creation of Files-Random Access Files-Other Stream Classes. | 9 | CO4 |
| 5 | UNIT V: Applet Programming-Applet Life Cycle-Graphics Programming Introducing the AWT: Working with Windows, Graphics and Text- AWT Classes- Working with Frames-Working with Graphics-Working with Color-Working with Fonts-Using AWT Controls, Layout Managers and Menus. | 9 | CO5, CO6 |

TEXT BOOKS:

1. Herbert Schildt,(2005),”*The Complete Reference Java*” , 5thEdition,TMH
2. Cay S. Horstmann and Gary Cornell,(2005) “*Core Java Volume I-Fundamentals*”, (7th Edition)- Pearson Education. ISBN no -10: 0-13-148202-5
3. K. Arnold and J. Gosling (2000) “*The JAVA programming language*”, (4rd edition), Pearson Education, ISBN: 0-321-34980-6.

REFERENCE BOOKS:

1. Timothy Budd, (2000) “*Understanding Object-oriented programming with Java*”, Pearson Education,.
2. Y. Daniel Liang (2003), “*An Introduction to JAVA Programming*,” Prentice-Hall of India Pvt. Ltd.

E-REFERENCES

1. <https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-cs08/>
2. <https://www.w3schools.com/java/>
3. <https://www.programiz.com/java-programming>
4. <https://www.coursera.org/learn/object-oriented-java>
5. http://www.spoken_tutorial.org

SECOND SEMESTER

Course Title: **CORE THEORY 8 – JAVA SCRIPT**

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to develop a basic understanding of how JavaScript works and to learn basic syntax, variable types, Creating conditional structures, Looping Statements , storing data in arrays and learn how to design using JavaScript built-in functions and creating recursive functions. Understanding the concept of Form validation and JavaScript Events. To develop the skills of designing JavaScript redirect, ImageMap and cookies

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Develop the knowledge JavaScript Structure, Variables, data types, different types of operators and Control Structures in JavaScript. |
| CO2 | Implementation of arrays, Looping Structures, Functions in JavaScript. |
| CO3 | Learn the concepts of JavaScript Form Validation and JavaScript Events. |
| CO4 | Gain the Knowledge of JavaScript Exception Handling-OOPS concept. |
| CO5 | Implementation of JavaScript redirect, JavaScript ImageMap. Learning the concepts of DOM. |
| CO6 | Implementation of JavaScript Dialog Boxes and Cookies. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3- StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-----------------|
| 1 | UNIT-I: Introduction to Scripting: Introduction - Java Script Structure - Java Script Variables – Global variable - Data types - Java Script Operators – Java Script Control Statements – Java Script Looping statements - Java script Arrays - array literal – creating instance of Array directly- using an array constructor- JavaScript Array methods. | 9 | CO1 |
| 2 | UNIT-II: JavaScript Functions- JavaScript Function Arguments – Function with Return Value – JavaScript Function Object –JavaScript Function methods – Passing arrays to functions – recursion – java script global functions - JavaScript String methods – JavaScript Number methods- Java Script Get date function- Java Script Set date function - JavaScript Regular Expression- Quantifiers – Literal Characters – Meta characters-Modifiers–Regular Expression Properties –Regular Expression methods. | 9 | CO2 |
| 3 | UNIT-III: JavaScript Validation - JavaScript Form Validation- JavaScript Retype Password Validation - JavaScript Number Validation- JavaScript Validation with image - JavaScript email validation- JavaScript Events- JavaScript addEventListener() - JavaScript onclick event -, JavaScript dblclick event - JavaScript onload event - JavaScript onresize event. JavaScript Set Object- JavaScript Set Methods | 9 | CO3 |
| 4 | UNIT-IV: JavaScript Exception Handling –JavaScript try-catch- JavaScript OOPs-JavaScript Class –JavaScript Object- JavaScript prototype – JavaScript Constructor method- JavaScript static method – JavaScript Encapsulation – JavaScript Inheritance- JavaScript Polymorphism – JavaScript abstraction - JavaScript redirect - JavaScript Image Map. | 9 | CO4 |
| 5 | UNIT-V: JavaScript DOM- Properties of document object- Methods of document object- Accessing field value by document object- JavaScript Dialog Boxes –Alert Dialog Box – Confirmation Dialog Box – Prompt Dialog Box. JavaScript Cookies- Cookie Attributes-Cookie with multiple name-deleting Cookies- Intro to JSON JSON syntax, Need of JSON in real web sites, JSON object, JSON array, Complex JSON objects, Reading JSON objects using jQuery. | 9 | CO5 , CO6 |

TEXT BOOKS:

- 1 Mark Myers,(2014). *A Smarter Way to learn JavaScript* (1st edition), Lightning Source Inc Publishers,ISBN-10:1497408180
- 2 David Flanagan ,(2011). *JavaScript : The Definitive Guide*(7th edition), O'Reilly publishers,ISBN-10-05-0596805527
- 3 Marjin Haverbeke,(2018). *Eloquent JavaScript A Modern Introduction to Programming* (3rd edition), No Starch Press Publishers.

REFERENCE BOOKS:

1. Ivelin Demirov,(2014).*Learn JavaScript with Interactive Exercises Visually*, (3rd Edition), Sams publishers.

REFERENCES:

- 1 <https://www.tutorialspoint.com/javascript/index.htm>
- 2 <https://www.javatpoint.com/javascript-tutorial>
- 3 <https://www.guru99.com/interactive-javascript-tutorials.html>
- 4 <https://www.tutorialrepublic.com/javascript-tutorial/>
- 5 <https://www.javascript.com/try>

SECOND SEMESTER

Course title: **ELECTIVE 2 - INTRODUCTION TO CLOUD COMPUTING**

| | |
|-------------------------------|-----------------------|
| CourseCode: | Credits 03 |
| L:T:P:S :4:0:0:0 | CIAMarks :40 |
| Exam Hours :03 | ESEMarks :60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to give an insight into the basics of cloud computing along with virtualization, cloud computing is one of the fastest growing domain from a while now. It will provide the students basic understanding about cloud and virtualization along with it how one can migrate over it

Course outcome: the end of course, the student will be able to

| | |
|-----|--|
| CO1 | Knows the reason about the basic Cloud models and Importance of various kinds of cloud platforms |
| CO2 | Develop Cloud Concepts and how to implement a software virtualization concept to meet desired needs and Requirements. |
| CO3 | Analyze the Concepts of cloud Utility and Enterprise grid computing, Implementing security level of third party in cloud computing, cloud security benefits and Government policies. |
| CO4 | Design the Cloud Architecture- Layers and Models |
| CO5 | Usage of cloud Configuration using Cloud Simulators |
| CO6 | Know the advantages of VMware virtualization and its Types |

Mapping of Course outcomes to program outcomes:

| C0/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO6 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |

4- StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| SNO | Content of module | Hrs | COS |
|-----|---|-----|---------|
| 1 | UNIT-I Cloud Computing Overview Origins of Cloud computing – Cloud components - Essential characteristics – On-demand selfservice, Broad network access, Location independent resource pooling ,Rapid elasticity , Measured service, Comparing cloud providers with traditional IT service providers, Roots of cloud computing. | 9 | CO1 |
| 2 | UNIT-II Cloud Insights Architectural influences – High-performance computing, Utility and Enterprise grid computing, Cloud scenarios – Benefits: scalability ,simplicity ,vendors ,security, Limitations – Sensitive information - Application development- security level of third party - security benefits, Regularity issues: Government policies. | 9 | CO2 |
| 3 | UNIT-III Cloud Architecture- Layers and Models Layers in cloud architecture, Software as a Service (SaaS), features of SaaS and benefits, Platform as a Service (PaaS), features of PaaS and benefits, Infrastructure as a Service (IaaS), features of IaaS and benefits, Service providers, challenges and risks in cloud adoption. | 9 | CO3 |
| 4 | UNIT-IV Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - Advantages of Cloud computing. Cloud Simulators- CloudSim and GreenCloud Introduction to Simulator, understanding CloudSim simulator, CloudSim Architecture(User code, CloudSim, GridSim, SimJava) | 9 | CO4 |
| 5 | UNIT-V Introduction to VMWare Simulator Basics of VMWare, advantages of VMware virtualization, using Vmware workstation, creating virtual machines- understanding virtual machines, | 9 | CO5,CO6 |

TEXT BOOKS:

1. Anthony T.Velte , Toby J. Velte Robert (2010) “*Cloud computing a practical approach*” - TATA McGraw- Hill , New Delhi ISBN no:978-0-07-162695
2. Michael Miller (2008) “*Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online*” “Que Print Publishers ,ISBN no: 9780768686227

REFERENCE BOOKS:

1. Judith Hurwitz , Robin Bloor , Marcia Kaufman ,Fern Halper, (2010) “*Cloud computing for dummies*”- Wiley Publishing, ISBN no:978-0-470-48470-8
2. Rajkumar Buyya, James Broberg, Andrzej Goscinski. (2011) “*Cloud Computing Principles and Paradigms*”, Wiley & Sons, Inc publications. ISBN no: 978-0-470-88799-8

E-REFERENCES:

1. <https://www.ibm.com/in-en/cloud/learn/cloud-computing>
2. http://dphoto.lecturer.pens.ac.id/lecture_notes/internet_of_things/cloud%20computing
3. <https://ptgmedia.pearsoncmg.com/images/9780133387520/samplepages/0133387526.pdf>
4. <https://searchaws.techtarget.com/definition/Amazon-Web-Services>
5. <https://www.simplilearn.com/tutorials/aws-tutorial/what-is-aws>

SECOND SEMESTERCourse Title: **ELECTIVE 2 - FUNDAMENTALS OF IOT**

| | |
|--------------------------------|---------------------|
| CourseCode: Elective-II | Credits 03 |
| L:T:P:S :4:0:0:0 | CIAMarks :40 |
| Exam Hours :03 | ESEMarks :60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to understand the fundamentals of Internet of Things and its architecture, to learn about the basics of IOT protocol, to gain understanding and build a small low cost embedded system using RaspberryPi, to apply the concept of Internet of Things in the real world scenario.

Course outcomes: At the end of course, the student will be able to

| | |
|------------|---|
| CO1 | Interpret the vision of IoT from a global context |
| CO2 | Describe the fundamentals of IoT and M2M |
| CO3 | Analyze applications of IoT in Raspberry PI |
| CO4 | Appreciate the role of cloud computing and services in IoT. |
| CO5 | Appreciate the role of Big data analytics in a typical IoT system and determine its industrial perspective. |
| CO6 | Illustrate the application of IoT in Industrial Automation and identify Real World Design Constraints. |

Mapping of Course Outcomes to Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 1 | 2 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 2 |
| CO 3 | 2 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 |
| CO 4 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 2 |
| | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| SNO | CONTENT OF MODULE | Hrs | COS |
|-----|--|-----|----------|
| 1 | UNIT I: Introduction - Physical Design of IoT- Logical Design of IoT- IoT Enabling Technologies - IoT Levels & Deployment Templates. | 9 | CO1 |
| 2 | UNIT II: Iot and M2M : M2M – Difference between IoT and M2M-SDN and NFV for IoT. IoT system management: Need for SNMP-Network operator requirements- NETCONF - YANG - IoT System Management with NETCONF-YANG. | 9 | CO2 |
| 3 | UNIT III: IoT Platforms Design Methodology: Ten steps in IoT design methodology- IoT Physical Devices & Endpoints: Basic building blocks of IoT devices – Exemplary device: Raspberry Pi – Linux on Raspberry Pi – Raspberry Pi Interfaces. | 9 | CO3 |
| 4 | UNIT IV: IoT Physical Servers and Cloud Offerings : Introduction to Cloud storage models and Communication APIs – WAMP/AutoBahn for IoT – Xively Cloud for IoT – Python Web Application Framework for DJANGO – DJANGO Architecture. | 9 | CO4 |
| 5 | UNIT V: Amazon Web Services for IoT – Amazon EC2 – Amazon AutoScaling – Amazon S3 – AmazonRDS – Amazon DynamoDB – Data Analytics for IoT: Apache Hadoop – MapReduce Programming Model – Hadoop YARN | 9 | CO5, CO6 |

TEXT BOOKS:

1. ArshdeepBahga, Vijay Madiseti (2015), *Internet of Things: A Hands-on Approach*, (1st Edition), Universities Press, ISBN: 978-8173719547
2. Dimitrios Serpanos, Marilyn Wolf (2018), *Internet-of-Things (IoT) Systems: Architectures, Algorithms, Methodologies* (1st Edition), Springer, ISBN : 978-3319697147

REFERENCE BOOKS:

1. Honbo Zhou (2011), *The Internet of Things in the Cloud: A Middleware Perspective*, (1st Edition), CRC Press, 2012. ISBN: 978-1439892992
2. Olivier Hersent, David Boswarthick, Omar Elloumi (2012), *The Internet of Things – Key applications and Protocols*, Wiley, ISBN: 978-8126557653
3. Raj Kamal (2017), *Internet of Things Architecture and Design Principles* (First Edition), Mc-Graw Hill Education. ISBN: 978-9352605224
4. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand. David Boyle (2014). *From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence* (1st Edition), Academic Press, ISBN : 012407684X

E- REFERENCES:

1. <https://nptel.ac.in/courses/106/105/106105166/>
2. <https://www.edureka.co/blog/iot-tutorial/>
3. <https://www.javatpoint.com/iot-internet-of-things>

SECOND SEMESTER

Course title: **ELECTIVE 2 - INTRODUCTION TO GRID COMPUTING**

| | |
|-------------------------------|-----------------------|
| CourseCode: | Credits 03 |
| L:T:P:S :4:0:0:0 | CIAMarks :40 |
| Exam Hours :03 | ESEMarks :60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to understand the fundamentals of grid and cluster computing, to learn Grid and cluster computing technologies and its architecture, to learn about the basics of webservices and OGSA in Grid computing, to gain understanding of cluster middle ware, to build and administer a cluster for load balancing and sharing.

Course Outcome: At the end students will be able to

| | |
|------------|---|
| CO1 | To define the fundamentals and requirements of Grid. |
| CO2 | Illustrate the Grid web services and OGSA Architecture. |
| CO3 | Gain the insights of cluster computing and cluster middleware. |
| CO4 | Describe the cluster architecture and its networking design. |
| CO5 | Organize and administer setting up of cluster. Illustrate load balancing and load sharing in clusters |
| CO6 | Compare the grid and cluster in real World Design Constraints. |

Mapping of Course Outcomes to Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 1 | 2 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 2 | 3 |
| CO2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 2 |
| CO3 | 2 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 |
| CO4 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 2 |
| CO6 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |

4- Strong Correlation 2- Medium Correlation 1- Low Correlation

| SNo | CONTENT OF MODULE | Hrs | COS |
|-----|--|-----|------------|
| 1 | UNIT I: Introduction –The data centre, the Grid/High-Performance Distributed Computing – Cluster computing and Grid Computing – Meta computing - web services and Grid computing. Technologies and Architecture for Grid Computing:Issues in Data Grids - Key Functional Requirements in Grid Computing– standards | 9 | CO1 |
| 2 | UNIT II: Web Services and the Service Oriented Architecture (SOA): History and Background - Service Oriented Architecture-Working principle of Web Service - SOAP and WSDLDescription - Creating Web Services - Server Side. OGSA and WSRF:OGSA for Resource Distribution - Stateful Web Services in OGSA, WSRF (Web Services Resource Framework) | 9 | CO2 |
| 3 | UNIT III: Cluster Computing: Approaches to Parallel Computing - Low-Cost Parallel Computing through Clusters - Definition and Architecture of a Cluster - Functionality a Cluster- Categories of Clusters. Cluster Middleware: An Introduction Levels and Layers of Single System Image (SSI) - Cluster Middleware Design Objectives - Resource Management and Scheduling | 9 | CO3 |
| 4 | UNIT IV: Early Cluster Architectures and High Throughput Computing Clusters: Early Cluster Architectures - High Throughput Computing Clusters, Condor.Networking, Protocols & I/O for Clusters: Networks and Inter-connection/Switching Devices - Design Issues in Interconnection Networking/Switching, Design Architecture. | 9 | CO4 |
| 5 | UNIT V: Setting Up and Administering a Cluster: Setting up a Simple Cluster - Design Considerations for the Front End of a Cluster - Setting Up Node -Meta-clusters - Administering Heterogeneous Clusters. Load Sharing and Load Balancing: Introduction- Strategies for Load Balancing - Modelling Parameters | 9 | CO5 CO6 |

TEXT BOOKS:

1. C.S.R Prabhu (2008), *Grid and Cluster Computing* (1st Edition), PHI, ISBN: 9788120334281
2. Jinjun Chen, Lizhe Wang, Wei Jie (2009), *Grid Computing : Infrastructure, Service and Applications* (1st Edition), CRC Press, ISBN : 978-1420067668

REFERENCE BOOKS:

1. Frederic Magoules (2009), *Fundamentals of Grid Computing: Theory, Algorithms and Technologies* (1st Edition), CRC Press, ISBN: 978-1439803677
2. Barry Wilkinson (2017), *Grid Computing Techniques and Applications* (1st Edition), Chapman and Hall/CRC, ISBN: 9781138116061
3. RakjumarBuyya , Clemens Szyperski (2002), *Cluster Computing* (1st Edition), Nova Biomedical, ISBN:978-1590331132

E- REFERENCES

1. <https://www.mooc-list.com/course/introduction-grid-computing-uva>
2. <https://www.mooc-list.com/course/high-performance-scientific-computing-coursera>
3. <http://bedford-computing.co.uk/learning/wp-content/uploads/2016/03/sg246778.pdf>
4. <http://www.buyya.com/papers/GridIntro-CSI2005.pdf>
5. <http://www.cs.kent.edu/~farrell/grid04/reference>

SECOND SEMESTER

Course Title: PRACTICAL III - JAVA PROGRAMMING LAB

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 02 |
| L:T:P:S :0:0:5:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to demonstrate the insight of an exciting growing field Java Programming. Learn the OOPS concepts to develop the knowledge of Java programs .Analyze real time programs to acquire the knowledge of Applets and AWT concepts. Derive the coding of Java techniques focusing on industry applications. Exhibit the fundamental techniques and principles in achieving Java Projects

Course outcome: the end of course, the student will be able to

| | |
|-----|--|
| CO1 | Create Java programs using class , object using Object oriented concepts |
| CO2 | Apply knowledge and demonstrate programming proficiency using the various error-handling techniques using exception handling and multithreading. |
| CO3 | Analyze programs and various projects using inheritance and polymorphism |
| CO4 | Implement files concepts and establish database connection. |
| CO5 | Develop GUI using Applets and AWT components. |
| CO6 | Validate the students to have JAVA programming skills that will help them to solve complex real-world problems in for decision support. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| SNO | CONTENT OF MODULE | HRS | COS |
|-----|---|-----|----------------|
| 1 | <p><u>APPLICATIONS:</u></p> <ul style="list-style-type: none"> ● Substring Removal from a String. Use String Buffer Class. ● Determining the Perimeter and Area of a Triangle. Use Stream Class. ● Determining the Order of Numbers Generated randomly using Random Class. ● Usage of Calendar Class and Manipulation | 9 | CO1 |
| 2 | <ul style="list-style-type: none"> ● Implementation of Point Class for Image Manipulation. ● String Manipulation Using Char Array. ● Usage of Vector Classes. | 9 | CO2 |
| 3 | <ul style="list-style-type: none"> ● Interfaces and Packages ● Implementing Thread based Applications and Exception Handling. ● Application using Synchronization such as Thread based, Class based and Synchronized Statements. | 9 | CO3 |
| 4 | <ul style="list-style-type: none"> ● Textfiles (copy, display, counting characters, words and lines) ● Data file creating and processing for electricity billing. ● Data file creating and processing for telephone billing | 9 | CO4 |
| 5 | <p><u>APPLETS</u></p> <ul style="list-style-type: none"> ● Working with Frames and Various Controls. ● Working with Dialog Box and Menus. ● Working with Colors and Fonts. ● Drawing various shapes using Graphical statements. ● Design a simple calculator with minimal of 10 operations ● Usage of buttons, labels, text components in suitable application | 9 | CO5,CO6 |

SECOND SEMESTER

Course Title: PRACTICAL IV - JAVASCRIPT LAB

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 02 |
| L:T:P:S :0:0:5:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to develop simple applications using control flow and loops, create arrays and perform various array functions and perform form validations, using different form events and design applications using object oriented concept and Cookies and to acquire knowledge about designing DOM.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Develop application using Control structures and Looping statements. |
| CO2 | Develop application using array functions, String Functions and Date Functions |
| CO3 | Develop application using User defined Functions and Recursion |
| CO4 | Build and implement application using Object oriented programming concept |
| CO5 | Build and develop application using Cookies |
| CO6 | Develop Application using Form Validation |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |

3- StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--------------------|-----|-----|
|-------|--------------------|-----|-----|

| | | | |
|---|--|---|-------------|
| 1 | Create application using Control Structures such as IF-Statement – IF-Else, IF-Else IF – Nested IF, Switch Statement ,Built in application using Looping Statements such as For ,While, Do-While Statement | 9 | CO1 |
| 2 | Create Application using array, Develop programs using String and Date Functions | 9 | CO2 |
| 3 | Design application using Form Events and Validate the Forms | 9 | CO3 |
| 4 | Design application using Exception handling and Develop application using OOPs Concept | 9 | CO4 |
| 5 | Develop Application JavaScript redirect –Image Map, Implementation of DOM and Cookies Concept | 9 | CO5, CO6 |

**SECOND
SEMESTER SPOKEN
TUTORIAL**

SP02 - JAVA

| S.NO | CONTENTS |
|----------|---|
| 1 | Getting started java Installation – First Java Program – Installing Eclipse – Getting started Eclipse-Hello World Program in Eclipse – Errors and Debugging in Eclipse – Programming features Eclipse – Numerical Datatypes – Arithmetic Operations – Strings – Primitive type conversions – Relational Operations – Logical Operations – if else – Nested if – switch case – while loop – For loop – do while – introduction to Array – Array operations – creating class – creating object – instance fields – Methods – Default constructor – Parameterized constructors – using this keyword – Non static block – Constructor overloading – Method overloading – userinput – subclassing and method overriding – Calling methods of the superclass – Using final keyword – Polymorphism – Abstract Classes – Java Interfaces – Static Variables – Static Methods – Static Blocks. |

Note:

Courses Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India. At the end of the course Online Examination will be conducted for 45 minutes and qualified students (Minimum passing 40%) will be issued certificate by IIT,Mumbai.

THIRD SEMESTER

SYLLABUS

Course Title: CORE THEORY 9 - ENTERPRISE COMPUTING

| | | |
|------------------|-----------|------|
| Course Code: | Credits | : 04 |
| L:T:P:S :4:0:0:0 | CIA Marks | : 40 |
| Exam Hours: 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to understand the various concepts of Enterprise programming, developing RMI Application, Servlet and session management and learn data manipulation using JDBC, develop web applications using JSP, implement Javamail API and familiarize the students with the concepts of reusable classes using JavaBeans, Hibernate and Spring Framework applications.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-----|---|
| CO1 | Understand various concepts of Enterprise Computing, analyze and implement the RMI Architecture for the necessary applications. |
| CO2 | Implement Session management using Servlet and implement JDBC for the database connectivity. |
| CO3 | Develop Web applications using JSP and JSP error pages. |
| CO4 | Design an application that sends and receives email with attachments. |
| CO5 | Implement Database connectivity through Hibernate Framework and also build web applications using Spring MVC. |
| CO6 | Study and use modern tools for rapidly building enterprise applications. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO 4 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 |
| CO 5 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|----------|
| 1 | Need for Enterprise Programming – J2EE Advantage – Enterprise Architecture types– Architecture of J2EE – J2EE Components – J2EE Containers – Introducing RMI – RMI Architecture – Application Development with RMI – RMI over IIOP. | 9 | CO1 |
| 2 | Introduction to Servlets – Servlet Life Cycle – Servlet API Basics – HTTP Redirects –Cookies –State and Session Management –Hidden Fields – URL rewriting –Session Management with the Servlet API –Inter Servlet Communication – Server Side Includes and Request Forwarding –Data Base Access with JDBC. | 9 | CO2 |
| 3 | JSP: Introduction JSP –Examining MVC and JSP –JSP scripting elements & directives –Working with variables scopes –Error Pages –using Java Beans in JSP. | 6 | CO3 |
| 4 | Javamail: Working with Java Mail –Understanding Protocols for Javamail –Components –Javamail API –Understanding Java Messaging Services: JMS Components EJB Fundamentals – EJB Architecture – EJB Roles –Introduction to Session Beans, Entity Beans & Message Driven Beans. | 9 | CO4 |
| 5 | Hibernate: Overview of Hibernate, Hibernate Architecture, Hibernate Mapping Types, Hibernate O/R Mapping, Hibernate Annotation, Hibernate Query Language –Spring MVC –Overview of Spring, Spring Architecture, bean life cycle,XML Configuration on Spring, Aspect – oriented Spring, Managing Database, and Managing Transaction. | 12 | CO5, CO6 |

TEXT BOOKS:

1. Jason hunter, William Crawford (2001). *Java Server Programming* (2nd Edition), O'Reilly Media, Inc., ISBN:9780596000400.
2. J McGovern, RA datia, Y Fain (2003). *J2EE 14 Bible*, Wiley-dreamtech India PvtLtd.
3. James Holmes, Herbert Schildt (2000). *Struts: The complete Reference* (2nd Edition), TMH.
4. H.Schildt (2002). *Java 2 Complete Reference* (5th Edition), TMH.

Editi

REFERENCE BOOKS:

1. K Moss (1999). *Java Servlets* (Second Edition), TMH.
2. Joseph O'Neil (1998). *Java Beans from the Ground Up*, TMH.
3. Tom Valesky (2000). *Enterprise JavaBeans*, Addison Wesley.
4. Cay S Horstmann & Gary Cornell (2002). *Core Java Vol II Advanced Features* (8th Edition), Addison Wesley.

E- REFERENCES:

1. <https://www.tutorialspoint.com/servlets/servlets-first-example.htm>
2. <http://www.servlets.com/jservlet2/examples/>
3. http://www.j2eetutorials.50webs.com/JSP_example1.html
4. <http://www.javatpoint.com/ejb-tutorial>
5. <https://slideplayer.com/slide/7362666/>

THIRD SEMESTER

Course Title: **CORE THEORY 10 - PROGRAMMING IN PYTHON**

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to develop a basic understanding of programming and the Python programming language and understand the basics of Strings, Lists and Tuples, learn how to design object-oriented programs with Python classes, learn how to use class inheritance in Python for reusability and how to use exception handling in Python applications for error handling, to provide knowledge on how to develop the ability to write database applications in Python, to develop the skills of designing Graphical user interface in Python and to acquire knowledge about Data science in Python using numpy.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | To acquire basic programming skills of Python programming language. |
| CO2 | To develop applications using python sequence. |
| CO3 | Implement basic object oriented concepts like inheritance and polymorphism. |
| CO4 | Develop GUI applications using PyGTK. and GUI applications. |
| CO5 | To have basic knowledge of implementing data science in python. |
| CO6 | To use python as a tool for research. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3- StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-------------|
| 1 | UNIT-I : Introduction to Python - Installing in various Operating Systems - Variables and Data Types - Operators – Conditional Statements- if-if-else-nested if – Looping – for-while-nested loops– Control Statements- break-continue-pass- Input/output Statements | 9 | CO1 |
| 2 | UNIT-II: Sequences -String Manipulations - Lists –Tuples – Mapping and Set types - Dictionaries –Set- Functions- Defining a function–calling a function–types of function – function arguments-lambda function- Exception Handling- Modules | 9 | CO2 |
| 3 | UNIT-III : File handling - Object Oriented Programming - Classes - Objects –Attributes - Inheritance - Overloading - Polymorphism -Interacting with Databases - Introduction to MySQL - interacting with MySQL –Database connection-creating database table, insert operation, read operation-update operation-delete operation - Regular Expressions - Text handling | 9 | CO3 |
| 4 | UNIT-IV: Introduction to Graphics programming - Introduction to GTK - PyGTK - Developing GUI applications using PyGTK–Tooltip, Check button, Combo box, Menus, Calendar, Image, Image processing- Network Programming- socket module - server socket methods - client socket methods - general socket methods- Web services using SOAP | 9 | CO4, CO6 |
| 5 | UNIT-V: Data Science in Python –Numpy – Numpy introduction, Data types Object – dtype-Numerical operations on Numpy arrays– Changing the dimensions of arrays -matrix arithmetic Scipy–introduction – basic functions – special function – optimization – linear algebra –Pandas-Introduction to Series and DataFrames –reading and writing data – Data Exploration – Data Munging- Introduction to version control system – subversion/Git | 9 | CO5, CO6 |

TEXT BOOKS:

1. Allen B Downey(2012), *Think Python: How to Think Like a Computer Scientist*(1st Edition), O'Reilly Publications.
2. Jeff McNeil(2010), *Python 26 Text Processing: Beginners Guide*, Packet Publications.
3. Mark Pilgrim(2009), *Dive into Python*(2nd edition), Apress publications.

REFERENCE BOOKS:

1. Kent D Lee(2010), *Python Programming Fundamentals*(2nd Edition), Springer,.
2. John V Guttag, *Introduction to Computation and Programming Using Python*, Prentice Hall of India.

E- REFERENCES

1. <http://wwwswaroopchcom/notes/python>
2. http://enwikibooksorg/wiki/Python_Programming
3. <http://docspythonorg/release/301/tutorial/>
4. <http://learnpythonthehardwayorg/>
5. <https://wwwcourseraorg/course/interactivepython>
6. <http://wwwpython-courseeu/pandasphp>
7. http://wwwspoken_tutorialorg
8. <https://www.coursera.org/learn/python-data?specialization=python>
9. <https://www.coursera.org/learn/python-programming-introduction>

THIRD SEMESTER

Course Title: CORE THEORY 11 - DATA WAREHOUSING AND DATA MINING

.....

.....

| | | |
|-------------------------|------------------|-----------|
| Course Code: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESE Marks | 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand and implement classical models and algorithms in data warehousing and data mining. To analyze the data, identify the problems, and choose the relevant algorithms for the chosen dataset. To compare and contrast different conceptions of data mining, to characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-----|--|
| CO1 | To appreciate the basic principles, concepts and applications of data warehousing and data mining |
| CO2 | Have a good knowledge of the preprocessing techniques |
| CO3 | To perform Data Mining using association rules |
| CO4 | To get insights from data using classification and prediction techniques |
| CO5 | Knowledge of clustering techniques and outliers |
| CO6 | To be able to apply data mining techniques to real world data by cleaning the data, integrating the data from different sources, predicting a model to group the data tuples into classes, discovering patterns using association rule mining and grouping the data set into clusters. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3- Strong Correlation 2- Medium Correlation 1- Low Correlation

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-------------|
| 1 | UNIT I: Introduction to data warehousing – OLAP – Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases – Mining Issues – Metrics – Social implications of Data mining Data Mining Techniques – Introduction – A statistical perspective on Data Mining – similaritymeasures–DecisionTrees–NeuralNetworks–Genetic Algorithms. | 9 | CO1 |
| 2 | UNIT II: Data Preprocessing: Why preprocess the data – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization. | 9 | CO2 |
| 3 | UNIT III: Data Mining Techniques: Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining. | 9 | CO3 |
| 4 | UNIT IV: Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy. | 9 | CO4 |
| 5 | UNIT V: Clustering Techniques: cluster Analysis – Clustering Methods – Similarity and Distance Measures– Hierarchical Methods – Partitional Methods – Outlier Analysis. | 9 | CO5, CO6 |

TEXT BOOKS:

1. Jiawei Han, MichelineKamber, Jian Pei (2008), *Data Mining: Concepts and Techniques*, 2nd edition, MorganKaufmann.
2. Mohammed J.Zaki,Wagnew Meira,Jr,Wagner Meira,(2014),*Data Mining and Analysis*,Cambridge UniversityPress.
3. CharuC.Aggarwal(2015),*Data Mining*, 2ndedition,Springer InternationalPublishing.

REFERENCE BOOKS:

1. RasmusLerdorfMH Dunham (2003), *Data Mining: Introductory and Advanced Topics*, 2003, Pearson Education.
2. PaulrajPonnaiah(2001), *Data Warehousing Fundamentals*, 2001, WileyPublishers.
3. SN Sivananda and S Sumathi(2006), *Data Mining*, 2006,Thomsan Learning, Chennai.

E-REFERENCES:

1. <http://nptel.iitm.ac.in/video.php?subjectId=106106093>
2. <http://cecs.louisville.edu/datamining/PDF/0471228524.pdf>
3. <http://www.spoken-tutorials.org>
4. <https://www.udemy.com/fundamentals-of-data-mining/>
5. <https://www.coursera.org/learn/cluster-analysis>

THIRD SEMESTER

Course Title: CORE THEORY 12 - SOFTWARE TESTING

.....

...

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 04 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES

On taking this course the student will be able to study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods, to discuss various software testing issues and solutions in software unit test; integration, regression, and system testing, to learn how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report, to learn various software testing process like verification and validation, to gain the techniques and skills on how to use modern software testing tools to support software testing projects.

Course outcomes: At the end of course, the student will be able to

| | |
|-----|---|
| CO1 | Discuss about the concept of bugs and analyses the principles in software testing to prevent and remove bugs. |
| CO2 | Discuss about domains and path Analyze Linguistic and Structural Metric |
| CO3 | Discuss about Verification and Validation. Analyse various levels of Testing, Testing Approaches, and Types of Testing & Test Plan. |
| CO4 | Analyze Defect Management Discuss about Acceptance testing and special test. |
| CO5 | Analyze various automation testing tools. |
| CO6 | Gain the knowledge about various testing tools. |

Mapping of Course Outcomes to ProgramOutcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No. | CONTENT OF MODULE | Hrs | COs |
|-------|---|-----|---------|
| 1 | UNIT I: Introduction: Purpose – Productivity and Quality in Software – Testing Vs Debugging Model for Testing – Bugs – Types of Bugs – Testing during Development Life- cycle. Requirement Traceability matrix-Work Bench. Principles of software testing, Salient features of Good Testing-Challenges in Testing-cost Aspect of Testing-Developing Testing Methodologies. | 9 | CO1 |
| 2 | UNIT II: Domain Testing: Domains and Paths– Domains and Interface Testing- Metrics –Linguistic and Structural Metric. | 9 | CO2 |
| 3 | UNIT III: Software Testing Process-Verification and Validation-Levels of Testing-Testing Approaches-Types of Testing-Test Plan. | 9 | CO3 |
| 4 | UNIT IV: Test Model- Defect Management-Levels of Testing-Acceptance Testing-Special Tests-Test Planning. | 9 | CO4 |
| 5 | UNIT V: Software Testing Tools Overview- QTP Tools- Performance Testing Tools-LoadRunner Tool. Testing Management Tools-TestDirector-GUI Testing-SilkTest- Open Source Testing Tool-JMeter. | 9 | CO5,CO6 |

TEXT BOOKS

1. B. Beizer (2003). *Software Testing Techniques*, Second Edition), DreamTechIndia, New Delhi. (UNIT I andII).
2. K.V.KK. Prasad (2005). *Software Testing Tools*, DreamTech. , India, NewDelhi.
3. (UNIT III, IV andV).
4. M.G.Limaye (2009). *Software Testing Principles, Techniques and Tools*, TataMc.Graw Hill Education Private Limited, New Delhi.(UNIT III andIV)

REFERENCE BOOKS

1. I.Burnstein (2003). *Practical Software Testing*, Springer InternationalEdition.
2. M G Limaye (2009). *Software Testing*, TMH, NewDelhi.

E-REFERENCES

1. <http://awards.istqb.org/award-winner/boris-beizer.html>
2. <http://www.testingreferences.com/testinghistory.php>
3. <http://www.swquality.com/users/pustaver/Books/books.htm>
4. <http://www.bullseye.com/coverage.html>
5. https://www.tutorialspoint.com/software_testing/
6. <https://lecturenotes.in/subject/129/software-testing-st>
7. www.ecs.csun.edu/~rlingard/COMP595VAV/SoftwareTesting.ppt

THIRD SEMESTER

Course Title: **ELECTIVE 3 - CRYPTOGRAPHY**

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 03 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES

To understand the mathematics behind cryptography, security concepts, vulnerabilities, different types of cryptosystems and attacks on various cryptosystems.

Course outcomes: At the end of course, the student will be able

| COS | Content of module |
|-----|--|
| CO1 | Gain knowledge about Conventional encryption model |
| CO2 | Analyse Euclidean Algorithm and Number theory |
| CO3 | Understanding Key exchanges. |
| CO4 | Detailed representation of Hashing functions. |
| CO5 | Describe the various Digital signatures logic. |
| CO6 | Apply different encryption and decryption techniques |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 1 | 3 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 1 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 1 |

3- StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | HRS | COS |
|------|---|-----|----------|
| 1 | UNIT I: Conventional encryption model –Security Concepts- Substitution and Transposition Ciphers- DES algorithm –AES algorithm - Random number generation. | 9 | CO1 |
| 2 | UNIT II: Number Theory: Modular arithmetic – Euler’s theorem – Euclid’s algorithm – Extended Euclidean Algorithm and its applications. Chinese remainder theorem – Prime numbers and factorization –Discrete Logarithms. | 9 | CO2 |
| 3 | UNIT III: Principles of Public key Cryptography– RSA algorithm – Key Management- Diffie – Hellman key exchange | 9 | CO3 |
| 4 | UNIT IV: Message Authentication and Hash functions: Authentication requirements –Authentication function- Message Authentication codes-Hash functions-Secure Hash Algorithm. | 9 | CO4 |
| 5 | UNIT V: Digital Signature and Authentication Protocols: Digital Signature Authentication Protocols –Digital Signature Standard. | 9 | CO5 ,CO6 |

TEXT BOOK

1. Stallings. W (2013). Cryptography and Network Security Principles and Practice, Pearson Education, Delhi, ISBN:9788131761663.

REFERENCE BOOKS

1. Charlie Kaufman, Radia Perlman, Mike specimen (2016). Network Security Private Communication in a public world, Prentice Hall PTR, ISBN: 9789332586000
2. Michael Welsehenbach (2013). Cryptography in C & C++, Apress, ISBN: 9781430250999.

E-REFERENCES

1. <http://www.webopedia.com/TERM/C/cryptography.html>
2. <http://www.sagemath.org/pdf/en/reference/cryptography/cryptography.pdf>
3. <http://www.freetechbooks.com/lecture-notes-on-cryptography-t565.html>
4. <https://nptel.ac.in/courses/10610503/>
5. <https://nptel.ac.in/courses/106105162/>

THIRD SEMESTER

Course Title: ELECTIVE3 - INFORMATION SECURITY

.....
.....

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 03 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to understand and revise the common threats faced today. To understand the foundational theory behind information security and analyze what are the basic principles and techniques when designing a secure system

.To apply attacks and defenses work in practice. How to assess threats for their significance 414453.6. How to gauge the protections and limitations provided by today's technology

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-----|---|
| CO1 | Understand Information Security Principles such as security attacks and services. |
| CO2 | Design Terms, concepts related to public key cryptography and digital signatures. |
| CO3 | Apply the Concepts of various privacy methods. |
| CO4 | Analyse Typical Network Attacks and Threats from the Internet. |
| CO5 | Create SNMP, Firewall design Principles and Intrusion detection system. |
| CO6 | Create the protections and limitations provided by internet security technology |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3- StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-------------|
| 1 | UNIT I: Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms | 9 | CO1 |
| 2 | Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos,X.509 Directory Authentication Service | 9 | CO2 |
| 3 | UNIT III: Email privacy: Pretty Good Privacy (PGP) and S/MIME.P Security Overview, IP Security Architecture, Authentication Header, Encapsulating SecurityPayload, Combining Security Associations and Key Management | 9 | CO3 |
| 4 | UNIT IV: Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET) | 9 | CO4 |
| 5 | UNIT V: Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3, Intruders, Viruses and related threats Firewall Design principles, Trusted Systems, Intrusion Detection Systems | 9 | CO5, CO6 |

TEXT BOOKS:

- 1 William Stallings (2008). *Network Security Essentials (Applications andStandards)*, Pearson Education.
- 2 Chris McNab (2016).*Network Security* (3rd edition), O'ReillyMedia.
- 3 Joseph MiggaKizza (2014). *Computer Network Security*, Springer International Publishing.

REFERENCE BOOKS:

- 1 Eric Maiwald (2004). *Fundamentals of Network Security*, Dreamtechpress.
- 2 CharlieKaufman, Radia Perlman and Mike Speciner, *Network Security - Private Communication in a Public World* (Second Edition),Pearson/PHI.

Website Reference:

1. <http://www.freetechbooks.com/an-introduction-to-computer-security-the-nist-handbook-t725.html>
2. <http://www.freetechbooks.com/fundamentals-of-cryptology-t801.html>

THIRD SEMESTER

Course Title: ELECTIVE 3 - INTERNET SECURITY AND COMPUTER FORENSICS

.....

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 03 |
| L:T:P:S :4:0:0:0 | CIA Marks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

To provide understanding of the main issues related to security in modern networked computer systems .Covers underlying concepts and foundations of computer security, basic knowledge about security-relevant decisions in designing ITinfrastructures

.To provide an understanding Computer forensics fundamental. To provide a comprehensive overview of collecting, investigating, preserving, and presenting evidence of cybercrime left in digital storage devices. To analyze various computer forensics technologies and to identify methods for data recovery.

Course outcomes: At the end of course, the student will be able to

| | |
|------------|---|
| CO1 | Gain a good understanding of the concepts and foundations of computer security, and identify vulnerabilities of IT systems |
| CO2 | Analyse basic security tools to enhance system security and can develop basic security enhancements in stand-alone applications |
| CO3 | Identify some of the factors driving the need for network security and analyse various computer forensics systems |
| CO4 | Analyse and summarize duplication and preservation of digital evidence |
| CO5 | Illustrate the methods for data recovery, evidence collection and data seizure. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 1 | 3 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 1 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |

3- Strong Correlation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | HRS | COS |
|------|---|-----|-----|
| 1 | UNIT I - NETWORK LAYER SECURITY & TRANSPORT LAYER SECURITY IPsec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPsec . Transport layer Security: SSL protocol, Cryptographic Computations - TLS Protocol. 189 CS-Engg&Tech- SRM2013 | 8 | CO1 |
| 2 | UNIT II - E-MAIL SECURITY & FIREWALLS PGP - S/MIME - Internet Firewalls for Trusted System: Roles of Firewalls - Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions. | 10 | CO2 |
| 3 | UNIT III - INTRODUCTION TO COMPUTER FORENSICS (9 hours) Computer Forensics Fundamentals – Types of Computer Forensics – Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition | 9 | CO3 |
| 4 | UNIT IV - EVIDENCE COLLECTION AND FORENSICS TOOLS Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ HardwareTools. | 9 | CO4 |
| 5 | UNIT V - ANALYSIS AND VALIDATION Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics | 9 | CO5 |

TEXT BOOK

1. Man Young Rhee (2003). *Internet Security: Cryptographic Principles, Algorithms and Protocols*, Wiley Publications, ISBN:9780470862469.

REFERENCEBOOKS

1. Nelson, Phillips, Enfinger, Steuart (2014). *A Guide to Computer Forensics and Investigations*, Publisher: engage, ISBN:9781305176089.
2. John R. Vacca (2002). *Computer Forensics*, Firewall Media, ISBN:1584503890
3. Richard E. Smith (2008). *Internet Cryptography*, Pearson Education, 3rd Edition, ISBN:8131704122
4. Marjie T. Britz (2013), *Computer Forensics and Cyber Crime: An Introduction*, Pearson Education, 1st Edition, ISBN:0132677717

E-REFERENCES

1. <https://www.geeksforgeeks.org/information-security-and-computer-forensics/>
2. <https://nptel.ac.in/courses/106106178/>

THIRD SEMESTER

Course Title: PRACTICAL V - ENTERPRISE COMPUTING LAB

| | | |
|-------------------------|-----------------|-----------|
| CourseCode: | Credits | 02 |
| L:T:P:S :0:0:5:0 | CIAMarks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking this course, student will be able to equip the students with the advanced feature of contemporary java, to enable them in handling complex programs relating to managing data and processes over the network, to provide a sound foundation on the concepts, precepts and practices, in a field that is of immense concern to the industry and business.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Invoke the remote methods in an application using Remote Method Invocation, Access database through Java programs, using Java Data Base Connectivity. |
| CO2 | Manage sessions within an application and communication between sessions. |
| CO3 | Implement and manage web sessions using Servlet and JSP. Handling Errors and Exceptions in any webapplication |
| CO4 | Understanding Java Messaging Services done through javamail API. |
| CO5 | Develop applications with hibernate framework. |
| CO6 | Develop spring applications with spring framework. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO 2 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 |
| CO 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |

3-StrongCorrelation 2- Medium Correlation 1- LowCorrelation

| S.No | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1 | a) Develop an RMI Application for arithmetic operations b) Simple Servlet Application with loginpage. | 5 | CO1 |
| 2 | a) Design Web application using HTML and java servlet for session tracking and management using cookies, Hidden form field, URL rewriting, HTTPsession. b) Display session details of any webapplication. | 9 | CO2 |
| 3 | a) Implementation of JSP: student scoringsystem b) Implement exception handling using Error pages inJSP. c) Design web page using JSP and implement the concept of Java Bean in JSP d) Design web page using HTML and java servlet pages for the implementation of inter servlet communication using RequestDispatcher. e) MYSQL database connectivity usingJDBC. | 6 | CO3 |
| 4 | a) Design a web page with options for sending email using JavamailAPI. | 7 | CO4 |
| 5 | a) Implementation of database manipulation using ORM Mapping in Hibernate. | 7 | CO5 |
| 6 | a) Design Simple application using spring framework. b) Web application for connecting database in spring. | 11 | CO6 |

THIRD SEMESTER

Course Title: PRACTICAL VI - PYTHON PROGRAMMING LAB

| | | |
|-------------------------|-----------------|-----------|
| CourseCode: | Credits | 02 |
| L:T:P:S :0:0:5:0 | CIAMarks | 40 |
| Exam Hours :03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking this course the student will be able to develop simple applications using control flow and loops, to create files and perform file access operations, develop applications using object oriented concepts, to create a database and connect to the database from python, to develop GUI programs using PYGTK, to acquire knowledge about Data science in Python using numpy.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | To do programs using conditional statements and control statements |
| CO2 | To do programs in List, Tuples, Function and handle exceptions |
| CO3 | To do File handling, programs using classes, inheritance and regular expression |
| CO4 | To connect to MYSQL database from python |
| CO5 | To develop GUI applications using PyGTK |
| CO6 | To develop programs using Numpy and Pandas |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

3- Strong Correlation 2- Medium Correlation 1- Low Correlation

PRACTICAL – VI

| S. No | CONTENTS OF MODULE | Hrs | COs |
|--------------|---|------------|-------------|
| 1 | Simple calculator to do all the arithmetic operations, Programs to use control flow tools like if, Programs to use for loop, New module for mathematical operations and use in your program | 9 | CO1 |
| 2 | Programs to read and write files, create and delete directories, Programs for String handling and regular expressions | 9 | CO2 |
| 3 | Programs to read and write files, create and delete directories, Programs with exception handling, Programs using classes and objects | 9 | CO3 |
| 4 | Connect with MYSQL and create an address book and do the operations, Insert, read, update and delete and GUI program using PYGTK | 9 | CO4, CO5 |
| 5 | Programs Using Numpy, Programs Using scipy, Programs using series and data frames and Programs using charts/graphs | 9 | CO6 |

THIRD

SEMESTER

SPOKEN

TUTORIAL

SP03 - PHP and MYSQL

| S.NO | CONTENTS |
|------|---|
| 1 | XAMPP in Windows- XAMPP in Linux- Echo Function- Variables in PHP- IfStatement- Switch Statement- Arithmetic Operators- Comparison Operators- LogicalOperators- Arrays- Multi Dimensional Arrays- Loops While Statement- Loops DoWhile Statement- Loops For Statement- Loops Foreach Statement- Functions Basic- Functions Advanced- GET Variable- POST Variable- Embedding PHP- Common Wayto Display HTML- Common Errors Part 1- Common Errors Part 2- Common Errors Part 3-MYSQL part 1-MYSQL part 2-MYSQL part 3-MYSQL part 4-MYSQL part 5- MYSQL part 6-MYSQL part 7-MYSQL part 8- Simple VisitorCounter. |
| 2 | PHP String Functions Part 1- PHP String Functions Part 2-file upload part 1- File Upload Part 2- Cookies Part 1- Cookies Part2- Sessions- MD5 Encryption- SendingEmail Part 1- Sending Email Part 2- Sending Email Part 3- Display Images from aDirectory- User Login Part 1- User Login Part 2- User Login Part 3- User PasswordChange Part 1- User Password Change Part 2- User Password Change Part 3- UserRegistration Part 1- User Registration Part 2- User Registration Part 3- User Registration Part 4- User Registration Part 5- User Registration |

Note:

Courses Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India. At the end of the course Online Examination will be conducted for 45 minutes and qualified students (Minimum passing 40%) will be issued certificate by IIT,Mumbai.

FOURTH SEMESTER

Course Title: PROJECT & VIVA-VOCE

| | | |
|-------------------------|------------------|-----------|
| CourseCode: | Credits | 15 |
| L:T:P:S :0:0:0:0 | CIA Marks | 40 |
| ExamHours:03 | ESEMarks | 60 |

LEARNING OBJECTIVES:

On taking the course, the students will be able to Implement the solution for the chosen problem using the concepts and the techniques learnt in the curriculum, Identify, formulate and implement computing solutions, Design and conduct experiments, analyze and interpret data, Record the result, demonstrate skills to use modern tools, software and equipment's to analyse the chosen problem.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Demonstrate a depth of knowledge of modern technology. |
| CO2 | Complete an independent research project, resulting in dissertation. |
| CO3 | Communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms. |
| CO4 | Self-study, reflect on their learning and take appropriate actions to improve it. |

Mapping of Course Outcomes to Program Outcomes:

3-StrongCorrelation 2- Medium Correlation 1-
LowCorrelation PROCEDURE

- The final semester will be entirely assigned for the student to carry out their projectwork.
- The Head of the Department will assign an Internal Guide for eachstudent.
- The students should submit the contact details of the organization to theirguide.
- During regular intervals, student should report his/her progress of the projectwork.
- After the submission ofthe final report, an external examiner will evaluate the project document and conduct the viva voceexamination.

FOURTH

SEMESTER

SPOKEN

TUTORIAL

SP04 - LaTeX

| S.NO | CONTENTS |
|-------------|---|
| 1 | Beamer- Bibliography- Equations- Inside Story ofBibliography- Latex on Windows using Texworks - Letter-Writing - Mathematical Typesetting - ReportWriting - Tables and Figures. |

Note:

Courses Offered by IIT Mumbai through Spoken Tutorial Projects MHRD, Government of India. At the end of the course Online Examination will be conducted for 45 minutes and qualified students (Minimum passing 40%) will be issued certificate by IIT,Mumbai.

FOURTH SEMESTER

Course Title: MOOC Certification Course

LEARNING OBJECTIVE

The objective of enabling students obtain certificates for courses is to make students employable in the industry or pursue a suitable higher education programme.

Massive Open Online Courses (MOOC)

Through an online portal, 4-, 8-, or 12-week online courses, typically on topics relevant to students in all years of higher education along with basic core courses in sciences and humanities with exposure to relevant tools and technologies, are being offered. The enrolment to and learning from these courses involves no cost. Following these online courses, an in-person, proctored certification exam will be conducted and a certificate is provided through the participating institutions and industry, when applicable.

Massive Open Online Courses (MOOC) is essentially an asynchronous platform and a process for teaching through pre-recorded lectures, resource video materials, lecture notes, assignments and quizzes, which are usually online and provide self-assessment in regular intervals during learning.

The learning, through scheduling of fixed time duration for completion of courses and, therefore, the simultaneous participation of teachers and a large number of students may be termed synchronous and is thus similar to a classroom, albeit on the Internet and being much larger in size.

When offered with consideration for students in non-urban and rural areas through supplementary DVDs and mobile delivered content, they enable quality and equitable access to a much larger population of students and can lead to a significant rise in the Gross Enrollment Ratio.

These courses are open for anyone to access – at no cost. So anyone who is interested in learning gets access to quality content, which also includes discussion with the content creator and access to assignments for self-testing.

The faculty who are currently offering courses are from the IITs or from other reputed institutes such as CMI, IMSc etc.

APPENDIX

APPENDIX – A: OUTCOME-BASED EDUCATION (OBE)

Outcome-Based Education (OBE) is a student-centric teaching and learning methodology in which the course delivery, assessment are planned to achieve stated objectives and outcomes. It focuses on measuring student performance i.e. outcomes at different levels.

Outcome-based education (OBE) is an educational theory that bases each part of an educational system around goals (outcomes). By the end of the educational experience each student should have achieved the goal. There is no specified style of teaching or assessment in OBE; instead classes, opportunities, and assessments should all help students achieve the specified outcomes. There are three educational Outcomes as defined by the National Board of Accreditation.

Program Educational Objectives (PEOs)

The Programme Educational Objectives of a program are the statements that describe the expected achievements of graduates in their career, and also in particular, what the graduates are expected to perform and achieve during the first few years after graduation

Programme Outcomes (POs)

Program outcomes are finer statements that designate what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes.

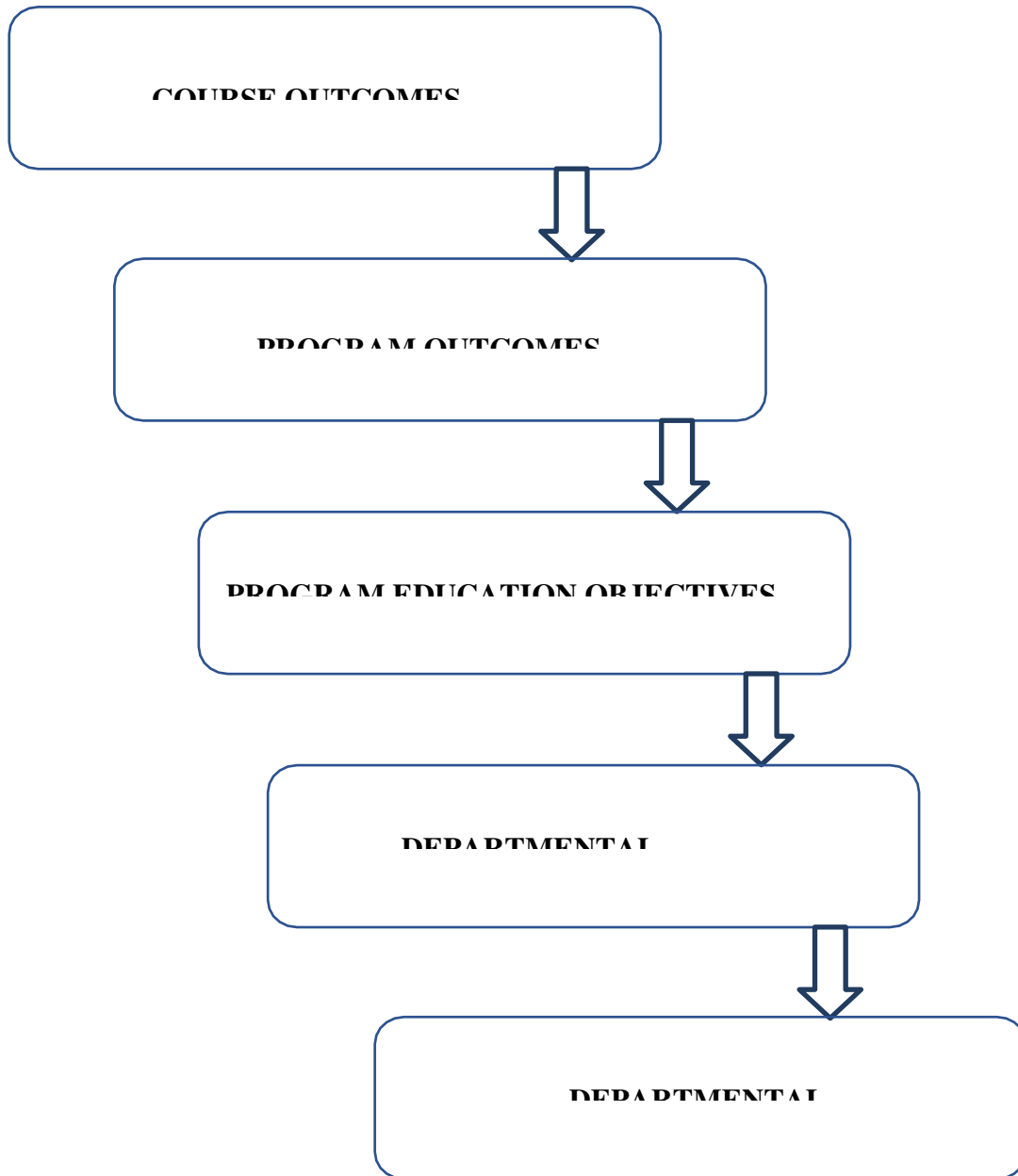
Programme Specific Outcomes (PSO)

Programme Specific Outcomes are what the students should be able to do at the time of graduation with reference to a specific discipline.

Course Outcome (CO)

Course outcomes are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course

MAPPING OF OUTCOMES



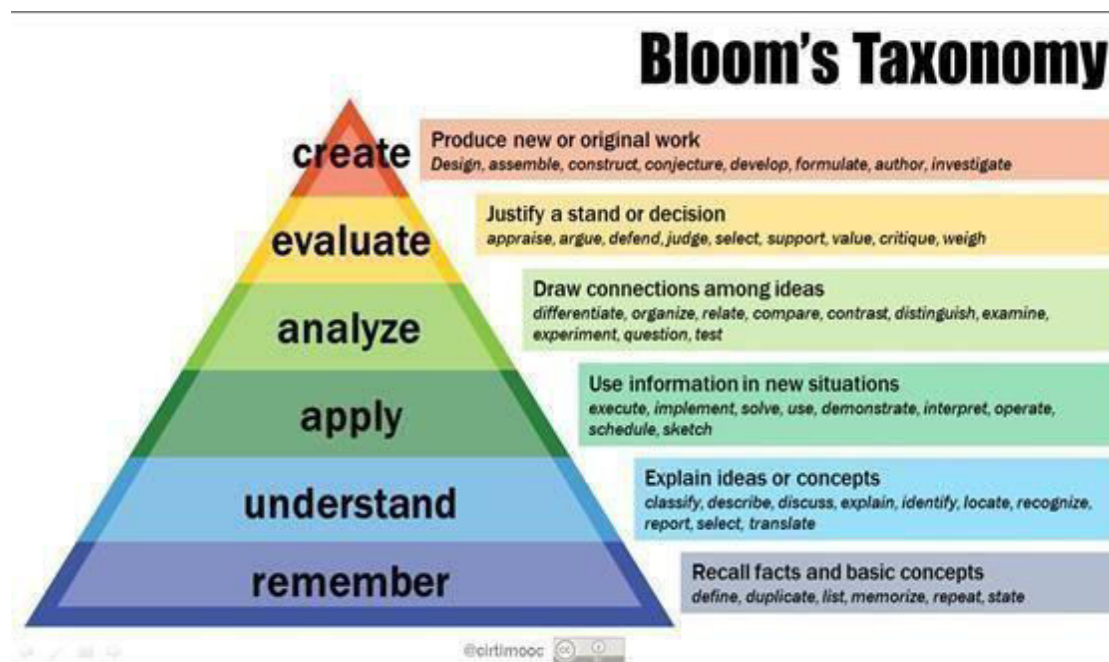
APPENDIX - B

PROGRAM OUTCOMES (PO) IN RELATION TO GRADUATE ATTRIBUTES

| S.No | Graduate Attributes | Description |
|------|--|---|
| 1 | Knowledge | Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of a graduate programme of study. |
| 2 | Critical Thinking | Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development. |
| 3 | Problem Solving | Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations. |
| 4 | Usage of Modern Tools | Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data. |
| 5 | Communication | Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; |
| 6 | Life-Long Learning | Ability to acquire knowledge and skills, including learning how to learn, that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling. |
| 7 | Ethical Practices and Social Responsibility | Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. |
| 8 | Independent and Reflective Learning | Critical sensibility to lived experiences, with self-awareness and reflexivity of both self and society. |

APPENDIX - C: BLOOM'S TAXONOMY

Bloom's taxonomy is a classification system used to define and distinguish different levels of human cognition—i.e., thinking, learning, and understanding. Educators have typically used Bloom's taxonomy to inform or guide the development of assessments (tests and other evaluations of student learning), curriculum (units, lessons, projects, and other learning activities), and instructional methods such as questioning strategies. [eduglosarry.org]



| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

Knowledge levels for assessment of Outcomes based on Blooms Taxonomy

| Level | Parameter | Description |
|-------|------------|--|
| K1 | Remember | It is the ability to remember the previously learned material/information |
| K2 | Understand | It is the ability to grasp the meaning of material |
| K3 | Apply | It is the ability to use learned material in new and concrete situations |
| K4 | Analyze | It is the ability to break down material/concept into its component parts/subsections so that its organizational structure may be understood |

| | | |
|----|----------|---|
| K5 | Evaluate | It is the ability to put parts/subsections together to form a new whole material/idea/concept/information |
| K6 | Create | Compile information together in a different way by combining elements in a new pattern or proposing alternativesolutions. |

DEPARTMENT OF M.C.A

OUTCOME BASED EDUCATION (OBE) SYLLABUS

Under Choice Based Credit System (CBCS) Pattern

TWO YEARS MCA PROGRAMME

2020 - 2021 BATCH ONWARDS



**DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE
(AUTONOMOUS)**

College with Potential for Excellence

Linguistic Minority Institution affiliated to University of Madras

E.V.R. PERIYAR HIGH ROAD,

ARUMBAKKAM, CHENNAI – 600106, TAMILNADU.

CONTENTS

PAGE NO.

1. Vision, Mission and Program Educational Objectives (PEO) 1
2. Program Outcomes (PO) 1
3. Mapping of POs with PEOs 2

SCHEME

4. Scheme of First Semester 3
5. Scheme of Second Semester 4
6. Scheme of Third Semester 5
7. Scheme of Fourth Semester 6

SYLLABUS

8. Syllabus of First Semester

- a) Principles of Database Management System 7
- b) Advanced Java Programming 9
- c) Advanced Data Structures and Algorithms 11
- d) Operating System Concepts 13
- e) NME 1-Basics of Statistics 15
- f) Database Programming Lab 17
- g) Advanced Java Programming Lab 18

9. Syllabus of Second Semester

- a) Python for Data Science 19
- b) Mobile Application Development 21
- c) Fundamentals of Machine Learning 23
- d) Mobile Communications 25
- e) Core Elective 1
 - Principles of Digital Image Processing 27
 - Introduction to Multimedia 29
 - Computer Animation 31
- f) Python for Data Science Lab 33
- g) Mobile Application Development Lab 34

10. Syllabus of Third Semester

- a) Introduction to Big Data Analytics 35
- b) Dot Net Programming 37

| | |
|---|----|
| c) Principles of Cloud Computing | 39 |
| d) Core Elective 2 | |
| ➤ Computer Forensics and Bioinformatics | 41 |
| ➤ Network Security | 43 |
| ➤ Information Security | 45 |
| e) Core Elective 3 | |
| ➤ Introduction to Internet of Things | 47 |
| ➤ Block Chain Technology | 49 |
| ➤ Green Computing | 51 |
| f) Big Data Analytics Lab | 53 |
| g) Dot Net Programming Lab | 54 |
| 11. Syllabus of Fourth Semester | |
| a) Project Work | 55 |

VISION

Empower every student to be innovative, creative and productive in the domain of Computer Science by importing quality education, developing skills and inculcating human values.

MISSION

| | |
|-----------|---|
| M1 | To organize workshops at regular intervals to bridge the gap between the academia and industry. |
| M2 | To enable the students to be industry ready by developing state-of-the-art curriculum in tune with industry requirements. |
| M3 | By providing the necessary skills and to make students to excel in challenging scenario. |
| M4 | To make students to understand the concepts using innovative teaching materials. |

PROGRAMME EDUCATIONAL OUTCOMES (PEOs)

| | |
|-------------|---|
| PEO1 | To progress their career productively in software industry, academia, research, entrepreneurial pursuit, government, consulting firms and other Information Technology enabled services. |
| PEO2 | To achieve peer-recognition; as an individual or in a team; by adopting ethics and professionalism and communicate effectively to excel well in cross culture and inter-disciplinary teams. |
| PEO3 | To continue a lifelong professional development in computing that contributes in self and societal growth. |

PEO TO MISSION STATEMENT MAPPING

| MISSION STATEMENTS | PEO1 | PEO2 | PEO3 |
|--------------------|------|------|------|
| M1 | 3 | 2 | 2 |
| M2 | 3 | 3 | 2 |
| M3 | 3 | 3 | 3 |
| M4 | 3 | 2 | 3 |

CORRELATION: 3- STRONG 2- MEDIUM 1- LOW

PROGRAMME OUTCOMES [Pos] FOR POST GRADUATE

At the end of the PG programme, the student will be able:

| | |
|------------|--|
| PO1 | To attain suitable scientific knowledge and technical skills to realize, calibrate and develop innovative processes / skills for creation of inventive products which are beneficial to society. |
| PO2 | To implement discipline, professionalism, team spirit, communication skills, social and ethical commitment in the post graduates in order to embellish leadership roles expediting perfection in different sector with a categorical professional distinctiveness, business savvy, international recognition and imperishable expansion. |
| PO3 | To be habituated with the emerging expanses of erudition and their applications in several domains of biological sciences and to enlighten the students of its relevance in forthcoming studies. |
| PO4 | To enhance the insight of research-oriented knowledge in conjunction with literature survey, design of experimental methodology, analysis and interpretation of results and draw valid conclusions. |
| PO5 | To provoke entrepreneurship among the students along with strong ethics and communication skills. |
| PO6 | To engage in Lifelong learning and enduring proficient progress. |

MAPPING OF POs TO PEOS

| PEO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|--------|-----|-----|-----|-----|-----|-----|
| PEO 1 | 3 | 3 | 2 | 3 | 3 | 3 |
| PEO 2 | 2 | 3 | 2 | 3 | 3 | 3 |
| PEO 3 | 3 | 3 | 3 | 3 | 2 | 3 |

CORRELATION: 3- STRONG 2- MEDIUM 1- LOW

PROGRAMME SPECIFIC OUTCOMES [PSOs] FOR MCA

| | |
|-------------|--|
| PSO1 | Understand, analyze and develop Computer Programs in the areas related to algorithms, process and solutions for specific application development using appropriate data modeling concepts. |
| PSO2 | Design, develop, test and maintain desktop, web, mobile and cross-platform software applications using latest tools, technologies and skills and computing models and thereby enhance the ability to carry out research, experiment, contemporary issues to solve industrial problems. |
| PSO3 | Develop skill set to communicate one's ideas effectively and to demonstrate team, work as a member/leader to solve complex computing problems and design appropriate techniques to enhance ability for life-long learning. |
| PSO4 | Make graduates to understand cross-cultural, societal, profession, legal and ethical issues prevailing in industry. |

ASSESSMENT PATTERN

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remember; K2- Understand; K3- Apply; K4-Analyze; K5- Evaluate; K6-Create;

1. THEORY EXAMINATION

CIA- Continuous Internal Assessment (40 Marks)

Test – I & II: 25 Marks (Theory)

| Bloom's Category | Section | Description | Marks | Total |
|---------------------|--------------------------------------|--------------------------|-------|-----------|
| K1, K2 | A-10 x 1 Mark [MCQ/Short answers] | Choose/Fill ups/One word | 10 | 50 |
| K3, K4,K5,K6 | B-4 out of 6 x 10 Marks | 250 Words | 40 | |

Components of Continuous Internal Assessment (CIA)

| Components | | | Calculation | CIA Total |
|--|----|----|--------------------------|-----------|
| Test | I | 50 | (Test1 + Test2) / 4 = 25 | 40 |
| | II | 50 | | |
| Generic Skills (Group discussion/Real time Project work/Seminar/ Poster Presentation) | | | 10 | |
| Attendance | | | 05 | |

ESE- Semester End Examination (100 Marks; Weightage is 60%)

| Bloom's Category | Section | Description | Marks | Total |
|------------------|-------------------------------------|-------------|-------|-------|
| K1, K2,K3,K4 | A – 5 out of 8 x 5 Marks | 250 Words | 25 | 100 |
| K3, K4,K5,K6 | B– 5 (Either or pattern) x 15 Marks | 500 Words | 75 | |

2. PRACTICAL EXAMINATION (100 Marks)

| Bloom's Category | CIA | ESE | | Total |
|------------------|-----------------|-----------------|-------------|-------|
| | Lab Performance | Lab Performance | Record Work | |
| K3, K4, K5,K6 | 40 | 50 | 10 | 100 |

DEPARTMENT OF M.C.A

SCHEME OF I SEMESTER M.C.A PROGRAMME

| Sl. No. | Course Category | Course Code | Course | Credit Distribution | | | | Over all Credits | Total Contact Hours/ Week | Marks | | |
|--------------|----------------------|-------------|---|---------------------|---|---|---|------------------|---------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CIA | ESE | Total |
| 1 | Core Theory T1 | XX29101 | Principles of Database Management Systems | 3 | 1 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Core Theory T2 | XX29102 | Advanced Java Programming | 3 | 1 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Core Theory T3 | XX29103 | Advanced Data Structures and algorithms | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Core Theory T4 | XX29104 | Operating System Concepts | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | Non-Major Elective 1 | XX29105 | Basics of Statistics | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 6 | Core Practical P1 | XX29106 | Database Programming Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 7 | Core Practical P2 | XX29107 | Advanced Java Programming Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 8 | Soft Skills* | ---- | Soft Skills-I | 0 | 0 | 0 | 0 | 2 | 0 | 50 | 50 | 100 |
| 9 | ST** | XX29108 | Spoken Tutorial I-LINUX | 0 | 0 | 0 | 0 | 1 | 0 | - | - | - |
| Total | | | | - | - | - | - | 27 | 30 | 330 | 470 | 800 |

CIA-Continuous Internal Assessment

ESE-End Semester Examination

Soft Skills*- Syllabus framed and approved by English Department.

ST**- Courses offered by IIT Mumbai through Spoken Tutorial Project MHRD Govt. of India. Online Examination will be conducted and qualified students (minimum passing percentage of 40%) will be issued certificate by IIT Mumbai. Students will submit a copy of the certificate after qualifying the online test as a proof to the COE's office to earn 1 credit for the same.

XX -Year of Admission

DEPARTMENT OF M.C.A

SCHEME OF II SEMESTER M.C.A PROGRAMME

| Sl. No. | Course Category | Course Code | Course | Credit Distribution | | | | Over all Credits | Total Contact Hours/ Week | Marks | | |
|--------------|------------------------|--|---|---------------------|---|---|---|------------------|---------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CIA | ESE | Total |
| 1 | Core Theory T5 | XX29209 | Python for Data Science | 3 | 1 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Core Theory T6 | XX29210 | Mobile Application Development | 3 | 1 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Core Theory T7 | XX29211 | Fundamentals of Machine Learning | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Core Theory T8 | XX29212 | Mobile Communications | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | Core Theory Elective 1 | XX29213(A) XX29213(B) XX29213(C) | a. Principles of Digital Image Processing b. Introduction to Multimedia c. Computer Animation | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 6 | Core Practical P3 | XX29214 | Python for Data Science Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 7 | Core Practical P4 | XX29215 | Mobile Application Development Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 8 | Intern# | XX29216 | Summer Internship | 0 | 0 | 0 | 0 | 1 | 0 | - | - | - |
| 9 | Soft Skills* | ---- | Soft Skills-II | 0 | 0 | 0 | 0 | 2 | 0 | 50 | 50 | 100 |
| 10 | ST** | XX29217 | Spoken Tutorial II-PYTHON | 0 | 0 | 0 | 0 | 1 | 0 | - | - | - |
| Total | | | | - | - | - | - | 28 | 30 | 330 | 470 | 800 |

CIA-Continuous Internal Assessment

ESE-End Semester Examination

Intern# -Internship will be carried out by the students during their second semester/ summer vacation of the first year with a minimum of 3 weeks/21 days (as per UGC guidelines) and the internship certificate should be sent to the COE office and the same will be included in the Second Semester Marks Statement to earn 1 credit.

Soft Skills*- Syllabus framed and approved by English Department.

ST**- Courses offered by IIT Mumbai through Spoken Tutorial Project MHRD Govt. of India. Online Examination will be conducted and qualified students (minimum passing percentage of 40%) will be issued certificate by IIT Mumbai. Students will submit a copy of the certificate after qualifying the online test as a proof to the COE's office to earn 1 credit for the same.

XX -Year of Admission

DEPARTMENT OF M.C.A

SCHEME OF III SEMESTER M.C.A PROGRAMME

| Sl. No. | Course Category | Course Code | Course | Credit Distribution | | | | Over all Credits | Total Contact Hours/ Week | Marks | | |
|--------------|------------------------|--|--|---------------------|---|---|---|------------------|---------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CIA | ESE | Total |
| 1 | Core Theory T9 | XX29318 | Introduction to Big Data Analytics | 3 | 1 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Core Theory T10 | XX29319 | Dot Net Programming | 3 | 1 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Core Theory T11 | XX29320 | Principles of Cloud Computing | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Core Theory Elective 2 | XX29321(A) XX29321(B) XX29321(C) | a. Computer Forensics and Bioinformatics b. Network Security c. Information Security | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | Core Theory Elective 3 | XX29322(A) XX29322(B) XX29322(C) | a. Introduction to Internet of Things b. Block Chain Technology c. Green Computing | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 6 | Core Practical P5 | XX29323 | Big Data Analytics Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 7 | Core Practical P6 | XX29324 | Dot Net Programming Lab | 0 | 0 | 5 | 0 | 2 | 5 | 40 | 60 | 100 |
| 8 | Soft Skills* | ----- | Soft Skills-III | 0 | 0 | 0 | 0 | 2 | 0 | 50 | 50 | 100 |
| 9 | ST** | XX29325 | Spoken Tutorial III-GIT | 0 | 0 | 0 | 0 | 1 | 0 | - | - | - |
| Total | | | | - | - | - | - | 27 | 30 | 330 | 470 | 800 |

CIA-Continuous Internal Assessment

ESE-End Semester Examination

Soft Skills*- Syllabus framed and approved by English Department.

ST**- Courses offered by IIT Mumbai through Spoken Tutorial Project MHRD Govt. of India. Online Examination will be conducted and qualified students (minimum passing percentage of 40%) will be issued certificate by IIT Mumbai. Students will submit a copy of the certificate after qualifying the online test as a proof to the COE's office to earn 1 credit for the same.

XX -Year of Admission

DEPARTMENT OF M.C.A

SCHEME OF IV SEMESTER M.C.A PROGRAMME

| Sl. No. | Course Category | Course Code | Course | Credit Distribution | | | | Over all Credits | Total Contact Hours/ Week | Marks | | |
|--------------|-----------------------|-------------|--------------------------|---------------------|---|---|---|------------------|---------------------------|-----------|------------|------------|
| | | | | L | T | P | S | | | CIA | ESE | Total |
| 1 | Core Project T13 | XX29426 | Project Work | 0 | 0 | 0 | 0 | 12 | - | 40 | 60 | 100 |
| 2 | Certificate Course ## | XX29427 | Certificate Course-NPTEL | 0 | 0 | 0 | 0 | 2 | - | - | - | - |
| 3 | Soft Skills* | ----- | Soft Skills-IV | 0 | 0 | 0 | 0 | 2 | - | 50 | 50 | 100 |
| 4 | ST** | XX29428 | Spoken Tutorial IV-LATEX | 0 | 0 | 0 | 0 | 1 | - | - | - | - |
| Total | | | | | | | | 17 | - | 90 | 110 | 200 |

CIA-Continuous Internal Assessment

ESE-End Semester Examination

Certificate Course ## -Certificate Courses offered by NPTEL. Students should complete any one Certificate Course (Not Less Than 8 Weeks) within the duration of the course (on or before the completion of the final semester). Students will submit a copy of the certificate issued by NPTEL after qualifying as a proof to the COE's office to earn 2 credits for the same.

Soft Skills*- Syllabus framed and approved by English Department.

ST**- Courses offered by IIT Mumbai through Spoken Tutorial Project MHRD Govt. of India. Online Examination will be conducted and qualified students (minimum passing percentage of 40%) will be issued certificate by IIT Mumbai. Students will submit a copy of the certificate after qualifying the online test as a proof to the COE's office to earn 1 credit for the same.

XX -Year of Admission

FIRST SEMESTER

Course Title: CORE THEORY T1-PRINCIPLES OF DATABASE MANAGEMENT SYSTEMS (For Students admitted from 2020 onwards)

| | | | |
|-------------|----------------------------------|-----------|------|
| Course Code | : XX29101 (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 3:1:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To understand the fundamentals of data models and conceptualize and depict a database system using ER diagram
- To make a study of SQL and relational database design.
- To know about data storage techniques and query processing.
- To impart introductory knowledge on NoSQL.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Explain difference between file system and database system, the basic concepts of data models and its classification like ER model, relational model, network model, object oriented model and case study as ER model. |
| CO2 | Discuss the relational database terminologies; analyze types of keys in relational database system. Understand the Relational algebra and improve the performance of database by normalization and hence the types of normal forms. |
| CO3 | Implementation of Relational Database in Oracle SQL, analyzing of DDL, DML and DRL statements, Joins, Group functions and Integrity Constraints with syntax and examples. |
| CO4 | Demonstrate the types of PL/SQL statements with examples and hence discuss the purpose of Cursors, Triggers, Procedures and Functions in PL/SQL with its implementation. |
| CO5 | Apply the database tuning methodologies on Indexes, Database Design, and Queries. Explain the Transaction States and properties of Transactions and acquire the basic knowledge about concurrency techniques over databases. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 2 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 2 | 2 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----|------------|
| 1 | Introduction to Databases- Characteristics of the Database -Advantages of using DBMS - Categories of Data Models-Schemas and Instances -Three-Schema Architecture-Data Independence- Conceptual Modeling using ER Model: Entities and Attributes, Entity types and Entity sets, Relationship types, Degree of a Relationship Type, Weak Entity types, Notations for ER diagrams, Naming Conventions, An Example ER diagram. | 12 | CO1 |
| 2 | Relational Model Concepts: Domains, Attributes, Tuples, Relations, Types of Keys- Relational Algebra: Unary Operations, Operations from Set Theory, Cartesian product, Division and Rename. Normalization: Purpose of Normalization – Functional Dependencies –First Normal Form, Second | 12 | CO2 |

| | | | |
|---|---|----|-----|
| | Normal Form, Third Normal Form-Boyce-Codd Normal Form (BCNF). | | |
| 3 | Basic SQL: Attribute Data types and Domains in SQL -DDL Commands- DML Commands-Select statement using where, in, between, order by, like, distinct, relational operators and logical operators- Numeric functions-Character functions -Date functions- - SQL Group functions - SQL Set Operators – Commit-Rollback-Integrity Constraints in SQL. | 12 | CO3 |
| 4 | Nested Query-Inner Joins-Outer Joins-Format of PL/SQL Block-Decision making statements in PL/SQL-Looping Statements in PL/SQL-Implicit Cursor- Explicit Cursor- Built-in Exceptions -User-Defined Exceptions. | 12 | CO4 |
| 5 | Indexing: Types of Indexing - Transaction and System Concepts: Transaction States, The System Log, Commit point of a Transaction, Desirable properties of Transactions- Concurrency Control: Two-phase locking technique. | 12 | CO5 |

Text Books:

1. Ramez Elmasri and Shamkant B. Navathe, “**Fundamentals of Database Systems**”, 7th Edition, Pearson Education, 2017. (Units I,II,V)
2. Sharad Maheswari and Ruchin Jain, “**Introduction to SQL and PL/SQL**”, Firewall Media, 2016. (Units III,IV)

Reference Books:

1. Avi Silberschatz, Henry F. Korth and S. Sudarshan. “**Database System Concepts**”, 6th Edition, McGraw Hill.
2. Raghurama Krishnan and Johannes Gehrke, “Data Base Management Systems”, TMH 3rd Edition,2003
3. Majumdr, Bhattacharyya,” Data Base Management Systems”, TMH ,96.

E-References:

1. <https://nptel.ac.in/courses/106/105/106105175/>
2. <https://www.db-book.com/db6/slide-dir/index.html>
3. <https://beginnersbook.com/2015/04/dbms-tutorial/>
4. <https://www.technolamp.co.in/2011/09/database-management-systems-dbms-imp.html>

FIRST SEMESTER

Course Title: CORE THEORY T2-ADVANCED JAVA PROGRAMMING (For Students admitted from 2020 onwards)

| | | | |
|-------------|----------------------------------|-----------|------|
| Course Code | : XX29102 (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 3:1:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To provide the ability to design a console based, GUI based and web based advanced applications.
- Students will also be able to understand integrated development environment to create, debug and run multi-tier and enterprise-level applications
- To develop distributed applications
- Analyzing different problems in Web Applications and providing solutions
- Applying the knowledge to develop Web Applications for industries and individuals.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Describe how servlets fit into Java-based web application architecture |
| CO2 | Explain the concepts and terminologies of JSP |
| CO3 | Build client-server web applications |
| CO4 | Apply the concepts of RMI in an application |
| CO5 | Design and implement dynamic web page with validation using JavaScript objects |
| CO6 | Develop proficiency in creating solutions for web applications |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 2 |
| CO6 | 3 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----|----------------|
| 1 | Introduction to Javascript: Data types and literals –Type Casting - Variables - Java Script Array – Operators and Expressions - Java Script Programming Constructs- JavaScript Functions- Dialog boxes. | 12 | CO1,CO5 |
| 2 | Forms used by a Website: Form object-Form object's Methods - Different elements - Other built-in Object-User defined objects – Regular expression – Form validation. | 12 | CO6 |
| 3 | Java Servlets: Servlet life-Cycle -Types of Servlet – Servlet Chaining -Forward Model - Include Model - Session Tracking Mechanisms -URI-Rewriting - Hidden Form Fields – Cookies-HttpSession - using JDBC in Servlets. | 12 | CO3 |
| 4 | RMI : RMI Overview – Developing applications with RMI: Declaring & Implementing remote interfaces - stubs & skeletons - Registering remote objects - writing RMI clients – Pushing data from RMI Servlet – RMI over Inter- ORB Protocol. | 12 | CO4 |
| 5 | JSP: JSP Overview – Advantages of JSP over Servlet - life Cycle of JSP Page - Examining MVC and JSP - JSP Scripting Elements- JSP Directives - JSP implicit objects – JSP exception – JSP | 12 | CO2 |

| | | |
|--------------|--|--|
| action tags. | | |
|--------------|--|--|

Text Books:

1. Ivan Bayross, "Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI ", BPB publication", 211.
2. J. McGovern,R. Adatia,Y. Fain, "J2EE 1.4 Bible", Wiley-dreamtech India Pvt. Ltd, 2113.

Reference Books:

1. Thomas Powell and Fritz Schneider, "JavaScript 2.1 The Complete Reference", Second Edition, McGraw-Hill,2014.
2. Thomas A.Powell and Fritz Schneider, *JavaScript: The Complete Reference*, TataMcGraw Hill, 2012.
3. Patrick Naughton and Herbert Schildt, Java 2: The complete Reference, Tata-
4. McGraw Hill Publishing, 2nd Reprint, 2011.
5. Kogent Solution Inc, "Java 6 Programming Black Book", Dreamtech Press, 2017.
6. J2EE the Complete Reference, First Edition by Jim Keogh, Tata McGraw Hill, 2012.
7. Java Servlet Programming, Second Edition by Jason Hunter, William Crawford, O'Reilly, 2011.

E-References:

1. <https://www.edureka.co/blog/advanced-java-tutorial>
2. <https://www.javatpoint.com/jsp-tutorial>
3. <https://www.javatpoint.com/servlet-tutorial>
4. <https://www.javatpoint.com/RMI>
5. <https://www.javascriputorial.net/>
6. <https://www.javatpoint.com/javascript-tutorial>

FIRST SEMESTER

Course Title: CORE THEORY T3-ADVANCED DATA STRUCTURES AND ALGORITHMS (For Students admitted from 2020 onwards)

| | | | |
|-------------|----------------------------------|-----------|------|
| Course Code | : XX29103 (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To impart the knowledge about the concepts of data structures and algorithms.
- To enable the students to analyze the efficiency of algorithms.
- Train the students to design and analyze linear and non-linear data structures.
- Enable the students to implement suitable data structures and algorithms in real time applications

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyze the performance of algorithms using asymptotic notations. |
| CO2 | Evaluate and provide suitable techniques for solving a problem using basic properties of Data Structures. |
| CO3 | Illustrate different types of algorithmic approaches to problem solving. |
| CO4 | Understand the nature of problems and to develop prototypes or applications of varying complexities. |
| CO5 | Determine the drawbacks of data structures and algorithms and assess the tradeoffs involved. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 |

3-Strong 2-Medium 0-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|---|-----|-----|
| 1 | Introduction: Abstract data types - asymptotic notations – complexity analysis – Arrays- representation of arrays. Linked lists: Singly linked list- Circular linked lists – Doubly linked lists. Stacks: Operation, array representation of a stack, Application – expression evaluation, Recursion – Towers of Hanoi. Queues: operations - circular queues. | 12 | CO1 |
| 2 | Trees – Basic terminologies, Binary Trees – Binary Tree Traversals – Binary Tree Representations – Binary Search Trees – Threaded Binary Trees- AVL Trees-Red- Black Trees. | 12 | CO2 |
| 3 | Graphs: Representation of Graphs – Graph Implementation – Graph Traversals – BFS, DFS, Single-Source Shortest Path Problem- Dijkstra’s algorithm, Bellman-Ford algorithm. Minimum Cost Spanning Trees by Prim’s and Kruskal’s algorithm– All Pair Shortest Path Problem- Floyd Warshall algorithm. | 12 | CO3 |
| 4 | Divide and Conquer – Quick sort, Merge sort, Binary Search. Greedy Method: General Method – knapsack problem. | 12 | CO4 |
| 5 | Back Tracking: General Method – 8-queens, Sum of Subsets. Branch and Bound: General Method – Travelling Salesperson problem. | 12 | CO5 |

Text Books:

1. E. Horowitz, S. Sahni and S. Rajasekaran, "Computer Algorithms", Galgotia Publishers, 2001.
2. E. Horowitz, S. Sahni and Mehta, "Fundamentals of Data Structures in C++", Galgotia Publishers, 2000.

Reference Books:

1. G. L. Heileman, "Data Structures, Algorithms and Object Oriented Programming", Revised Edition, TMH, 1999.
2. A.V. Aho, J.E. Hopcroft, J.D. Ullmann, "The Design and Analysis of Computer Algorithms", Pearson Education Asia, Addison Wesley Publishers, 2006.
3. S.K. Basu, "Design Methods and Analysis of Algorithms", Fourth Edition, 2013.
4. Kruse R.L, Leung B.P, Tondo C.L, "Data structures and Program design in C", Pearson, Second Edition, 2007

E-References:

1. <https://nptel.ac.in/courses/106/102/106102064/>
2. <https://www.programiz.com/dsa>
3. https://www.tutorialspoint.com/data_structures_algorithms/index.htm
4. <https://www.javatpoint.com/daa-tutorial>

FIRST SEMESTER

Course Title: CORE THEORY T4-OPERATING SYSTEM CONCEPTS (For Students admitted from 2020 onwards)

| | | | |
|-------------|----------------------------------|-----------|------|
| Course Code | : XX29104 (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To be aware of the evolution and fundamental principles of operating system, processes and their communication
- To understand the various operating system components like process management, memory management
- To know about file management and the distributed file system concepts in operating systems
- To be aware of components of operating system with relevant case study.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Defining the need of operating system components and evolution, its architecture and different types of system calls |
| CO2 | Introduce the concept of process, operations and scheduling and thereby explain the concept of process scheduling, CPU scheduling criteria and algorithms. . |
| CO3 | Acquire the knowledge of process synchronization and illustrate the critical section problems and ways to handle the dead lock problems with the help of algorithms. |
| CO4 | Explain and discuss the background of memory with segmentation and paging techniques and the virtual memory management with various page replacement algorithms |
| CO5 | Describe file management with file organization, file access methods, B-trees, and File System security. |
| CO6 | Sketch out the various storage structures with different disk scheduling algorithms. Explain how a Linux server can be integrated within a multi-platform environment. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 2 | 1 | 1 | 2 |
| CO2 | 3 | 2 | 1 | 2 |
| CO3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 3 | 2 |
| CO5 | 2 | 1 | 3 | 2 |
| CO6 | 3 | 1 | 2 | 2 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----|-----------------|
| 1 | Introduction: Types of operating systems-operating systems services-System calls-Systems programs- Process Management: Process concept- Process Scheduling- Operation on Processes-Co-Operating Processes- Interprocess Communications-CPU Scheduling: Scheduling Criteria-Scheduling algorithms. | 12 | CO1 |
| 2 | Process Synchronization –Critical Section Problem – Semaphores-Classical problems of synchronization-Deadlock Characterization-Deadlock Prevention-Deadlock avoidance-Deadlock Detection-Deadlock Recovery. | 12 | CO2, CO3 |
| 3 | Memory Management -Swapping-Contiguous Memory Allocation-Paging-Segmentation-Virtual Memory-Demand paging-Page Replacement-Thrashing. | 12 | CO4 |

| | | | |
|---|--|----|-------------|
| 4 | Disk Structures-Disk Scheduling algorithms-File Systems Organization-File concepts-File Operations-Access methods-Directory Structures-File System Implementation-Directory Implementation-Allocation Methods-Free Space management. | 12 | CO5, CO6 |
| 5 | History of Linux- Properties of Linux-Linux Commands-Overview of the Linux file system-Manipulation of files –File Security. | 12 | CO6 |

Text Book:

1. Abraham Silberschalz Peter B Galvin, G.Gagne, “Operating Systems Concepts”, 9th Edition, John Wiley & Sons, 2013.

Reference Books:

1. Andrew S.Tanenbaum, “Modern operating Systems”, Third Edition, PHI Learning Pvt. Ltd., 2008.
2. D M Dhamdhere, “ Operating Systems: A Concept-based Approach”, Second Edition, Tata McGraw-Hill Education, 2007.
3. H M Deital, P J Deital and D R Choffnes, “Operating Systems”, 3rd edition, Pearson Education, 2011.
4. William Stallings, “Operating Systems: Internals and Design Principles”, Seventh Edition, Prentice Hall, 2011.

E-References:

1. https://www.tutorialspoint.com/operating_system/index.htm
2. <https://www.javatpoint.com/os-tutorial>
3. <https://nptel.ac.in/courses/106/105/106105214/>

FIRST SEMESTER

Course Title: NON MAJOR ELECTIVE 1-BASICS OF STATISTICS (For Students admitted from 2020 onwards)

| | | | |
|-------------|----------------------------------|-----------|------|
| Course Code | : XX29105 (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To provide an understanding of the statistical methods and probabilistic concepts by which real- life problems are analyzed (Focus on problems- No derivations)
- To develop the students ability to deal with numerical and quantitative issues
- To enable the use of statistical, graphical and algebraic techniques wherever relevant.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Recall the concepts of sample spaces, events, axiomatic approach, conditional probability, Baye's theorem. Summarize the random variables, expectation and variance. Demonstrate the chebyshev's inequality. |
| CO2 | Distinguish Discrete and continuous distributions. Solve the real time problems involving various distributions like Binomial, Poisson and normal distributions. |
| CO3 | Explain the concept of Bivariate analysis and point out the importance of correlation analysis, Regression analysis and various curves using method of least squares. |
| CO4 | Summarize the concept of sampling and various methods of sampling. Point out the various errors such as standard error, type I error, type II error. Explain the Null Hypothesis and alternative hypothesis. Point the importance of estimation. |
| CO5 | Differentiate large and small samples. Compare the various parametric tests like Z-test, t-test, F test by giving practical examples. Explain the non parametric chi square test with illustrated examples |
| CO6 | Restate the analysis of variance and classify the one way and two classifications. Categorize the computing randomized design and randomized block design. Define time series and list the components of time series. Illustrate the measurement of trend and seasonal variations. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 1 | 2 |
| CO3 | 3 | 3 | 1 | 2 |
| CO4 | 3 | 2 | 1 | 3 |
| CO5 | 3 | 2 | 2 | 2 |
| CO6 | 3 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|---|-----|---------|
| 1 | Sample spaces - Events - Axiomatic approach to Probability - Conditional Probability - Independent Events -Baye's Formula - Random Variables - Continuous and Discrete Random Variables - Distribution Function of a Random Variables - Expectation, Variance - Coefficient of Variation -Chebyshev's Inequality. | 12 | CO1,CO2 |
| | Bivariate Distribution – Conditional and Marginal Distributions – Discrete Distributions: | 12 | CO3 |

| | | | |
|---|---|----|---------|
| 2 | Discrete, Uniform, Binomial, Poisson and Geometric Distributions – Continuous Distributions : Uniform, Normal, Exponential and Gamma Distributions (only simple problems). | | |
| 3 | Correlation: Bivariate Data - Correlation between Two Variables - Covariance between Two Variables - Karl Pearson's Coefficient of Correlation - Rank Correlation. Regression Analysis : Simple Linear Regression - Regression Equations. | 12 | CO3,CO4 |
| 4 | Concepts of Sampling Distributions and Standard Error -Point Estimation (Concepts Only) - Interval Estimation of Mean and Proportion. Tests of Hypotheses - Critical Region - Two Types of Errors - Level of Significance - Power of the Test - Large Sample Tests for Mean and Proportion - Exact Tests Based on Normal, t, f and Chi-Square Distributions. | 12 | CO5 |
| 5 | Basic Principles of Experimentation – Analysis of Variance – One Way and Two Way Classifications – Computing Randomized Design – Randomized Block Design. | 12 | CO6 |

Text Book:

1. Gupta S.C and Kapoor V.K, "Fundamentals of Mathematical Statistics", 11th Edition, Sultan Chand & Sons, India, 2007.

Reference Books:

1. P.R.Vital, —Mathematical Statistics||, Marghan Publication, 2004.
2. T.K.V. Iyengar "Probability & Statistics for MCA". S. Chand & company, New Delhi, 2009 edition.
3. Trivedi, K.S, "Probability and Statistics with Reliability, Queuing and Computer Science Applications", Prentice Hall India,1994.
4. James T. McClave and Terry Sincich, "Statistics", 12th Edition, Pearson Education, India, 2013.
5. Erwin Miller and John E.Freund, "Probability and Statistics for Engineers", 7th Edition, Pearson Education, India, 2017.

E-References:

1. <https://nptel.ac.in/courses/111/105/111105041/>
2. <https://nptel.ac.in/courses/111/105/111105043/>
3. <https://nptel.ac.in/courses/110/106/110106064/>

FIRST SEMESTER

Course Title: CORE PRACTICAL P1-DATABASE PROGRAMMING LAB
(For Students admitted from 2020 onwards)

| | |
|---|-----------------------|
| Course Code : XX29106 (XX-Year of admission) | Credits : 02 |
| L:T:P:S : 0:0:5:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Objectives:

- *To explain basic database concepts, applications, data models, schemas and instances.*
- *To demonstrate the use of constraints and relational algebra operations.*
- *Describe the basics of SQL and construct queries using SQL.*
- *To emphasize the importance of normalization in databases.*
- *To facilitate students in Database design*

Lab Exercises:

1. DDL Statements
2. DML Statements
3. SELECT statement
4. Numeric functions
5. Character functions
6. Date functions
7. Group Functions
8. Set Operations
9. Nested query
10. Joins
11. Commit and Rollback
12. PL/SQL-Decision Making statements
13. PL/SQL-Looping statements
14. PL/SQL-Cursors
15. PL/SQL-Exception Handling

FIRST SEMESTER

Course Title: CORE PRACTICAL P2: ADVANCED JAVA PROGRAMMING LAB
(For Students admitted from 2020 onwards)

| | |
|---|-----------------------|
| Course Code : XX29107 (XX-Year of admission) | Credits : 02 |
| L:T:P:S : 0:0:5:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Objectives:

- *The course covers Graphical User Interface (GUI) networking, JavaScript and database*
- *Student will be able to use advanced technology in Java such as Remote method Invocation , JSP.*
- *Student will be able to develop web application using Java Servlet.*

Lab Exercises:

1. Design a form and implement java script showing all the major form validations.
2. JavaScript program illustrating the Date and Math Objects
3. JavaScript program to handle different events.
4. Basic Servlet Programming
5. Servlet Collaboration-Request Dispatcher
6. Session Management and Implementation of Cookies using Servlet
7. Developing a web application with MySQL Database using Servlet
8. Designing online applications with JSP
9. Creating Web services with RMI.

*******End of First Semester*******

SECOND SEMESTER

Course Title: CORE THEORY T5- PYTHON FOR DATA SCIENCE (For Students admitted from 2020 onwards)

| | | | |
|-------------|----------------------------------|-----------|------|
| Course Code | : XX29209 (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 3:1:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To introduce Python programming language through its core language basics and program design techniques suitable for modern applications.
- To understand the wide range of programming facilities available in Python covering graphics, GUI, data visualization and Databases.
- To utilize high-performance programming constructs available in Python to develop solutions in real life scenarios.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Examine Python syntax and semantics and be fluent in the use of Python input output functions. |
| CO2 | Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions. |
| CO3 | Interpret/Evaluate the concepts of Object-Oriented Programming using Python. |
| CO4 | Demonstrate proficiency in handling Strings and File Systems. |
| CO5 | Discover the capabilities of numpy ,scipy and matplotlib for scientific programming. |
| CO6 | Implement exemplary applications related to Pandas and DataFrames in Python. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|---|-----|---------|
| 1 | Introduction to Python - Installing in various Operating Systems - Executing Python Programs - Basic Programming concepts - Variables, expressions and statements - Input/Output –Operators. | 12 | CO1 |
| 2 | Conditional Statements - Functions - Arguments - Return values - Iteration - Loops - Strings - Data Structures: Lists - Dictionaries - Tuples – Sequences- Modules. | 12 | CO2 |
| 3 | File Handling - Regular Expressions - Text handling - Object Oriented Programming- Classes - Objects - Inheritance - Overloading - Polymorphism Interacting with Databases - Exception Handling -Introduction to MySQL -Interacting with MySQL - Building a address book with add/edit/delete/search features. | 12 | CO3,CO4 |

| | | | |
|---|---|----|-----|
| 4 | Scientific Programming using NumPy/SciPy and Matplotlib – Array operations, 2D numpy arrays, Numpy basic Statistics ,ScipyLinalg, scipy Optimize. Matplotlib – Introduction, Simple plots, Figures and Subplots. | 12 | CO5 |
| 5 | Introduction to Pandas-Creation of Series- Operations-Creation of Dataframes- Operations-Import/Export of different types of Files-Slicing - Filtering- groupby- Aggregation-Simple plot using pandas-Real time Case Study. | 12 | CO6 |

Text Books:

1. Allen B. Downey O'Reilly —Think Python: How to Think Like a Computer Scientist.
2. Python Programming: A Modern Approach, Vamsi Kurama, Pearson Education
3. Core Python Programming, R. Nageswara Rao, 2nd Edition, Dreamtech.

Reference Books:

1. Learning Python, Mark Lutz, Orielly
2. Core Python Programming, W.Chun, Pearson.
3. Introduction to Python, Kenneth A. Lambert, Cengage
4. Programming in Python, Pooja Sharma, BPB Publications, 2017.
5. Python in a Nutshell, A. Martelli, A. Ravenscroft, S. Holden, OREILLY.

E-References:

1. <https://nptel.ac.in/courses/106/106/106106182/>
2. <https://nptel.ac.in/courses/106/106/106106145/>
3. <https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-cs36/>
4. <https://www.tutorialspoint.com/python/>
5. <https://www.udacity.com/course/introduction-to-python>

SECOND SEMESTER

Course Title: CORE THEORY T6-MOBILE APPLICATION DEVELOPMENT (For Students admitted from 2020 onwards)

| | | | |
|-------------|----------------------------------|-----------|------|
| Course Code | : XX29210 (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 3:1:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To introduce Android platform and its architecture.
- To learn activity creation and Android UI designing.
- To be familiarized with Intent, Broadcast receivers and Internet services.
- To work with SQLite Database and content providers.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Define Android applications, download and install Android Studio, work in development environment and to execute the First Android Application. |
| CO2 | Illustrate the use of activities, fragments and intents in Android to invoke Built-in Applications and use of notification in Android. |
| CO3 | Design and implement the user interfaces using basic widgets, views, view groups and layouts of Android. |
| CO4 | Work with user interface to handle pictures and menus and explain data storage options using the internal and external storage using Shared Preferences, files, SQLite database and Content Providers. |
| CO5 | Illustrate the formation of SMS and E-mail in the mobile phones and demonstrate the Location Based Services (LBS) and consumption of Web Services in Android using JSON and Sockets. |
| CO6 | Developing Android Services by establishing communication between a service and an activity and illustrating the steps for publishing Android applications. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 2 | 2 | 3 |
| CO3 | 3 | 3 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 3 |
| CO5 | 3 | 3 | 3 | 2 |
| CO6 | 3 | 3 | 2 | 2 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|---|-----|---------|
| 1 | Introduction to Android – Features of Android-Architecture of Android-Obtaining the Required Tools- Creating First Android Application - Anatomy of Android Application-Components of Android Application-Lifecycle of Activity. Intents: Creating Intents, Types of Intents, Intents returning result, Intent Filters, Calling Built-In Application Using Intents and Displaying Notifications using PendingIntent. Fragments: Lifecycle of Fragment, Types of Fragments and how to create and use fragments. | 12 | CO1,CO2 |
| 2 | Screen Layouts: Linear, Table, Relative, Absolute and Grid. Basic Views: Toast, TextView, EditText, Button, AutoCompleteTextView, CheckBox, ToggleButton, | 12 | CO3 |

| | | | |
|---|--|----|-----|
| | ImageButton, RadioButton, SeekBar, ListView, ImageView, DatePicker and TimePicker- Adapting to Display Orientation - Creating the views programmatically. | | |
| 3 | Menus: OptionsMenu, ContextMenu and PopupMenu. Data Persistence: Saving and Loading using Shared Preferences - Persisting Data to Files - SQLite Database: Create, Insert, Delete, Update and Select queries. Content Provider: Creating and using Content Provider. | 12 | CO4 |
| 4 | Sending SMS - Sending E-Mail- Location – Based Services: Displaying Maps - Getting Location Data. Networking: Consuming Web Services Using HTTP - Consuming JSON Services - Sockets Programming. | 12 | CO5 |
| 5 | Developing Android Services: Lifecycle of Service, Types of service and Creating own services. Threading: Worker thread and Async thread. Publishing Android Applications: Preparing for Publishing - Deploying APK Files. | 12 | CO6 |

Text Book:

1. J.F. DiMarzio, “**Beginning Android Programming with Android Studio**”, 4th Edition, Wiley Publications, 2017.

Reference Books:

1. Wei Meng Lee, “**Beginning Android 4 Application Development**”, Wiley Publications, 2013.
2. Anubhav Pradhan, Anil V Deshpande, ‘Mobile Applications Development’, First Edition.
3. Barry Burd ‘Android Applications Development all in one for Dummies’, First Edition.
4. “Teach Your self Android Application Development in 24 hours” First Edition, SAMS.
5. Rick Boyer, “**Android 9 Development Cookbook**”, 3rd Edition, Packt Publishing, 2018.
6. Reto Meier and Ian Lake, “**Professional Android**”, 4th Edition, Wiley Publishers.

E-References:

1. <http://developer.android.com/>
2. <https://www.tutorialspoint.com/android/index.htm>
3. <https://abhiandroid.com/>

SECOND SEMESTER

**Course Title: CORE THEORY T7-FUNDAMENTALS OF MACHINE LEARNING
(For Students admitted from 2020 onwards)**

| | | | |
|--------------------|----------------------------------|------------------|------|
| Course Code | : XX29211 (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To introduce students to the basic concepts and techniques of Machine Learning.
- To have a thorough understanding of the Supervised and Unsupervised learning techniques
- To study the various probability based learning techniques
- To understand graphical models of machine learning algorithms

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | The learners shall understand the machine learning techniques like Clustering, Induction. Bayesian, Decision Tree, Analytical and Instance based learning and to apply the techniques in computing. |
| CO2 | The learners shall be able to compare the various machine learning techniques and design issues in machine learning. |
| CO3 | Introduce students to state-of-the-art methods and modern programming tools for data analysis. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 |
| CO3 | 2 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|---|-----|---------|
| 1 | INTRODUCTION: Designing a learning system - Perspectives and Issues in machine learning - Concept learning task - Concept learning as search - Version spaces - Candidate Elimination learning algorithm - Inductive Bias. | 12 | CO1 |
| 2 | DECISION TREE LEARNING: Decision Tree representation - Appropriate Problems for Decision Tree Learning - Basic Decision tree learning algorithm - Hypothesis space search and Inductive Bias in Decision tree learning - Issues in Decision Tree Learning. ANN: Perceptrons - Back propagation Algorithms. | 12 | CO1 |
| 3 | BAYESIAN LEARNING: Bayes Theorem and Concept learning - Maximum Likelihood and Least Squared error hypothesis - Maximum Likelihood hypotheses for predicting probabilities - Minimum description Length principle - Bayes optimal classifier - Gibbs algorithm - Naïve Bayes classifier - Bayesian Belief networks -EM algorithm. | 12 | CO1,CO2 |
| 4 | ANALYTICAL AND COMBINING ANALYTICAL AND INDUCTIVE LEARNING: Analytical learning - Explanation based learning - Inductive Analytical approaches to learning - Using prior knowledge to initialize the hypothesis, to alter the search objective and to augment search operators. | 12 | CO3 |
| 5 | INSTANCE-BASED LEARNING AND REINFORCEMENT LEARNING: K - nearest neighbor learning -Locally weighted regression - Radial Basis functions - Case based reasoning - Reinforcement learning: Learning task-Q Learning:Q function - Algorithm for learning Q-convergence - Updating sequence - Temporal difference learning. | 12 | CO3 |

Text Book:

1. Tom M Mitchell, "Machine Learning", McGraw Hill, 1st Edition, 2003.

Reference Books:

1. Ethem Alpaydin, "Introduction to Machine Learning", MIT Press, 2nd Edition, 2010.
2. Stephan Marsland, "Machine Learning - An Algorithmic Perspective", Chapman and Hall, 1st Edition, 2009.
3. Nils Nilsson, "Introduction to Machine Learning", MIT Press, 1997.
4. Jude Shavil, Thomas G Dietterich, "Readings in Machine Learning", Morgan Kaufmann Publishers, 1990.8.
Peter Harrington, "Machine Learning in Action", DreamTech

E-References:

1. <https://nptel.ac.in/courses/106/105/106105152/>
2. <http://www.cs.cmu.edu/~tom/mlbook.html>

SECOND SEMESTER

Course Title: CORE THEORY T8-MOBILE COMMUNICATIONS (For Students admitted from 2020 onwards)

| | |
|--|----------------|
| Course Code : XX29212 (XX-Year of admission) | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Objectives:

- Understand the basic concepts of mobile computing
- Understand Wireless LAN, Bluetooth and WiFi Technologies
- Be familiar with the network protocol stack
- Learn the basics of mobile telecommunication system
- Be exposed to Ad-Hoc networks

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Explain the basics of mobile telecommunication system |
| CO2 | Illustrate the generations of telecommunication systems in wireless network |
| CO3 | Understand the architecture of Wireless LAN technologies |
| CO4 | Determine the functionality of network layer and Identify a routing protocol for a given Ad hoc networks |
| CO5 | Explain the functionality of Transport and Application layer |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 |
| CO2 | 2 | 3 | 3 | 2 |
| CO3 | 2 | 2 | 2 | 3 |
| CO4 | 3 | 2 | 2 | 3 |
| CO5 | 2 | 3 | 2 | 2 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|---|-----|-----|
| 1 | Introduction: Introduction to Mobile Computing – Applications of Mobile Computing- Generations of Mobile Communication Technologies-MAC Protocols – SDMA-TDMA-FDMA-CDMA. | 12 | CO1 |
| 2 | Mobile Telecommunication System: GSM – Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Mobility Management – Security – GPRS- UMTS- Architecture. | 12 | CO2 |
| 3 | Wireless Networks: Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services – Blue Tooth- Wi-Fi – WiMAX. | 12 | CO3 |
| 4 | Mobile Network Layer: Mobile IP – DHCP – AdHoc– Proactive and Reactive Routing Protocols – Multicast Routing- Vehicular Ad Hoc networks (VANET) –MANET Vs VANET – Security. | 12 | CO4 |
| 5 | Mobile Transport and Application Layer: Mobile TCP– WAP – Architecture – WDP – WTLS – WTP –WSP – WAE – WTA Architecture – WML. | 12 | CO5 |

Text Books:

1. Jochen Schiller, —Mobile Communications||, PHI, Second Edition, 2003.
2. Prasant Kumar Pattnaik, Rajib Mall, —Fundamentals of Mobile Computing||, PHI Learning Pvt.Ltd, New Delhi – 2012

Reference Books:

1. Dharma Prakash Agarwal, Qing and An Zeng, "Introduction to Wireless and Mobile systems",Thomson Asia Pvt Ltd, 2005.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, —Principles of Mobile Computing||, Springer, 2003.
3. William.C.Y.Lee,—Mobile Cellular Telecommunications-Analog and Digital Systems||, Second Edition,Tata Mc Graw Hill Edition ,2006.
4. C.K.Toth, —AdHoc Mobile Wireless Networks||, First Edition, Pearson Education, 2002.

E-References:

1. Android Developers : <http://developer.android.com/index.html>
2. Apple Developer : <https://developer.apple.com/>
3. Windows Phone Dev Center : <http://developer.windowsphone.com>
4. BlackBerry Developer : <http://developer.blackberry.com>

SECOND SEMESTER

Course Title: CORE THEORY ELECTIVE 1-PRINCIPLES OF DIGITAL IMAGE PROCESSING
(For Students admitted from 2020 onwards)

| | |
|--|-----------------------|
| Course Code : XX29213(A) (XX-Year of admission) | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Objectives:

- To provide the basic knowledge on image processing techniques like image acquisition, enhancement, transform, segmentation, object recognition in images and their applications.
- To impart the mathematical logic behind the various image processing algorithms
- To facilitate the students apprehend and implement various image processing algorithms.
- To impart the performance of the algorithms with real time applications.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Understand and analyse the problems in the formation of various types of images |
| CO2 | Analyze the need for image transforms, different types of image transforms and their properties |
| CO3 | Analyze different techniques employed for the enhancement of images using filters |
| CO4 | Implement different segmentation technique. |
| CO5 | Analyzing and extracting suitable features for classification of objects. |
| CO6 | Familiar with the use of Python and OpenCV for Image Analysis |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----|-----|
| 1 | Introduction – Steps in Digital Image Processing, Components of an Image Processing System – Image sensing and acquisition, Image Sampling and Quantization: Basic Concepts, Representing Digital Images, Basic Relationships between pixels. – color models – basics of color image processing | 12 | CO1 |
| 2 | Intensity Transformations and Spatial Filtering: Some basic gray level transformation functions – Histogram Processing – Fundamentals of Spatial Filtering – Smoothing Spatial Filters. | 12 | CO2 |
| 3 | Filtering in the Frequency Domain – The Discrete Fourier Transform of One Variable, Extensions to Functions of Two Variables, The Basics of Filtering in the Frequency Domain, Image Smoothing Using Low-pass Frequency Domain, Image Sharpening Using High-pass Filters. | 12 | CO3 |
| 4 | Image Segmentation: Fundamentals – Point, Line and Edge Detection- Thresholding , Segmentation by Region Growing and by Region Splitting and Merging. Feature Extraction: Boundary Pre-processing – Boundary Features Descriptors – Region Features Descriptors – Principal Components as Feature Descriptors. | 12 | CO4 |

| | | | |
|---|--|----|---------|
| 5 | <p>Image Pattern Classification: Patterns and Pattern Classes, Pattern Classification by Prototype Matching: Minimum Distance Classifier, Correlation For 2-D Prototype Matching.</p> <p>Case Study: Performing image pre-processing using enhancement methods, Implementing Segmentation techniques and Classifying objects using Python, ML libraries and predefined models.</p> | 12 | CO5,CO6 |
|---|--|----|---------|

Text Book:

1. Rafael.C. Gonzalez, Richard.E.Woods, “**Digital Image processing**”, Fourth Edition, Pearson Education Limited, 2018.

Reference Books:

1. A.K. Jain, “Fundamentals of Digital Image Processing”, PHI, 2011
2. Mark Nixon, Alberto Aguado, “Feature Extraction and Image Processing”, Second Edition, Elsevier, 2008.
3. S. Jayaraman, S. Esakkirajan, T. Veerakumar, “Digital Image Processing”, Mc-Graw Hill, 2012 .
4. Himanshu Singh, “Practical Machine Learning and Image Processing: For Facial Recognition, Object Detection, and Pattern Recognition Using Python”, Apress, 2019

E-References:

1. <http://www.nptel.iitm.ac.in/video.php?subjectId=117105079>
2. <https://docs.opencv.org/>
3. https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_tutorials.html
4. <https://scikit-image.org/>
5. <https://github.com/Gogul09/image-classification-python>

SECOND SEMESTER

Course Title: CORE THEORY ELECTIVE 1-INTRODUCTION TO MULTIMEDIA (For Students admitted from 2020 onwards)

| | | | |
|-------------|-------------------------------------|-----------|------|
| Course Code | : XX29213(B) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- This course aims to introduce the fundamental elements of multimedia.
- It will provide an understanding of the fundamental elements in multimedia.
- The emphasis will be on learning the representations, perceptions and applications of multimedia.
- Software skills and hands on work on digital media will also be emphasized.
- On completion of the subject, the students will understand the technologies behind multimedia applications and master the skills for developing multimedia projects.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Describe the types of media and define multimedia system. |
| CO2 | Describe the process of digitizing (quantization) of different analog signals (text, graphics, sound and video). |
| CO3 | Use and apply tools for image processing, video, sound and animation. |
| CO4 | Apply methodology to develop a multimedia system. |
| CO5 | Apply acquired knowledge in the field of multimedia in practice and independently continue to expand knowledge |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 |
| CO2 | 2 | 3 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 3 |
| CO4 | 2 | 2 | 2 | 2 |
| CO5 | 2 | 2 | 2 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----------|------------|
| 1 | Introduction to Multimedia: What is multimedia, Components of multimedia, Web and Internet multimedia applications, Transition from conventional media to digital media. Computer Fonts and Hypertext. Usage of text in Multimedia, Families and faces of fonts, outline fonts, bitmap fonts International character sets and hypertext, Digital fonts techniques. | 12 | CO1 |
| 2 | Audio Fundamentals and Representations : Digitization of sound, frequency and bandwidth, decibel system, data rate, audio file format, Sound synthesis, MIDI, wavetable, Compression and transmission of audio on Internet, Adding sound to your multimedia project, Audio software and hardware. | 12 | CO2 |
| 3 | Image Fundamentals and Representations: Colour Science , Colour, Colour Models, Colour palettes, Dithering, 2D Graphics, Image Compression and File Formats :GIF, JPEG, JPEG 2000, PNG, TIFF, EXIF, PS, PDF, Basic Image Processing [Can Use Photoshop], Use of image editing software, White balance correction, Dynamic range correction, Gamma correction, Photo Retouching. | 12 | CO3 |

| | | | |
|---|---|----|-----|
| 4 | Video and Animation: Video Basics , How Video Works, Broadcast Video Standards, Analog video, Digital video, Video Recording and Tape formats, Shooting and Editing Video (Use Adobe Premier for editing), Video Compression and File Formats , Video compression based on motion compensation, MPEG-1, MPEG-2, MPEG-4, MPEG-7, MPEG-21, Animation: Cell Animation, Computer Animation, Morphing. | 12 | CO4 |
| 5 | Multimedia Authoring: Multimedia Authoring Basics, Some Authoring Tools, Macromedia Director & Flash . | 12 | CO5 |

Text Books:

1. Tay Vaughan, "Multimedia making it work", Tata McGraw-Hill, 2008.
2. Rajneesh Aggarwal & B. B Tiwari, "Multimedia Systems", Excel Publication, New Delhi, 2007.

Reference Books:

1. Li & Drew, "Fundamentals of Multimedia" , Pearson Education, 2009.
2. Fred Halsall , "Multimedia Communications: Applications, Networks, Protocols and Standards", Addison Wesley, 2000
3. Parekh Ranjan, "Principles of Multimedia", Tata McGraw-Hill, 2007
4. Anirban Mukhopadhyay and Arup Chattopadhyay, "Introduction to Computer Graphics and Multimedia", Second Edition, Vikas Publishing House.

E-References:

1. Anatomy of a Sound Board. PC Magazine Online Located at: <http://www.zdnet.com/cshopper/features/9510/feature2/sub3.html>
2. Berinato, S. (1997). Streaming video enters spotlight. PC Week Online. [On-line]. Available: <http://www8.zdnet.com/pcweek/news/0728/28video.html>
3. CyberTech Information Group. (1997). Streaming video. [On-line]. Available: <http://www.web-ads.com/cbertech/vivofree.html>

SECOND SEMESTER

Course Title: CORE THEORY ELECTIVE 1-COMPUTER ANIMATION (For Students admitted from 2020 onwards)

| | | |
|---|-----------|------|
| Course Code : XX29213(C) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Course Objectives:

- *-Recognize, locate, and navigate through all aspects of the new user interface.*
- *Create, manipulate, and edit text and graphics to obtain desired graphical outcomes.*
- *Understand, create, and edit symbols, filters and instances in 3Dspaces.*
- *Design, create, edit, and manipulate animation using several animation tools and techniques.*
- *Utilize tweens and articulated motions with inverse kinematics to morph shapes.*
- *Design, create, and edit a flash-based navigation menus and interactive movies.*
- *Utilize and understand sound and sound formats in flash movies and components to create interactivity.*

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Provides an overview of the evolution of animation, and how animation came into existence. |
| CO2 | The process of animation techniques developed with various equipments and how the process was performed. |
| CO3 | The animation techniques such as cell animation, classic characters, cut out animation, stop motion effects, puppet stop motion, pixilation, optical printing, vector / key framed animation, sand animation, silhouette animation, pin-screen animation, Chinese shadow puppetry and rot scope techniques are illustrated which would be helpful for creating clear and good animation. |
| CO4 | The information about how animation was developed in India, It also deals with the growth of Indian animation companies and studios, it discusses the emerging trends in Indian animation industry and outsourcing demands. It helps them to understand how great animators helped to improvise animation to Indian directors. |
| CO5 | Develop proficiency in creating solutions for web applications |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----------|------------|
| 1 | Creating Your First Flash Animation – how to create a new blank movie file in Flash MX – and the tools and steps involved in making your first simple animation using motion twining – basic shapes – Flash Animation 2 - Shape Twining – pick up at the end of where we left off – Shape twining in Flash MX. | 12 | CO1 |
| 2 | Flash Lesson 8 -Adding Simple Audio – add a looping audio background to our Flash character animation to complete it – Lip-Synching For Animation: Basic Phonemes – add actual expression and realistic mouth-movements to your animation – it helps | 12 | CO2 |

| | | | |
|---|---|----|-----|
| | to study how the shape of the mouth changes with each sound – these ten basic phonemes shapes can match almost any sound of speech – in varying degrees of expression. | | |
| 3 | Flash Animation – Fireworks E-card – using Flash’s drawing tools to set a scene for an animation – creating the scene for a Fourth of July exploding fireworks E-card – a future lesson will demonstrate how to animate it – Flash Animation - Animating E-card – set the stage for our E-card – use a new kind of symbol called a MovieClip. | 12 | CO3 |
| 4 | Flash Tip – Tools of the Trade – Drawing in Flash With a Graphics Tablet – frame-by-frame vector animation with this high-tech – but inexpensive – plug and play tool – Animation Tip – Tools of the Trade – Light Tables – 2D animation for cell painting – computer animation – a light table. | 12 | CO4 |
| 5 | Animating the limbs – add speech bubbles – about adding actual audio tracks later – to learn about working with text in Flash – and to give our characters a -voice to communicate with the viewer – so to animate our facial features and give them expression and lip movements. | 12 | CO5 |

Text Books:

1. Adam Watkins, “Maya A Professional Guide”, Dreamtech, First edition– 2003.
2. Joey Lott and Robert Reinhardt, “Flash 8 Action Script Bible”, Wiley India (P)Ltd.2006.

Reference Books:

1. Tom Meade and Shinsaka Anima, “The Complete Reference Maya6”, TataMC.Graw–Hill Publishing Company Limited edition2004.
2. Robert Reinhardt and SnowDowd, “Macromedia Flash 8 Bible”, Wiley India Pvt Ltd.2006.

E-References:

1. https://www.tutorialspoint.com/computer_graphics/computer_animation.htm
2. <https://www.geeksforgeeks.org/computer-animation>

SECOND SEMESTER

Course Title: CORE PRACTICAL P3-PYTHON FOR DATA SCIENCE LAB
(For Students admitted from 2020 onwards)

| | | | |
|--------------------|---|------------------|-------------|
| Course Code | : XX29214 (XX-Year of admission) | Credits | : 02 |
| L:T:P:S | : 0:0:5:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- *Master the fundamentals of writing Python scripts*
- *Learn core Python scripting elements such as variables and flow control structures*
- *Discover how to work with lists and sequence data*
- *Write Python functions to facilitate code reuse*
- *Use Python to read and write files*
- *Make their code robust by handling errors and exceptions properly*
- *Work with the Python standard library*
- *Explore Python's object-oriented features*

Lab Exercises:

1. Multilevel Inheritance
2. Exception Handling
3. File Operations
4. List Operations
5. String Operations
6. Python with SQLiteDB
7. Module in Python
8. Plotting two graphs using matplotlib and subplot
9. Plotting bar chart graph using matplotlib
10. Plotting pie chart graph using matplotlib

SECOND SEMESTER

Course Title: **CORE PRACTICAL P4-MOBILE APPLICATION DEVELOPMENT LAB**
(For Students admitted from 2020 onwards)

| | | | |
|-------------|---|-----------|------|
| Course Code | : XX29215 XX29213(A) (XX-Year of admission) | Credits | : 02 |
| L:T:P:S | : 0:0:5:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- Describe the platforms upon which the Android OS will run.
- Create simple applications that runs under Android OS
- Access and work with the Android file system
- Define and access with databases under Android OS

Lab Exercises:

1. Activity Lifecycle
2. Fragments
3. Notifications
4. Screen Orientation
5. Implicit and Explicit Intents
6. Intents returning results
7. Working with Basic Widgets-Button, Textview, Edittext, Togglebutton, Radiobutton, Radiogroup, Autocompletetextview, Checkbox, Seekbar, Listview, Pickerviews.
8. Storing data permanently using Shared preferences, Files and SQLite
9. Sending SMS
10. Location Based Services
11. JSON Services
12. Socket Programming
13. Illustration of menus-Option menu, Context menu, Popup menu
14. Android Services
15. Android Threading

*****End of Second Semester*****

THIRD SEMESTER

**Course Title: CORE THEORY T9-INTRODUCTION TO BIG DATA ANALYTICS
(For Students admitted from 2020 onwards)**

| | | | |
|--------------------|---|------------------|------|
| Course Code | : XX29318 XX29213(A) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 3:1:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To explore the fundamental concepts of big data analytics
- To learn to analyze the big data using intelligent techniques.
- To understand the various search methods and visualization techniques.
- To learn to use various techniques for mining data stream.
- To understand the applications using MapReduce Concepts

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Knows the reason about the evolution of data science and its development. Study the basic of big data analytics and to develop the code. Importance of various kinds of data comparing the other language. |
| CO2 | Develop HDFS environment using NOSQL implementing the queries. Aggregate the data using NOSQL. |
| CO3 | Concept of basic Hadoop, data format and analyzing the data in the HDFS environment. Implementing the concept Hadoop pipes and implementations and java interfaces. Significance of various methods of compression, serialization. |
| CO4 | Apply Mapreduce applications, unit test , MRUnit, Create file using MapReduce sorting and shuffling process. Creating input and output format of Mapreduce. |
| CO5 | Usage of Hadoop related tools. Definition of hbase, Hbase clients, Cassandra, Pig, HiveQL. Life Build data manipulation byHiveQL queries. |
| CO6 | Analyze Life Build data manipulation by HiveQL queries. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|---|-----|-----|
| 1 | Understanding big data: What is Big Data – Why Big Data – Convergence of key trends – unstructured data – industry examples of Big Data – Web analytics – Big Data and marketing – Fraud and Big Data – Risk and Big Data – Credit Risk Management – Big Data and algorithmic trading – Big Data and healthcare – Big Data in Medicine. | 12 | CO1 |
| 2 | NoSQL data management: Introduction to NoSQL – Aggregate Data Models – Aggregates – Key- Value And Document Data Models – Relationships – Graph Databases – Schemaless Databases – Materialized Views – Distribution Models – | 12 | CO2 |

| | | | |
|---|--|----|---------|
| | Sharding – Master-Slave Replication – Peer-Peer Replication - Sharding And Replication – Consistency – Relaxing Consistency – Version Stamps – MapReduce – Partitioning and Combining – Composing MapReduce Calculations. | | |
| 3 | Basics of Hadoop Data format – Analyzing data with Hadoop – Scaling out – Hadoop streaming- Hadoop pipes – Design of Hadoop distributed file system (HDFS) – HDFS concepts – Java interface - data flow – Hadoop I/O – Data Integrity – Compression – Serialization – Avro – File-Based Data Structures. | 12 | CO3 |
| 4 | MapReduce applications MapReduce workflows – Unit tests with MRUnit – test data and local tests – anatomy of MapReduce job run – classic Map-reduce – YARN – failures in classic Map- reduce and YARN – job scheduling – shuffle and sort – task execution – MapReduce types – Input Formats – Output Formats. | 12 | CO4 |
| 5 | Hadoop related tools Hbase – Data model and implementations – Hbase clients – Hbase examples – praxis. Cassandra – cassandra data model – cassandra examples – cassandra clients – Hadoop integration. Pig – Grunt – Pig data model – Pig Latin – developing and testing Pig Latin scripts. Hive – Data types and file formats – HiveQL data definition – HiveQL data manipulation –HiveQL queries. | 12 | CO5,CO6 |

Text Books:

1. Michael Minelli, Michelle Chambers, and Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013.
2. P. J. Sadalage and M. Fowler, "NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence", Addison-Wesley Professional, 2012.
3. Tom White, "Hadoop: The Definitive Guide", Third Edition, O'Reilley, 2012.
4. Eric Sammer, "Hadoop Operations", O'Reilley, 2012.
5. Alan Gates, "ProgrammigPig", O'Reilley, 2011. Hadoop in Practice by Alex Holmes, MANNING Publ
6. E. Capriolo, D. Wampler, and J. Rutherglen, "Programming Hive", O'Reilley, 2012.

Reference Books:

1. Lars George, "HBase: The Definitive Guide", O'Reilley, 2011.
2. Eben Hewitt, "Cassandra: The Definitive Guide", O'Reilley, 2010.
3. HadoopMapReduceCookbook|, Srinath Perera, Thilina Gunaratne Software

E-References:

1. Hadoop: <http://hadoop.apache.org/>
2. Hive: <https://cwiki.apache.org/confluence/display/Hive/Home> Pig latin:
3. <http://pig.apache.org/docs/r0.7.0/tutorial.html>

THIRD SEMESTER

**Course Title: CORE THEORY T10-DOT NET PROGRAMMING
(For Students admitted from 2020 onwards)**

| | | | |
|--------------------|---|------------------|------|
| Course Code | : XX29319 XX29213(A) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 3:1:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To understand .NET Platform and its core functionalities.
- To develop windows and web applications with Microsoft SQL and Visual Studio.
- To understand and develop user defined Applications using MVC framework.
- To strengthen Object Oriented Programming using advance VB.NET concepts

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Explore Microsoft .NET Integrated Development Environment (IDE) |
| CO2 | Understand the basic concepts of VB.NET framework. |
| CO3 | Developing programs using VB .NET. |
| CO4 | Illustrate and implement the concepts of Class and objects, Inheritance, Overloading, Exceptions and File Handling in VB.NET |
| CO5 | Building ASP.NET Programming through Web Server Controls, Validation Controls and DataList Web Server Controls. |
| CO6 | Apply ADO.NET and OLEDB concepts for establishing connectivity among applications with reduced code complexity and develop network applications |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 1 | 2 |
| CO3 | 3 | 3 | 1 | 2 |
| CO4 | 3 | 2 | 1 | 3 |
| CO5 | 3 | 2 | 2 | 2 |
| CO6 | 3 | 3 | 3 | 2 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----|---------|
| 1 | Introducing Microsoft .NET:- Microsoft .NET platform: .NET Enterprise Servers, .NET framework and .NET Building block Services - .NET Namespaces. Common Type System(CTS), Common Language Specification(CLS) and CLR Execution (Class loader, verifier, JIT compilers). | 12 | CO1 |
| 2 | VB.Net Basics: VB Dot Net Framework Basics - Visual Studio Environment – Data Types , Variables, constants ,Operators and Expressions – Decisions and Conditions - Loops - Sub Procedures and Functions – Built-in functions - Arrays - Structures- Enumerators – Delegates and Events. | 12 | CO2,CO3 |
| 3 | VB.Net Advanced: Windows Forms and Basic Controls - Timer control - Graphics and Animation: The Graphics Environment – Simple Animation – Scroll Bar Controls - Menus and Status Bars- Multi Form applications - Class and Objects - Inheritance - Exception Handling. | 12 | CO3,CO4 |

| | | | |
|---|--|----|-----|
| 4 | ASP.NET Basics: ASP.NET Language Structure - Page Structure - Page event, Properties & Compiler Directives. Basic Web Server Controls: TextBox, Label, Button, CheckBox, RadioButton and LinkButton. Validation Controls: RequiredValidator, CompareValidator and RegularExpressionValidator. DataListWebserver Controls: ListBox, CheckedList, RadioButtonList, DropDownList and Data Grid control. | 12 | CO5 |
| 5 | Working with Data: Benefits of ADO.NET, ADO.NET Architecture, Main classes in ADO.NET, Developing a Windows/Web application using database. OLEDB Connection class, Command class, Transaction class, DataAdaptor class, DataSet class. ASP.NET Advanced: MVC Pattern, Life Cycle, Controllers, Actions, Views, Data Model. Model Binding, using Databases. Request and Response Objects, Cookies. | 12 | CO6 |

Text Books:

1. Jeff Prosize, Programming Microsoft .NET - Microsoft Press, 1st Edition, 2009.
2. Visual Basic.Net Black Book by Steven Holzner Dreamtech Press
3. The Complete Reference Visual Basic .NET Jeffery R. Shapiro Tata McGraw Hills
4. Thuan Thai, .NET Framework, O'Reilly publications, 3rd edition, 2009

Reference Books:

1. David S Platt, Introducing Microsoft .NET ,Microsoft press, 3rd Edition, 2003
2. Murach's Beginning Visual basic .Net By Anne Bohem
3. Freeman, Adam, Pro ASP.NET MVC, aprèss, 2013
4. Paul Yao, David Durant, Programming .NET Compact Framework 3.5, PearsonEducation, 2nd Edition, 2010.

E-References:

1. http://www.nptelvideos.com/visualbasic_net/visualbasicnet_video_tutorials.php
2. <http://www.nptelvideos.com/video.php?id=1775&c=21>
3. <https://freevideolectures.com/course/3002/dot-net-tutorial/1>
4. http://www.philadelphia.edu.jo/academics/qhamarsheh/uploads/Lecture_14_Introduction_to_ASP.pdf
5. <http://sigc.edu/departament/computerscience/studymet/AdvancedASP.NET.pdf>

THIRD SEMESTER

**Course Title: CORE THEORY T11-PRINCIPLES OF CLOUD COMPUTING
(For Students admitted from 2020 onwards)**

| | | | |
|--------------------|---|------------------|------|
| Course Code | : XX29320 XX29213(A) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To introduce the broad perspective of cloud architecture and model
- To understand the concept of virtualization and design of cloud Services
- To be familiar with the lead players in cloud.
- To study the various security issues in cloud computing.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyze the core concepts of the cloud computing paradigm: Evolution, characteristics, advantages and challenges brought about by the various models and services in cloud computing. |
| CO2 | Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models. |
| CO3 | Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost. |
| CO4 | Analyse and develop multimedia cloud application. |
| CO5 | Implementation of cloud platform using python |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|---|-----------|-----|
| 1 | Introduction to Cloud Computing – Definition of Cloud – Characteristics of Cloud Computing – Cloud Models – Cloud Service Examples – Cloud Based Services and applications- Cloud Concepts and Technologies. | 12 | CO1 |
| 2 | Cloud Services and Platforms: Compute Services – Storage Services – Database Services – Application Services – Content Delivery Services – Analytic Services – Deployment and Management Services – Identity and Access Management Services – Open Source Private Cloud Software. Developing for Cloud: Cloud Application Design – Reference Architectures for Cloud Applications – Cloud Application Design Methodologies – Data Storage Approaches. | 12 | CO2 |
| 3 | Python for Cloud: Python for Amazon Web Services – Python for Google Cloud Platform – Python for Windows Azure – Python for MapReduce – Python Packages of Interest – Python Web Application Framework Django. | 12 | CO3 |

| | | | |
|---|---|----|-----|
| 4 | Cloud Application Benchmarking and Tuning: Introduction – Workload Characteristics – Application Performance Metrics – Design Consideration for Benchmarking Methodology – Benchmarking tools – Deployment Prototyping – Cloud Security. | 12 | CO4 |
| 5 | Case Studies: Cloud for Manufacturing Industry – Cloud for Healthcare – Cloud for Education – Load Testing and Bottleneck Detection – Hadoop Benchmarking – Live Video Streaming App – Video Transcoding App. | 12 | CO5 |

Text Book:

1. Arshdeep Bahga and Vijay Madiseti, " **Cloud Computing: A Hands on Approach**", University Press, Hyderabad, 2014.

Reference Books:

1. Barrie Sosinsky, " **Cloud Computing Bible**", Wiley Publishing Inc, 2013.
2. John W.Rittinghouse and James F.Ransome, " **Cloud Computing: Implementation, Management, and Security**", CRC Press, 2010.
3. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, " **Distributed and Cloud Computing, From Parallel Processing to the Internet of Things**", Morgan Kaufmann Publishers, 2012

E-References:

1. <https://nptel.ac.in/courses/106/105/106105167/>
2. https://www.tutorialspoint.com/cloud_computing/index.html
3. <https://www.guru99.com/cloud-computing-for-beginners.html>
4. <https://www.youtube.com/watch?v=LICA-ILkO4w>

THIRD SEMESTER

Course Title: CORE THEORY ELECTIVE 2-COMPUTER FORENSICS AND BIOINFORMATICS
(For Students admitted from 2020 onwards)

| | |
|---|-----------------------|
| Course Code : XX29321 (A) (XX-Year of admission) | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Objectives:

- To provide an understanding Computer forensics fundamentals
- To analyze various computer forensics technologies
- To provide computer forensics systems
- To identify methods for data recovery.
- To understand Genomic data acquisition and analysis, comparative and predictive analysis in Bioinformatics field.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Demonstrate competency in the collection, processing, analyses, and evaluation of evidence. |
| CO2 | Demonstrate competency in the principles of crime scene investigation, including the recognition, collection, identification, preservation, and documentation of physical evidence. Classify and apply the acquisition tools |
| CO3 | Identify the role of the forensic scientist and physical evidence within the criminal justice system. Identify and examine current and emerging concepts and practices within the forensic science field. |
| CO4 | To get introduced to the basic concepts of Bioinformatics and its significance in Biological data analysis. |
| CO5 | Describe the history, scope and importance of Bioinformatics and role of internet in Bioinformatics |
| CO6 | Classify different types of Biological Databases. Introduction to the basics of sequence alignment and analysis |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 1 | 3 |
| CO4 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 2 | 2 | 3 |
| CO6 | 2 | 1 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----|-----|
| 1 | Understanding of Computer Forensics: Computer Forensics vs other related disciplines – A brief history of Computer Forensics – Understanding Case law – Developing Computer Forensics resources-Preparing for Computer Investigation. | 12 | CO1 |
| 2 | Data Acquisition: Understanding Storage Formats for Digital Evidence – Determining the Best Acquisition Model – Contingency Planning for Image Acquisitions – Using Acquisition Tools – Validating Data Acquisition. | 12 | CO2 |
| 3 | Processing Crime and Incident Scenes: Identifying Digital Evidence – Collecting Evidence in Private Sector Incident Scenes – Seizing Digital Evidence at the Scene – Storing Digital Evidence. | 12 | CO3 |

| | | | |
|---|---|----|---------|
| 4 | Introduction to Bioinformatics – Databases and Matrices – Biological Database – Database Searching – Scoring Matrices. | 12 | CO4,CO5 |
| 5 | Sequence Alignment – Pair wise sequence alignment – Multiple sequence alignment. Probabilistic Modes - Markov chain - Hidden Markov Models. | 12 | CO6 |

Text Books:

1. Bill Nelson, Amelia Philips and Christopher Stewart, "Guide to Computer Forensics and Investigations", Cengage learning, 2010.
2. Ruchi Singh and Richa Sharma, Bioinformatics, University Press, Hyderabad, 2010.
3. Richard Durbin, Sean Eddy, Anders Krogh, and Graeme Mitchison, "Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids", Cambridge University Press, 2008.

Reference Books:

1. Jay G Heiser and Warren G Kruse, "Computer Forensics: Incident Response Essentials", Addison Wesley, New Delhi, 2010.
2. Robert M Slade, "Software Forensics: Collecting Evidence from the scene of a Digital Crime", Tata Mc Graw Hill, New Delhi, 2011.
3. Arthur M Lesk, "Introduction to Bioinformatics", Oxford University Press, 2014.
4. Bishop M.J., Rawlings C.J. (Eds.), "DNA and protein sequence analysis: A Practical Approach", IRL Press, Oxford, 2010

E-References:

1. <https://www.bioinformatics.org/>
2. <https://resources.infosecinstitute.com/category/computerforensics/introduction/>

THIRD SEMESTER

**Course Title: CORE THEORY ELECTIVE 2-NETWORK SECURITY
(For Students admitted from 2020 onwards)**

| | | | |
|--------------------|--------------------------------------|------------------|------|
| Course Code | : XX29321 (B) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To know about various encryption techniques.
- To understand the concept of Public key cryptography.
- To study about message authentication and hash functions
- To impart knowledge on Network security

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Classify the symmetric encryption techniques |
| CO2 | Illustrate various Public key cryptographic techniques |
| CO3 | Evaluate the authentication and hash algorithms. |
| CO4 | Discuss authentication applications |
| CO5 | Summarize the intrusion detection and its solutions to overcome the attacks. |
| CO6 | Basic concepts of system level security |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 3 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 1 |
| CO4 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 3 |
| CO6 | 3 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----|-----|
| 1 | Introduction: Security trends – Legal, Ethical and Professional Aspects of Security, Need for Security at Multiple levels, Security Policies – Model of network security – Security attacks, services and mechanisms – OSI security architecture – Classical encryption techniques: substitution techniques, transposition techniques, steganography - Foundations of modern cryptography: perfect security – information theory – product cryptosystem – cryptanalysis. | 12 | CO1 |
| 2 | Symmetric key cryptography: Mathematics of symmetric key Cryptography: Algebraic structures – Modular arithmetic-Euclid"s algorithm- Congruence and matrices – Groups, Rings, Fields- Finite fields- SYMMETRIC KEY CIPHERS: SDES – Block cipher Principles of DES – Strength of DES – Differential and linear cryptanalysis – Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – Advanced Encryption Standard – RC4 – Key distribution. | 12 | CO2 |
| 3 | Public key cryptography: Mathematics of asymmetric key Cryptography: Primes – Primality Testing – Factorization – Euler,,s totient function, Fermat,,s and Euler,,s Theorem – Chinese Remainder Theorem – Exponentiation and logarithm – | 12 | CO3 |

| | | | |
|---|---|----|---------|
| | ASYMMETRIC KEY CIPHERS: RSA cryptosystem – Key distribution – Key management – Diffie Hellman key exchange – ElGamal cryptosystem – Elliptic curve arithmetic- Elliptic curve cryptography. | | |
| 4 | Message authentication and integrity: Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – SHA – Digital signature and authentication protocols – DSS- Entity Authentication: Biometrics, Passwords, Challenge Response protocols- Authentication applications – Kerberos, X.509. | 12 | CO4 |
| 5 | Security practice and system security: Electronic Mail security – PGP, S/MIME – IP security – Web Security – SYSTEM SECURITY: Intruders – Malicious software – viruses – Firewalls. | 12 | CO5,CO6 |

Text Book:

1. William Stallings, -Cryptography and Network Security: Principles and Practice “, PHI 3rd Edition, 2006.

Reference Books:

1. C K Shyamala, N Harini and Dr. T R Padmanabhan ” Cryptography and Network Security”, Wiley IndiaPvt.Ltd
2. Behrouz A.Foruzan, “Cryptography and Network Security”, Tata McGraw Hill2007.
3. Charlie Kaufman, Radia Perlman, and Mike Speciner, “Network Security: PRIVATE Communication in a PUBLIC World, Prentice Hall”, ISBN0-13-046019-2

E-References:

1. https://www.tutorialspoint.com/information_security_cyber_law/network_security.htm
2. <https://www.pdfdrive.com/network-security-books.html>

THIRD SEMESTER

**Course Title: CORE THEORY ELECTIVE 2-INFORMATION SECURITY
(For Students admitted from 2020 onwards)**

| | | | |
|--------------------|--------------------------------------|------------------|------|
| Course Code | : XX29321 (C) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To understand and apply the models of information security
- To study and analyze cryptographic and forensic methods
- Analyze and simulate the network and application security
- Explore the nature and logic behind security threats on the web as an ethical hacker

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyze the broad perceptive and need of information security. |
| CO2 | Explain the various encryption techniques and illustrate the master fundamentals of secret and public cryptography. |
| CO3 | Compute the Risk control strategies and Risk Management and compare with Hash Algorithms, Signature and network security designs. |
| CO4 | Describe the policies of Information Security and hence identify network security designs using available secure solutions. |
| CO5 | Illustrate the Intrusion Detection and Prevention Systems and discover the layers of application security |
| CO6 | Identify different threats and suggest fixes in data and cyber security. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 2 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 |
| CO5 | 2 | 2 | 2 | 1 |
| CO6 | 2 | 2 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----|---------|
| 1 | Information Security - Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, , Balancing Security and Access, Security SDLC. | 12 | CO1 |
| 2 | Cryptography- Classical Cryptography, Symmetric Cryptography, Public Key (Asymmetric cryptography), Modern Cryptography. Forensics: DRM technology (including watermarking and fingerprinting), Steganography, Biometrics. | 12 | CO2,CO3 |
| 3 | Network Security- Network Protocols, Wireless Security (WiFi, WiMAX, Bluetooth, cell phone), IDS and IPS, Network Intrusion Management. | 12 | CO4 |
| 4 | Application Security- Software Security, Mobile Security, and Database Security. | 12 | CO5 |
| 5 | Information Security Threats- Viruses, Worms and other malware, Email Threats, | 12 | CO6 |

| | | | |
|--|---|--|--|
| | Web Threats, Identity Theft, Data Security Breaches, Ethical Hacking -Hacking Tools and Techniques. | | |
|--|---|--|--|

Text Books:

1. W. Stallings, "Cryptography and Network Security: Principles and Practice", 6th Edition, Prentice Hall, 2013.
2. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003

Reference Books:

1. Neil Daswani, Christoph Kern, Anita Kesavan, "Foundations of Security: What Every Programme", APRESS, 2007.
2. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, 2003.

E-References:

1. <http://williamstallings.com/Cybersecurity/>
2. [freecomputerbooks.com › compscspcialSecurityBooks](http://freecomputerbooks.com/compscspcialSecurityBooks)

THIRD SEMESTER

**Course Title: CORE THEORY ELECTIVE 3-INTRODUCTION TO INTERNET OF THINGS
(For Students admitted from 2020 onwards)**

| | | | |
|--------------------|--|------------------|-------------|
| Course Code | : XX29322(A) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To understand the fundamentals of Internet of Things
- To learn about the basics of IOT protocols
- To build a small low cost embedded system using RaspberryPi.
- To apply the concept of Internet of Things in the real world scenario

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Interpret the vision of IoT from a global context |
| CO2 | Describe the fundamentals of IoT and M2M |
| CO3 | Analyze applications of IoT in Raspberry PI |
| CO4 | Appreciate the role of big data, cloud computing and data analytics in a typical IoT system |
| CO5 | Determine the market perspective of IoT |
| CO6 | Illustrate the application of IoT in Industrial Automation and identify Real World Design Constraints. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|-------------|-------------|-------------|-------------|
| CO1 | 3 | 3 | 2 | 2 |
| CO2 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 2 | 3 | 3 |
| CO6 | 2 | 1 | 3 | 3 |

3-Strong 2-Medium 1-Low

| Sl No. | Contents of Module | Hrs | COs |
|---------------|---|------------|------------|
| 1 | Introduction - Physical Design of IoT- Logical Design of IoT- IoT Enabling Technologies - IoT Levels & Deployment Templates. | 12 | CO1 |
| 2 | IoT and M2M - M2M – Difference between IoT and M2M-SDN and NFV for IoT - IoT system management –Need for SNMP-Network operator requirements- NETCONF - YANG - IoT System Management with NETCONF-YANG. | 12 | CO2 |
| 3 | IoT Platforms Design Methodology: Ten steps in IoT design methodology- IoT Physical Devices & Endpoints: Basic building blocks of IoT devices – Exemplary device: Raspberry Pi – Linux on Raspberry Pi – Raspberry Pi Interfaces – Programming Raspberry Pi with Python. | 12 | CO3 |
| 4 | IoT Physical Servers and Cloud Offerings :Introduction to Cloud storage models and Communication APIs – WAMP/AutoBahn for IoT – Xively Cloud for IoT – Python Web Application Framework -DJANGO — Amazon Web Services for IoT – Amazon EC2 – Amazon AutoScaling – Amazon S3 – AmazonRDS – Amazon DynamoDB – Data Analytics for IoT: Apache Hadoop –MapReduce Programming Model – Hadoop | 12 | CO4 |

| | | | |
|---|--|----|---------|
| | MapReduce job Execution – MapReduce job for Execution Workflow. | | |
| 5 | Case Studies and Real-World Applications: Realworld design constraints – Applications: Asset Management - Smart Grid - Commercial Building Automation - Smart Cities - Participatory Sensing. | 12 | CO5,CO6 |

Text Books:

1. ArshdeepBahga, Vijay Madiseti, "Internet of Things: A Hands-on Approach" , First Edition, Universities Press, 2015.
2. Jan Holler, VlasiosTsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier, 2014.

Reference Books:

1. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), "Architecting the Internet of Things", Springer, 2011.
2. Honbo Zhou, "The Internet of Things in the Cloud: A Middleware Perspective", CRC Press, 2012.
3. Olivier Hersent, David Boswarthick, Omar Elloumi , "The Internet of Things – Key applications and Protocols", Wiley, 2012
4. AmmarRayes, SamereSalam, "Internet of Things – From Hype to Reality", First Edition, Springer Publishers, 2017.
5. Raj Kamal, "Internet of Things Architecture and Design Principles", First Edition, Mc-Graw Hill Education, 2017.
6. AgusKurniawan, "Smart Internet of Things Projects", First Edition, Packt Publishing Ltd., 2016.

E-References:

1. <https://nptel.ac.in/courses/106/105/106105166/>
2. <https://www.edureka.co/blog/iot-tutorial/>
3. <https://www.javatpoint.com/iot-internet-of-things>

THIRD SEMESTER

Course Title: CORE THEORY ELECTIVE 3-BLOCK CHAIN TECHNOLOGY (For Students admitted from 2020 onwards)

| | | | |
|-------------|-------------------------------------|-----------|------|
| Course Code | : XX29322(B) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- Understand how blockchain systems (mainly Bitcoin and Ethereum) work.
- To securely interact with them.
- Design, build, and deploy smart contracts and distributed applications.
- Integrate ideas from blockchain technology into their own projects.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-----|---|
| CO1 | Understand emerging abstract models for Blockchain Technology. |
| CO2 | Identify major research challenges and technical gaps existing between theory and practice in crypto currency domain. |
| CO3 | It provides conceptual understanding of the function of Blockchain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable. |
| CO4 | Apply hyperledger Fabric and Ethereum platform to implement the Block chain Application. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|-----|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|--|-----|-----|
| 1 | Introduction to Blockchain: Blockchain-Centralized vs Decentralized systems-Layers of blockchain- Limitations of Centralized Systems - Blockchain adoption so far-Blockchain uses and Use cases-Byzantine Generals' Problem-The blockchain and Merkle Trees-Properties of Blockchain Solutions-Blockchain Transactions-Distributed Consensus Mechanisms-Blockchain applications. | 12 | CO1 |
| 2 | Working of BitCoin: Bitcoin -Working with bitcoins- The Bitcoin Blockchain: Block Structure, The Genesis Block- The Bitcoin Network: Bitcoin Transactions, Consensus and Block Mining, Block Propagation-Full Nodes vs SPVs. | 12 | CO2 |
| 3 | Working of Ethereum: Design Philosophy of Ehtereum-Etherreum Blockchain-Ethereum accounts-Trie Usage-Merkle Patricia Tree -Ethereum Transaction and Message Structure-Ethereum State Transaction Function-Gas and Transaction Cost-Ethereum smart contracts-Ethereum virtual machine and code execution- Ethereum Ecosystem: Swarm, Whisper, DApp, Development Components. | 12 | CO3 |
| 4 | Hyperledger: Introduction to Hyperledger-Blockchain for business-Advantages of Hyperledger fabric-Problems with existing blockchain technology-Hyperledger fabric architecture-Consensus in Hyperledger-Hyperledger tools-Hyperledger components. | 12 | CO4 |
| 5 | Blockchain-Outside of Currencies: Internet of Things: Physical Object Layer, Device Layer, Network Layer, Management Layer and Application Layer- | 12 | CO4 |

Text Books:

1. B. Singhal & G. Dhameja, "Beginning Blockchain: A Beginner's Guide to Building Blockchain Solutions", First Edition, Apress 2018. (Units: I, II, III)
2. Nakul Shah, "Blockchain for Business with Hyperledger Fabric: A complete guide to enterprise blockchain implementation using Hyperledger Fabric", BPB Publications, 2019 (Unit IV)
3. Bashir, Imran, "Mastering Blockchain: Deeper Insights Into Decentralization, Cryptography, Bitcoin, and Popular Blockchain Frameworks", 2017. (Unit V)

Reference Books:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, "Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, 2016.
2. D. Mohanty, Blockchain - From Concept to Execution, (2e) BPB Publications, 2018.
3. Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies".
4. Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System".
5. Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015.

E-References:

1. <https://www.tutorialspoint.com/blockchain/index.htm>
2. <https://www.javatpoint.com/blockchain-tutorial>
3. <https://nptel.ac.in/courses/106/105/106105184/>
4. https://onlinecourses.nptel.ac.in/noc20_cs01/preview

THIRD SEMESTER

**Course Title: CORE THEORY ELECTIVE 3-GREEN COMPUTING
(For Students admitted from 2020 onwards)**

| | | | |
|--------------------|-------------------------------------|------------------|------|
| Course Code | : XX29322(C) (XX-Year of admission) | Credits | : 04 |
| L:T:P:S | : 4:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- To learn the fundamentals of Green Computing.
- To analyze the Green computing Grid Framework.
- To understand the issues related with Green compliance.
- To study and develop various case studies.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Discuss Green IT with its different dimensions and Strategies |
| CO2 | Describe Green devices and hardware along with its green software methodologies. |
| CO3 | Analyze the various green enterprise activities, functions and their role with IT. |
| CO4 | Describe the concepts of how to manage the green IT with necessary components. |
| CO5 | Discuss the various laws, standards and protocols, key sustainability for regulating green IT. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|------------|------|------|------|------|
| CO1 | 2 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 2 |
| CO4 | 2 | 3 | 3 | 3 |
| CO5 | 2 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

| SI No. | Contents of Module | Hrs | COs |
|--------|---|-----|-----|
| 1 | Green IT-Overview: Introduction, Environmental Concerns and Sustainable Development, Environmental Impacts of IT, Green IT, Holistic Approach to Greening IT, Greening IT, Applying IT for enhancing Environmental sustainability, Green IT Standards and Eco-Labeling of IT, Enterprise Green IT strategy, Green IT: Burden or Opportunity? | 12 | CO1 |
| 2 | Green Devices and Hardware with Green Software: Green Devices and Hardware: Introduction, Life Cycle of a device or hardware, Reuse, Recycle and Dispose. Green Software: Introduction, Energy-saving software techniques, Evaluating and Measuring software Impact to platform power. | 12 | CO2 |
| 3 | Green Enterprises and the Role of IT: Introduction, Organization and Enterprise Greening, Information systems in Greening Enterprises, Greening Enterprise: IT Usage and Hardware, Inter-Organizational Enterprise activities and Green Issues, Enablers and making the case for IT and Green Enterprise. | 12 | CO3 |
| 4 | Managing Green IT: Introduction, Strategizing Green Initiatives, Implementation of Green IT, Information Assurance, Communication and Social media. | 12 | CO4 |
| 5 | Regulating the Green IT: Laws, Standards and Protocols Introduction, The regulatory environment and IT manufacturers, Non regulatory | 12 | CO5 |

| | | | |
|--|---|--|--|
| | government initiatives, Industry associations and standards bodies, Green building standards, Green data centers, Social movements and Greenpeace. Green IT: An Outlook: Introduction, Awareness to implementations, Greening by IT, Green IT: A megatrend?, A seven-step approach to creating green IT strategy, Research and Development directions. | | |
|--|---|--|--|

Text Book:

1. Harnessing Green IT Principles and Practices , San Murugesan, G.R. Gangadharan Wiley Publication, ISBN:9788126539680

Reference Books:

1. Bhuvan Unhelkar, "Green IT Strategies and Applications-Using Environmental Intelligence", CRC Press, June 2014.
2. Woody Leonhard, Katherine Murray, "Green Home computing for dummies", August 2012.
3. Alin Gales, Michael Schaefer, Mike Ebbers, "Green Data Center: steps for the Journey", Shroff/IBM rebook, 2011.
4. John Lamb, "The Greening of IT", Pearson Education, 2009..
5. Jason Harris, "Green Computing and Green IT- Best Practices on regulations and industry", Lulu.com, 2008
6. Carl Speshocky, "Empowering Green Initiatives with IT", John Wiley and Sons, 2010.
7. Wu Chun Feng, "Green computing: Large Scale energy efficiency", CRC Press

E-References:

1. <http://digitalthinkerhelp.com/what-is-green-computing-advantages-disadvantages-examples/>
2. https://www.tutorialspoint.com/environmental_studies/environmental_studies_towards_sustainable_future.htm

THIRD SEMESTER

Course Title: **CORE PRACTICAL P5- BIG DATA ANALYTICS LAB**
(For Students admitted from 2020 onwards)

| | | | |
|-------------|----------------------------------|-----------|------|
| Course Code | : XX29323 (XX-Year of admission) | Credits | : 02 |
| L:T:P:S | : 0:0:5:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

- *Demonstrate the insight of an exciting growing field of Big Data analytics.*
- *Derive the scripts of Hadoop, NoSql, MapReduce to develop the knowledge of data science*
- *Derive the coding to manage and analyze big data like Hadoop, NoSql, MapReduce.*
- *Practice big data analytics and machine learning approaches, which include the study of modern computing big data technologies.*
- *Scaling up machine learning techniques focusing on industry applications.*
- *Exhibit the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability.*
- *Validate the students to have skills that will help them to solve complex real-world problems in for decision support.*

Lab Exercises:

1. Perform setting up and Installing Hadoop in its three operating modes:
 - i. Standalone, Pseudo distributed, fully distributed
 - ii. Use web based tools to monitor your Hadoop setup.
2. Implement the following file management tasks in Hadoop:
 - a. Adding files and directories
 - b. Retrieving files
 - c. Deleting files Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.
3. Run a basic Word Count Map Reduce program to understand Map ReduceParadigm.
4. Write a Map Reduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record- oriented.
5. Implement Matrix Multiplication with Hadoop MapReduce
6. Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.
7. Install and Run Hive then use Hive to create, alter, and drop databases,tables, views, functions, and indexes.

THIRD SEMESTER

Course Title: CORE PRACTICAL P6- DOT NET PROGRAMMING LAB
(For Students admitted from 2020 onwards)

| | |
|---|-----------------------|
| Course Code : XX29324 (XX-Year of admission) | Credits : 02 |
| L:T:P:S : 0:0:5:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Course Objectives:

- To develop windows and web applications in MVC .Net platform.
- To strengthen Object Oriented Programming using advanced concepts in VB.NET.

Lab Exercises-VB.NET:

1. Simple Computations
2. Classes and methods
2. Constructors with parameters
3. Pass by values and pass by reference
4. Arrays
5. Structures
6. Enumerator
7. Method Overloading
8. Inheritance
9. Delegates and Events
10. Exception Handling

Lab Exercises-ASP.NET:

1. Create a windows form with the following controls Textbox, Radio button, Check box, Command Button
2. Write a program for Menu option.
3. Create a program to perform validation using validation controls.
4. Windows Application with Database Connectivity using VB.NET and ADO.NET
5. Windows Application with Database Connectivity using VB.NET and OLEDB.
6. Web Application with Database Connectivity using ASP.NET and ADO.NET
7. Developing an application to implement request, response objects and cookies

*****End of Third Semester*****

FOURTH SEMESTER

Course Title: CORE PROJECT T13-PROJECT WORK (For Students admitted from 2020 onwards)

| | | | |
|-------------|----------------------------------|-----------|------|
| Course Code | : XX29426 (XX-Year of admission) | Credits | : 12 |
| L:T:P:S | : 0:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Course Objectives:

Students will be able to:

- *Implement the solution for the chosen problem using the concepts and the techniques learnt in the curriculum.*
- *Develop software applications*
- *Record the research results for a given problem*
- *Identify, formulate and implement computing solutions.*
- *Design and conduct experiments, analyze and interpret data.*
- *Analyze a system, component or process as per needs and specification.*
- *Work on multidisciplinary tasks and will be aware of the new and emerging disciplines.*
- *Demonstrate skills to use modern tools, software and equipments to analyze problems.*

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-----|---|
| CO1 | Demonstrate a sound technical knowledge, skills and attitude of their selected project topic. |
| CO2 | Understand problem identification, formulation and solution. |
| CO3 | Design solutions to complex problems utilizing a systems approach. |
| CO4 | Communicate with engineers and the community at large in written and oral forms. |

Mapping of Course Outcomes to Program Specific Outcomes:

| | PSO1 | PSO2 | PSO3 | PSO4 |
|-----|------|------|------|------|
| CO1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 2 |
| CO4 | 2 | 3 | 3 | 3 |

3-Strong 2-Medium 1-Low

Procedure:

- The Head of the Department will assign an Internal Guide for each student.
- As soon as the student gets project, the student should submit the contact details of the organization to their guide.
- During regular intervals, student should report about his/her progress of the project work.
- The final semester will be entirely assigned for the student to carry out their project work.
- After the submission of the final report, an external examiner will evaluate the project document and conduct the viva voce examination.

*******End of Fourth Semester*******



DWARAKA DOSS GOVERDHAN
DOSS VAISHNAV COLLEGE
SCHOOL OF MANAGEMENT

School of Management

(NEW Curriculum - Syllabus, effective from JUNE – 2021)

Choice Based Credit System (CBCS)

Outcome based Education (OBE)

M.B.A.

Scheme and Syllabus

DG Vaishnav College

#833, EVR Periyar High Road,

Arumbakkam, Chennai – 600106

Phone – 91-44-23635104

Web site: www.dgvcmba.com

TABLE OF CONTENTS

| S.No | PARTICULARS | Page No |
|-----------------|--|---------|
| 1 | Vision, Mission and Program Educational Objectives (PEO) | 3 |
| 2 | Program Outcomes (PO) with Graduate Attributes | 3 |
| 3 | Mapping of POs with PEOs | 3 |
| SCHEME | | |
| 4 | Scheme of First Semester MBA | 5 |
| 5 | Scheme of Second Semester MBA | 6 |
| SYLLABUS | | |
| 6 | Syllabus of First Semester MBA: | 7 - 37 |
| | <ul style="list-style-type: none"> a) MBA-101 Management Process And Organizational Behavior b) MBA102 Statistics For Management c) MBA 103 Economics For Managers d) MBA104 Accounting For Managers e) MBA105 Legal Systems In Business f) MBA 106 International Business Management g) MBA107 Entrepreneurship h) MBA-S-101 Soft Skills-I – Advanced Language & Presentation Skills/ Personality Enrichment. | |
| 7 | Syllabus of Second Semester MBA: | 38 |
| | <ul style="list-style-type: none"> a) MBA201 Human Resource Management b) MBA202 Resource Management Techniques c) MBA 203 Operations Management d) MBA204 Financial Management e) MBA205 Research Methodology f) MBA206 Management Information Systems g) MBA207 Marketing Management h) MBA-S-201 Soft Skills-II- Computing Skills Data Analysis & Business Modeling/ Technical Writing And Presentation. i) MBA-299 Internship 1 | |
| | Syllabus of Third Semester MBA: | |
| | <ul style="list-style-type: none"> a) MBA301 Strategic Management b) MBA302 Total Quality Management c) *Elective 1 to 4 | |

| | | |
|----|---|--|
| | d) MBA-S-301 Soft Skills-II Spoken and Presentation skills/ Rural Development Programme e) MBA-399 Internship 2 | |
| | Syllabus of Fourth Semester MBA: a) *Elective 5 to 8 b) MBA-S-401 Soft Skills-Managerial Skills/ Career Advancement Course For Managers. c) MBA-499 Final Project | |
| 8 | Syllabus of Business Analytics/CIMA | |
| 9 | Appendix A Outcome Based Education | |
| 10 | Appendix B Graduate Parameters as defined by National Board of Accreditation | |
| 11 | Appendix C Bloom's Taxonomy | |

**List of Electives mentioned in Scheme of Syllabus*

VISION

Our **Vision** is to emerge as a centre of excellence in Management, imparting value based education to develop transformational leaders with functional expertise and entrepreneurial perspectives.

MISSION

| | |
|-----------|--|
| M1 | Impart Quality Education to the students in core areas and business management with moral Values through our dedicated team. |
| M2 | Create learning atmosphere that fosters individual intellectual development. |
| M3 | Provide platform for the students to explore their innovative and creative skills. |
| M4 | Promoting activities to cultivate the spirit of Entrepreneurship to the students |
| M5 | Empowering the students in Organizing Events to gain Experience in Team work and Leadership Qualities. |
| M6 | Preparing the students for their role as MBA in society with an awareness of Ethical, Environment, Economies, safety and Quality Issues. |

PROGRAM EDUCATION OBJECTIVES (PEOs)

| | |
|-------------|--|
| PEO1 | Successful Professionals in Leading National and International Business Enterprise or Research/ Academic or Entrepreneurs. |
| PEO2 | Attitudes and abilities of Leader to adapt the Changing Global Business Scenario. |
| PEO3 | Good Professional Personality and Ethical Values to lead as responsible citizens and competent professionals. |

PEO TO MISSION STATEMENT MAPPING

| MISSION STATEMENTS | PEO1 | PEO2 | PEO3 |
|--------------------|------|------|------|
| M1 | 3 | 3 | 3 |
| M2 | 3 | 1 | 2 |
| M3 | 3 | 2 | - |
| M4 | 3 | 3 | 2 |
| M5 | 3 | 2 | - |
| M6 | 3 | 2 | 2 |

CORRELATION

3 - STRONG 2 - MEDIUM 1 - LOW (-) - NO CORRELATION

PROGRAM OUTCOMES (PO) WITH GRADUATE ATTRIBUTES

| | | |
|------------|---|---|
| PO1 | Domain Knowledge | Apply Knowledge of Management Theories & Practices to solve Business Problems |
| PO2 | Critical Thinking & Decision Making / Problem Solving | Foster Analytical & Critical Thinking abilities for Data – Based Decision Making. |
| PO3 | Leadership | Ability to develop value based Leadership Ability |
| PO4 | Environment & Sustainability | Ability to understand, Analyze & communicate Global, Economic, Legal & Ethical aspects of Business. |
| PO5 | Team Work | Ability to lead themselves & others in the achievement of Organizational Goals, Contributing effectively to a team environment. |
| PO6 | Entrepreneurship | Ability to identify Entrepreneurial opportunities & leverage, Managerial & Leadership Skills for funding leading start – ups as well as growing family Business |
| PO7 | Social Responsiveness & Ethical | Apply ethical principles & commit to Professional Ethics & Responsibility and norms of Management Practices. |
| PO8 | Continuous Learning | Recognize the need and prepare to engage in lifelong learning in the broad context of technology changes leading sustainability. |

Mapping of POs TO PEOs

| PE0/PO | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|
| PE01 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 |
| PE02 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 |
| PE03 | 3 | 3 | 2 | 2 | 2 | 1 | 3 | 1 |

CORRELATION

3 - STRONG

2 - MEDIUM

1 - LOW

(-) - NO CORRELATION

PROGRAM SPECIFIC OUTCOMES

PSO 1: Graduates will have ability to Identify, Formulate and analyze the problems relating to Marketing, Finance, Human Resource and Supply chain Management.

PSO 2: Graduates will have an ability to implement / Use appropriate Techniques, Management Skills, and Analytical Techniques and to solve Management Problems.

SCHOOL OF MANAGEMENT
SCHEME OF I SEMESTER MBA PROGRAM

| Sl. NO | Course Code | Course | DEPT | Credit Distribution | | | | Over all Credits | Marks | | |
|--------------|-------------|---|------|---------------------|---|---|---|------------------|------------|------------|------------|
| | | | | L | T | P | C | | CIA | SEE | Total |
| 1 | MBA-101 | MANAGEMENT PROCESS AND ORGANIZATIONAL BEHAVIOUR | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 2 | MBA-102 | STATISTICS FOR MANAGEMENT | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | MBA-103 | ECONOMICS FOR MANAGERS | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 4 | MBA-104 | ACCOUNTING FOR MANAGERS | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 5 | MBA-105 | LEGAL SYSTEMS IN BUSINESS | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 6 | MBA-106 | INTERNATIONAL BUSINESS MANAGEMENT | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 7 | MBA- 107 | ENTREPRENEURSHIP | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 8 | MBA-S-101 | SOFT SKILLS-I – ADVANCED LANGUAGE & PRESENTATION SKILLS | MBA | 0 | 0 | 2 | 0 | 2 | 40 | 60 | 100 |
| Total | | | | | | | | 30 | 320 | 480 | 800 |

SCHOOL OF MANAGEMENT
SCHEME OF II SEMESTER MBA PROGRAM

| Si. No | Course Code | Course | Dept | Credit Distribution | | | | Over All Credits | Marks | | |
|--------------|-------------|--|------|---------------------|---|---|---|------------------|------------|------------|------------|
| | | | | L | T | P | C | | CIA | SEE | Total |
| 1 | MBA-201 | HUMAN RESOURCE MANAGEMENT | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 2 | MBA-202 | RESOURCE MANAGEMENT TECHNIQUES | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | MBA-203 | OPERATIONS MANAGEMENT | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 4 | MBA-204 | FINANCIAL MANAGEMENT | MBA | 3 | 0 | 1 | 1 | 4 | 40 | 60 | 100 |
| 5 | MBA-205 | RESEARCH METHODOLOGY | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 6 | MBA-206 | MANAGEMENT INFORMATION SYSTEMS | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 7 | MBA-207 | MARKETING MANAGEMENT | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 8 | MBA-S-201 | SOFT SKILLS-II- Computing Skill-DATA ANALYSIS AND BUSINESS MODELING | MBA | 2 | 0 | 0 | 0 | 2 | 40 | 60 | 100 |
| 9 | MBA-299 | INTERNSHIP –1- (DEC – JAN 4 WEEKS) | MBA | 0 | 0 | 0 | 4 | 4 | 25 | 75 | 100 |
| Total | | | | | | | | 34 | 345 | 555 | 900 |

SCHOOL OF MANAGEMENT
SCHEME OF III SEMESTER MBA PROGRAM

| Si. No | Course Code | Course | Dept | Credit Distribution | | | | Over All Credits | Marks | | |
|--------------|------------------------|---|------|---------------------|---|---|---|------------------|------------|------------|------------|
| | | | | L | T | P | C | | CIA | SEE | Total |
| 1 | MBA-301 | STRATEGIC MANAGEMENT | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 2 | MBA-302 | TOTAL QUALITY MANAGEMENT | MBA | 3 | 0 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | | ELECTIVE – 1 | MBA | 3 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | | ELECTIVE – 2 | MBA | 3 | 0 | 0 | 1 | 3 | 40 | 60 | 100 |
| 5 | | ELECTIVE – 3 | MBA | 3 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6 | | ELECTIVE – 4 | MBA | 3 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 7 | MBA-S-301 MBA-S-302 | SOFT SKILLS – SPOKEN AND PRESENTATION SKILL | MBA | 0 | 0 | 2 | 0 | 2 | 40 | 60 | 100 |
| 11 | MBA 399 | INTERNSHIP 2 – (MAY – JUN - 4Weeks) | MBA | 0 | 0 | 4 | 0 | 4 | 25 | 75 | 100 |
| Total | | | | | | | | 26 | 345 | 555 | 900 |

SCHOOL OF MANAGEMENT

SCHEME OF IV SEMESTER MBA PROGRAM

| Si. No | Course Code | Course | Dept | Credit Distribution | | | | Over All Credits | Marks | | |
|--|-------------|--|------|---------------------|---|---|---|------------------|------------|------------|------------|
| | | | | L | T | P | C | | CIA | SEE | Total |
| 1 | | ELECTIVE – 5 | MBA | 3 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | | ELECTIVE – 6 | MBA | 3 | 0 | 0 | 1 | 3 | 40 | 60 | 100 |
| 3 | | ELECTIVE – 7 | MBA | 3 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | | ELECTIVE – 8 | MBA | 3 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5 | MBA-S-401 | SOFT-SKILLS – MANAGERIAL SKILLS | MBA | 0 | 0 | 2 | 0 | 2 | 40 | 60 | 100 |
| 6 | MBA-499 | FINAL PROJECT – (DEC-JAN- 8 WEEKS) | MBA | 0 | 0 | 8 | 0 | 8 | 50 | 150 | 200 |
| 7 | MBA-EEC-301 | EMPLOYABILITY ENRICHMENT COURSE CIMA/BUSINESS ANALYTICS (IoA) (Optional) | MBA | 0 | 0 | 2 | 0 | 2 | | | |
| 8 | MBA-EEC-302 | MOOCS Course (Optional) | MBA | 0 | 0 | 2 | 0 | 1 | | | |
| 9 | MBA-EEC-303 | INTERNATIONAL IMMERSION PROGRAM (Optional) | MBA | 0 | 0 | 2 | 0 | 1 | | | |
| Total (Optional credits not included) | | | | | | | | 22 | 250 | 450 | 700 |

| | | | | |
|--------------------|------------|-------------|-------------|-------------|
| GRAND TOTAL | 112 | 1220 | 1980 | 3200 |
|--------------------|------------|-------------|-------------|-------------|

LIST of ELECTIVES for MBA (Full Time)-Semester III and IV

| Course Code | Course Title | Dept. | L | T | P | C |
|----------------------------------|---|--------------|----------|----------|----------|----------|
| FINANCE | | | | | | |
| FIN-301 | INVESTMENT MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| FIN-302 | INTERNATIONAL FINANCIAL MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| FIN-303 | MERCHANT BANKING AND FINANCIAL SERVICES | MBA | 3 | 0 | 0 | 3 |
| FIN-401 | FINANCIAL DERIVATIVES | MBA | 3 | 0 | 0 | 3 |
| FIN-402 | RISK MANAGEMENT AND INSURANCE | MBA | 3 | 0 | 0 | 3 |
| FIN-403 | CORPORATE TAXATION | MBA | 3 | 0 | 0 | 3 |
| MARKETING | | | | | | |
| MKT-301 | SERVICES MARKETING | MBA | 3 | 0 | 0 | 3 |
| MKT-302 | INTEGRATED MARKETING COMMUNICATION | MBA | 3 | 0 | 0 | 3 |
| MKT-303 | GLOBAL MARKETING MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| MKT-401 | SALES AND DISTRIBUTION MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| MKT-402 | RETAIL MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| MKT-404 | SOCIAL MEDIA MARKETING | MBA | 3 | 0 | 0 | 3 |
| HUMAN RESOURCE MANAGEMENT | | | | | | |
| HR-301 | STRATEGIC HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT | MBA | 3 | 0 | 0 | 3 |
| HR-302 | LABOUR LEGISLATIONS | MBA | 3 | 0 | 0 | 3 |
| HR-303 | GLOBAL HUMAN RESOURCE MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| HR-305 | LEADERSHIP AND ORGANISATIONAL EFFECTIVENESS | MBA | 3 | 0 | 0 | 3 |
| HR-401 | KNOWLEDGE MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| HR-402 | TRAINING AND HUMAN PERFORMANCE ENHANCEMENT | MBA | 3 | 0 | 0 | 3 |
| SYSTEMS | | | | | | |

| | | | | | | |
|---------|---|-----|---|---|---|---|
| SYS-301 | BIG DATA TECHNOLOGY | MBA | 3 | 0 | 0 | 3 |
| SYS-302 | DATA MINING AND WAREHOUSING | MBA | 3 | 0 | 0 | 3 |
| SYS-303 | CLOUD COMPUTING | MBA | 3 | 0 | 0 | 3 |
| SYS-401 | E – COMMERCE TECHNOLOGY AND MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| SYS-402 | EMERGING TECHNOLOGIES FOR MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| SYS-403 | ENTERPRISE RESOURCE PLANNING | MBA | 3 | 0 | 0 | 3 |
| | SUPPLY CHAIN MANAGEMENT ELECTIVES | | | | | |
| SCM-301 | INTEGRATED SUPPLY CHAIN MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| SCM-302 | PURCHASING MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| SCM-401 | INTERNATIONAL LOGISTICS AND MANAGEMENT OF GLOBAL SUPPLY CHAIN | MBA | 3 | 0 | 0 | 3 |
| SCM-402 | TRANSPORTATION AND WAREHOUSING MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| | ENTREPRENEURSHIP | | | | | |
| ENT-301 | MANAGING NEW BUSINESS INITIATIVES | MBA | 3 | 0 | 0 | 3 |
| ENT-302 | MANAGEMENT PRACTICES FOR FAMILY BUSINESSES | MBA | 3 | 0 | 0 | 3 |
| ENT-303 | PROJECT MANAGEMENT | MBA | 3 | 0 | 0 | 3 |
| ENT-401 | MANAGING STARTUPS | MBA | 3 | 0 | 0 | 3 |
| ENT-402 | FINANCING NEW VENTURES | MBA | 3 | 0 | 0 | 3 |
| ENT-403 | SOCIAL ENTREPRENEURSHIP | MBA | 3 | 0 | 0 | 3 |

FIRST SEMESTER
(SYLLABUS)

MANAGEMENT PROCESSES AND ORGANIZATIONAL BEHAVIOUR

Course Code : MBA101

L:T:P:C : 3:0:1:4

Exam Hours : 03

Credits : 04

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Apply the Principles of Management and effective Decision making and critical thinking and strategy formulation. |
| CO2 | Demonstrate the applicability of the concept of OB to analyze the behavior of people in the Organization. |
| CO3 | Analyze Individual Behavior, Job Satisfaction and the importance of Motivation. |
| CO4 | Exposure on Group Behavior and the need of Leadership and to handle stress |
| CO5 | Evaluate Organization needs, structure and its effectiveness |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 |
| CO2 | 3 | 1 | 3 | 2 | 3 | 2 | 1 | 1 |
| CO3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| CO4 | 3 | 1 | 3 | 1 | 3 | 2 | 1 | 2 |
| CO5 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 2 |

| Si No | CONTENTS OF MODULE | Hrs | Cos |
|--------------|--|------------|------------|
| 1 | Management Processes - Planning, Nature and purpose of planning - Planning process- Types of plans- Objectives- Managing by Objective (MBO) strategies –Decision Making - Types of decision - Decision making process - Organizing - Organization structure - Line and staff authority – Departmentation - Span of control - Centralization and decentralization - Delegation of authority – Staffing - Selection and Recruitment - Career development - Career stages - Directing –controlling - Types of control - Budgetary and non-budgetary control techniques -Managing productivity - Quality control - span of control, centralization Vs decentralization, Business Modeling. | 9 | CO1 |
| 2 | Introduction to Organization Behavior - Historical perspective - Organization – Management - Role of managers - Evolution of management thought - Organization and the environmental factors - Managing globally - Strategies for International business. | 9 | CO2 |

| | | | |
|---|---|---|-----|
| 3 | Foundations of individual Behavior - Personality – types – Factors influencing personality – Theories – Learning – Types of learners – The learning process – Learning theories – Organizational behaviour modification. Attitudes – Characteristics – Measurement - Values. Perceptions –Importance –Factors influencing perception. Motivation – Importance –Types –Effects on work behavior - Motivation- concepts and applications - Theories of Motivation | 9 | CO3 |
| 4 | Foundations of Group Behavior – Formation – Groups in organizations – Influence – Group dynamics – Emergence of informal leaders and working norms – Group decision making techniques –Team building – Interpersonal relations –Communication – Control - conflicts and negotiations, communication - Meaning –Importance –Leadership styles –Theories – Leaders Vs Managers –Sources of power –Power centers –Power and Politics Stress - Managing change. Stress –Work Stressors – Prevention and Management of stress – Balancing work and Life | 9 | CO4 |
| 5 | Dynamics of organization - QWL, International OB. Definition, need and importance of organizational behaviour –Nature and scope – Frame work – Organizational behaviour models. Organizational culture and climate –Factors affecting organizational climate – Importance. Job satisfaction –Determinants – Measurements – Influence on behavior. Organizational change –Importance – Stability Vs Change – Proactive Vs Reaction change –the change process – Resistance to change – Organizational development – Characteristics – objectives – Organizational effectiveness Developing Gender sensitive workplace. | 9 | CO5 |

TEXT BOOKS:

1. **Robbins**, Essentials of Management, 6e Pearson Education India 2010
2. **Bhattacharya**, Principles of Management: Text and Cases, 1e Pearson Education India 2012
3. **Robbins**, Essentials of Organizational Behavior, 14/e Pearson Education India 2019

REFERENCE BOOKS:

1. Fundamentals of Management-Stephen P Robbins, Mary Coulter et al, Pearson Publications, 11th edition
2. Management-Richard L. Daft, Cengage learning, 12th Edition, 2016
3. Organization Behavior – Ashwathappa, Himalaya Publication, 7th Edition, 2007
4. **Robbins**, Organizational Behavior, 18/e Pearson Education India 2019

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|------------|
| | | | | | | (4) | (4) |
| Remember | 1 | 2 | | | | | |
| Understand | | 1 | | | | | |
| Apply | 4 | 2 | 2 | | 2.5 | | |
| Analyze | | 2 | 2 | 2 | | | Case Study |
| Evaluate | 2 | 2 | | 2 | 2.5 | | |
| Create | | 1 | 1 | 1 | | Business Simulation | |

ESE- End Semester Examination (100 Marks, weightage 60%)

| Bloom's Category | Test |
|------------------|------|
| Remember | 5 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

STATISTICS FOR MANAGEMENT

Course Code : MBA102

L:T:P:C : 3:0:1:4

Exam Hours : 03

Credits : 04

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Recall and solving problems based on the addition theorem, multiplication theorem, conditional probability and Baye's theorem. Restate the Discrete distributions such as Binomial and Poisson distribution. |
| CO2 | Differentiate the univariate and bivariate analysis. Explain correlation, rank correlation and regression analysis by numerical example |
| CO3 | Summarize the concept of sampling, Null Hypothesis, alternative Hypothesis, type I and type II errors, sampling errors and standard errors. |
| CO4 | Distinguish between small samples and large samples. Summarize the concept of parametric test z-test, t-test, F-test and non parametric test chi-square test by given examples. |
| CO5 | Demonstrate the analysis of variance of one way classification and two way classification with numerical examples |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 2 | 3 | - | - | - | - | - | 1 |
| CO2 | 2 | 3 | - | - | - | 1 | - | 1 |
| CO3 | 2 | 3 | - | - | - | 1 | - | 1 |
| CO4 | 2 | 3 | - | - | - | - | - | 1 |
| CO5 | 2 | 3 | - | - | - | 1 | - | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|--|------------|------------|
| 1 | Probability: Introduction to probability theory: events and their probabilities, subjective probabilities; continuous and discrete distributions: Binomial, Poisson, Normal, and exponential distributions; Expected values, averages and standard deviations. Conditional Probability – Bayes' theorem. | 9 | CO1 |
| 2 | Correlation, Regression Analysis: Correlation coefficient – Rank Correlation coefficient – Regression lines. | 9 | CO2 |
| 3 | Sampling distribution : Estimation and Hypothesis, Sampling Distribution concepts, Introduction to sampling distributions, concepts – sample size — Hypothesis – Testing of Proportion and Mean - Methods of sampling – Concepts of sampling and non- sampling errors – Standard error- Type I and Type II error in Hypothesis testing | 9 | CO3 |
| 4 | Parametric Analysis –. Chi Square Test – Goodness of Fit – Relationship between variables - t test | 9 | CO4 |
| 5 | Analysis of variance – one-way and two-way classification | 9 | CO5 |

TEXT BOOKS:

1. **Mariappan**, Operations Research, 1e by Pearson Education India 2013.
2. **Natarajan**, Operations Research, 2e by Pearson Education India 2014.
3. **Taha**, Operations Research: An Introduction, 10e Pearson Education India 2018

REFERENCE BOOKS:

1. Green & Tull, Market Research, Prentice Hall
2. Amir D. Aczel, Complete Business Statistics, 5th ed., Irwin McGraw Hill, 2001
3. Hooda R.P, Statistics for Business and Economics, 2nd ed., McMillan India
4. Richard I. Levin & David S. Rubin, Statistics For Management, 7th ed., PHI
5. Dr. P.N. Arora and Mrs. S. Arora, Statistics for management, S. Chand & Company Ltd.

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODE L (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|-------------|----------------|------------------|-------------------|--|-------------------------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | Application of correlation on business model | |
| Analyze | 3 | 2 | 3 | 3 | | | Application of Research tools |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (100 Marks, weightage 60%)

| Bloom's Category | Test |
|------------------|------|
| Remember | 5 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

ECONOMICS FOR MANAGERS

Course Code : MBA103
L:T:P:C : 3:0:1:4
Exam Hours : 03

Credits : 04
CIA Marks : 40
ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyse Market demand and supply patterns through forecasting techniques. |
| CO2 | Evaluate National Income using techniques and underlying policies. |
| CO3 | Compare market structures and different pricing methods. |
| CO4 | Analyse and evaluate demand pattern using Date software. |
| CO5 | Identify the consequence of globalization and role of Banks in International Trade. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 2 | 3 | 1 | 3 | 1 | 3 | 1 | 3 |
| CO2 | 3 | 3 | 1 | 3 | 1 | 2 | 1 | 2 |
| CO3 | 2 | 1 | 1 | 3 | 2 | 3 | 2 | 2 |
| CO4 | 3 | 3 | 1 | 3 | 1 | 3 | 2 | 3 |
| CO5 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|--|------------|------------|
| 1 | Introduction to Managerial Economics – Decision making in the household: Consumer choice, Theory of Demand; Its Determination, Estimation and Forecasting – Decision making in the firm: production, cost, supply; its Determination and Derivation. | 9 | CO1 |

| | | | |
|---|--|---|-------------|
| 2 | Macroeconomics : National Income – GDP – GNP – NNP –Price Indices – Inflation – Output – Consumption – Savings – Investment– Economic collapse - Economy Resilience - International Trade , IS-LM Model , Impact of government policies –Monetary policy – Fiscal policy – Indian Trade policy –Exchange rate policy | 9 | CO2 |
| 3 | Equilibrium in different market structures – Perfect Competition, Monopoly, Discriminating Monopoly, Monopolistic Competition, Oligopoly; Pricing – Types and Methods | 9 | CO3 |
| 4 | Econometrics – Different Data types – Regression Models ; Demand analysis and Forecasting – Techniques of Demand Forecasting ; Use of Software packages for Forecasting ; Use of Big Data Analytics in Economics. | 9 | CO4, CO5 |
| 5 | Role of Central Banks – Role of Commercial Banks – Impact of Interest Rates in all areas – Foreign Exchange Market : Determination of Exchange rate , Impact of Foreign Exchange Rate , Forward Contracts , Futures and Options to manage the impact of Exchange Rate changes ; Concept of Globalization – Institutions encouraging IN Trade – Balance of Trade – Balance of Payments. New Economic Model. | 9 | CO5 |

TEXT BOOKS:

1. **Agarwal**, Managerial Economics, 1/ePearson Education India 2013
2. **Slooman**, Essential Economics for Business, 5ePearson Education India 2019
3. **Keat**, Managerial Economics, 7ePearson Education India 2013

REFERENCE BOOKS:

1. Mithani, D M, Managerial Economics – Theory & Applications, Himalaya Pub.
2. Mehta, P L, Managerial Economics – Analysis, Problems & Cases, Sultan Chand
3. Peterson, H. C and Lewis, W. C. Managerial Economics, 4th Ed, Prentice Hall
4. Abel & Bernanke, Macroeconomics, 4thed, Pearson Pub
5. Froyen, Macroeconomics, 6th ed., Pearson Education

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |

| | | | | | | | |
|----------|---|---|---|---|---|-----------------------------------|----------------------------------|
| Analyze | 3 | 2 | 3 | 3 | | Micro And Macro Analysis | |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | Study on Economic Policies |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-----------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

ACCOUNTING FOR MANAGERS

Course Code : MBA104

L:T:P:C : 3:0:1:4

Exam Hours : 03

Credits : 04

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Apply the conceptual framework of accounting, and apply the comprehensive treatment of accounting principles and standards. |
| CO2 | Analyze the financial concepts and interpret the Financial statements |
| CO3 | Analyze and Evaluate financial data of Company. |
| CO4 | Apply the cost principles for production of products. |
| CO5 | Apply Analytical techniques to generate financial statements through technology application. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| CO5 | 3 | 3 | 1 | 2 | 1 | 3 | 2 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | <p>Unit I: Financial Accounting</p> <p>Definition - Principle Concepts & Conventions – Accounting Standards - Preparation Of Final Accounts: Trial Balance- Trading, Profit/Loss Account and Balance Sheet</p> <p>Understanding Of Final Accounts with Adjustments: Provision for Doubtful Debts, Discount on Debtors and Creditors, Bad Debts, Interest on Capital, Prepaid Expenses and Outstanding.</p> | 9 | CO1 |
| 2 | <p>Unit II: Company Accounts</p> <p>Meaning Of Company – Maintenance Of Books Of Accounts – Profit Or Loss Before Incorporation – Alteration Of Share Capital – Preferential Allotment, Employee Stock Option – Buy Back Of Securities - Introduction of Insolvency and Bankruptcy Code 2016 - Objectives.</p> | 9 | CO2 |

| | | | |
|---|---|---|-------------|
| 3 | Unit III: Analysis Of Financial Statement Financial Statement Analysis-Common size Statement and Comparative Statement, Ratio Analysis - Comparison between Funds Flow and Cash Flow Statement – Cash Flow Analysis (as per IND AS7 Standard) | 9 | CO3 |
| 4 | Unit IV: Cost Accounting Cost Accounts – Classification And Accounting Of Manufacturing Costs – Cost Accounting System - Budgets And Budgetary Control – Marginal Cost Analysis, Cost Accounting – Elements Of Cost | 9 | CO4, CO3 |
| 5 | Unit V: Accounting In Computerised Environment Significance Of Computerized Accounting System – Codification And Grouping Of Accounts – Maintaining The Hierarchy Of Ledgers – Prepackaged Accounting Software. | 9 | CO5 |

TEXT BOOKS:

1. **Dhamija**, Financial Accounting for Managers, 3e Pearson Education India 2019\
2. **Gupta**, Financial Accounting for Management, 6e Pearson Education India 2019
3. **Horngren**, Horngren’s Cost Accounting, 16e Pearson Education India 2017

REFERENCE BOOKS:

1. Carl S Warren, James M Reeves, Philip E Fess, “Financial Accounting” , Thompson, 2003
2. T.S. Reddy & Y. Hari Prasad Reddy – Financial and Management Accounting – Margham Publications,
3. Nhavesh M. SPaul, Cost Accounting or Management Accounting, Allied Publishers Ltd., New Delhi, 1997
4. S.P. Jain & K.L. Narang, Cost Accounting, Kalyani Publishers, Ludhiana, 1997
5. N. Ramachandran & Ramkumar – “Financial accounting for management – Tata McGraw hill

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|---|
| | | | | | | (4) | (4) |
| Remember | 1 | 1 | | | | | |
| Understand | 1 | 2 | | | 2 | | |
| Apply | 2 | 2 | | 2 | | | |
| Analyze | 3 | 3 | 5 | 3 | 3 | Audit Report analysis | |
| Evaluate | | 2 | | | | | |
| Create | | | | | | | Financial statement of new business Model |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

LEGAL SYSTEMS IN BUSINESS

Course Code : MBA105

L:P:T:C : 3:0:1:4

Exam Hours : 03

Credits : 04

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Examine the relevance of business law to individuals and businesses and the role of law in an economic, political and social context |
| CO2 | Identify the legal principles governing contractual agreements. |
| CO3 | Apply the principles of company law in Incorporation process. |
| CO4 | Implement appropriate laws in IR. |
| CO5 | Analyze and evaluate Consumer Protection Laws. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | 1 |
| CO2 | 3 | 1 | 1 | 3 | 1 | 2 | 2 | 1 |
| CO3 | 3 | 1 | 1 | 3 | 1 | 3 | 2 | 2 |
| CO4 | 3 | 1 | 2 | 3 | 2 | 2 | 3 | 2 |
| CO5 | 3 | 3 | 1 | 3 | 1 | 3 | 2 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|--|------------|-----------------|
| 1 | Commercial Law - The Indian Contract Act 1872 Definition of contract, essentials elements and types of a contract, Formation of a contract, performance of contracts, breach of contract and its remedies, Quasi contracts - Contract Of Agency: Nature of agency, Creation and types of agents, Authority and liability of Agent and principal: Rights and duties of principal and agents, termination of agency. | 9 | CO1 |
| 2 | Commercial Law - The Sale of Goods Act 1930 Special contracts – sale of goods act 1930 – negotiable instruments act 1881, Types of negotiable instruments | 9 | CO2 |
| 3 | Company Law Kinds of companies – formation & incorporation of a company – memorandum & articles of association – prospectus – Power, duties and liabilities of Directors– meetings– winding up of a company | 9 | CO3, CO5 |

| | | | |
|---|--|---|-------------|
| 4 | Industrial Law Introduction to Industrial Disputes Act 1947, An Overview of Factories Act, 1948 – Employee Provident Fund & Miscellaneous Act, 1952 – Employee State Insurance Act, 1948, Payment of Wages Act, 1936. | 9 | CO4, CO5 |
| 5 | Consumer Protection Act and Cyber Laws The consumer protection act- Consumer rights, Procedure for consumer grievance redressal, Types of consumer redressal machineries and Forums- Cyber Laws, Introduction to IT Act 2000, Introduction of IPRS-Patents, Copyright, Trademarks. | 9 | CO5 |
| | Online Course on Taxation - GST (with Completion Certificate mandatory- Internal Assessment) | | |

TEXT BOOKS:

1. N.D. Kapoor, “Elements of Mercantile Law”, Sultan Chand & Company, India, 2006.
2. P. K. Goel, Business Law for Managers, Biztantatara Publishers, India, 2008.
3. Sheth, Business Law, 3e16ePearson Education India 2017

REFERENCE BOOKS:

1. P.P.S. Gonga, “Mercantile Law”, S.Chand & Co, New Delhi.
2. Dr. Vinod K. Singhania, “Direct Taxes Planning Management”.
3. G.K.Kapoor – “Lectures on corporate and allied laws” – Sultan chand & sons
4. Richard Stim, Intellectual Property- Copyrights, Trademarks and Patents, Cenage learning.
5. Akhileshwar Pathack, Legal Aspects of Business, 4th Edition, Tata McGraw Hill, 2009

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|--|------------|---------------|-------------------|---------------------|-------------------------|--------------------------------------|-----------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | Mind Mapping | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Studies |
| Evaluate | | 2 | | | 5 | | Case Studies |

| | | | | | | | |
|--------|--|--|--|--|--|--|--|
| Create | | | | | | | |
|--------|--|--|--|--|--|--|--|

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

ENTREPRENEURSHIP

Course Code : MBA- 107

Credits : 04

L:P:T:S : 3:1:0:0

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Imbibe entrepreneurial concept and models, and Develop skill |
| CO2 | Differentiate entrepreneurs and Entrepreneurs skill |
| CO3 | Establish records for small business, relating to legal aspects and other functional management practices |
| CO4 | Mobilize resources for ED in an Optimum way |
| CO5 | Identify and Utilize the support eco-system for managing the business and start a New Business Model. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 2 | 1 | 2 | 2 | 3 | 1 | 2 |
| CO2 | 3 | 2 | 3 | 2 | 2 | 3 | 1 | 2 |
| CO3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|--|------------|------------|
| 1 | Competing Theories of Entrepreneurship: Definition of entrepreneurship, Characteristics of entrepreneurship, A conception model, Types of Businesses –Family Business VS Startup- Definition of SSI, MSI, MSE, Ancillary, | 7 | CO1 |
| 2 | Understanding Entrepreneurship, Growth of a Business Idea , Intellectual Property, Family Business, Doing Business in India , Entrepreneurial Support Entrepreneurs and emergence of Indian Entrepreneurs – Traits of successful entrepreneurs – Entrepreneurs Vs Managers - Entrepreneurial Development Program – Entrepreneurial Development Institute (EDI) | 9 | CO2 |

| | | | |
|---|---|---|-------------|
| 3 | Maintenance of Records - Ledgers, Documentation, formalities - Legal aspects in establishing and maintenance of Small Business Strategic Management in Small Business - Financial Management in Small Business – Working capital management - Marketing Management in Small Business – Selling to Government, Industries, Institutions and Consumer market - Production Management in Small Business - Human Resource Management in Small Business. | 8 | CO3, CO4 |
| 4 | Mobilizing Resources - Buying a Business , Entrepreneurial Finance , Making a Business Plan Operations and Management - Managing Operations , Human Resource Management, Entrepreneurial Marketing, New Product Development , E-Business , Networking ,Project Management | 8 | CO1 CO5 |
| 5 | Growth and Social Responsibility - Growth , Exit Strategies , Social Responsibility, Ethics in Business Institutions Supporting <u>Small</u> Business Enterprises – SIDBI, IDBI, SIPCOT, TIIC, TCO, SIDCO, NSIC, TDA ,Export Promotion council, etc. Intellectual Property Entrepreneurial Support , Women Entrepreneurs , Sickness in Small Business Enterprise | 8 | CO4 CO6 |

TEXT BOOKS :

1. **Charantimath**, Entrepreneurship Development and Small Business Enterprises, 3/e Pearson Education India 2018
2. **Kumar**, Entrepreneurship: Creating and Leading an Entrepreneurial Organization , 1e Pearson Education India 2012
3. **Holt**, Entrepreneurship : New Venture Creation Pearson Education India 2016.

REFERENCES:

1. Hisrich R D, Peters M P, “Entrepreneurship” 8th Edition, Tata McGraw-Hill, 2013.
2. Mathew J Manimala, “Enterprenuership theory at cross roads: paradigms and praxis” 2nd Edition Dream tech, 2005.
3. Rajeev Roy, ‘Entrepreneurship’ 2nd Edition, Oxford University Press, 2011.
4. EDII “Faulty and External Experts – A Hand Book for New Entrepreneurs Publishers: Entrepreneurship Development”, Institute of India, Ahmadabad, 1986.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM’S CATEGOR Y MARKS (OUT OF 40) | CI A (7) | MODE L (10) | ASSIGNME NT (5) | PRESENTATI ON (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|---|----------------|-------------------|-----------------------|-------------------------|-----------------------------|-----------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |

| | | | | | | | |
|----------|---|---|---|---|---|----------------------------|------------------------------|
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Reengineering business model |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Business Plan for Start up | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

INTERNATIONAL BUSINESS MANAGEMENT

Course Code : MBA207

L:P:T:C : 3:0:1:4

Exam Hours : 03

Credits : 04

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Recognize challenges and opportunities for Foreign Trade markets |
| CO2 | Critically analyze the procedures in Exports and Imports |
| CO3 | Explore strategies and analyze the impact of Global strategies in International Business |
| CO4 | Apply the concept of globalisation techniques to support problems in MNC management |
| CO5 | Evaluate the impact of statutory and regulatory compliances on an organizations integrative trade initiatives. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 2 | - | - | 2 | - | 2 | - | 1 |
| CO2 | 2 | 3 | - | 3 | - | 2 | - | 1 |
| CO3 | 2 | 1 | 1 | 3 | - | 3 | 2 | 1 |
| CO4 | 2 | - | 1 | 2 | - | 2 | - | 1 |
| CO5 | 2 | - | - | 3 | - | - | - | 1 |

| Sl No | CONTENTS OF MODULE | Hrs | Cos |
|--------------|---|------------|-------------|
| 1 | Introduction to International Business – Conceptual Foundation of International Business – Definition – Growth – Dimensions – Reasons for growth – Differences between Domestic and International Business – Theories of International trade and Investments (FDI) – India’s Foreign Trade Policy – Balance of Payments – International Economic Institutions – IMF, World Bank, ADB – International Liquidity | 9 | CO1 |
| 2 | Export and Import Management - Export Procedures – Export Documentation – Bill of Lading & Mate’s Receipt – Letter of Credit – Meaning, Types and Mechanism – Uniform Customs and Practice (UCP) – Export License – Role of Commercial Banks, EXIM and ECGC in Export Finance – Packing Credit – Export Bills – Export Incentives – Foreign Exchange Market and Exchange Rate Determination | 9 | CO2 |
| 3 | International Business Strategy – Role and Impact of Firm Specific Advantage – Location Advantages – Global Entry Modes –Corporate Life Cycle Theory – Strategic Advantages of Exporting, Importing and Counter Trade – Services Export and Import – Franchising and Licensing – Contract Manufacturing - Management Contracts – Trunkey Projects – Wholly Owned Manufacturing Facilities – Assembly Operations – Joint Ventures – Third Party Location – Merger & Acquisition – International Strategies of CSR and Corporate Environmental Sustainability | 9 | CO3 |
| 4 | MNC Management – International Environment – Globalization – Concept of MNEs – Meaning and Approaches – Structural Design of MNEs – Performance Measurement and Performance indicators Evaluation System – Culture and Cultural Diversity – Negotiation and Conflict Management. | 9 | CO4, CO5 |
| 5 | Multilateral Agreements – Regional Trade Blocks – Multilateral Agreements – WTO – GATT – UNCTAD – Global Arbitration Review (GAR) – International Laws a Brief Review – Tariffs – Import Quotas – Dumping – Exchange Control – International Cartels – State Trading – International Economic integration – Foreign Capital India | 9 | CO5 |

| | | | |
|--|---|--|--|
| | Included Case study on Medicine & Vaccine distribution among countries and role played by various pharma industries during pandemic | | |
|--|---|--|--|

TEXT BOOKS:

1. **Varma**, International Business, 1/ePearson Education India 2012
2. **Sundaram**, The International Business Environment: Text and Cases, Pearson Education India 2015
3. **Daniels**, International Business, 16/ePearson Education India 2018

REFERENCE BOOKS:

1. K Aswathappa, International Business, Mcgraw Hill, 4th Edn, 2010
2. John D Daniels, Lee H Radebaugh and Daniels P Sullivan, INTERNATIONAL BUSINESS – Environments and Operations, Pearson, 2004, 10th Edition
3. Varma, Fundamentals of International Business, 4/ePearson Education India 2019

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|-------------------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | Trade Policies | |
| Evaluate | | 2 | | | 5 | | Foreign Exchange Market |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

SOFT SKILLS-II (ADVANCED LANGUAGE AND COMMUNICATION)

| | | | |
|--------------------|--------------------|------------------|-------------|
| Course Code | : MBA-S-201 | Credits | : 02 |
| L:T:P:C | : 2:0:0:2 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Objective

- ENABLE students to convert the conceptual understanding of communication into everyday practice TRAIN students to ground concepts/ideas in their own experience
- CREATE a learner-language interface enabling students to exercise control over language use SENSITIVE students to the nuances of the four basic communication skills – Listening, Speaking, Reading and Writing

Contents:

1. Twinning Functions of Listening and Speaking – Recap of active and passive listening exercises – Analytical listening – syllable/word stress: clear enunciation – Qualities of a good listener and a good speaker.
2. Twinning Functions of Reading and Writing – Discriminatory reader thoughtful writer – Spotting, correcting errors; critique – Skimming, scanning, structuring – language, tone, ordering, etiquette and perspective.
3. Individual Communication – Self advertising – Over stating and under stating – Overcoming shyness – Writing curriculum vitae, Statement of Purpose – Talking about oneself; interview.
4. Intermediary Communication – Overcoming mental blocks, prejudices and hotspots of the addressee – telephone, teleconferencing, web chat – greeting, introducing – memos, reports, minutes, business correspondence.
5. Social Communication – Etiquette in LSRW – polite yet assertive, tackling questions, seeking permission, expressing gratitude – gender fair language – discourse and transactional analysis – empathy.

Practical's:

- Unit 1:** Listening Comprehension using audio programmes + Creating audio files for speaking.
Unit 2: class and take home exercises
Unit 3 and Unit 4: Group games and role play
Unit 5: Create archives from different media for LSRW

Text Books

1. Windshuttle, Keith and Elizabeth Elliot. 1999. Writing, Researching and Communicating: Communication Skills for the Information Age. 3rd Reprint. Tata McGraw-Hill. Australia
2. Dignen, Flinders and Sweeney. English 365. Cambridge University Press
3. Goleman, Daniel. 1998. Working with Emotional Intelligence. Bantam Books. New York
4. Jones, Leo and Richard Alexander. 2003. New International Business English. Cambridge University Press
5. I. Jayakaran. 2000. Everyone's Guide to Effective Writing. 2 M Publishing International.

Personality Enrichment

Course Code : MBA-S-102

L:P:T:C : 0:0:2:2

Exam Hours : 03

Credits : 02

CIA Marks : 40

ESE Marks : 60

Unit 1- Self Disclosure

Characteristics of self-disclosure – Self disclosure benefits and appropriateness – Self disclosure and self-awareness – Self disclosure and feedback.

Exercise:

1. Self-Description– Reflect and answer the following questions on a sheet of paper about yourself: Who am I? What am I like? How do others perceive me? What are my strengths as a person? In what areas do I want to develop greater skills?
2. Adjective Checklist – the following exercise is aimed at providing an opportunity for participants to disclose their view of themselves to the other members of their group and to receive feedback on how the other group members perceive them.
3. Self-Disclosure and Self Awareness – the purpose of this exercise is to allow participants to focus on the areas as described in the Johari Window.

Unit II – Anger, Stress and Managing Feelings

The nature of stress- managing stress through social support systems – the nature of anger – guidelines for managing anger constructively – dealing with an angry person

Exercise:

1. Handling put downs techniques practiced through role plays.
2. changing your feelings discuss how people can make their assumptions more constructively.
3. defusing the Bomb exercise discuss how one can manage provocations.

Unit III – Interpersonal Effectiveness

Managing anxiety and fear – Breathing – an antidote to stress – progressive muscle relaxation – understanding your shyness – building one' self esteem – avoiding self blame – taking risks, tolerating failure, persisting and celebrating success – self talk.

Exercise:

1. being positive about yourself
2. Understanding your shyness analyze the social situation of shyness and the causes of your shyness.
3. Systematic Muscle Relaxation train one in the procedure for systematic muscle relaxation.
4. learning how to breathe deeply help one to relax systematically when one is anxious by controlling one's breathing.

Unit IV: Study Skills

Importance of study environment – using VCR3 to increase memory power: visualizing, concentrating, relating, repeating, reviewing- memory hindrances – memory helpers – knowing vs memorizing – memory and studying – the SQ3R method; survey, write questions, read, recite , review – mnemonic devices – rhymes – acronyms – pegging – cooperative learning .

Exercise: 1.Using the techniques of memory enhancers to review your classroom and textbook notes

Unit V: Goal Setting and Managing Time

The basis of effective goals – steps to be followed to obtain optimum results from goal setting – Identifying the reasons for procrastination – guidelines to overcome procrastination – priority management at home and college

Exercise: 1. Steps to prepare one's short term goals and long term goals.

2. Role play activity through reelection of identifying how priority management affect one's ability to live a balanced life.

Reference:

1. Johnson, D.W. (1997). Reaching out – Interpersonal Effectiveness and Self Actualization. 6th ed. Boston: Allyn and Bacon.
2. Sherfield, R. M. ; Montgomery, R.J. and Moody, P, G. (2010). Developing Soft Skills. 4th ed. New Delhi: Pearson.
3. Robbins, S. P. and Hunsaker, Phillip, L. (2009). Training in Interpersonal skills. Tips for managing people at work. 5th ed. New Delhi: PHI Learning.

SECOND SEMESTER
(SYLLABUS)

HUMAN RESOURCE MANAGEMENT

Course Code : MBA201
L:P:T:C : 3:0:1:4
Exam Hours : 03

Credits : 04
CIA Marks : 40
ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Evaluate the HR Environment and develop HR policies with IR factors and solve HR Problems |
| CO2 | Analyze the dynamics in HR environment and contribute to development, implementation and evaluation of Employee recruitment, selection and retention plans and process |
| CO3 | Develop relevant skills necessary for application in HR related issues |
| CO4 | Develop, implement and evaluate employee orientation, training and development process |
| CO5 | Facilitate and support effective employee and labor relations |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | 3 | 2 | - | 2 | 2 | 1 |
| CO2 | 3 | 3 | - | 3 | - | - | 2 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 1 |
| CO4 | 2 | 3 | 3 | 2 | - | - | 3 | 1 |
| CO5 | 3 | 2 | 3 | 2 | 2 | - | 3 | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Introduction to HRM Definition, environment, changing role, HR Manager's proficiencies, Labour legislation in India: Industrial relationship, wages, working hours, conditions of services and employment, equality and empowerment of women, social security, guidelines for handling sexual harassment complaints, Diversity management and affirmative action programs, Strategic HRM, Strategic HR process and roles, HR score card | 9 | CO1 |
| 2 | HR Planning Process Job analysis, description and specification, HR Planning process, recruitment , Testing and selection, Interviewing candidates, and short listing and appointment, promotion transfers, VRS, exit interview, types of separation, Meaning of HRD and its role in training | 12 | CO2, CO3 |
| 3 | Training and development Orienting employees, training process, methods, management development managing Organizational change and development, Performance management and appraisal, career planning and development, Workers Engagement. | 10 | CO3, CO4 |
| 4 | Compensation Establishing pay plans, Pay for performance and financial incentives and non-financial incentives, Benefits and services, Knowledge management | 9 | CO4, CO5 |
| 5 | Labour Relations and Industrial Relations Collective Bargaining, Grievance Management-Causes-Implications Redressal Methods, Introduction to Trade Union | 5 | CO5 |

TEXT BOOKS:

1. **Dessler**, Fundamentals of Human Resource Management, 4e Pearson Education India 2017
2. **Dessler**, Human Resource Management, 18e Pearson Education India 2018
3. Human Resource Management-Aswathappa K HPH

REFERENCE BOOKS:

1. Bohlander, Snell & Sherman, Managing Human Resources, 12th ed, Thompson
2. Dale S. Beach, Personnel - The management of people at work, Mc Millan, New York
3. Human Resource Management - David A. Decenzo, Stephen P. Robbins, 10/e, Wiley India Pvt. Ltd., 20

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|-------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | Case study | HR Policies |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|------------------|------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

RESOURCE MANAGEMENT TECHNIQUES

Course Code : MBA- 202

Credits : 04

L:P:T:C : 3-0-1-4

CIA Marks : 40

Exam Hours : 3

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Formulate the Linear programming problem and solve by graphical method, simplex method, Big Method. |
| CO2 | Define transportation and assignment problem. Demonstrate the balanced, unbalanced, maximization and minimization assignment problems with illustration. Differentiate Transportation problem and assignment problem |
| CO3 | Recall the concept of Critical Path Method and Programme Evaluation Review Technique. Solving real time problems using critical path method and Programme evaluation technique |
| CO4 | Explain the queuing theory concept. List the out the models of queuing theory and discuss with numerical examples. |
| CO5 | Restate the concept of sequencing problem in Business. Distinguish between n jobs two machines, n jobs three machines, n jobs m machines and 2 jobs n machines by giving examples and illustrate. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 3 | - | - | 1 | 1 | - | 1 |
| CO2 | 2 | 3 | - | - | - | - | - | 1 |
| CO3 | 2 | 3 | - | - | 1 | 1 | - | 1 |
| CO4 | 2 | 3 | - | - | 1 | 1 | - | 1 |
| CO5 | 2 | 3 | - | - | 1 | 1 | - | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|--------|---|-----|-----|
| 1 | Introduction - The art of mathematical modeling of Business problems, Business Applications, Linear Programming: Formulation of Problems. Solution using Graphs, Simplex method. | 9 | |
| 2 | Transportation – Initial basic feasible solutions – North West corner rule – least cost method – vogel’s approximation method – optimum solution – Modi method – Assignment methods – Travelling Salesmen problem. | 9 | |
| 3 | Network Analysis: PERT – CPM., Game theory – Pure strategy – Mixed strategy – Dominance property – graphical method. | 9 | |
| 4 | Queuing theory -- single -channel models – Infinite number of customers and infinite calling source. Replacement models – Individual replacement models(with and without time value of money) – Group replacement models. | 9 | |

| | | | |
|---|---|---|--|
| 5 | Sequencing – processing of n jobs through 2 machines – processing of n jobs through 3 machines – processing of n jobs through m machines – processing of 2 jobs through machines (Graphical method) | 9 | |
|---|---|---|--|

TEXT BOOKS:

1. **Mariappan**, Operations Research, 1e by Pearson Education India 2013.
2. **Natarajan**, Operations Research, 2e by Pearson Education India 2014.
3. **Taha**, Operations Research: An Introduction, 10e Pearson Education India 2018

REFERENCE BOOKS:

1. Barry Render & Ralph M. Stair, Jr., Quantitative Analysis for Management, Prentice Hall of India, Seventh edition.
2. Hiller & Lieberman, Operations Research.
3. Sharma J.K., Operations Research: Theory and Application, New Delhi, Macmillan India 2001.
4. Quantitative approaches to Decision making, Levis and Krikaptrik. McGraw Hill – 1998.
5. Anderson, Sweeney and Williams, Quantitative Methods for Business, Thomson, 2002.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGOR Y MARKS (OUT OF 40) | CI A (7) | MODE L (10) | ASSIGNME NT (5) | PRESENTATIO N (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|---|----------------|-------------------|-----------------------|-------------------------|-----------------------------|--|-----------------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | Network Analysis - Time & Cost | |
| Analyze | 3 | 2 | 3 | 3 | | | |
| Evaluate | | 2 | | | 5 | | Queuin g Models |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

OPERATIONS MANAGEMENT

Course Code : MBA203

Credits : 04

L:P:T:C : 3:0:1:4

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Identify the elements of operations management and various transformation process to enhance productivity and competitiveness |
| CO2 | Analyze and evaluate various facility alternatives and their capacity decisions, develop a PPC,MPS, scheduling and sequencing techniques |
| CO3 | Manage the scope, cost, timing and quality of the project and focus on suitable quality control methods |
| CO4 | Plan and implement suitable inventory/material handling principles and practices |
| CO5 | Utilize and Implement systems integrated managerial functions |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | - | - | - | - | 1 | - |
| CO2 | 2 | - | - | 1 | - | - | 1 | - |
| CO3 | 2 | 2 | - | - | - | 1 | 1 | - |
| CO4 | 2 | - | - | - | - | - | 1 | - |
| CO5 | 2 | - | - | - | - | - | 1 | - |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---------------------------|------------|------------|
|---------------|---------------------------|------------|------------|

| | | | |
|---|---|---|-------------|
| 1 | Introduction to Operations Management: need for emphasis on Operations, Product Design, Plant location, Types of production systems –product layout, process layout and cellular manufacturing system etc. The sub functional areas of Production function, namely: Materials Management, Maintenance Management, Quality Management, Production, Planning and Control. | 9 | CO1 |
| 2 | Facility location – Facility layout; Product design, Process selection, Make or buy decision, Layout design and Preparation route chart, Handling of Materials-Systems, Design | 9 | CO2 |
| 3 | Project Management- control of time & cost, Quality Management-cost of quality, Six-SIGMA, ISO certification, quality in service industry | 9 | CO3 |
| 4 | Demand forecasting, Aggregate planning, Inventory Management – MRP-I, MRP-II, and use of Simulation technique for managing materials, inventory, Supply chain concepts | 9 | CO4, CO5 |
| 5 | Computer Integrated Manufacturing systems, Capacity Planning – Just-in-time production systems. Job design and work measurement, Value engineering & value analysis, Business process Re-engineering, Lean concepts. | 9 | CO5 |

TEXT BOOKS:

1. **Mahadevan**, Operations Management: Theory and Practice, 3e Pearson Education India 2015.
2. **Krajewick**, Operations Management, 12e Pearson Education India 2018
3. **Heizer**, Operations Management, 12e Pearson Education India 2017

REFERENCE BOOKS:

1. Richard B Chase, F Robert Jacobs, Nicholas J Aquilano, Nitin K Agarwal - Operations Management – for competitive advantage, Tata McGraw – Hill Publishing Company Limited, Delhi.
2. P. Saravanan , S. Sumathi - Production and Materials Management, Margham Publications, Chennai
3. Buffa – Production Management – Tata McGraw – Hill publications.
4. Gaither, “Production and Operations Management”, Thomson Asia (P) Ltd., Bombay, Ninth Ed, 2002.
5. Lee J. Krajewski and Larry P. Ritzman, “Operations Management: Strategy and Analysis”, Addison
6. Wesley, 2000

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY | OTHER ACTIVITIES |
|------------------|---------|------------|----------------|------------------|---------------|------------------|
|------------------|---------|------------|----------------|------------------|---------------|------------------|

| MARKS (OUT OF 40) | | | | | (5) | (PLS SPECIFY) | |
|-------------------------|---|---|---|---|-----|--|---------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | Product Design of any Startup | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Study |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

MARKETING MANAGEMENT

Course Code : MBA207

L:T:P:C : 3:0:1:4

Exam Hours : 03

Credits : 04

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Formulate a marketing plan including marketing objectives, marketing mix, statistics and evaluate competition |
| CO2 | Identify and demonstrate the dynamic nature of the environment in which marketing decisions are taken. Formulate marketing plan including marketing objectives, marketing mix, strategies, and budgetary considerations. |
| CO3 | Determine strategies for developing new products and services relevant to evolving market needs and develop pricing policies |
| CO4 | Develop plans for efficient distribution |
| CO5 | Establish the usage of social media, internet to explore new markets. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | - | 2 | - | - | - | 1 |
| CO2 | 3 | 3 | 2 | 2 | - | - | 2 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 2 | - | 2 | 1 |
| CO4 | 3 | 1 | - | 2 | 3 | - | 1 | 1 |
| CO5 | 3 | 1 | - | 3 | - | 3 | - | 1 |

| Sl NO | CONTENTS OF MODULE | Hrs | Cos |
|--------------|--|------------|------------|
| 1 | Unit I: Introduction, Concepts of marketing, traditional and modern methods of marketing, selling and marketing, marketing environment, Marketing Segmentation and marketing Mix | 9 | CO1 |
| 2 | Unit II: Consumer Behaviour, Marketing Research and Marketing information System, Positioning and differentiating the marketing offers | 9 | CO2 |

| | | | |
|---|--|---|-----|
| 3 | Unit III: Product mix, Levels of product, Branding, label, New product development, Price mix – determination of price, pricing methods and pricing strategies | 9 | CO3 |
| 4 | Unit IV: Distribution - channels, physical distribution, logistics, and promotion Mix – advertising, sales promotion, personal selling, publicity, direct marketing | 9 | CO4 |
| 5 | Unit V: Consumerism,. Services marketing, rural marketing, new developments in marketing, internet marketing – C2C, B2B, B2C, Digital marketing, Social media Marketing, CRM, relationship marketing, Introduction concepts to Marketing Analytics, Influencer Marketing Strategy. | 9 | CO5 |

TEXT BOOKS:

1. Marketing Management by C B Gupta and Rajan Nair
2. **Kotler**, Marketing Management, 15e Pearson Education India 2018
3. RajanSaxena, Marketing Management, 2nd edition, New Delhi, Tata Mcgraw Hill Publishing Co.Ltd., Yr. 2001.

REFERENCE BOOKS:

1. Kotler, **Marketing: An Introduction,13/e Pearson Education India 2017**
2. S.A. Sharlekar – Marketing Management – Himalaya Publishing Co.,
3. Boyd Walker –Marketing Management - McGraw Hill.
4. **Kotler**, Principles of Marketing, 17e Pearson Education India 2018
5. Gony Armstrong, Philip Kotler, Marketing an Introduction 11th ed., Pearson Education Asia

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITIES (5) | OTHER ACTIVITIES (PLS) |
|------------------------|---------|------------|----------------|------------------|---------------------|------------------------|
|------------------------|---------|------------|----------------|------------------|---------------------|------------------------|

| (OUT OF 40) | | | | | | SPECIFY) | |
|-------------|---|---|---|---|---|------------|-----------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | Case Study | |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | Role play |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

FINANCIAL MANAGEMENT

Course Code : MBA204

L:T:P:C : 3:1:1:5

Exam Hours : 03

Credits : 05

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Enables knowledge on Strategic Financial Policy and Planning and various Financial Models involved in it. Importance of Capital Budgeting in Finance. |
| CO2 | Evaluate the Investment Decision and to enrich their knowledge on Risk, Uncertainty and Time value of Money. |
| CO3 | Analyze the role of Capital Structure and Restructuring |
| CO4 | Plan and Implement the required Working Capital and Cash Management |
| CO5 | Explore on Securities and Commercial Paper |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | - | - | - | - | 1 | 1 |
| CO2 | 3 | 3 | 2 | - | - | - | - | 1 |
| CO3 | 3 | 3 | - | - | - | 1 | - | 1 |
| CO4 | 3 | 3 | 2 | - | - | 3 | - | 1 |
| CO5 | 3 | 3 | - | - | - | 3 | - | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Financial Policy and Strategic Planning –Strategic Planning Process – Objectives and Goals – Major Kinds of Strategies and Policies – Corporate Planning – Process of Financial Planning – Types of Financial Plan – Financial Models – Tools or Techniques of Financial Modeling – Applications of Financial Models – Types of Financial Models - Process of Financial Model Development | 9 | CO1 |
| 2 | Capital budgeting – cash flow estimation - Investments Decisions under Risk and Uncertainty – Techniques of Investment Decision – Risk Adjusted Discount Rate, Certainty Equivalent Factor, Statistical Method, Sensitivity Analysis and Simulation Method – Corporate Strategy and High Technology Investments – Time value of money. | 9 | CO1, CO2 |
| 3 | Capital structure and dividend policy – leverage and dividend theories, Sources of capital – Cost of capital and financing - Expansion and Financial Restructuring – Corporate Restructuring, Capital Allocation. | 9 | CO3 |
| 4 | Working capital management – Managing current assets – Receivables / Inventory management and Cash Management. | 9 | CO4 |
| 5 | Financing Strategy - Innovative Sources of Finance – Asset Backed Securities - Hybrid Securities namely Convertible and Non-Convertible Debentures, Deep Discount Bonds, Secured Premium Notes, Convertible Preference Shares – Option Financing, Warrants, Convertibles and Exchangeable, Commercial Paper, IPO. | 9 | CO5 |

TEXT BOOKS:

1. M.Y. Khan and P.K.Jain Financial management, Text, Problems and cases Tata McGraw Hill, 6th edition, 2011.
2. M. Pandey Financial Management, Vikas Publishing House Pvt. Ltd., 10th edition, 2012.

REFERENCE BOOKS:

1. Rajni Sofat & Preeti Hiro, STRATEGIC FINANCIAL MANAGEMENT, PHI, Delhi, 2011
2. Weaver & Weston, STRATEGIC CORPORATE FINANCE, Cengage Learning, Delhi, 2001
3. Chandra, Prasanna, FINANCIAL MANAGEMENT, Tata McGraw Hill, Delhi. 2007

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMEN T (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|--|------------|---------------|--------------------|---------------------|--------------------------|--|--|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | Current Financia l Trend Analysis |
| Analyze | 3 | 2 | 3 | 3 | 5 | Case Study | |
| Evaluate | | 2 | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

RESEARCH METHODOLOGY

Course Code : MBA205

L:T:P:C : 3:0:1:4

Exam Hours : 03

Credits : 05

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Analyze the impact of research in business and evaluate research problems and develop hypothesis |
| CO2 | Apply the appropriate research design and construct a measurement scale. |
| CO3 | Develop a valid instrument/Questionnaire for data collection using sampling technique |
| CO4 | Apply the SPSS for data analysis |
| CO5 | Apply SPSS for data analysis and develop a report using APA format |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | - | - | - | 1 | - | 1 |
| CO2 | 3 | - | - | - | - | 1 | - | 1 |
| CO3 | 3 | - | - | - | - | 1 | - | 1 |
| CO4 | 3 | 3 | - | - | - | 2 | - | 1 |
| CO5 | 3 | 3 | - | - | - | 2 | 3 | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Introduction-Business Research-Definition and significance-the research process-Types of Research-Exploratory and causal Research-Theoretical and empirical Research-Cross-Sectional and time-series Research - Research questions/problems-Research objectives-Research hypotheses-Characteristics-research in an evolutionary perspective -the role of theory in research. | 9 | CO1 |
| 2 | Research design-definition-types of research design-exploratory and causal research design-descriptive and experimental design-different type of experimental design-validity of findings-internal and external validity-variables in research-measurement and scaling-different scales-construction of instruments-validity and reliability of instrument. | 9 | CO2 |
| 3 | Types of data-primary vs secondary data-Methods of primary data collection- Survey Vs observation-Experiments- Construction of questionnaire and instrument- Validation of questionnaire-sampling plan-sample size-determinants optimal sample size-sampling techniques-Probability Vs non probability sampling methods | 9 | CO3 |
| 4 | Data preparation-editing-coding-data entry-validity of data-hypothesis testing-qualitative vs quantitative data analysis - bivariate and multivariate statistical techniques-factor analysis - discriminant analysis-cluster analysis-multiple regression and correlation-multidimensional scaling-application of statistical software for data analysis, SPSS & R Open Source software | 9 | CO4 |
| 5 | Research report-different types-contents of report-need of executive summary-chapterization -contents of chapter-report writing- The role of audience-Readability-comprehension-tone-final proof-report format-title of the report-ethics in research-ethical behavior of research-subjectivity and objectivity in research. Report Generation and Presentation using Tableau. | 9 | CO5 |

TEXT BOOKS:

1. **Bajpai**, Business Research Methods, 2ePearson Education India 2017

2. **Krishnasamy**, Management Research Methodology: Integration of Methods and Techniques , 1e, Pearson Education India 2006
3. **Chandra**, Research Methodology, 1ePearson Education India 2017

REFERENCE BOOKS:

1. Zikmund, Business Research Methods, 7thedn., Thompson
2. Donald R. Cooper and Ramela S. Schindler, Business Research Methods, 8th ed., Tata McGraw Hill Publishing Co Ltd., New Delhi ,2000
3. Research Methodology : a guide for Researchers in Management and Social Sciences, Taylor, Sinha, Prentice Hall India.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODE L (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|-------------|----------------|------------------|-------------------|--|------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | Case Study |
| Analyze | 3 | 2 | 3 | 3 | | Identification of Business Research Problems | |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Team of maximum 6 students would undertake the project. The faculty coordinator would provide the topic based on the modules | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

MANAGEMENT INFORMATION SYSTEMS

Course Code : MBA- 206

L:P:T:S : 3:1:0:0

Exam Hours : 03

Credits : 04

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

- CO1 Develop leadership qualities through Management Information system in achieving business competitive advantage through informed decision making.
- CO2 Develop logical models for the information systems based on stated user requirement.
- CO3 Select and apply appropriate programming structure and techniques based on specific problem context.
- CO4 Modify implementation plan appropriately in response to unexpected requirement or environmental change.
- CO5 Perform common business transaction as an end user in an ERP system.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | - | - | - | - | 2 | - |
| CO2 | 2 | - | - | - | - | - | 2 | - |
| CO3 | 2 | 3 | 2 | 2 | - | - | 2 | 2 |
| CO4 | 2 | 2 | - | - | - | - | 2 | 2 |
| CO5 | 2 | 2 | - | - | 3 | 3 | 2 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|--------|---|-----|-----|
| 1 | Introduction – concept of MIS – Types of information systems – Efficient information systems – Organization and Business organization –Decision making Process, Types of management decisions and information need – Business, Technical and Economic Dimensions of information- The meaning and role of MIS, Constraint in MIS operation, Ethical and Social Issues in Information Systems | 9 | CO1 |
| 2 | Information Technology Infrastructure, IT Infrastructure and Emerging Technologies, Telecommunications, the Internet and Wireless Technology, Securing Information Systems, Cloud computing-infrastructure as a service (IAAS), Platform as a service (PAAS), software / application as a service (SAAS) | 7 | CO2 |
| 3 | Statutory compliance reports by company secretary-functional information system- HRIS - marketing information system-production | 5 | CO3 |

| | | | |
|---|--|----|-----|
| | information system-accounting information system - inventory information system | | |
| 4 | SAD- What is system analysis and design-system development life cycle-prototyping -System analysis activities –tools for system analysis and design-pitfalls in MIS development, Enterprise Resource Planning & SAP – characteristics of ERP , Benefits of ERP and ERP Implementation– Expert System – Decision Support System – Executive Information System– SAP Modules | 10 | CO4 |
| 5 | Data Base Systems & Business Intelligence: Databases DBMS: Relational data bases –Meaning of Data Base – Components of DBMS – Data Base Technology, Types of Database – Comparison of DBMS&RDBMS – Advantages and disadvantages of data base, Relational Data model, Recent Trends in database-Query language – Data Warehousing – Data Mining | 9 | CO5 |

Text books:

1. **Sahilraj**, Management Information System, 2ePearson Education India 2017
2. **Laudon**, Essentials of MIS, 11ePearson Education India 2016
3. **Laudon**, MIS, 16ePearson Education India 2019

References:

2. L.M.Prasad, Management Information Systems, Sultan Chand & Sons, New Delhi 2010
3. Joyce J Elam , Case series for Management Information Systems’, Simon and Schuster Custom Publishing, 1996.
4. Steven Alter, Information Systems – A Management Perspective - Addison-Wesley, 1999.
5. Joyce J Elam , Case series for Management Information Systems’, Simon and Schuster Custom Publishing, 1996.
6. Steven Alter, Information Systems – A Management Perspective - Addison-Wesley, 1999.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM’S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODE L (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|-------------|----------------|------------------|-------------------|--------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | ERP analysis | |

| | | | | | | | |
|----------|---|---|---|---|---|--|--------------------------|
| Analyze | 3 | 2 | 3 | 3 | | | Emerging Technologies |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

SOFT SKILLS-II(COMPUTING SKILL DATA ANALYSIS AND BUSINESS MODELING)

| | | | |
|--------------------|--------------------|------------------|-------------|
| Course Code | : MBA-S-201 | Credits | : 02 |
| L:T:P:C | : 2:0:0:2 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

DATA ANALYSIS AND BUSINESS MODELING

[Business models studied in theory to be practiced using Spreadsheet / Analysis Software]

OBJECTIVE :

To have hands-on experience on decision modeling.

| S.No. | Exp. No. | Details of experiments (Experiment Names) | Duration |
|-------|----------|--|----------|
| 1 | 1 | Descriptive Statistics | 4 |
| 2 | 2 | Hypothesis - Parametric | 4 |
| 3 | 3 | Hypothesis – Non-parametric | 4 |
| 4 | 4 | Correlation & Regression | 4 |
| 5 | 5 | Forecasting | 4 |
| 6 | - | Extended experiment – 1 | 4 |
| 7 | 6 | Portfolio Selection | 4 |
| 8 | 7 | Risk Analysis & Sensitivity Analysis | 4 |
| 9 | 8 | Revenue Management | 4 |
| 10 | - | Extended experiment – 2 | 4 |
| 11 | 9 | Transportation & Assignment | 4 |
| 12 | 10 | Networking Models | 4 |
| 13 | 11 | Queuing Theory | 4 |
| 14 | 12 | Inventory Models | 4 |
| 15 | - | Extended experiments – 3 | 4 |

Spread Sheet Software & Data Analysis Tools.

OUTCOME

Knowledge of spreadsheets and data analysis software for business modeling.

TEXTBOOKS

1. David M. Levine et al, “Statistics for Managers using MS Excel’ (6th Edition) Pearson, 2010
 2. David R. Anderson, et al, ‘An Introduction to Management Sciences: Quantitative approaches to Decision Making, (13th edition) South-Western College Pub, 2011.
 3. Hansa Lysander Manohar , “ Data Analysis and Business Modelling using MS Excel “, PHI Learning private Ltd, 2017.
 4. William J. Stevenson, Ceyhun Ozgur, ‘Introduction to Management Science with Spreadsheet’, Tata McGraw Hill, 2009.
 5. Wayne L. Winston, Microsoft Excel 2010: Data Analysis & Business Modeling, 3rd edition, Microsoft Press, 2011.
 6. Vikas Gupta, Comdex Business Accounting with Ms Excel, 2010 and Tally ERP 9.0 Course Kit, Wiley India, 2012
 7. Kiran Pandya and Smriti Bulsari, SPSS in simple steps, Dreamtech, 2011.
-

TECHNICAL WRITING AND PRESENTATION

Course Code : MBA-S-203
L:T:P:C
: 2:0:0:2
Exam Hours : 03

Credits : 02
CIA Marks : 40
ESE Marks : 60

Objectives of the Course:

Aims to teach oral and written skills in English with illustrations and examples drawn from project reports, paper presentations and published papers in scientific journals. The grammar exercises are not taught in a rule-based manner but through observation and use in specific contexts. Newspaper and popular scientific reports are also included as course material. Presentation skills are taught through practice sessions. During the course, all participants make presentations and also critique the presentations by others. Emphasis is placed on teaching how to present the same findings orally and in writing.

Syllabus Outline:

Unit I

Reinforcement of Language Skills

[Correcting common errors] – Verbosity – How to avoid unnecessary jargon – Words and Usage – List of “aura” words, Synonyms and Antonyms – Phrasing, Tense, Voice, Prepositions, and Punctuation. Type of technical reports – creating specs, lab manuals, worksheets.

Unit II

Organization of Ideas

1. Preparing a Basic plan – Structuring the ideas, collecting the relevant materials 2. Creating Outlines – Headings of Sections, Topic Sentences. 3. Reviewing Sentences and Rewriting Paragraphs 4. Revising Drafts

Unit III

Contents of a Report [Some Basic Research Methodology]

1. Cover and title page 2. Table of Contents 3. List of Tables and Figures 4. Preface, Foreword, Acknowledgement 5. Abstract 6. Introduction 7. Body (in Sections and Subsections) 8. Results 9. Conclusions and Recommendations 10. Appendices 11. References

Unit IV

Format [Both physical and stylistic]

1. Margins 2. Headings 3. Indentation 4. Pagination 5. Type face and fonts 6. Abbreviations 7. Symbols 8. Layouts 9. Proofreading Symbols

Unit V

Presentation of the Report

1. Difference between Oral Presentations and Written Reports (Even when the material is the same) 2. How to give a good presentation? 3. Proper use of technological aids 4. Discussion skills

Recommended Texts:

- i) E Handouts of Rensselaer Polytechnic, USA.[necessary permission has to be obtained by the course instructor for classroom use] www.rpi.edu Gupta, Ruby and Anugrah Rohini Lall.
- ii) Basic Technical Communication. Cambridge University Press, 2009. Hoover, Hardy. Essentials for the Scientific and Technical Writer.1970; Rpt.New York: Dover Publications, Inc.,1980 Kirkman, John. Good Style for Scientific and Engineering Writing. London: Pitman Publishing Ltd., 1980.

SEMESTER 3 & 4

STRATEGIC MANAGEMENT

Course Code : MBA 301

Credits : 03

L:T:P:C : 3:0:0:3

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Evaluate the strategies implemented by organizations and to analyze the mission, vision and their objectives |
| CO2 | Analyse micro and macro environmental issues |
| CO3 | Identify strategic capabilities and gap and resolve them by applying suitable strategies |
| CO4 | Apply control techniques/audit performance of strategy implemented |
| CO5 | Analyze the issues faced by the organization |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | - | - | - | 2 | 2 | - |
| CO2 | 3 | - | 3 | - | - | 2 | - | - |
| CO3 | 2 | 2 | - | - | 2 | 2 | - | - |
| CO4 | 2 | 3 | - | 2 | - | 2 | - | - |
| CO5 | 2 | - | - | 2 | - | 2 | 2 | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Introduction to strategic management, hierarchy of strategic intent-mission, vision, goal and objectives, strategic management process | 9 | CO1 |
| 2 | Environmental Appraisal, organizational appraisal, corporate level strategies, business level strategies, strategic analysis and choice | 9 | CO2 |
| 3 | Strategic implementation – activating strategies, structural implementation, behavioral implementation, functional and operational implementation | 9 | CO3 |
| 4 | Strategy evaluation and control– overview, strategic control techniques, financial and social performance control techniques. | 9 | CO4 |
| 5 | Strategic issues in specified areas- global business, managing technology and innovation, organization adaptation and change, specified type of organizations. Global Strategy in the New Normal. | 9 | CO5 |

TEXT BOOKS:

1. **David**, Strategic Management Concepts: A Competitive Advantage Approach, 16e Pearson Education India 2018
2. **Wheelen**, Strategic Management and Business Policy, 15e Pearson Education India 2018
3. **Thomas**, Strategic Management, 1e Pearson Education India 2015.

REFERENCE BOOKS:

1. Business Policy and strategic management – by Azhar Kazmi, Tata Mcgraw Hill, new delhi, edn 2, 2006
2. Strategic Management, competitiveness and Globalization, Thomson, 2001.
3. R. Srinivasan, Strategic Management the Indian context, Prentice Hall of India, 2002.
4. **Mohapatra**, Case Studies on Strategic Management , 1e Pearson Education India 2011
5. **Carpenter**, Strategic Management, 2e Pearson Education India 2012

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CI A (7) | MODE L (10) | ASSIGNMEN T (5) | PRESENTATIO N (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|--|----------------|-------------------|-----------------------|-------------------------|-----------------------------|--------------------------------------|------------------------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Busines s Case Studies |
| Evaluate | | 2 | | | 5 | Functiona l Analysis | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

TOTAL QUALITY MANAGEMENT

Course Code : MBA302

Credits : 04

L:P:T:C : 4:0:0:4

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Relate Philosophies of Quality Management with organization performance |
| CO2 | Demonstrate tools and techniques of Quality Management and Implementation |
| CO3 | Analyze the various types of techniques are used to measure quality and create customer satisfaction |
| CO4 | Use quality management methods analyzing and solving problems of organization; |
| CO5 | Critically appraise the organizational, communication and teamwork requirements for effective quality management |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | - | - | - | 1 | - | 1 |
| CO2 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 |
| CO3 | 3 | 3 | - | 1 | - | 1 | 1 | 1 |
| CO4 | 3 | - | - | 2 | - | 1 | 1 | 1 |
| CO5 | 3 | 3 | - | 1 | - | 1 | 1 | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Basics of TQM, Gurus of TQM, Quality-definition & dimensions, Barriers to TQM, Deming Philosophy, Quality Statements, Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Employee Involvement—empowerment, effective teams, suggestion systems, Performance appraisals & rewarding practices | 9 | CO1 |

| | | | |
|---|---|---|-------------|
| 2 | KAIZEN- Continuous Process Improvement, Juran Trilogy, PDSA / PDCA Cycle, 5S, Reengineering, Benchmarking-process & pitfalls, The seven tools of quality, Control Charts for improving Process capability, New seven Management tools, Quality circle. | 9 | CO2 |
| 3 | SIX SIGMA-process, DMAIC / DMADV, LEAN Management— Value Stream, Flow, Pull, Single Minute Exchange of Dies (SMED); LEAN SIX SIGMA | 9 | CO3 |
| 4 | Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures, Benchmarking; Quality Management Systems- ISO 9000:2000, TS 16949, ISO 14000 – Concept, Requirements, Benefits, Documentation, Quality Auditing | 9 | CO4, CO5 |
| 5 | Quality Function Deployment (QFD) – Kano’s model of customer satisfaction, House of Quality-Voice of the customer, Planning Matrix, Voice of the Organization, technical correlations, Technical descriptors, Targets ; QFD Process, Benefits, Applications of QFD; Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, Failure Mode and Effect Analysis (FMEA) – Stages, documentation | 9 | CO5 |

TEXT BOOKS:

1. **Besterfield**, Total Quality Management, 5e Pearson Education India 2018
2. **Charantimath**, Total Quality Management, 5e Pearson Education India 2017
3. Quality Management, Donna C. Summers, 2nd Edition, Pearson Publishing, 2015

REFERENCE BOOKS:

1. James R.Evans & William M.Lidsay, “The Management and Control of Quality”, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. “Total Quality Management”, McGraw-Hill, 1991.
3. Oakland.J.S. “Total Quality Management”, Butterworth Heinemann Ltd., Oxford, 1989.
4. Narayana V. and Sreenivasan, N.S. “Quality Management – Concepts and Tasks”, New Age International 1996.
5. Zeiri.“Total Quality Management for Engineers”, Wood Head Publishers, 1991

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM’S CATEGOR | CI A | MODE L | ASSIGNMEN T | PRESENTATIO N | CLUB ACTIVIT | OTHER ACTIVITIES |
|-----------------|------|--------|-------------|---------------|--------------|------------------|
|-----------------|------|--------|-------------|---------------|--------------|------------------|

| Y MARKS (OUT OF 40) | (7) | (10) | (5) | (5) | Y (5) | (PLS SPECIFY) | |
|---------------------------|-----|------|-----|-----|----------|---------------------------------------|---------------------------------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | Applicatio n of TQM in Industry | Six sigma & Lean concep t |
| Analyze | 3 | 2 | 3 | 3 | | | |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

3. ELECTIVE - 1*

4. ELECTIVE- 2*

5 ELECTIVE- 3*

6 ELECTIVE -4*

*** The elective syllabi are on page 34 onwards**

SPOKEN AND PRESENTATION SKILLS

Course Code : MBA-S-301
L:T:P:C
 : 2:0:0:2
Exam Hours : 03

Credits : 02
CIA Marks : 40
ESE Marks : 60

OBJECTIVES

- *coach* students to identify, classify and apply relevant skill sets.
- *illustrate* role of skills in real-life situations with case studies, role play, etc.
- *translate* performance of skills into efficient habits.
- *enable* students to perceive cultural codes involved in presentation and design language performance accordingly.

Contents:

UNIT I: General Language Knowledge and Presentation.

UNIT II: Special Language Knowledge and Presentation.

UNIT III: General Communication Skills for Presentation.

UNIT IV: Professional Communication Skills for Presentation.

UNIT V: Social Communication Skills for Presentation.

REFERENCES:

1. Cathcart, Robert. S. and Larry A. Samovar. 1970. *Small Group Communication: A Reader*. 5th Edition. Wm. C. Brown Publishers. Iowa.
2. Tamblyn, Doni and Sharyn Weiss. 2000. *The Big Book of Humours Training Games*. 2004 Edition. Tata McGraw-Hill. New Delhi.
3. Andrews, Sudhor. 1988. *How to succeed at Interviews*. 21st Reprint. Tata McGraw-Hill. New Delhi.
4. Monippally, Matthukutty. M. 2001. *Business Communication Strategies*. 11th Reprint. Tata McGraw-Hill. New Delhi.

RURAL DEVELOPMENT PROGRAMME

Course Code : MBA-S-303
L:T:P:C
: 2:0:0:2
Exam Hours : 03

Credits : 02
CIA Marks : 40
ESE Marks : 60

1. DESCRIPTION:

This course RURAL DEVELOPMENT PROGRAMME is included as an integral part of the curriculum to expose students to rural realities with an emphasis on development and marketing communication. This rural development programme duration is 30 hours.

2. COURSE OBJECTIVE:

- To serve the needs of society and industry through education and research
- To develop innovative leaders by giving hands on experience in social problems.

3. LEARNING OUTCOMES:

- Participation in these programmes helps students to create grass root level products and services
- These activities will bolster social- sector organization in development.

4. COURSE APPROACH:

The student spends 30 hours in looking and studying a rural area of their choice. The student interacts with rural people and come up the problems they generally face in the particular locality. The student then will use his expertise to solve few problems by give some suitable solutions.

5. COURSE RUBRICS: Evaluation Items Marks

| | | |
|------------------------------------|---|----|
| Rural Diary | - | 10 |
| Qualitative Feedback (Finding Gap) | | 20 |
| Presentation | - | 20 |
| Rural report | - | 30 |
| Periodic Interaction with Guide | - | 20 |

SEMESTER -IV

1. ELECTIVE 5*

2. ELECTIVE 6*

3. ELECTIVE 7*

4. ELECTIVE 8*

*** The elective syllabi are on page 35 onwards**

MANAGERIAL SKILLS

Course Code : MBA-S-401

L:T:P:C

: 2:0:0:2

Exam Hours : 03

Credits : 02

CIA Marks : 40

ESE Marks : 60

OBJECTIVES

- To help students to understand the mechanism of stress particularly negative emotions such as anxiety, anger and depression for effective management.
- To introduce the basic concepts of body language for conflict management.
- To give inputs on some of the important interpersonal skills such as group decision-making, negotiation and leadership skills.
- To make students learn and practice the steps involved in time management.
- To impart training for empowerment thereby encouraging the students to become successful entrepreneurs.

Unit I- Stress management

Definitions and Manifestations of stress.,Stress coping ability and stress inoculation training, Management of various forms of fear (examination fear, stage fear or public speaking anxiety), depression and anger.

Unit II- Conflict Management skills

Types of conflict (intrapersonal, Intra group and inter group conflicts), Basic concepts, cues, signals, symbols and secrets of body language, Significance of body language in communication and assertiveness training, Conflict stimulation and conflict resolution techniques for effective management.

Unit III- Interpersonal Skills

Group decision making (strengths and weaknesses), Developing characteristics of charismatic and transformational leadership, Emotional intelligence and leadership effectiveness- self awareness, self management, self motivation, empathy and social skills, Negotiation skills- preparation and planning, definition of ground rules, clarification and justification, bargaining and problem solving, closure and implementation.

Unit IV- Time Management

Time wasters- Procrastination. Time management personality profile, Time management tips and strategies, Advantages of time management.

Unit V- Towards Empowerment

Stimulating innovation and change- coping with “temporariness”, Network culture, Power tactics and power in groups (coalitions), Managerial empowerment and entrepreneurship, Prevention of moral dwarfism especially terrorism, Altruism (prosocial behaviour/helping behaviour), Spirituality (clarifications with regard to spirituality)- strong sense of purpose- trust and respect- humanistic practices- toleration of fellow human beings expressions.

REFERENCES

1. Swaminathan. V.D & Kaliappan. K.V. (2001). Psychology for Effective Living. Chennai. The Madras Psychology Society.
 2. Robbins, S.B. (2005). Organizational Behaviour. New Delhi: Prentice Hall of India.
 3. Smith, B. (2004). Body Language. Delhi: Rohan Book Company.
- Hurlock, E.B. (2006). Personality Development, 28th Reprint. New Delhi: Tata McGraw Hill

CAREER ADVANCEMENT COURSE FOR MANAGERS

Course Code : MBA-S-402

L:T:P:C

: 2:0:0:2

Exam Hours : 03

Credits : 02

CIA Marks : 40

ESE Marks : 60

OBJECTIVE

- To improve aptitude, problem solving skills and reasoning ability of the students
- To solve problems in teams & groups
- To understand the importance of verbal and written communication in the workplace
 - To understand the significance of oral presentations, and the cases of their use
- To practice verbal communication by making a technical presentation to the class
- To develop time management and creative thinking skills.

UNIT I - BASIC NUMERACY

Types and Properties of Numbers, LCM, GCD, Fractions and decimals, Surds

UNIT II - ARITHMETIC – I

Percentages, Profit & Loss, Equations

UNIT III - REASONING - I

Logical Reasoning

UNIT IV - SOFT SKILLS – I

Presentation skills, Idea Generation & Lateral Thinking, E-mail Etiquette

UNIT V - SOFT SKILLS – II

Goal Setting and Prioritizing

REFERENCES

1. Quantitative Aptitude by Dinesh Khattar – Pearsons Publications
2. Quantitative Aptitude and Reasoning by RV Praveen – EEE Publications
3. Quantitative Aptitude by AbijithGuha – TATA Mc GRAW Hill Publications
4. Soft Skills for Everyone by Jeff Butterfield – Cengage Learning India Private Limited
5. Six Thinking Hats is a book by Edward de Bono - Little Brown and Company
6. IBPS PO - CWE Success Master by Arihant - Arihant Publications (I) Pvt.Ltd

ELECTIVES

For Semester III and IV

INTEGRATED MARKETING COMMUNICATION (IMC)

Course Code : MKT302

Credits : 03

L:T:P:C : 3:0:0:3

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Demonstrate a comprehensive understanding of Marketing Communications theories and concepts. Understand primary marketing communication models the marketer's use. |
| CO2 | Develop suitable promotional objective and strategy for the Marketing campaign. |
| CO3 | Describe a range of Advertising media and methods available to marketers. Analyse and evaluate the cost effectiveness of various forms of media. |
| CO4 | Formulate appropriate promotional tool for a product or service. |
| CO5 | Conceive the issues of the Promotional activities. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 2 | - | 1 | - | - | - | - |
| CO2 | 2 | - | - | - | - | - | - | - |
| CO3 | 2 | 1 | - | 1 | 1 | - | 1 | 1 |
| CO4 | 2 | - | - | - | 1 | 1 | 1 | 1 |
| CO5 | 1 | - | - | - | - | - | - | - |

| Si. No | CONTENTS OF MODULE | Hrs | COs |
|---------------|--|------------|------------|
| 1 | Unit I: Integrated Marketing Communications, Brand Equity Management -brand leverage, luxury branding, Buyer Behaviors, Promotions Opportunity Analysis, Models of Marketing communication – AIDAS Model, DAGMAR Model, PCB Model and Marketing communication planning process | 9 | CO1 |
| 2 | Unit II Managing the Marketing Communication Process - Analysis of promotional opportunities, concepts of segmentation and target marketing, promotional strategy of formulation and competitive positioning, determination of promotional objectives, deciding promotional appropriation, integrating marketing communication programme, commissioning and contracting external resources | 9 | CO2 |

| | | | |
|---|--|---|-----|
| 3 | Unit III Advertising Media: different types of media; media selection; measuring media effectiveness, advertising appeal, idea generation, copy writing, layout, copy testing, media objectives- reach, frequency, cost, etc. media strategy, media scheduling, ad agency – functions and types, outdoor Advertising | 9 | CO3 |
| 4 | Unit IV Promotional Tools: Trade Promotions, Consumer Promotions, Personal Selling, Database Marketing, and Customer Relationship Management, Public Relations, Sponsorship Programs, and Regulations | 9 | CO4 |
| 5 | Unit – V Wider Issues and Dimensions - Sales promotions, personal selling, direct marketing, public relations, publicity and corporate advertising, unconventional promotional media, marketing communication budgeting, measuring promotional performance, global marketing communication, legal and ethical issues in integrated marketing Communication | 9 | CO5 |

TEXT BOOKS:

1. Kenneth E Clow / Donald E Baack, Intergrated Advertising Promotion and Marketin Communication, Pearson Education
2. **Batra**, Advertising Management, 5e Pearson Education India 2006
3. **Malaval**, Integrated Marketing Communication: Pentacom, 4/e Pearson Education India 2015

REFERENCE BOOKS:

1. Belch, Advertising and Promotion, Tata McGraw Hill
2. Frank Jefkins, Advertising, Macmillan India Ltd
3. Oguinn, Advertising, thomson Learning
4. Kueglar Jr, Web Advertising and Marketing, Prentice Hall of India

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|---------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |

| | | | | | | | |
|----------|---|---|---|---|---|------------|--------------|
| Apply | 2 | 2 | 2 | 2 | | | Brand War |
| Analyze | 3 | 2 | 3 | 3 | | | |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Ad Copy | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

RETAIL MARKETING

Course Code : MKT402

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Discuss the concept of retailing, its evolution in Global retailing, and India's trend in Retailing. Importance of retail in the distribution component of the marketing mix. |
| CO2 | Conceive the complexity of retail channels (store and non-store) used as alternative routes to market, and evaluate the merits of alternative strategies for different types of retail business. |
| CO3 | Interpret and implement effective retail strategies for better Store Management. |
| CO4 | Apply the core Marketing strategies for effective Retail Shop Management. |
| CO5 | Apprehend emerging trends in Retailing and correlate the factors influencing Retail shopper's behavior. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 1 | - | 3 | 3 | 3 | 3 | - |
| CO2 | 2 | 1 | 3 | - | 3 | 2 | 2 | 1 |
| CO3 | 1 | - | 2 | 2 | 2 | - | - | 1 |
| CO4 | 1 | 3 | - | - | 1 | - | - | 1 |
| CO5 | - | 2 | - | 2 | - | 1 | 1 | - |

| Si. NO | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---------------------------|------------|------------|
|---------------|---------------------------|------------|------------|

| | | | |
|---|---|---|-----|
| 1 | Unit I: Introduction Global Retailing Overview-Retail Trends in India-Technological Influences on Retail Industry-Indian Government Policy Implication on Retail Sector. | 9 | CO1 |
| 2 | Unit II: Retail Formats Organized and Unorganized Format-Characteristics of Each Format-Emerging Trends in Recent Format-Global Retail Formats &MNC Role in Organized Retail Format | 9 | CO2 |
| 3 | Unit III: Retailing Decisions Choice of Retail Location-Atmospherics-Positioning Of Retail Stores-Building Retail Store Image Retail Service Quality Management-Retail Pricing | 9 | CO3 |
| 4 | Unit IV: Retail Shop Management Visual Merchandise Management –Inventory Management-Retail Store Brand-Retail Advertising and Promotion | 9 | CO4 |
| 5 | Unit V:Retail Shopper Behavior and Online Retail Shopper Profile Analysis-Complaint Management-Factors Influencing Retail Shopper Behavior-Online Retail and Emerging Trends | 9 | CO5 |

TEXT BOOKS:

1. **Vedamani**, Retail Management, 5e Pearson Education India 2017
2. **Berman**, Retail Management, 13e Pearson Education India 2017

REFERENCE BOOKS:

1. Patrick M Dunne And Rober F Lusch,Retailing Thomas Learning,4th Edition 2008
2. Chetan Bajaj, Rajnish Tow And Nidhi,V.Srivatsava Retail Management, Oxford University Press,2007
3. SwapnaPradhan,Retail Management-Text And Cases Tata McGraw Hill, 2nd Edition 2008

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CI A (7) | MODE L (10) | ASSIGNME NT (5) | PRESENTATI ON (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|----------|-------------|-----------------|-------------------|--------------------|--------------------------------|-------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | Case Studie |

| | | | | | | | |
|----------|---|---|---|---|---|---------------------------|---|
| | | | | | | | s |
| Analyze | 3 | 2 | 3 | 3 | | Application Strategies | |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

SALES AND DISTRIBUTION MANAGEMENT

Course Code : MKT401

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Apply the concept of sales and demonstrate the roles and responsibilities of sales person as a KEY individual to achieve the Organization goal. |
| CO2 | Describe and Formulate strategies to effectively manage company's sales operations. |
| CO3 | Illustrate the fundamentals of Distribution channels and channel members. |
| CO4 | Identify the Channel intermediary and apply new strategies to pitch new market. |
| CO5 | Perceive digital tools to enhance logistics management. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 1 | - | - | - | - | - | 2 | - |
| CO2 | 1 | - | - | - | 2 | - | - | 1 |
| CO3 | 2 | - | - | 2 | - | 2 | 1 | - |
| CO4 | 2 | - | 3 | - | 1 | 1 | - | 1 |
| CO5 | 1 | - | - | - | - | - | - | 1 |

| No | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|-------------|
| 1 | Unit I Personal selling and marketing - Objectives of sales management, personal selling objectives, theories of selling, personal selling process, size of sales force, ethical responsibilities in sales management, compensation, selection of sales personnel, motivation of sales force | 9 | CO1, CO2 |
| 2 | Unit II Sales meeting, Sales contest, sales quotas, sales territories, evaluating and controlling of sales personnel, analysis of sales, cost analysis. | 9 | CO2 |
| 3 | Unit III Physical distribution-Distribution management, Marketing mix, marketing channels, wholesaling and retailing, designing channel system, selecting channel members. | 9 | CO3 |
| 4 | Unit IV Managing the marketing channel .Product, Pricing and Promotion issues in Channel Management and Physical Distribution, channel information system, Evaluating channel member performance – Vertical marketing systems – Retail co-operatives, Franchise systems and corporate marketing systems | 9 | CO4 |
| 5 | Unit – V E-enabled selling and distribution .E-commerce and e-retailing as a channel of distribution, Electronic intermediaries, Disintermediation and Re-intermediation, e-enabled logistics management and tracking systems. | 9 | CO5 |

TEXT BOOKS:

1. **Still**, Sales and Distribution Management, 6e Pearson Education India 2017
2. **Jobber**, Selling and Sales Management, 10e Pearson Education India 2018

REFERENCE BOOKS:

1. Johnson, Kurtz and Scheuing : Sales Management (McGraw-Hill)
2. Rosenbloom: Marketing Channels – a management view (Dryden Press)
3. David Jobber and Geoffrey Lancaster, Selling and Sales Management, Pearson Education
4. Anderson R, Professional Sales Management, Prentice Hall
5. Johnson, Sales Management – Concepts, practices and Cases, McGraw Hill
6. Dalrymple, Sales Management, Concept and Cases, John Wiley
7. Das Gupta, Sales Management, In the Indian Perspective, Prentice Hall

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|--------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | Sales Pitch | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Studies |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|------------------|------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

SERVICES MARKETING

Course Code : MKT301

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Interpret the growth of service economy and design service quality measurements to build customer loyalty. |
| CO2 | Demonstrate a knowledge of the extended marketing mix for services. |
| CO3 | Create service blueprinting and adopt positioning strategies for better service. |
| CO4 | Recognize the challenges faced in services delivery as outlined in the services gap model. |
| CO5 | Identify and formulate Marketing strategies for different service sectors. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 2 | 2 | 3 | 2 | - | 3 | - |
| CO2 | 3 | - | - | 2 | - | - | - | - |
| CO3 | 3 | 3 | - | 1 | - | 3 | 2 | 1 |
| CO4 | 1 | 3 | - | 3 | - | 2 | 2 | 1 |
| CO5 | - | 2 | 1 | 2 | 3 | 2 | 2 | - |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|--|------------|-------------|
| 1 | Unit I: Introduction to services marketing – Services economy – evolution and growth of service sector – nature and scope of services – characteristics – classification – service market potential – expanded marketing mix for services – service quality – introduction to gaps model and SERVQUAL dimensions. | 9 | CO1, CO2 |
| 2 | Unit II Focus on customers - Assessing service marketing opportunities– customer expectations and perceptions of services – customer behavior specific to usage of services – service markets segmentation – market targeting and selection. | 9 | CO2 |
| 3 | Unit III Service design – Levels of service product – Service life cycle – new service development– service blueprinting – physical evidence and service scape – competitive differentiation of services – service positioning strategies – developing positioning maps – pricing of services – methods and specific issues. | 9 | CO3 |
| 4 | Unit IV Service delivery – People in services – service process – distributing service direct distribution, channel functions, channels selection, impact of information technology – designing communications mix for promoting services – building service customer relationships and service recovery – role of internal marketing in service delivery-Drivers of service dissatisfaction | 9 | CO4 |
| 5 | Unit – V Marketing strategies for different services – Formulating service marketing strategies for health, hospitality, tourism, logistics, financial, information technology, educational, entertainment and public utility services. | 9 | CO5 |

TEXT BOOKS:

1. **Rao**, Services Marketing, 2e Pearson Education India 2011
2. **Lovelock**, Services Marketing : People Technology Strategy, 8ePearson Education India 2017
3. **Wirtz**, Essentials of Services Marketing, 3ePearson Education India 201

REFERENCE BOOKS:

1. Kenneth E Clow, et. Al “Services Marketing Operation Management and Strategy” Biztantra, New Delhi, 2004.
2. ChiristopherH.Lovelock, JochenWirtz, “Services Marketing”,PearsonEducation,N.Delhi, 2004.
3. HalenWoodroffe, “Services Marketing”, McMillan Publishing Co, New Delhi 2003.
4. NimitChowdhary and Monika Choudhary, “Text book of Marketing of Services”, the Indian experience, MacMillan Publishing Co, New Delhi, 2005.
5. ChristianGronroos, “Services Management and Marketing a ‘CRM Approach”, John Wiley and sons England 2001.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM’S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|----------------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | Service Gap Analysis |
| Apply | 2 | 2 | 2 | 2 | | | Case Studies |
| Analyze | 3 | 2 | 3 | 3 | | Blueprint of Retail Outlet | |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom’s Category | Test |
|------------------|------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

GLOBAL MARKETING MANAGEMENT

Course Code : MKT302

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Apply the principles of Global marketing, for effective marketing in domestic market. |
| CO2 | Apply all Political, legal and regulatory compliances while marketing in different countries. |
| CO3 | Develop skills in researching and analyzing trends in Global markets and in modern marketing places. |
| CO4 | Apply the principles of Marketing mix for effective campaign. |
| CO5 | Assess an organization's ability to enter and compete in international markets. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | - | 3 | - | 2 | 2 | 1 |
| CO2 | 3 | 3 | - | 3 | - | - | 3 | - |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | - |
| CO4 | 3 | 1 | 2 | 2 | - | 2 | 1 | 1 |
| CO5 | 2 | - | 3 | 2 | - | 3 | 2 | - |

| No | CONTENTS OF MODULE | Hrs | COs |
|----|--|-----|-----|
| 1 | UNIT I:INTRODUCTION TO GLOBAL MARKETING- Global Marketing -The Importance of Global Marketing- Management Orientations-Forces Affecting Global Integration and Global Marketing-The Global Marketing Environment: Multilateral Trade Agreements - Converging Market Needs and Wants and the Information Revolution - Transportation and Communication Improvements -Product Development Costs - World Economic Trends - Leverage -Restraining Forces | 9 | CO1 |
| 2 | UNIT II:THE GLOBAL MARKETING ENVIRONMENT The Global Economic Environment -The Global Trade Environment - Social and Cultural Environments - The Political, Legal, and Regulatory Environments of Global Marketing | 9 | CO2 |
| 3 | UNIT III: APPROACHING GLOBAL MARKETS Global Information Systems and Market Research - Segmentation, Targeting, and Positioning - Importing, Exporting, and Sourcing - Global Market Entry Strategies: Licensing, Investment, And Strategic Alliances | 9 | CO3 |
| 4 | UNIT IV: THE GLOBAL MARKETING MIX -Product and Brand Decisions - Pricing Decisions -Global Marketing Channels and Physical Distribution - Global Marketing Communications Decisions I: Advertising and Public Relations -Global Marketing Communications Decisions II: Sales Promotion, Personal Selling, Special Forms of Marketing Communication | 9 | CO4 |
| 5 | UNIT V: STRATEGY AND LEADERSHIP IN THE TWENTY-FIRST CENTURY Strategic Elements Of Competitive Advantage -Leading, Organizing, and Controlling The Global Marketing Effort -The Digital Revolution And The Global E-Marketplace | 9 | CO5 |

TEXT BOOKS:

1. **Gautam Dutta**, Global Marketing, 1e Pearson Education India 2016
2. **Keegan**, Global Marketing Management, 8e Pearson Education India 2017

REFERENCE BOOKS:

1. Patrick M Dunne And Rober F Lusch, Retailing Thomas Learning, 4th Edition 2008
2. Chetan Bajaj, Rajnish Tow And Nidhi, V. Srivatsava Retail Management, Oxford University Press, 2007
3. Swapna Pradhan, Retail Management-Text And Cases Tata McGraw Hill, 2nd Edition 2008

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|--|------------|---------------|-------------------|---------------------|--------------------------|--|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

SOCIAL MEDIA MARKETING

Course Code : MKT404

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Develop effective social media marketing strategies for various types of industries and businesses. |
| CO2 | Apply all Political, legal and regulatory compliances while marketing in different countries. |
| CO3 | Describe the major social media marketing portals that can be used to promote a company, brand, product, service or person. |
| CO4 | To work cooperatively within social media community by observing and listening critically with openness, then act ethically and follow through on commitments when communicating with various audience and build positive reputation within the community. |
| CO5 | Develop social media marketing plan and track progress in achieving goals with a variety of measurement tools, services, and metrics. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 2 | - | - | - | - | - | - | - |
| CO2 | 2 | - | - | - | - | - | - | - |
| CO3 | 2 | - | - | - | - | 3 | 2 | 1 |
| CO4 | 2 | 3 | - | - | - | 2 | 3 | 1 |
| CO5 | 2 | 3 | - | - | - | 1 | - | - |

| Si. No | CONTENTS OF MODULE | Hrs | COs |
|---------------|--|------------|------------|
| 1 | Unit I :Introduction Social media marketing-definition-scope and concept-history of social media marketing-Need for social media marketing-A comparative study between Traditional and Social media marketing-Social media marketing and consumer engagement-social feedback cycle-Social web and engagement-The operations and marketing connections | 9 | CO1 |
| 2 | Unit II :Social Media Business Eco System Using social media for business, Social business measurement-Employees as change agent-Social profile-Social application-Using brand outposts and communities | 9 | CO2 |
| 3 | Unit III Social Networking Sites Different types of social networking sites-Evolution of social networking sites-Marketing through social networking sites-Facebook marketing tools-Organic reach versus paid reach-adverts on Facebook Marketing through twitter-Twitter automation tools-LinkedIn marketing-Blog marketing-Video marketing-Google+ ,Pinterest-personal bonding on social media | 9 | CO3 |
| 4 | Unit IV Social CRM The new role of a customer-Difference between traditional CRM and social CRM-Outreach and influencer relations-Social CRM and business design-Enterprise design-Internal Collaboration Understanding conversations that matter- Social CRM and decision support system | 9 | CO4 |
| 5 | Unit-V Social Analytics Metrics and Measurement Social analytics – web analytics- Business analytics-social graph-social objects | 9 | CO5 |

TEXT BOOKS:

1. **Evans**, Social Media Marketing
2. **Bhatia**, Fundamentals Of Digital Marketing, 2e Pearson Education India 2019
3. **Miller**, Ultimate Web Marketing Guide Pearson Education India 2011

REFERENCE BOOKS:

1. Kotler.p, Roberto,N.,&Lee.N.(2008) social marketing-influencing behaviors for good(3rded) Thousandsoaks,CA:Sage publications, Inc. ISBN:978-1-4129-5647-5(paperback)
2. Jain, Sorav, Social media for business-stories of Indian boards

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMEN T (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|--|------------|---------------|--------------------|---------------------|--------------------------|--|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

STRATEGIC HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT

Course Code : HR- 301
L:P:T:S : 3:0:0:0
Exam Hours : 03

Credits : 03
CIA Marks : 40
ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Analyse the HR Framework in an organization and assess the HRD needs |
| CO2 | Apply digital techniques for HR functions like Recruitment and selection |
| CO3 | Identify the consequences of cultural diversity issues |
| CO4 | Design and optimize career development/planning |
| CO5 | Implement best practices of skill development to employees |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 3 |
| CO2 | 3 | 3 | 2 | - | 3 | 2 | 3 | 1 |
| CO3 | 3 | - | - | 3 | - | - | 3 | 2 |
| CO4 | 3 | 3 | 1 | 2 | - | 3 | 2 | 3 |
| CO5 | - | - | 3 | 3 | 3 | 3 | 3 | 3 |

| SI NO | CONTENTS OF MODULE | Hrs | Cos |
|--------------|--|------------|------------|
| 1 | Human resource development meaning, strategic framework for HRM and HRD. Vision, Mission and Values, Importance and challenges to organizations, HRD functions, roles of HRD professionals, HRD needs assessment, HRD practices, measures of HRD performance, links to HR, strategy and business goals, HRD program implementation and evaluation, recent trends, benchmarking and HRD audit, Industrial Relations – Scope and Need | 9 | CO1 |
| 2 | E- employee profile, e-selection and recruitment, virtual learning and orientation e-training and development, e-performance management and compensation design, development and implementation of HRIS, designing HR portals, issues in employee privacy, employee surveys online. | 8 | CO2 |
| 3 | Domestic Vs international HRM, cultural dynamics, culture assessment, cross cultural education and training programs, leadership and strategic HR issues in international assignments, current challenges in outsourcing, cross border and a repatriation, etc, building multicultural organizations, international compensation, exit management, shadowing | 8 | CO3 |
| 4 | Career concepts, roles, career stages, career planning and process, career development models, career motivation and enrichment, managing career plateaus, designing effective career development systems, competencies and career management, competency mapping models, equity and competency based compensation | 7 | CO4 |
| 5 | Employee coaching , Mentoring and counseling, need for coaching , role of HR in coaching, coaching and performance, skills for effective coaching, Mentoring – Scope and effectiveness, need for counseling, role of HR in counseling, components of counseling programs, counseling effectiveness, employee health and welfare programs, counseling effectiveness, work stress, sources, techniques, eastern and western practices, self-management and emotional intelligence. | 8 | CO5 |

TEXT BOOKS:

1. **Sharma**, Strategic Human Resource Management and Development, 1e Pearson Education India 201
2. **Greer**, Strategic Human Resource Management, 2e Pearson Education India 2005

REFERENCE BOOKS:

1. Jeffrey, Strategic Human resource management, Thompson, 2003
2. Werner, Human Resource Development, Thompson, 2002
3. Harrison, Employee Development, University Press, New Delhi,
4. Srinivas Kanula, Human Resource Management, Prentice Hall of India, 2005
5. Richard Regis, Strategic Human Resource Management and Development, Excel Books India, 2008

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGOR Y MARKS (OUT OF 40) | CI A (7) | MODE L (10) | ASSIGNME NT (5) | PRESENTATI ON (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|---|----------------|-------------------|-----------------------|-------------------------|-----------------------------|--|-----------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | Challenges in Multicultural Organisation s | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Studies |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

LABOUR LEGISLATIONS

Course Code : MBA302

Credits : 04

L:P:T:C : 3:0:0:3

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | To review the perspectives, theories and concepts in the field of labor and employment relations |
| CO2 | To interpret the salient features of welfare and wage Legislations |
| CO3 | To inspect the laws relating to Industrial Relations, Social Security and Working conditions and working conditions in different settings. |
| CO4 | To execute labor law and individual employment rights |
| CO5 | To assess the developments and changes that have taken place in the field of labour law from time to time |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | 2 | 3 | 3 | - | 3 | 1 |
| CO2 | 2 | 1 | - | 2 | 2 | - | 3 | 2 |
| CO3 | 3 | 2 | 1 | 3 | 2 | 2 | 3 | 2 |
| CO4 | 3 | 1 | - | 3 | - | 1 | 3 | 2 |
| CO5 | 2 | 2 | 1 | 3 | - | 2 | 3 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|--|------------|---------------------|
| 1 | Introduction to Labour Legislations and Regulatory Laws: Meaning and classification of Labour legislations in India. History & Development of Labour Legislations in India The Factories Act, 1948 | 9 | CO1 |
| 2 | Legislations related to Wages The Payment of Wages Act, 1936 The Minimum wages Act, 1948 | 9 | CO2 |
| 3 | Legislations related to Social Security The Employee Compensation Act, 1923 Payment of Gratuity Act, 1972 The Payment of Bonus Act, 1965 The Employee Provident Fund and Miscellaneous Act, 1952 The Employees State Insurance Act, 1948 | 15 | CO3, CO5 |

| | | | |
|---|---|---|-------------|
| 4 | Industrial Employment & Service conditions The Trade Unions Act, 1926 The Industrial Disputes Act, 1947 The Industrial Employment (Standing Orders) Act, 1946 | 9 | CO4, CO5 |
| 5 | Legislations related to environment Environment Protection Act, 1986 | 3 | CO5 |

TEXT BOOKS:

1. Kapoor N.D, Elements of Industrial Law, Sultan Chand
2. P.K.Padhi, Industrial Laws, PHI, 2008

REFERENCE BOOKS:

1. Srivastava, Industrial Relations and labour laws, Vikas, 4th ed, Respective Acts from Bare act
2. Dhandapani, commercial and Industrial law, Sultan Chand, 1998. _
3. Das Gupta, Maintaining Industrial discipline, Response Books, 2002

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|--|------------|---------------|-------------------|---------------------|-------------------------|--------------------------------------|-----------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | Mind Mapping | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Studies |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|------------------|------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

GLOBAL HUMAN RESOURCE MANAGEMENT

Course Code : HR 303
L:T:P:C : 3:0:0:3
Exam Hours : 03

Credits : 03
CIA Marks : 40
ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Evaluate the developing role of human resources in the global arena |
| CO2 | Analyze complex issues and manifold risks that have arisen due to increased globalization |
| CO3 | Develop a diagnostic and conceptual understanding of HRM in a broader, comparative and international perspective |
| CO4 | Manage the growing presence of multinationals and increasing diversity of workforce demands |
| CO5 | Analyze the strategic issues and strategies required to select and develop cross-cultural manpower resources |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 2 | 3 | 3 | 1 | - | 2 | 1 |
| CO2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 2 | 3 | 2 | - | 2 | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Introduction to GHRM Definition, reasons for going global, Approaches to GHRM, Difference between GHRM and Domestic HRM, Organizational dynamics and GHRM: Role of culture in International HRM, Culture and employee management issues, Organizational Processing GHRM, Linking HR to International expansion strategies, The Challenges of GHRM | 9 | CO1 |
| 2 | Strategies for International Growth: Exploiting global integration-The logic of global integration, differentiation, Mastering expatriation, beyond the traditional expatriate model, Becoming locally responsive: understanding and responding to diversity, the challenges of localization, Managing alliances and joint ventures- planning , negotiating, implementing and supporting alliance | 9 | CO2 |
| 3 | Recruitment, Selection and staffing in International context: International Managers- parent country nationals, third country nationals, host country nationals, advantages and disadvantages of different selection methods, different approaches to multinational staffing decisions, | 9 | CO3 |

| | | | |
|---|---|---|-----|
| | recruitment methods using head-hunters, cross-national advertising, e-recruitment; Selection criteria and techniques, international staffing issues – Outsourcing | | |
| 4 | Performance Management: A conceptual background, Constraints in goal attainment, performance management cycle, models, performance and appraisal in GHRM appraisal of expatriate, third and host country employees, issues and challenges in international performance management, country specific performance management practices. Training and development in international context:, types of expatriate training, HCN training, Career Development, developing international staff and multinational teams, knowledge transfer in multinational companies, repatriate training. | 9 | CO4 |
| 5 | International Compensation: Key components of international compensation and factors that influence compensation policy, Approaches to international compensation, compensation practices across the countries, global compensation: emerging issues. International Labour Relations: Key issues, response of labour unions to HRM practices in different countries. | 9 | CO5 |

TEXT BOOKS:

1. The Global Challenge- framework for International Human Resource Management, Evans, Pucik, Barsoux, Tata McGraw-Hill Irwin. Global Human resource management-Peter J Dowling, Denice
2. **E Welch**, Cengage Learning Global Human resource management - Monir H Tayeb – Oxford University Press - 2005.
3. **Edwards**, International Human Resource Management , 1e Pearson Education India 2005

REFERENCE BOOKS:

1. Adler, N.J. International Dimensions of Organizational Behaviour. Kent Pub., Boston, 1991.
2. Bartlett, C and Ghoshal, S Transnational Management: Text Cases and Readings in Cross Border Management, Irwin, Chicago, 1995.
3. Dowling, P.J., etc. International Dimensions of Human Resource Management. 2nd ed. Wadsworth, California, 1994.
4. Hofstede, G. cultures Consequence: International Differences in Work Related Values, 2nd edition Sage, London, 2001

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|------------------|------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

LEADERSHIP AND ORGANIZATIONAL EFFECTIVENESS

Course Code : HR 305

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits :03

CIA Marks :40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Interpret the importance of Leader with the theories applied, grid and models. |
| CO2 | Analyze the complexities associated with management of the group behavior in the organization. |
| CO3 | Develop own strategies for team leadership and influence them |
| CO4 | Examine relevant issues in applied management and leadership; including ethics, globalization, and strategic management. |
| CO5 | Generate ideas Managerial Effectiveness through group influences, negotiation skills and knowledge Management. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 |
| CO5 | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 2 |

| SI NO | CONTENTS OF MODULE | Hrs | Cos |
|--------------|---|------------|------------|
| 1 | Introduction to Leadership :Definition ,Importance of leadership, Roles of a leader, Leadership attitudes, ethical leadership, Theories of Leadership, leadership grid,, Content and process theories, Reinforcement theory, Contingency leadership theories and models, Leadership continuum theory, Normative leadership theory, Leadership substitute theory | 9 | CO1 |
| 2 | Team Leadership: Ginnert steam effectiveness leadership model the changing role of leadership in self- manage dreams, Leader follower relations, Dyadic theory, Leader member exchange theory ,Delegation ,Coaching, Managing conflict. Organizational Leadership: Charismatic and transformational leadership, | 9 | CO2 |

| | | | |
|---|---|---|-----|
| | Stewardship and servant leadership, Leadership of culture and diversity, Strategic leadership. | | |
| 3 | Leadership development and succession: Development through self-awareness and self-discipline, education, experience, and mentoring, succession. Evaluation of leadership development efforts, In dian cases on leadership | 9 | CO3 |
| 4 | The Concept Of Managerial Effectiveness Definition- The person, process, product approaches- Bridging the Gap- Measuring Managerial Effectiveness- Current industrial and Government practices in the Management of Managerial Effectiveness- the Effective Manager as an Optimizer. | 9 | CO4 |
| 5 | Environmental Issues In Managerial Effectiveness Organisational Processes- Organisational Climate• Leader-Group Influences-Job Challenge- Competition-Managerial Styles. Developing The Winning Edge Organisational and Managerial Efforts-Self Development- Negotiation Skills-Development of the Competitive Spirit- Knowledge Management-Fostering Creativity. | 9 | CO5 |

TEXT BOOKS:

1. **Leadership Development** - by John Mitchell, Natalie Mitchell and Bogdan Gudzenko, 2012
2. Human Resource Management - ©2015 | Pearson | Published: 18 Aug 2014
3. Leadership and Management Development: Developing Tomorrow's Managers - ©2010 | Financial Times Press | Published: 24 Jun 2010

REFERENCE BOOKS:

1. Blanchard and Thacker, 'Effective Training Systems, Strategies and Practices' Pearson 2005.
2. Dubin. Leadership, 'Research Findings, Practices & Skills', Biztantra, 2005.
3. Mathis Jackson Human, 'Resource Management', Thomson Southwestern, 2005.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITIES (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|---------------------|--------------------------------|------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Study |
| Evaluate | | 2 | | | 5 | HBR | |

| | | | | | | | |
|--------|--|--|--|--|--|--|--|
| Create | | | | | | | |
|--------|--|--|--|--|--|--|--|

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

KNOWLEDGE MANAGMENT

Course Code : HR401

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits :03

CIA Marks :40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Analyze the different knowledge types and explain how they are addressed by knowledge management |
| CO2 | Examine how valuable individual, group and organizational knowledge is managed throughout the knowledge management cycle |
| CO3 | Interpret the major roles and responsibilities in knowledge management implementations |
| CO4 | Identify some of the key tools and techniques used in knowledge management applications. |
| CO5 | Formulate and empower employees to solve customer problems in organizations |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 2 | 1 | - | 1 | 2 | - | 1 |
| CO2 | 2 | 1 | 2 | 3 | 3 | 1 | 2 | 2 |
| CO3 | 3 | 2 | 1 | 2 | - | - | 2 | 1 |
| CO4 | 2 | 2 | - | 1 | 2 | 1 | - | 2 |
| CO5 | 3 | 2 | 1 | - | 2 | 1 | 2 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|--|------------|------------|
| 1 | The Basics Understanding Knowledge ,KM System Life Cycle | 9 | CO1 |
| 2 | Knowledge Creation And Capture Knowledge Creation and Architecture., Capturing Tacit Knowledge., Other Knowledge Capturing Techniques. | 9 | CO2 |
| 3 | Knowledge Codification And System Implementation Knowledge Codification, System Testing and Deployment., Knowledge Transfer and Knowledge Sharing. Knowledge Transfer in the E-World | 9 | CO3 |
| 4 | KM System Tools And Portals Learning From Data, Data Mining, Knowing the Unknown, KM Tools and Knowledge Portals. | 9 | CO4 |
| 5 | Ethical, Legal and Managerial Issues Managing Knowledge Workers, the future of KM, the ownership of knowledge | 9 | CO5 |

TEXT BOOK:

1. **Awad**, Knowledge Management, 1e Pearson Education India 2007
2. **Tiwana**, Knowledge Management Toolkit w/CD Pearson Education India 2006

REFERENCES:

1. Knowledge Management – a resource book – A Thothathri Raman, Excel, 2004.

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMEN T (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|--|------------|---------------|--------------------|---------------------|--------------------------|--|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

TRAINING AND HUMAN PERFORMANCE ENHANCEMENT

Course Code : HR-402

Credits : 03

L:P:T:S : 3:1:0:0

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Discuss various aspects of the training design process and describe the strategic training and development process. |
| CO2 | Identify different methods used in needs assessment and discuss the role of organizational analysis, individual analysis and task analysis in needs assessment. |
| CO3 | Discuss the strength and weakness of traditional training methods and the new technology training methods |
| CO4 | Design a program for preparing for cross cultural assignments and able to discuss the potential legal issues that relate to training |
| CO5 | Effectively perform the manager's role in career management and design an effective socialization program for employees |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 1 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 1 |

| Sl NO | CONTENTS OF MODULE | Hrs | Cos |
|--------------|--|------------|------------|
| 1 | Introduction to Education and Development, Strategic Training and development Process, Factors influencing working , learning and Training, | 8 | CO1 |
| 2 | Training need Assessment, process, Models of need assessment, Learning theories, process and program design, Transfer of training – training design | 8 | CO2 |
| 3 | Traditional training methods, - on the job, off the job, E learning and use of technology in training, Training Evaluation- outcomes used for evaluation, evaluation design, practices , determining ROI | 8 | CO3 |
| 4 | Employee development – Approaches, process and strategies, Special issues in Training & Development – external and internal issues, Future of Training and development | 8 | CO4 |

| | | | |
|---|--|---|-----|
| 5 | Careers and career management - definition, model, career management systems, evaluation career management systems, Special challenges in career management – Socialisation, orientation | 8 | CO5 |
|---|--|---|-----|

TEXTBOOK:

1. Employee Training and Development by Raymond A Noe

REFERENCES :

- 1 Bewnet, Roger cd Improving Training effectiveness, Aldershot, Gower 1988
- 2 Buckley R & Caple, Jim, The Theory & Practice of Training, London, Kogan & Page 1995
- 3 Lynton R Pareek U Training to Development 2nd ed. New Delhi, Vistaar, 1990.
- 4 Pepper, Allan D, Managing the Training and Development function, Aldershot, Gower, 1984
- 5 Rae L etc. Hon to Measure Training Effectiveness, Aldershot, Gower, 1986
- 6 Reid M.A. etc. Training interventions, Managing Employee Development, 3rd ed. London IPM 1992
- 7.Serge P The Fifth Discipline, The Art and Practice of the learning organization London Century,1992

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|----------------------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Effective training methods |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Role Play | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|------------------|------|
| Remember | 6 |
| Understand | 8 |

| | |
|----------|----|
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

RECRUITMENT AND SELECTION

Course Code : HR 403

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Develop job specifications and person specifications to fit current recruitment needs of the business |
| CO2 | Examine selection methods and their effectiveness in helping identify the best interview candidates |
| CO3 | Best practices and protocols in responding to, and short-listing, applicants |
| CO4 | Develop communications and techniques in order to get the best out of recruitment interviews identify |
| CO5 | Recognize the importance of adopting a structured recruitment process and the use of relevant selection methods |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | | | | | | | | |
| CO2 | | | | | | | | |
| CO3 | | | | | | | | |
| CO4 | | | | | | | | |
| CO5 | | | | | | | | |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|--|------------|------------|
| 1 | Job Analysis. Meaning, definition and purpose. Methods of job analysis: subject expert workshops, critical incident technique, functional job analysis, job element method, repertory grid, critical incident | 9 | CO1 |
| 2 | Hiring Process: Hiring decision. Nature of hiring: Existing post or new post to be created. Need analysis, cost analysis and job analysis. Hiring internally and externally. Advantages and disadvantages of the sources. Job advertisement: drafting, size and contents | 9 | CO2 |

| | | | |
|---|---|---|-----|
| 3 | Screening the candidates: Application Forms: bio-data / resume / curriculum vitae and weighted application blanks: meaning definition, purpose, advantages and disadvantages – taking a behavioral approach to recruitment: spotting personality patterns, making basic assumptions, predicting the future, strategy Vs. Technique. | 9 | CO3 |
| 4 | Testing. Meaning, definition, purpose, advantages and disadvantages. Ability tests clerical ability test, mechanical ability test, mental ability test, physical ability test, personality assessment test, typing test, shorthand test, computer proficiency test Interviewing: Planning the interview, Interview process | 9 | CO4 |
| 5 | Reference checking & Appointment orders: meaning, definition and purpose. Meaning, definition, and purpose. Statutory requirements (under the Shops and commercial establishments Act). Contents of appointment letter, hard copy (or soft copy), method of delivery and retrieving the Acknowledgement copy. Medical Examination & acceptance of offer for joining | 9 | CO5 |

TEXT BOOKS:

1. Human Resource Selection by Robert D. Gatewood and Hubert S. Feild, South western Cengage Learning, Mason, Ohio 2001
2. Staffing Organization, Herbert G. Heneman III, Timothy A. Judge, 5th Edition, McGraw Hill International

REFERENCE BOOKS:

1. Employee Selection, Lilly M Berry, Thomson Publications
2. Hiring & keeping the best people, HBS Press
3. Human Resource Planning, Dipak Kumar Bhattacharyya, 2nd edition, Excel Books.
4. High performance hiring by Robert w. Wendover, Crisp Publication, California, 1991.
5. Recruitment and Selection: A Competency Approach, Y Gareth Roberts, CIPD House, 2004

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMEN T (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|--|------------|---------------|--------------------|---------------------|--------------------------|--|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |

| | | | | | | | |
|----------|--|--|--|--|--|--|--|
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

INVESTMENT MANAGEMENT

Course Code : FIN 301

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyze the investment securities and settings |
| CO2 | Appraise about capital market and SEBI |
| CO3 | Evaluate about Economy Analysis and Industry life cycle |
| CO4 | Create Fundamental analysis and Technical analysis for their investment |
| CO5 | Analyze the Portfolio theory and the mutual funds benefits and impact. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | - | - | - | - | - | - |
| CO2 | 2 | - | - | - | - | - | - | - |
| CO3 | 3 | 3 | - | 1 | - | - | 1 | 1 |
| CO4 | 3 | 3 | - | 1 | - | - | 1 | 1 |
| CO5 | 2 | 3 | - | - | - | 3 | 1 | - |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Investment setting — Securities — Sources of investment information — Security market indications— Security Contract regulation Act. Investor Protection | 9 | CO1 |
| 2 | Overview of capital market, Institutional structure in capital market, Reforms and state of capital market, New issue market and problems, Securities and Exchange Board of India (SEBI), Debt Market. | 9 | CO2 |
| 3 | Economic Analysis — Economic forecasting and stock Investment Decisions — Forecasting techniques. Industry Analysis — Industry classification. Economy and Industry Analysis. Industry life cycle - Company Analysis Measuring Earnings —Forecasting Earnings | 9 | CO3 |
| 4 | Fundamental Analysis Vs Technical Analysis — Charting methods — Market Indicators. Trend — Trend reversals — Patterns - Moving Average — Exponential | 9 | CO4 |

| | | | |
|---|--|---|-----|
| | moving Average —Oscillators | | |
| 5 | Portfolio Theory – Portfolio Construction — Performance Evaluation – Portfolio revision-Mutual Funds | 9 | CO5 |

TEXT BOOKS:

1. Punithavathy Pandian, 'Security Analysis & Portfolio Management' – Vikas Publishing House Pvt., Ltd., 2001
2. **Fischer**, Security Analysis Portfolio Management, 7e Pearson Education India 2018
3. **Ranganatham**, Security Analysis Portfolio Management, 7e Pearson Education India 2011

REFERENCE BOOKS:

1. Donald E. Fischer & Ronald J. Jordan, 'Security Analysis & Portfolio Management', Prentice Hall of India Private Ltd., New Delhi 2000.
2. Prasanna chandra, Investment analysis and Portfolio Management, Tata McGraw Hill, 2011.
3. B. S. Bhatia and G. S. Batra, "Management of Capital Markets, Financial Services and Institutions" - Deep & Deep Publication Pvt Ltd, New-Delhi, 2001.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|----------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Online Trading |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Portfolio for an Investor | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|------------------|------|
| Remember | 6 |

| | |
|------------|----|
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

INTERNATIONAL FINANCIAL MANAGEMENT

Course Code : FIN 302

Credits : 03

L:T:P:C : 3:0:0:3

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Compare Finance Functions nationally and Internationally and also to Analyze the International Monetary System |
| CO2 | Evaluate Foreign Exchange Market and FOREX |
| CO3 | Design International Long Term Finance by Analyzing various Banks both Nationally and Internationally |
| CO4 | Distinguish cross border Financing Decision and also about Working Capital Management |
| CO5 | Analyze the International Taxation and International Accounting |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 2 | - | - | - | - | - | - | - |
| CO2 | 2 | 2 | - | 2 | - | - | - | 1 |
| CO3 | 2 | 1 | - | 2 | - | 1 | - | 1 |
| CO4 | 1 | 1 | - | 1 | - | 1 | 1 | - |
| CO5 | 1 | 1 | - | - | - | - | - | - |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|--|------------|------------|
| 1 | International financial functions – Scope of international financial management – international flow of funds – development in international monetary system | 9 | CO1 |
| 2 | Foreign exchange market – Foreign exchange rates - Spot Prices and Forward Prices – Factors influencing Exchange rates – The effects of Exchange rates in Foreign Trade – Tools for hedging against Exchange rate variations – Forward, Futures , Swaps and Currency options – FEMA – Determination of Foreign Exchange rate and Forecasting – Reforms in FOREX market | 9 | CO2 |
| 3 | International long term finance – IMF – World bank – Euro bond market – Asian development bank – ADR's and GDR's | 9 | CO3 |

| | | | |
|---|--|----|-----|
| 4 | Cross border investment decisions - Financing Decisions of MNCs - Management of Working Capital - FDI - International banking & portfolio management | 12 | CO4 |
| 5 | International accounting – International taxation | 6 | CO5 |

TEXT BOOKS:

1. International financial management – Thummuluri Siddaiah – Pearson India
2. **Siddiah**, International Financial Management: An Analytical Framework 2e Pearson Education India 2015
3. **Eiteman**, Multinational Business Finance, 14e Pearson Education India 2017

REFERENCE BOOKS:

1. International financial management– Sharan – Pearson India publishers
2. International financial management– Apte – PHI

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|------------------|------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

MERCHANT BANKING AND FINANCIAL SERVICES

Course Code : FIN 303

Credits : 03

L:T:P:C : 3:0:0:3

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Analyses various Financial Services and Products available in the market. |
| CO2 | Evaluate about the Functions and Role of Merchant Banker |
| CO3 | Appraise their credentials for credit Rating and also about Mergers and Acquisitions |
| CO4 | Analyse the concept of Factoring, Financing and Evaluation. |
| CO5 | Evaluate about Consumer credit and Venture Capital |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 3 | 3 | 1 |
| CO5 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Financial Services Industry – Emergence – Developments – Fund Based and Non-fund based activities – modern activities – New Financial Products and Services, Innovative Financial Instruments – Challenges Ahead. | 9 | CO1 |
| 2 | Role of Merchant Banker in Appraisal of Projects, Designing Capital Structure and Instruments – Issue Pricing – Book Building – Preparation of Prospectus -Selection of Bankers, Advertising Consultants, etc. - Role | 9 | CO2 |

| | | | |
|---|---|---|-------------|
| | of Registrars –Bankers to the Issue, Underwriters, and Brokers. – Offer for Sale – Green Shoe Option – E-IPO, Private Placement – Bought out Deals– Issue Marketing – Advertising Strategies – NRI Marketing – Post Issue activities | | |
| 3 | Fee based services - Mergers and Acquisitions – Portfolio Management Services – Credit Rating – Credit Rating: Regulatory framework – Credit Rating Agencies – Rating Process and Methodology – Rating symbols/Grades – Pension Plan - Mutual Funds - Business Valuation. | 9 | CO3 |
| 4 | Factoring and Forfeiting - Mode of operation ; types, functions – Factoring in India - Bills Discounting –Real estate Industry – Housing Finance – Housing Finance system – National Housing Bank – Refinance scheme for HFCs – Asset Liability Management | 9 | CO4 |
| 5 | Securitization – Mortgage-Based Securitization – Reverse Mortgage Loan (RML) Securitization of Standard Assets - Financial Evaluation - Consumer Credit – Credit Cards –Real Estate Financing – Bills Discounting –Venture Capital.. | 9 | CO4, CO5 |

TEXT BOOKS:

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, 11th Edition, 2008
2. **Gurusamy**, MERCHANT BANKING AND FINANCIAL SERVICES, *Tata McGraw Hill, Delhi, 2009.*

REFERENCE BOOKS:

1. J.C.Verma, A Manual of Merchant Banking, Bharath Publishing House, New Delhi,
2. Varshney P.N. & Mittal D.K., Indian Financial System, Sultan Chand & Sons
3. Sasidharan, Financial Services and System, Tata McGraw Hill, New Delhi, 2nd Edition, 2011.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|--|------------|---------------|-------------------|---------------------|-------------------------|---|-----|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |

| | | | | | | | |
|----------|---|---|---|---|---|--------------------------|------------|
| Analyze | 3 | 2 | 3 | 3 | | | Case Study |
| Evaluate | | 2 | | | 5 | Venture Capital analysis | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

FINANCIAL DERIVATIVES

Course Code : FIN 401

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyse the various types of derivatives and its types |
| CO2 | Evaluate the value of forward contracts, hedging and limitations |
| CO3 | Appraise about Future contracts and its nature |
| CO4 | Critically examine the options and its values and strategies |
| CO5 | Develop knowledge on Swaps its principle and valuation and construct a swap model |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 2 | 1 | - | - | - | - | - | - |
| CO2 | 2 | 3 | - | - | - | - | - | - |
| CO3 | 2 | 3 | - | - | - | 2 | - | 1 |
| CO4 | 2 | 3 | - | - | - | 2 | - | 1 |
| CO5 | 2 | 2 | - | - | - | - | - | - |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Introduction to Derivatives – Types of derivatives –General characteristics of derivatives-Functions performed by derivatives markets – Traders in derivatives market-- Use of derivatives --Financial Implications in Financial Services, World Derivatives market – Derivatives in India. | 9 | CO1 |
| 2 | Forward contracts – Classification-Mechanism-features-advantages and disadvantages-valuation-pricing-hedging-Offsetting-limitations | 9 | CO2 |
| 3 | Futures contracts. Nature-Characteristics-Evolution-Participants-Pricing models-hedging strategies. | 9 | CO3 |
| 4 | Options-Options contract - Valuation of options-Hedging strategies using options | 9 | CO4 |
| 5 | Financial swaps-Principles and valuation | 9 | CO5 |

TEXT BOOKS:

1. Bishnupriya Mishra, SathyaSwaroopdebashish-Financial derivatives
2. **Maheswari**, Financial Derivatives: The Currency and Rates Factor, 1e Pearson Education India 2012
3. **Hull**, Options, Futures and other Derivatives, 10e Pearson Education India 2018

REFERENCE BOOKS:

1. Janakiraman, Derivatives and Risk Management, 1e Pearson Education India 2011
2. **S.S.S.Kumar**, 'Financial Derivatives – Prentice Hall India Pvt., Ltd.
3. **Gupta**, 'Financial Derivatives – Prentice Hall India Pvt., Ltd

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|--|------------|---------------|-------------------|---------------------|-------------------------|--------------------------------------|---------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Study |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Study of Derivative market | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

RISK MANAGEMENT AND INSURANCE

Course Code : FIN 402

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyze the various types of risk and also to measure risk. |
| CO2 | Evaluate the value of Risk, its avoidance, retention, diversifying and Controlling. |
| CO3 | Apply Risk Management tools and Hedging. It also gives exposure to Forward and Future Contracts |
| CO4 | Evaluate an exposure on Insurance sector and IRDA |
| CO5 | Evaluate on Insurance Policies, its process of claim, Foreign Insures in India and Bank Assurance |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 2 | - | | - | - | - | - |
| CO2 | 3 | 2 | - | 1 | - | - | - | 1 |
| CO3 | 3 | 2 | - | | - | - | 2 | 1 |
| CO4 | 2 | 1 | - | | - | 3 | 2 | 1 |
| CO5 | 2 | 1 | - | | - | - | - | - |

| SI NO | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | Risk – Types of Risk – Objectives of Risk Management – Sources of Risk – Risk Identification – Measurement of Risk | 9 | CO1 |
| 2 | Risk Avoidance – Risk retention – Transfer of risk – Value of Risk Management – Pooling – Diversifying risk – Loss of control | 9 | CO2 |
| 3 | Risk Management Tools options – Forward Contracts – Future contracts – Hedging – SWAPS | 9 | CO3 |
| 4 | General Insurance – Principles of General Insurance – General Insurance Products – Insurance contracts – objectives – Elements – Characteristics – Pricing – Market regulation & solvency regulations- Government regulation of insurance sector - Privatization of insurance business in India – insurance intermediaries – Insurance products pricing – IRDA – Objectives and implications. | 9 | CO4 |
| 5 | Insurance Principles and Policies – Insurance cost and Pricing - Claim valuation and cost- Reinsurance – Bank assurance – Foreign insures in India | 9 | CO5 |

TEXT BOOKS:

1. Dorfman – Introduction of risk management and insurance – Prenticehall
2. Harrington and Niehaus, ‘Risk management and Insurance, Tata Mcgraw Hill Publishing, New Delhi, 3rd Edition, 2010.
3. Trieschman, Hoyt, Sommer, ‘Risk management and Insurance, Cengage Learning, 3rd Edition,2011

REFERENCE BOOKS:

1. Mark S. Dorfman, Introduction to Risk management and Insurance, 10th Edition, Prentice hall of
2. India, 2011.
3. Stulz, Risk Management and Derivatives, Cengage Learning, 2nd Edition, 2011.
4. Skipper and Kwon, Risk management and Insurance, Blackwell Publishing, 2009.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODE L (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|-------------|----------------|------------------|-------------------|--------------------------------|--------------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Insurance Policies |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Risk Management tools | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|------------------|------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

CORPORATE TAXATION

Course Code : FIN 403

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Evaluate Income Tax and accounting and Income exempted from Tax |
| CO2 | Formulate head of income and about salaries and house property |
| CO3 | Compare Profits and Gains of business and profession, Capital gains and income from other sources |
| CO4 | Appraise Set off and carry forward of losses, assessment of individual & firms and deductions |
| CO5 | Formulate Assessment procedures, Tax planning, PAN , Filing of returns and IT authorities |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | - | - | - | 1 | - | 1 |
| CO2 | 3 | 3 | - | - | - | 1 | 1 | 1 |
| CO3 | 3 | 3 | - | - | - | 1 | 1 | 1 |
| CO4 | 3 | 3 | - | - | - | 1 | 1 | 1 |
| CO5 | 3 | 3 | - | 1 | - | 1 | - | 1 |

| Si. No. | CONTENTS OF MODULE | Hrs | Cos |
|----------------|--|------------|------------|
| 1 | Income tax law- scheme of taxation – important concepts – method of accounting – scope of total income and residential status – income exempted from tax | 9 | CO1 |
| 2 | Heads of Income – salaries and house property | 9 | CO2 |
| 3 | Profits and Gains of business and profession- Capital gains and income from other sources | 9 | CO3 |
| 4 | Set off and carry forward of losses – assessment of individual & firms – deductions under Chapter | 12 | CO4 |
| 5 | Assessment procedures - Tax planning – PAN – Filing of returns – IT authorities | 6 | CO5 |

TEXT BOOKS:

1. Income tax law and practice – V.P.gaur and Narang – Kalyani publishers

REFERENCE BOOKS:

1. Income tax – B.B.Lal – pearson india publishers
2. Income tax :law & practice – Singhanian – tax man publishers

ASSESSMENT PATTERN**CIA- Continuous Internal Assessment (40 Marks)**

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMEN T (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|--|------------|---------------|--------------------|---------------------|--------------------------|--|-----|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

E-COMMERCE TECHNOLOGY AND MANAGEMEN

| | | | |
|--------------------|------------------|--------------------|-------------|
| Course Code | : SYS-401 | Credits CIA | : 03 |
| L:P:T:S | : 2:1:0:0 | Marks | :40 |
| Exam Hours | : 03 | ESE marks | :60 |

Course objectives :

- To provide an understanding of e-commerce, the technology infrastructure and the business applications.
- To introduce ecommerce payments methods and security threats in e-commerce
- To recognize the ethical, social, legal and privacy issues in e-commerce

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Identify and describe the unique features of e-commerce technology and discuss their business significance |
| CO2 | Discuss the influence of electronic retailing, marketing and advertising on Business. |
| CO3 | Describe the business models and recognize business models in other emerging areas of e-commerce |
| CO4 | Identify the key security threats in business environment and understand the major e-commerce payment mechanism. |
| CO5 | Appreciate the importance of policies , procedures and laws in creating security. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Unit I - Fundamental Of E-Commerce Driving forces – benefits and limitations of e-commerce. Basics of Data mining, data warehousing and network infrastructure requirements. Overview of IP, TCP, HTML, OLAP and Cryptography. | 8 | CO1 |

| | | | |
|---|--|---|-----|
| 2 | Unit II - Business Applications in E-Commerce Retailing in E-commerce – market research on internet customers – e-commerce for service sector – Advertising in e-commerce – B2B e-commerce. | 8 | CO2 |
| 3 | Unit III - Commerce Infrastructure Intranet, Internet & Extranet – Structure, Architecture, Applications & Business Models. | 8 | CO3 |
| 4 | Unit IV - Commerce Payments and Security E-Payments and Protocols-Security schemes against internet fraud. Principles of e-fund transfer, credit and debit card usage, E-check and unified payment systems. | 8 | CO4 |
| 5 | Unit V - Legal and Privacy Issues in E-Commerce Legal, Ethics and Privacy issues – Protection needs and methodology - Consumer protection, Cyber laws, contracts and warranties. Taxation and Encryption Policies. | 8 | CO5 |

REFERENCES

1. Efraim Turban et al., 'Electronic Commerce – A managerial perspective', Pearson Education Asia
2. Kalakota et al, 'Frontiers of Electronic Commerce', Addison Wesley.
3. Sandeep Krishnamurthy, 'E-Commerce Management – Text and Cases', Thomson Learning.
4. P.T Joseph , 'E -Commerce A managerial perspective', Prentice Hall of India
5. Greenstein Firsman, 'Electronic Commerce', Tata McGraw Hill.
6. Nabil Adam et al, 'Electronic Commerce – Technical, Business and Legal Issues'. Prentice Hall.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

EMERGING TECHNOLOGIES FOR MANAGEMENT

Course Code : SYS-402
L:P:T:S : 2:1:0:0
Exam Hours : 03

Credits CIA : 03
Marks :40
ESE mar

Course objectives :

- To explore the emerging technologies Mobile computing, Wireless architecture, WAP and Green computing.
- To analyze the privacy risk and security management in using the emerging technologies for business management.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Explain the basic concepts of mobile computing, mobile security mobile OS and mobile database |
| CO2 | Describe the wireless architecture, tis benefits, applications and limitations. |
| CO3 | Discuss the WAP architecture , development tools and software and apply them in business management. |
| CO4 | Identify and analyse the environmental impact of the Information and Communication Technology and current mechanisms to reduce the energy consumption of ICT products |
| CO5 | Discuss the privacy risk and security management in the cloud. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 1 |

| Sl NO | CONTENTS OF MODULE | Hrs | Cos |
|--------------|--|------------|------------|
| 1 | Introduction to Mobile Computing Technology- Fundamentals of Cellular Systems. Mobile Security Introduction- Security in Wireless network - Security in Ad-hoc Networking Technologies – Security in Mobile Agents - Security Protocols. Mobile Database: Introduction – Databases – Database Hoarding. Mobile Operating System: Introduction- Palm OS – Windows Mobile OS | 8 | CO1 |
| 2 | Wireless Architecture- GSM Introduction- System Architecture – GSM Address and Identifiers – GSM Mobility Management. GPRS: Introduction- Benefits of GPRS - GPRP Architecture – GPRS Applications – Limitations of GPRS. WLL: | 8 | CO2 |

| | | | |
|---|--|---|-----|
| | Introduction – Configuration – Architecture – WLL technologies. VPN: Introduction – Goals of VPN – Types of VPN – Benefits. WiMAX: Introduction – Features – Architecture – Applications. Wi-Fi: Introduction – Working Concepts. | | |
| 3 | Introduction to WAP History-WAP architecture - WAP Application - WAP development tools and software – Working with WML Interactivity - Forms and User Input – Adding functionality with WML script – Database Driven WAP – Dynamic WAP application – Converting existing websites to WAP. | 8 | CO3 |
| 4 | Green Computing Green IT Fundamentals: Business, IT, and the Environment- Green Assets: Buildings, Data Centers- Socio-cultural aspects of Green IT – Green Enterprise Transformation Roadmap – Green Compliance: Protocols, Standards, and Audits – Emergent Carbon Issues: Technologies and Future- The Environmentally Responsible Business Strategies (ERBS) | 8 | CO4 |
| 5 | Security and Privacy Privacy: What is Privacy – Data Life Cycle – Key Privacy Concerns – Who is responsible for protecting Privacy – Privacy Risk Management – Legal and Regulatory Implications Security Management: Standards – Security Management in the Cloud – Availability Management – Access Control. | 8 | CO5 |

TEXT BOOKS

1. Prashant Kumar Patra, sanjit Kumar Dash (2010). Mobile Cloud Computing SCITECH
2. Tim Mather – Subra Kumaraswamy – Shahed Latif (2010). Cloud Security and Privacy – OREILLY
3. WAP (2001) – A beginners guide – Dale Bulbrook – Tata McGraw Hill Edition

REFERENCES

1. Kumkum Garg (2010). Mobile Computing Theory and Practice Pearson 2010
2. Ronald L. Krutz and Russell Dean Vines(2010)- Cloud Secutrity — Wiley – India

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMEN T (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|--|------------|---------------|--------------------|---------------------|--------------------------|--|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

ENTERPRISE RESOURCE PLANNING

Course objectives :

- To understand the business process of an enterprise and to get an over view of the scope, benefits and the evolution of ERP.
- To discuss the ERP implementation methodology, different phases of implementation and maintenance of ERP.
- To introduce the emerging trends in ERP developments.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Describe the fundamental technology , issues in planning design and the implementation of ERP systems. |
| CO2 | Analyse the business process and able to redesign and restructure the organisation. |
| CO3 | Discuss the role of customers ,vendors and employees, the key issues, the implementation methodology and the guidelines for the ERP implementation. |
| CO4 | Explain the post implementation phase ,success , failures and costs and risks of failure in ERP implementation. |
| CO5 | Explore the emerging trends in ERP . |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 1 |

| Sl NO | CONTENTS OF MODULE | Hrs | Cos |
|--------------|---------------------------|------------|------------|
|--------------|---------------------------|------------|------------|

| | | | |
|---|--|---|-----|
| 1 | Introduction Overview of enterprise systems – Evolution - Risks and benefits - Fundamental technology – Issues to be consider in planning design and implementation of cross functional integrated ERP systems. | 8 | CO1 |
| 2 | ERP Solutions and Functional Modules Overview of ERP software solutions- Small, medium and large enterprise vendor solutions, BPR, and best business practices - Business process Management, Functional modules. | 8 | CO2 |
| 3 | ERP Implementation Planning Evaluation and selection of ERP systems - Implementation life cycle – ERP implementation, Methodology and Frame work- Training – Data Migration. People Organization in implementation-Consultants, Vendors and Employees. | 8 | CO3 |
| 4 | Post Implementation Maintenance of ERP- Organizational and Industrial impact; Success and Failure factors of ERP Implementation. | 8 | CO4 |
| 5 | Emerging Trends on ERP Extended ERP systems and ERP add-ons -CRM, SCM, Business analytics - Future trends in ERP systems-web enabled, Wireless technologies, cloud computing.- SAP modules | 8 | CO5 |

REFERENCES

1. Sinha P. Magal and Jeffery Word, Essentials of Business Process and Information System, Wiley India,
2. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill,
3. Alexis Leon, Enterprise Resource Planning, second edition, Tata McGraw-Hill,
4. Mahadeo Jaiswal and Ganesh Vanapalli, ERP Macmillan India,
5. Vinod Kumar Grag and N.K. Venkitakrishnan, ERP- Concepts and Practice, Prentice Hall of India.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|--------------------|---------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |

| | | | | | | | |
|--------|--|--|--|--|--|--|--|
| Create | | | | | | | |
|--------|--|--|--|--|--|--|--|

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

BIG DATA TECHNOLOGY

Course Code : SYS301

L:P:T:S : 2:1:0:0

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course objectives :

- To optimize business decisions and create competitive advantage with Big Data analytics.
- To explore the fundamental concepts of big data analytics and learn to analyze the big data using intelligent techniques.
- To analyze the various search methods and visualization techniques.
- To introduce programming tools PIG & HIVE in Hadoop ecosystem.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Work with big data platform and explore the big data analytics techniques business applications. |
| CO2 | Apply the fundamentals of various big data analytics techniques. |
| CO3 | Analyze the HADOOP and Map Reduce technologies associated with big data analytics. |
| CO4 | Design efficient algorithms for mining the data from large volumes |
| CO5 | Differentiate various big data technologies like Hadoop , Pig, Hive, Hbase and No-SQL |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 1 |

| Sl NO | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | Introduction to Big Data- Introduction-distributed file system-Big Data and its importance, Four Vs Drivers for Big Data, Big data analytics, Big data application. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce. | 8 | CO1 |
| 2 | Introduction Hadoop Big Data- Apache Hadoop & Hadoop Ecosystem- Moving Data in and out of Hadoop- Understanding inputs and outputs of Map Reduce- Data Serialization. | 8 | CO2 |
| 3 | Hadoop Architecture Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands, Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop Map reduce paradigm, Map and Reduce tasks, job, Task trackers- Cluster Setup- SSH & Hadoop Configuration – HDFS Administering- Monitoring & Maintenance. | 8 | CO3 |
| 4 | Hadoop Ecosystem And Yarn Hadoop ecosystem components- Schedulers- Fair and Capacity, Hadoop 2.0 New Features- Name Node High Availability, HDFS Federation. MRv2, YARN, Running MRv1 in YARN | 8 | CO4 |
| 5 | Hive and Hive OI, HBase Hive Architecture and Installation, Comparison with Traditional Database. HiveQL- Querying Data- Sorting and Aggregating, Map Reduce Scripts. Joins & Sub queries, Hbase concepts-Advanced usage, schema design. advance indexing-PIG, Zookeeper- How it helps in monitoring a cluster. Hbase uses zookeeper and how to build application with zookeeper. | 8 | CO5 |

References:

1. Boris Lunlinsky, Kevin.T.Smith, Alexey Yakubovich, "Professional Hadoop Solutions", Wiley.
2. Chris Eaton, Dirk Deroos et al., "Understanding Big Data", McGraw Hill,2012.
3. Tom White, "HADOOP: The definitive Guide", O Reilly 2012.
4. Frank J Ohlhorst "Big Data Analytics: Turning Big Data into Big Money", Wiley and SAS Business Series, 2012
5. Colleen Mccue, "Data Mining and Predictive Analysis: Intelligence Gathering and Crime Analysis", Elsevier, 200

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMEN T (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|--|------------|---------------|--------------------|---------------------|--------------------------|--|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

DATA MINING AND WAREHOUSING

Course Code : SYS 302

Credits : 03

L:P:T:S : 2:1:0:0

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Objectives:

- Apply and implement classical models and algorithms in data warehouses and data mining
- Master data mining techniques in various applications like social, scientific and environmental context.
- Develop skill in selecting the appropriate data mining algorithm for solving practical problems.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Analyze the basic concepts of data warehousing and the required skills to develop and use them. |
| CO2 | Apply the methods and techniques for preprocessing of data. |
| CO3 | Describe the designing of Data Warehousing to solve the root problems. |
| CO4 | Explain different methodologies used in data mining and data ware housing |
| CO5 | Compare different approaches of data ware housing and data mining with various technologies. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 2 | 3 | 1 |
| CO2 | 3 | 3 | 2 | 2 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 2 | 1 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Introduction Introduction: The Evolution Of Data Warehousing (The Historical Context), The Data Warehouse - A Brief History, Characteristics, Operational Database Systems and Data Warehouse (OLTP & OLAP), Today's Development Environment. | 9 | CO1 |

| | | | |
|---|---|---|-----|
| 2 | Data Processing Data Marts, Metadata, Multidimensional Data Models: Types of Data and Their Uses, from Tables and Spreadsheets to Data Cubes, Identifying Facts and Dimensions, Designing Fact Tables | 8 | CO2 |
| 3 | Data warehouse Principles of Data Warehousing(Architecture and Design Techniques):System Processes, Data Warehousing Components, Architecture for a warehouse, Three-tier Data Warehouse Architecture, Steps for the design and construction of Data Warehouses | 8 | CO3 |
| 4 | Data Mining Data Mining: Introduction: Motivation, Importance, Knowledge Discovery Process, KDD and Data Mining, Classification of data mining systems, Major issues, from Data warehousing to data Mining. | 7 | CO4 |
| 5 | Data Integration Data Integration and Transformation, Data Reduction, Data Warehouse and OLAP Technology for Data Mining: data warehouse, Architecture, Implementation, Data warehouse usage. | 8 | CO5 |

Text Book

1. Krzysztof J. Cios, Witold Pedrycz, Roman W. Swiniarski, "Data mining: A Knowledge Discovery Approach" ,Springer, 2007.

References

- 1 .Hand D. J. , Heikki Mannila, Padhraic Smyth, "Principles of data mining" MIT Press, 2001.
2. Soumen Chakrabarti, Earl Cox, Ian H. Witten, Morgan Kaufmann, "Data mining: know it all ",2008

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|-------------------|--------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

CLOUD COMPUTING

Course Code : SYS 302

L:P:T:S : 2:1:0:0

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course objective :

To provide comprehensive and in-depth knowledge of Cloud Computing concepts, technologies, architecture and researching state-of-the-art in Cloud Computing fundamental issues, technologies, applications and implementations.

To provide the basic ideas and principles in data center design; cloud management techniques and cloud software deployment considerations

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Describe the key technologies, architecture, strengths, limitations and applications of cloud computing and explain the types and service models of cloud. |
| CO2 | Deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine. |
| CO3 | Communicate through cloud for the management and improvement of business or an organisation. |
| CO4 | Understand different CPU, memory and I/O virtualization techniques that serve in offering software, computation and storage services on the cloud |
| CO5 | Describe the core issues such as security, privacy, and interoperability in cloud platform. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 1 |

| SI NO | CONTENTS OF MODULE | Hrs | Cos |
|-------|---|-----|-----|
| 1 | Cloud-definition, Benefits, Usage Scenarios, History of Cloud Computing - Cloud Architecture - Types of Clouds - Business models around Clouds – Major Players in Cloud Computing - Issues in Clouds - Eucalyptus - Nimbus - Open Nebula, CloudSim. | 8 | CO1 |
| 2 | Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service – Communication as services. Service Providers- Google, Amazon, Microsoft Azure, IBM, Salesforce. | 8 | CO2 |
| 3 | Email Communication over the Cloud - CRM Management - Project Management- Event Management - Task Management – Calendar - Schedules - Word Processing – Presentation – Spreadsheet - Databases – Desktop - Social Networks and Groupware. | 8 | CO3 |
| 4 | Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization –System Vm, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - Hypervisors – Xen, KVM , VMWare, Virtual Box. | 8 | CO4 |
| 5 | Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud. | 8 | CO5 |

Text Books

1. John Rittinghouse & James Ransome, Cloud Computing, Implementation, Management and Strategy, CRC Press, 2010.
2. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Que Publishing, August 2008.
3. James E Smith, Ravi Nair, Virtual Machines, Morgan Kaufmann Publishers, 2006.

Reference Books

1. David E.Y. Sarna Implementing and Developing Cloud Application, CRC press 2011.
2. Lee Badger, Tim Grance, Robert Patt-Corner, Jeff Voas, NIST, Draft cloud computing synopsis and recommendation, May 2011.
3. Anthony T Velte, Toby J Velte, Robert Elsenpeter, Cloud Computing : A Practical Approach, Tata McGraw-Hill 2010.
4. Haley Beard, Best Practices for Managing and Measuring Processes for On demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.
5. G.J.Popek, R.P. Goldberg, Formal requirements for virtualizable third generation Architectures, Communications of the ACM, No.7 Vol.17, July 1974.

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMEN T (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIE S (PLS SPECIFY) | |
|---|------------|---------------|--------------------|---------------------|--------------------------|--|-----|
| | | | | | | (4) | (4) |
| Remember | | | | | | | |
| Understand | | | | | | | |
| Apply | | | | | | | |
| Analyze | | | | | | | |
| Evaluate | | | | | | | |
| Create | | | | | | | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|------------------|------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

SUPPLY CHAIN MANAGEMENT

TRANSPORTATION AND WAREHOUSING MANAGEMENT

Course Code : SCM402

L:T:P:C : 3:0:0:3

Exam Hours : 03

Credits :03

CIA Marks :40

SEE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Apply the flow of goods, Ordering rules and Information transmittal methods. |
| CO2 | Evaluate the different types of transportation and Insurance procedure to ship the goods. |
| CO3 | Plan Warehouse and Logistics operations for optimum utilization of resources. Learn more about technology enabled fulfillment centers. |
| CO4 | Analyze and Interpret different types of Machinery used to process materials and for stock storage and revival. |
| CO5 | Apprehend different Transportation and Warehousing Management System and its usage in Shipment of goods. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 2 | - | - | - | - | - | - | - |
| CO2 | 2 | - | - | 1 | - | 2 | - | - |
| CO3 | 2 | - | - | 2 | - | 2 | 1 | 1 |
| CO4 | 2 | - | - | 2 | - | 1 | 1 | 1 |
| CO5 | 2 | 3 | - | - | - | 2 | 1 | - |

| Si. No | CONTENTS OF MODULE | Hrs | COs |
|---------------|---|------------|------------|
| 1 | Unit I: Information flows and order processing--Sales order-inventory interface procedures, Order information transmittal methods, Ordering rules, Schedule supplies for production/operations. | 9 | CO1 |

| | | | |
|---|--|---|-----|
| 2 | Unit II: Transportation—Modes and transport service selection, Outbound Shipments to Customers, inbound Shipments from Vendors, Freight Bills and Freight Claims, Carrier routing, Vehicle scheduling, Equipment selection, Claims processing, Rate auditing | 9 | CO2 |
| 3 | Unit III: Warehousing—Types of warehouses, Space determination, Functions & operations of a warehouse--- consolidation, Break-bulk, Cross docking , Mixing, Assembly, Stock placement, packaging, racking, safety, quality, labor efficiency, layout and design, Reverse logistics and returned goods processing, Picking by FIFO, FEFO, LIFO, LEFO, expiration date, Pick Pack and Delivery Fulfillment, Inventory & Shelf Life Management Stock layout and dock design | 9 | CO3 |
| 4 | Unit IV: Materials handling--- Equipment selection, Equipment replacement policies, Order-picking procedures, Stock storage and retrieval | 9 | CO4 |
| 5 | Unit V: Transportation Management Systems (TMS) and Warehousing Management Systems (WMS), GPS & Communication Applications in Transport, Navigation & Fleet Management Using GPS | 9 | CO5 |

TEXT BOOKS:

1. Michael Hary, Baston Aweitz And Ajay Pandit, Retail Management, Tata McGraw Hill, 6th Ed 2007
2. Ogden, Integrated Retail Management, Biztranza India 200

REFERENCE BOOKS:

1. Patrick M Dunne And Rober F Lusch, Retailing Thomas Learning,4th Edition 2008
2. Chetan Bajaj, Rajnish Tow And Nidhi,V.Srivatsava Retail Management, Oxford University Press,2007
3. Swapna Pradhan, Retail Management-Text And Cases Tata McGraw Hill, 2nd Edition 2008

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGOR Y MARKS (OUT OF 40) | CI A (7) | MODE L (10) | ASSIGNME N T (5) | PRESENTATI O N (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|---|----------------|-------------------|------------------------|--------------------------|-----------------------------|-----------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |

| | | | | | | | |
|----------|---|---|---|---|---|-------------------------|--------------|
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Studies |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Modes of transportation | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

INTEGRATED SUPPLY CHAIN MANAGEMENT

Course Code : SCM -301

Credits : 03

L:P:T:S : 3:0:0:0

CIA Marks : 40

Exam Hours : 03

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Recollect the implications of SCM, network design decisions and models and scheming distribution network in supply chain management |
| CO2 | Asses the sourcing decisions in supply chain boons and banes of 3 PL/4PL and various types of RSP. |
| CO3 | Understand the tools and techniques useful in implementing supply chain management |
| CO4 | Analyze and appraising the performance of supply chain to control it effectively. |
| CO5 | Understand the key concepts and techniques that will allow you to analyze, manage and improve supply chain processes for different industries and markets. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 2 | 2 | 2 | 2 | 1 |
| CO2 | 3 | 3 | 2 | 2 | 2 | 1 | 1 |
| CO3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | The Role of Supply chain management in economy & organization– evolution, key concepts & importance of supply chain, Indian scenario in supply chain, Enablers of Supply Chain performance, Supply Chain Drivers and Metrics, Supply Chain performance Measures, Customer service & cost trade-offs | 8 | CO1 |
| 2 | Sourcing decisions in supply chain- supplier assessment & selection, design collaboration, procurement process ; Outsourcing-make vs buy. – 3PL & 4PL 5PL | 8 | CO2 |
| 3 | Managing Information flow in supply chains, Demand forecasting- qualitative, quantitative, time-series, behavioral issues ; Role of IT in supply chain—CRM, supplier relationships, Transaction execution, decision support ; E-Business & supply chain; emerging technologies | 8 | CO3 |

| | | | |
|---|---|---|-----|
| | such as radio-frequency identification (RFID), electronic product code (EPC), and voice directed activities | | |
| 4 | Managing material flow in Supply Chain—Inventory management & control, Warehousing – Strategic issues – Economic benefits, Service benefits ; Transportation in a Supply chain– Drivers of transportation decisions, Modes of Transportation– Design Options for a Transportation network , Vehicle scheduling, Transportation costs & E-Retailing, Network design in the supply chain. | 8 | CO4 |
| 5 | Supply chain integration—internal & external integration, relationships building; Supply chain restructuring—postponement; Agile supply chain; Pricing & revenue management, Conflict resolution in supply chain. | 8 | CO5 |

Text Books :

1. Supply Chain Management-Text & Cases, Janat Shah, Pearson, 2009
2. Supply Chain Management--Strategy, Planning and Operation, Sunil Chopra, Peter Meindl, D.V.Kalra, Pearson Education, India

References

1. Supply Chain Logistics Management , Donald J. Bowersox, David J. Closs, M. Bixby Cooper, Tata McGraw – Hill Publishing co Ltd, New Delhi.
2. Modeling the Supply Chain, Jeremy F. Shapiro, Massachusetts Institute of Technology, Published by Thomson India Edition, India.
3. Supply Chain Management , Stanley E . Fawcett, Lisa M. Ellaram, Jeffrey A Ogdan Pearson Education, India
4. Designing & Managing the Supply Chain, Simchi-Levi, Kaminski & Simchi-Levi, Tata McGraw Hill, 2004
5. Logistics and Supply Chain Management, authored by Anurag Saxena, Ph D, Lt. Col Kaaushik Sircar, published by Jaico Publishing House, India.
6. Supply Chain Management – A Logistics Perspective, Coyle, Bardi, and Langley 8th Edition, South- Western Thompson Learning (2008) ISBN 0-324-37692-8

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CI A (7) | MODE L (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVITY (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|----------|-------------|----------------|------------------|-------------------|--------------------------------|-----|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |

| | | | | | | | |
|------------|---|---|---|---|---|---------------------|--------------|
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Studies |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Emerging Technology | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

PURCHASING MANAGEMENT

Course Code : SCM301

L:P:T:S : 3:0:0:0

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Learn to analyze and develop a company's purchasing processes and organization |
| CO2 | Understand the companies' purchasing decisions and to compare Local, Nation wide and World wide suppliers |
| CO3 | Understand the role of purchasing in successful cooperation between companies |
| CO4 | Design purchasing profit centric models and perform cost analysis |
| CO5 | Know the best practices in Negotiations, ethics in purchasing and code of conduct for suppliers |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | 3 | 3 | 2 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |

| SI NO | CONTENTS OF MODULE | Hrs | Cos |
|--------------|---|------------|------------|
| 1 | Purchasing -- policy & procedures, purchasing cycle, purchase orders, Purchasing tools & techniques (ABC, VED, HML, FSN), Purchasing related information system, E-purchase, Purchasing organization. Purchasing of services. | 8 | CO1 |

| | | | | | | | |
|------------|---|---|---|---|---|-----------------|--------------|
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| | | | | | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Studies |
| Evaluate | | 2 | | | 5 | | |
| Create | | | | | | Vendor Analysis | |

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |
| | |

INTERNATIONAL LOGISTICS AND MANAGEMENT OF GLOBAL SUPPLY CHAIN

Course Code : SCM301

L:P:T:S : 3:0:0:0

Exam Hours : 03

Credits : 03

CIA Marks : 40

ESE Marks : 60

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Analyse the global movement of goods and compare the size of Industry with different Industries. |
| CO2 | Evaluate the low cost sourcing from different countries and their challenges faced. |
| CO3 | Implement Green supply chain movement of goods. |
| CO4 | Design Global network to achieve Seamless performance across the market. |
| CO5 | Design Supply chain mapping for the process. |

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| CO1 | 3 | - | - | - | - | 1 | - | 1 |
| CO2 | 2 | - | - | - | - | - | 2 | - |
| CO3 | 2 | - | - | 3 | - | - | 3 | - |
| CO4 | - | - | - | 2 | - | 1 | - | - |
| CO5 | - | - | - | - | - | - | - | 1 |

| Si. No | CONTENTS OF MODULE | Hrs | Cos |
|---------------|---|------------|------------|
| 1 | Global supply chain – its importance– Supply Chain Management and Logistics in a Global economy – Stages in International Development - export / import, Terms and conditions of purchase of sales (including INCOTERMS, method of payment, etc.), Quality considerations (e.g. ISO9000, industry quality specifications, etc, Transportation modes and costs, · Security issues, · Packing requirements (i.e. regulatory, preservation of cargo types of containers, packing materials,etc.), Insurance and transportation liability regimes | 8 | CO1 |
| 2 | International Sourcing – Rationale for low cost country sourcing – Challenges for Low Cost Country Sourcing, Calculation of landed costs , total cost approach , issues of contract administration, location, and evaluation of foreign suppliers, exchange fluctuations, customs procedures, and related topics – Guidelines for Sourcing , 3PL, 4PL . Trade agreements between countries, WTO, | 8 | CO2 |

| | | | |
|---|--|---|-----|
| 3 | Green sustainable supply chain, Environmentally Sustainable Purchasing, Green Transportation, Forces Shaping Today's Supply chain Environment, competitive Pressure, Corporate Social responsibility, Customer expectations, Role Shifting, Financial Pressure, Global capacity, Globalization, Mergers and Acquisitions, Technological innovation, Time compression | 8 | CO3 |
| 4 | Designing a Global Network --Establish a Triadic Presence, Achieve Seamless Performance Across Markets, Extend Reach Through Alliances, compete in Competitor's Home Market, Coordinate Global Activities, , Coordination and Control through Information Technology | 8 | CO4 |
| 5 | Supply Chain Mapping-- Importance of Supply Chain Design – Process mapping – Process Analysis – Supply chain Design – Supply chain Mapping approaches | 8 | CO5 |

References

1. Purchasing & Supply Chain Management, 4th ed., Monczka, Handfield, Giunipero, Patterson, Southwestern/Cengage Learning (2009), ISBN: 0324381344
2. Purchasing and Supply Chain Management, Kenneth Lysons; Brian Farrington, ISBN 10: 0273694383 / 0-273-69438-3 , ISBN 13: 9780273694380
3. World Class Supply Management, Burt, Dobler, and Starling, 7th edition
4. Purchase and Supply Chain Management, Benton Jr, W.C, McGraw-Hill, second ed., 2010
5. Purchasing and Supply Chain Management, Monczka, Robert; Trent, Robert; and Handfield, Robert, 3rd Edition, 2004, Cincinnati: South-Western. ISBN 0-538-81495-0

ASSESSMENT PATTERN

CIA- Continuous Internal Assessment (40 Marks)

| BLOOM'S CATEGORY MARKS (OUT OF 40) | CIA (7) | MODEL (10) | ASSIGNMENT (5) | PRESENTATION (5) | CLUB ACTIVIT Y (5) | OTHER ACTIVITIES (PLS SPECIFY) | |
|------------------------------------|---------|------------|----------------|------------------|--------------------|--------------------------------|------------|
| | | | | | | (4) | (4) |
| Remember | 2 | 2 | | | | | |
| Understand | | 2 | | | | | |
| Apply | 2 | 2 | 2 | 2 | | | |
| Analyze | 3 | 2 | 3 | 3 | | | Case Study |
| Evaluate | | 2 | | | 5 | | |

| | | | | | | | |
|--------|--|--|--|--|--|---|--|
| Create | | | | | | Designing Global Supply Chain Network | |
|--------|--|--|--|--|--|---|--|

ESE- End Semester Examination (60 Marks)

| Bloom's Category | Test |
|-------------------------|-------------|
| Remember | 6 |
| Understand | 8 |
| Apply | 14 |
| Analyze | 22 |
| Evaluate | 24 |
| Create | 26 |

PAPER 1: MANAGING NEW BUSINESS INITIATIVES

| | |
|-----------------------------|-----------------------|
| Course Code : ENT301 | Credits : 03 |
| L:P:T:S : 3:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Objective: This paper provides a step-by-step process for managing innovation and entrepreneurship in an organization in both turbulent and stable economic times. It demonstrates the students how to manage innovation on a day-to-day basis--using a wide range of real world scenarios and the opportunities available Globally.

Content

Unit I

The Entrepreneurial/Innovative Economy-Creativity and Innovation-Building Innovation and Entrepreneurship strategic-Design Thinking-Aspects of Design Thinking-Future Thinking

Unit II

Developing New Product, Service and Ventures-Business Plan-Innovation Strategy and Sources of Innovation-Technology Change and Emerging Technologies

Unit III

Data-Driven Decisions and The Lean Startup-Business Model Canvas and Value Proposition Design-Industry, Feasibility and Market Analysis

Unit IV

Organisational Structure, People and Processes-Entrepreneurial Financing-Protecting your Innovation-Pitching and Presenting your business or innovation

Unit V

International and Domestic Innovation- Change in Business Environment-Global Market-International opportunities for Innovation and Entrepreneurship-Performance Measures of Innovation and Entrepreneurship.

REFERENCE:

- Robert D Hisrich; Claudine, Kearney, Managing innovation and entrepreneurship, Sage Publication, 2014
- Peter Drucker, Innovation and Entrepreneurship, Butterworth Heinemann Publication, ISBN 978-0750685085, 2007
- David Smith, Exploring Innovation, 2nd Edition, McGraw-Hill, ISBN 978-0-077-12123-5, 2009

PAPER 2: MANAGEMENT PRACTICES FOR FAMILY BUSINESSES

| | | | |
|--------------------|------------------|------------------|-------------|
| Course Code | : ENT302 | Credits | : 03 |
| L:P:T:S | : 3:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Objective: This subject covers the most important managerial challenges facing family businesses. The students will understand the differences between family and nonfamily businesses and the unique nature of family businesses.

Content

Unit I

Defining Family Business-Types of family involvement-Economic Contribution of family firm-Strength and Weakness of family business-Governance of family firm-Ownership-Corporate Governance

Unit II

Strategic Management in Family firm-Socioemotional wealth (SEW)-Competitive advantage of the family business-Branding-Paradox perspective

Unit III

Succession in the Family firm-Opportunities and Challenges of Succession option-Succession process-Valuing the firm-Financing the Succession-ESOP

Unit IV

Financial Management in Family Business-Family Equity-Leverage, risk and firm value-Value Management-Key Financial Indicators

Unit V

Relationships and Conflicts in the family firm-Types of Conflict-Conflict Management Style-Communication strategies

REFERENCE

- Thomas Zellweger, Managing the Family Business Theory and Practice, Edward Elgar Publishing, ISBN 9781783470716, 1783470712, 2017
- Keanon Alderson, Understanding the Family Business, Business Expert Press, 2011

PAPER 3: PROJECT MANAGEMENT

| | | | |
|--------------------|------------------|------------------|-------------|
| Course Code | : ENT303 | Credits | : 03 |
| L:P:T:S | : 3:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Objectives: The course is intended to develop the knowledge of the students in the management of projects, special emphasis will be provided on project formulation as also on various tools and techniques for project appraisal and control so that they are able to draft the project proposal in any area of management and evaluate the worth of projects.

Content

Unit I

Concept of project: Basic concepts, classification, characteristics of project, Project life cycle, Project management, Tools & Techniques of project management, project organization.

Unit II

Organizational Capability-Structure, Culture, and Roles-Types of Organizational Structures-Organizational Culture and Its Impact on Projects-Agile Project Management- Traditional Project Executive Roles-Traditional Project Management Roles

Unit III

Leading and Managing Project Teams-Acquire,Develop and Manage Project Team-Relationship Building Within the Core Team-Managing Project Conflicts-Scope Planning-Work Breakdown Structure (WBS)-Plan Schedule Management- Show the Project Schedule on a Gantt Chart-Resource Management

Unit IV

Budgeting Projects- Estimate Cost-Establishing Cost Control-Plan Risk Management-Risk Analysis-Development of Contemporary Quality Concepts-Develop Project Management Plan

Unit V

Determining Project Progress and Results-Plan Procurement Management-Improving Project Supply Chains-Project Balanced Scorecard Approach-Finishing the Project and Realizing the Benefits

REFERENCE

- Timothy J. Kloppenborg, Vittal S. Anantatmula, Kathryn Wells, Contemporary Project Management, 4th Edition, Cengage India Publishing, 2019
- Dr. Sanjiv MarwahMarwah, Project Management, Dreamtech Press, 2011
- Chaturvedi & Jauhari-Project Management, Himalaya Publishing, 1st Edition, 2016

PAPER 4: MANAGING STARTUPS

| | | | |
|--------------------|------------------|------------------|-------------|
| Course Code | : ENT401 | Credits | : 03 |
| L:P:T:S | : 3:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Objective: Entrepreneurship is a fast-growing and ever-changing discipline. Of late, people of all ages, backgrounds, and nationalities are launching businesses of their own and, in the process, are reshaping the world's economy. The objective of this paper is to provide the possibilities, the challenges, and the rewards of owning their own business and to provide the tools they will need in order to be successful if they choose the path of entrepreneurship.

Content:

Unit I

The Challenge of Entrepreneurship-The Foundations of Entrepreneurship- Ethics and Social Responsibility: Doing the Right Thing-Inside the Entrepreneurial Mind: From Ideas to Reality

Unit II

The Entrepreneurial Journey Begins-Conducting a Feasibility Analysis and Designing a Business Model- Crafting a Business Plan and Building a Solid Strategic Plan- Forms of Business Ownership and Buying an Existing Business- Franchising and the Entrepreneur

Unit III

Launching the Business-Building a Powerful Bootstrap Marketing Plan- E-Commerce and the Entrepreneur-Pricing and Credit Strategies-Creating a Successful Financial Plan-Managing Cash Flow

Unit IV

Putting the Business Plan to Work: Sources of Funds- Sources of Financing: Equity and Debt- Choosing the Right Location and Layout-Global Aspects of Entrepreneurship-Building a New Venture Team and Planning for the Next Generation

Unit V

Strategic Planning and Supply Chain Management-Sourcing and procurement Methods-Demand Planning and Forecasting-Logistics and Distribution Optimization of the product.

REFERENCE:

- Thomas W. Zimmerer, Norman M. Scarborough, Essentials of Entrepreneurship and Small Business Management, 5th Edition, Pearson Publishing, 1997
- P. Narayana Reddy, Entrepreneurship: Text and Cases, Cengage Learning, 2010

PAPER 5 : FINANCING NEW VENTURES

| | | | |
|--------------------|------------------|------------------|-------------|
| Course Code | : ENT402 | Credits | : 03 |
| L:P:T:S | : 3:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Objective: Successfully Launching New Ventures explores the allure of entrepreneurship, teaching students how to successfully launch and grow their own business. This paper examines both the excitement and difficulty of launching a new company and the financial requirements.

Unit I

Introduction to Entrepreneurship-characteristics of an entrepreneur, Entrepreneurial scene in India. . Types of entrepreneurship, social entrepreneurship, life cycle in entrepreneurship, general myths about entrepreneurship, Importance of business plan

Unit II

Developing successful Business ideas-Recognizing Opportunities and Generating Ideas-Feasibility Analysis-Developing an Effective Business Model- Industry and Competitor Analysis- Writing a Business Plan

Unit III

Moving from an idea to an Entrepreneurial firm-Preparing the Proper Ethical and Legal Foundation-Assessing a New Venture's Financial Strength and Viability-Building a New-Venture Team-Getting Financing or Funding

Unit IV

Managing and growing an Entrepreneurial firm-Unique Marketing Issues-The Importance of Intellectual Property-Preparing for and Evaluating the Challenges of Growth-. Strategies for Firm Growth- Franchising

Unit V

Funds for Social Innovations-Different ways to get funding :Business plan competitions, challenges and winning awards-Seed stage and angel funding-Grants and donations-Crowd funding-Social enterprise incubators-Social Venture Capital firms-Debt Financing –Loan Guarantees – Pooling –Social Impact Bonds – Micro Finance – Others

REFERENCE:

- Bruce R. Barringer, R. Duane Ireland, Entrepreneurship: Successfully Launching New Ventures, 6th Edition, Pearson Education, 2020
- Kathleen R Allen, New Venture Creation, 6th Edition, South Western, 2012

PAPER 6 : SOCIAL ENTREPRENEURSHIP

| | | | |
|--------------------|------------------|------------------|-------------|
| Course Code | : ENT403 | Credits | : 03 |
| L:P:T:S | : 3:0:0:0 | CIA Marks | : 40 |
| Exam Hours | : 03 | ESE Marks | : 60 |

Objective: To provide knowledge about The Social Entrepreneurship Help students to develop “a Social entrepreneurial imagination and to bring out the practice of Social Entrepreneurship in India”.

Content

Unit I

Social Entrepreneur, Social Entrepreneurship and Social Enterprises-Meaning, definition: Social entrepreneur, social entrepreneurship, social enterprises. Characteristics of Social Entrepreneurship- Characteristics of Social Entrepreneur- social catalysts, socially aware, opportunity seeking, innovative, resourceful, accountable. Differences between Business and Social entrepreneur, Entrepreneurship and Social Entrepreneurship. Social Entrepreneurship in developing countries and in India.

Unit II

The Social Entrepreneurship Process-Social Entrepreneurship Framework-Qualities and Skills of Social Entrepreneur-Challenges in Social Entrepreneurship-Concept on entrepreneurial strategy-Developing an Entrepreneurial Competitive Strategy

Unit III

Systems Thinking and Social Innovation-Social Innovation and the Enabling Environment , Strategic Approaches to Social Innovation - Social Intrapreneurship, CSV & B-Corps. Agripreneurship

Unit IV

Funds for Social Innovations-Different ways to get funding :Business plan competitions, challenges and winning awards-Seed stage and angel funding-Grants and donations-Crowd funding-Social enterprise incubators-Social Venture Capital firms-Debt Financing –Loan Guarantees – Pooling –Social Impact Bonds – Micro Finance – Others

Unit V

Strategic Leadership -Leadership in a Diverse World - Developing Leaders and Planning Succession Leadership Issue for Future Entrepreneurs

REFERENCE

- Robert A. Philips Margret Bonefiel Ritesh Sharma, Social entrepreneurship, the next big business opportunity Global Vision Publishing House, New Delhi, 2011
- Stephen Goldsmith, The Power of Social Innovation: How Civic Entrepreneurs Ignite Community Networks for Good, 1st Edition, 2010.
- Lichtenstein & Plowman, The Leadership of Emergence: A Complex Systems Leadership Theory of Emergence at Successive Organizational Levels Identifying Entrepreneurial Leadership in Practice & Process: Forging a New Path, May 29, 2009

INTERNSHIPS AND PROJECTS

| | | | L | T | P | C |
|---------|-----------------------------------|------------|----------|----------|----------|----------|
| MBA-398 | INTERNSHIP-1–(DEC-JAN- 4 WEEKS) | MBA | - | - | 4 | 4 |
| MBA 399 | INTERNSHIP 2 –(MAY-JUN – 4 WEEKS) | MBA | - | - | 4 | 4 |
| MBA-499 | FINAL PROJECT –(DEC-JAN- 8 WEEKS) | <i>MBA</i> | - | - | 8 | 8 |

An internship or project is an opportunity for students to apply their theoretical concepts to real life situations in the work place.

Internship I AND II:

- The student will be acquiring skills and hands on work experience during the internship.
- The following parameters will be used to evaluate the internship: Industry knowledge, Process knowledge, Skills acquired, Independent handling of processes or functions, application of theory to practice and Activity Time Sheet and daily attendance to be maintained by the Company Project Guide.
- The internship will be evaluated based on a presentation and study report.

Final Project :

- A problem should be defined, objectives set, data has to be collected and analyzed using statistical tools and techniques, inferences drawn and recommendations made. A 75 to 100 pages Research Report should be submitted at the end of the Final Project .
- The Project will be evaluated for the quality of Research undertaken and the quality of problem solving accomplished.
- The Project will be evaluated based on a viva voce and the Research Project report.

SYLLABUS FOR BUSINESS ANALYTICS (ISDC)

Module 1: Statistics with R

Module Overview

The following module comprises of R programming basics and application of several Statistical Techniques using it. The module aims to provide exposure in terms of Statistical Analysis, Hypothesis Testing, Regression and Correlation using R programming language.

Learning Objectives

The objective of this module to make students exercise the fundamentals of statistical analysis in R environment. They would be able to analysis data for the purpose of exploration using Descriptive and Inferential Statistics. Students will understand Probability and Sampling Distributions and learn the creative application of Linear Regression in multivariate context for predictive purpose.

Learning Outcomes

After the successful completion of this module, students will be able to:

- Install, Code and Use R Programming Language in R Studio IDE to perform basic tasks on Vectors, Matrices and Data frames.
- Describe key terminologies, concepts and techniques employed in Statistical Analysis.
- Define, Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.
- Conduct and Interpret a variety of Hypothesis Tests to aid Decision Making.
- Understand, Analyse, Interpret Correlation and Regression to analyse the underlying relationships between different variables.

Unit I

Introduction to R Programming

R and R Studio, Logical Arguments, Missing Values, Characters, Factors and Numeric, Help in R, Vector to Matrix, Matrix Access, Data Frames, Data Frame Access, Basic Data Manipulation Techniques, Usage of various apply functions – apply, lapply, sapply and tapply, Outliers treatment.

Unit II

Descriptive Statistics

Types of Data, Nominal, Ordinal, Scale and Ratio, Measures of Central Tendency, Mean, Mode and Median, Bar Chart, Pie Chart and Box Plot, Measures of Variability, Range, Inter-Quartile-Range, Standard Deviation, Skewness and Kurtosis, Histogram, Stem and Leaf Diagram, Standard Error of Mean and Confidence Intervals.

Unit III

Probability, Probability & Sampling Distribution

Experiment, Sample Space and Events, Classical Probability, General Rules Of Addition, Conditional Probability, General Rules For Multiplication, Independent Events, Bayes' Theorem, Discrete Probability Distributions: Binomial, Poisson, Continuous Probability Distribution, Normal Distribution & t-distribution, Sampling Distribution and Central Limit Theorem.

Unit IV

Statistical Inference and Hypothesis Testing

Population and Sample, Null and Alternate Hypothesis, Level of Significance, Type I and Type II Errors, One Sample t Test, Confidence Intervals, One Sample Proportion Test, Paired Sample t Test, Independent Samples t Test, Two Sample Proportion Tests, One Way Analysis of Variance and Chi Square Test.

Unit V

Correlation and Regression

Analysis of Relationship, Positive and Negative Correlation, Perfect Correlation, Correlation Matrix,

Scatter Plots, Simple Linear Regression, R Square, Adjusted R Square, Testing of Slope, Standard Error of Estimate, Overall Model Fitness, Assumptions of Linear Regression, Multiple Regression, Coefficients of Partial Determination, Durbin Watson Statistics, Variance Inflation Factor.

References

1. Ken Black, 2013, *Business Statistics*, New Delhi, Wiley.
2. Lee, Cheng. et al., 2013, *Statistics for Business and Financial Economics*, New York: Heidelberg Dordrecht.
3. Anderson, David R., Thomas A. Williams and Dennis J. Sweeney, 2012, *Statistics for Business and Economics*, New Delhi: South Western.
4. Waller, Derek, 2008, *Statistics for Business*, London: BH Publications.
5. Levin, Richard I. and David S. Rubin, 1994, *Statistics for Management*, New Delhi: Prentice Hall.

Module 2: Python Programming

Module Overview

Python Programming module is intended for students who wish to learn the Python programming language. This module is highly important so as to proceed with this programme. The module comprises of Programming basics with regards to Python Language such as Data Types, Operators, Functions, Classes and Exception Handling.

Learning Objectives

This module will help students gain much needed knowledge pertaining to Python Programming, so as to prepare them for the advanced modules such as ML. Python scripting is user-friendly and is the most used language in industry when it comes to designing and scripting applications with respect to Emerging Technologies.

Learning Outcomes

Upon successful completion of this module, students should be able to:

- To understand why Python is a useful scripting language.
- To learn how to use lists, tuples, and dictionaries in Python programs.
- To learn how to write loops and decision statements in Python.
- To learn how to write functions and pass arguments in Python.
- To learn how to design object-oriented programs with Python classes.
- To learn how to use exception handling in Python applications for error handling.

Unit I

Introduction

History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

Unit II

Types, Operators and Expressions

Types - Integers, Strings, Booleans; Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions.

Unit III

Data Structures and Control Flow

Lists, Operations, Slicing, Methods, Tuples, Sets, Dictionaries, Sequences, Comprehensions, Conditional blocks using If, Else and El-if, For Loop, For loop using Ranges, String, list and Dictionaries, While Loop, Loop Manipulation using Pass, Continue, Break and Else, Conditional and Loops Block.

Unit IV

Functions Modules and Packages

Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Function Returning Values, Scope of the Variables in a Function - Global and Local Variables. Creating modules, Name Spacing, Introduction to PIP, Installing Packages via PIP, Using Python Packages.

Unit V

Object Oriented Programming & Exception Handling

Classes, Self-Variable, Methods, Constructor Method, Inheritance, Overriding Methods, Data Hiding, Difference between an Error and Exception, Handling Exception, Try Except Block, Raising Exceptions, and User Defined Exceptions.

References

1. R.Nageswara Rao, 2018, *Core Python Programming*, Dreamtech.
2. John Hearty, 2016, *Advanced Machine Learning with Python*, Packt.
3. Jake VanderPlas, 2016, *Python Data Science Handbook: Essential Tools for Working with Data*, O'Reilly.
4. Mark Lutz, 2010, *Programming Python*, O'Reilly.
5. Tim Hall and J-P Stacey, 2009, *Python 3 for Absolute Beginners*, Apress.

Module 3: Structured Query Language

Module Overview

In this course, the students will learn the basics of the SQL/No SQL and the Relational Databases. They will learn about the Relational Model and Relational Model concepts and constraints. The students will get exposure to key concepts with regards to SQL Language and DBMS such as Normalization, Transaction Processing along-side an exposure to No SQL programming.

Learning Outcomes

This module will help students gain much needed knowledge pertaining to Relational Database Management Systems, Data Models, SQL query processing, Normalization along with an introduction to No SQL Database systems using Mongo DB.

Learning Objectives

- To understand the basic concepts and the applications of Database Systems.
- To master the basics of SQL and construct queries using SQL.
- To become familiar with the basic issues of Transaction Processing and Concurrency Control.
- To become familiar with NO SQL Programming Language.
- Explain the architecture, define objects, load and query data within No SQL databases.

Unit I

Introduction to Database Management Systems

Introduction-Database System Applications, Purpose of Database Systems, Views of Data, Data Abstraction, Instances and Schemas, Data Models, Database Languages, DDL, DML, Database Architecture, Database Users and Administrators, Database Design, ER Diagrams, Entities, Attributes and Entity Sets, Relationships and Relationship sets, Integrity Constraints, Views.

Unit II

SQL Operators and Relational Theorems

Relational Algebra and Calculus, Selection and Projection, Set Operations, Renaming, Joins, Division, Relational calculus, Tuple Relational Calculus, Domain Relational Calculus, Forms

of Basic SQL Query, Nested Queries, Comparison Operators, Aggregate Operators, NULL values, Logical connectives, AND, OR and NOT, Outer Joins, Triggers.

Unit III

Normalizat ion

Problems Caused by Redundancy, Decompositions, Functional Dependencies, Normal Forms, First, Second, Third Normal forms, BCNF, Properties of Decompositions, Loss less Join Decomposition, Dependency Preserving Decomposition, Multi Valued Dependencies, Fourth Normal Form, Join Dependencies, Fifth Normal Form.

Unit IV

Transacti ons

Transaction Management, Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent, Executions, Serializability, Recoverability, Implementation of Isolation, testing for serializability, Concurrency Control, Lock, Timestamp Based Protocols, Validation Based Protocols, Recovery, Failure Classification, Storage Structure, Atomicity, LogBased Recovery, Remote Backup Systems. **Unit V**

No SQL

Overview of No SQL, Types of No SQL Databases, No SQL Storage Architecture, CRUD Operations in MongoDB, Querying, Modifying and Managing No SQL Databases, Indexing and Ordering, Migrating from RDBMS to No SQL, No SQL in Cloud, Database Administration.

References

1. Guy Harrison, 2015, *Next Generation Databases: No SQL and Big Data*, Apress.
2. Ramez Elmasri, ShamkatB.Navathe, 2013, *Database Systems*, Pearson.
3. Pramod J. Sadalage, Martin Fowler, 2012, *No SQL Distilled*, Addison Wesley.
4. A.Silberschatz, H.F. Korth, S.Sudarshan, 2006, *Database System Concepts*, McGraw Hill.
5. Raghurama Krishnan, Johannes Gehrke, 2003, *Database Management Systems*, McGraw Hill.

Module 4: SaS and Tableau

Module Overview

This module forms an introduction as well an in-depth study in the discipline of SaS programming with regards to Statistical Analysis along with Data Visualization through Tableau. The module comprises of basic introduction and programming in SaS, using Procedures within SaS and Data Visualization using Tableau application.

Learning objectives

This course will provide students and exposure towards SaS, Tableau and its usability in the field of analytics. The course comprises of an introduction to SaS, its procedures, visualizations along with Tableau application usage and visualization basics.

Learning outcomes

Upon successful completion of this module, students should be able to:

- Deploy SaS in a virtual environment and import data for analysis.
- Prepare and manipulate datasets for analysis in SaS.
- Perform exploratory data analysis within SaS environment using various procedures and functions.
- Understand Tableau Interface, Panes and Implement Visualization Techniques.
- Prepare, Deploy and Publish Stories, Dashboards based on Analytical Cases.

UNIT I

Introduction to SaS

Overview of SaS university edition, Deploying SaS Studio on virtual platform, File Management, SaS libraries, importing data, Structure of Data and Data Types, Program Syntax, saving data, PROC IMPORT and PROC CONTENTS, Displaying Data and Generating Logs, List Input.

UNIT II

SaS Programming

Variables and Syntax Rules, Data Set Options, Operators, In-File Statement, Input Styles, Select Statements, Leave and Continue, Decision Making via SaS, Where Statement, Looping Constructs, SaS Functions, Arrays and Array Processing, Modifying and Combining Data Sets.

UNIT III

SaS Procedures

Proc Data, Proc Sort, Proc Means Sort, Proc Means, Proc Univariate, Proc Freq, Proc Plot, Proc Sgplot, Proc Summary, Proc Contents, Proc Append, Proc Copy, Proc SQL, Proc Delete, Proc Format, Proc Import, Proc Export, Proc Transpose, Proc GChart, Proc GPlot, Proc Report.

UNIT IV

Visualization with Tableau - I

Tableau Software Ecosystem, Toolbar Icons, Data Window and Aggregation, Tableau Data Source, Data Extract, Connect to Data, Measure Names, Number of Records & Measures, Heat Maps, Tree maps, Bar Chart, Line Chart, Area Fill Charts, Pie Chart, Scatter Plot, Circle View, Bullet Graph, Packed Bubble, Histogram, Boxplot and Gantt Chart, Sorting Data, Enhancing Views with Filters, Sets, Groups & Hierarchies.

UNIT V

Visualization with Tableau - II

Cross-tabulation, Dashboard Designing, Dashboard Actions, Joining Database, Functions in Tableau, Aggregate Functions, Numeric Functions, Date Functions, Stories, Advanced Mapping, Advanced Parameters, Tableau Best Practices, Combining Multiple Dashboards into Stories, Publishing Stories and Dashboards.

References

1. Ron Cody, 2018, *An Introduction to SaS University Edition*, SaS Institute.

2. Ron Cody, 2018, *Learning SaS by Example*, SaS Institute.
3. Deepti Gupta. 2018, *Applied Analytics through Case Studies Using SaS*, Apress.
4. Joshua N. Milligan, 2015, *Learning Tableau*, Packt.
5. Ben Jones, 2014, *Communication Data with Tableau: Designing, Developing and Delivering Data Visualization*,

Module 5: Big Data Analytics

Module Overview

This module forms an introduction as well as an in-depth study in the field of Big Data and Hadoop. It comprises of the fundamentals as well as advanced topics needed to progress in this technology. The students will learn about the applications, usage and several use case scenarios pertaining to Big Data- Hadoop where they can use the knowledge and progress ahead.

Learning objectives

This course will help students gain knowledge and understanding about Big Data Technology, Hadoop Ecosystem and various tools related to it. The students will learn about the HDFS File System, Map Reduce Framework, Analysing data using Hbase and Hive along with the Integration of R with Hadoop. **Learning outcomes**

Upon successful completion of this module, students should be able to:

- Understand the fundamentals of Big Data and its Applications in various Domains.
- Conceptualize and Incorporate the Technologies behind Big Data.
- Understand HDFS File Structure, Map Reduce Framework, the architectures related to them and to use them to solve complex problems.
- Integrate R with Hadoop and solve analytical problems.
- Understand and Use Hive/Hbase shell pertaining to relational data handling under Hadoop.

UNIT I

Introduction to Big Data

What Is Big Data? History of Data Management, Evolution of Big Data, Structuring of Big Data, Elements of Big Data, Application of Big Data in the Business Context, Careers in Big Data. Business Applications of Big Data: The Significance of Social Network Data, Financial Fraud and Big Data, Fraud Detection in Insurance, Use of Big Data in the Retail Industry.

UNIT II

Technologies for Handling Big Data

Distributed and Parallel Computing for Big Data, Understanding Hadoop, Cloud Computing, Grid Computing and In-Memory Technology for Big Data. VMWare Installation of Hadoop, Linux and its Shell Commands, Different Hadoop Distributions and their advantages, Hortonworks, Cloudera, MapR. **UNIT III**

Understanding the Hadoop Ecosystem

The Hadoop Ecosystem, Storing Data with HDFS, Design of HDFS, HDFS Concepts, Command Line Interface to HDFS, Hadoop File Systems, Java Interface to Hadoop, Anatomy of a file read, Anatomy of a file write, Replica placement and Coherency Model. Parallel Copying with distcp, keeping an HDFS Cluster Balanced.

Unit IV

Map Reduce Fundamentals

Origins of Map Reduce, How Map Reduce Works, Optimization Techniques for Map Reduce Jobs, Applications of Map Reduce, Java Map Reduce classes (new API), Data flow, combiner functions, running a distributed Map Reduce Job. Configuration API, setting up the development environment, Managing Configuration.

Unit V

Integrating R with Hadoop, Understanding Hive & Hbase

Understanding R-Hadoop, Integration Procedure, Packages needed for R under Hadoop Ecosystem, Text Mining for Deriving Useful Information using R within Hadoop, Introduction to Hive & Hbase, Hive and Hbase Architecture, Understanding Queries, Mining Big Data with Hive & Hbase.

References

1. Arshdeep Bahga, 2016, *Big Data Science & Analytics: A Hands-On Approach*, VPT.
2. Tom White, 2012, *Hadoop: The Definitive Guide*, O'Reilly.
3. Adam Shook and Donald Miner, 2012, *Map Reduce Design Patterns: Building Effective Algorithms and Analytics for Hadoop and Other Systems*, O'Reilly.
4. Dean Wampler, Edward Capriolo & Jason Rutherglen, 2012, *Programming Hive*, O'Reilly.

5. Lars George, 2011, *HBase - The Definitive Guide: Random Access to Your Planet-Size Data*, O'Reilly

Module 6: Social Media Analytics

Module Overview

This module comprises of advanced disciplines and units pertaining to Analytics, Data Acquisition via web, Understanding and analysing Unstructured Data along with the future implementations and growth in the discipline of Analytics.

Learning objectives

This course aims at giving exposure on the advanced aspects with regards to Analytics. The course comprises of Social Media, Mobile, Text Analytics along with Web Scraping and the future advancements in the field of Analytics.

Learning outcomes

Upon successful completion of this module, students should be able to:

- Apply and use Social Media Analytics for the betterment of the business.
- Use Mobile Analytics for solving complex business problems and to stop churn.
- Evaluate the business problem and apply analytics techniques for better output.
- Analyse and understand patterns and techniques in Social Media & Mobile Analytics to solve complex problems.

UNIT I

Overview

Social Media, On-Line Social Network, Off-Line Social Network, Metrics and Measurement, Dashboard, Target Audience, Desired Action, Content, Market Research Online Communities, Cluster Analysis, Conjoint Analysis, Multidimensional Scaling, Social Media Listening, Social Media Scoring, Social Media Modelling.

UNIT II

Mobile Analytics Understanding Mobile Analytics Concepts, difference between Mobile Analytics and Site Analytics, Natural language Processing with Mobile Analytics, Text Mining for Mobile Analytics, Mobile Analytics Tools, Churn Analytics.

UNIT III

Text Analytics

Text Data, Sources of Text Data, Information Clusters, Patterns, Trends, Tagging, Natural Learning Process, Lexical Analysis, Social Network Nodes, Linkage Structure, Node Labelling, Content-Based Classification, Word Stemming, Stemming Algorithms, Polarity of the Attitude, Psychological Profiling, Sentiment Analysis. **UNIT IV**

Web Scraping

Web Scraping of unstructured data, Gathering data from HTTP and HTTPS format, Web Scraping from XML and JSON file, Regular expressions, Extraction Strategies, Term Document Matrix, Data Cleansing, Data Manipulation and Data Transformation after Scrapping.

UNIT V

Future of Analytics

Introduction to Big Data, Predictive Analysis for Business, Social Information Processing and Distributed Computing, Advances in Machine Learning, Traditional Data Models Evolve, Analytics to Solve Social Problems, Location Based Data Explosion, Data Privacy Backlash, Internet of Things, Artificial Intelligence. **References**

1. Galit Shamuelli, 2017, *Data Mining for Business Analytics: Concepts, Techniques and Applications with R*, Wiley.
2. Luis Torgo, 2017, *Data Mining with R: Learning Case Studies*, Chapman.
3. Zaki & Meira, 2014, *Data Mining and Analysis Fundamental Concepts and Algorithms*, Cambridge.
4. Han, Kamber & Pei, 2013, *Data Mining: Concepts and Techniques*, Morgan Kaufmann.
5. Han, Jiawei and Kamber, Micheline, 2012, *Data Mining: Concepts and Techniques*, Morgan Kaufman.

Module 7: Natural Language Processing

Module Overview

The following module aims to provide an exposure to students based on Natural Language Processing Techniques, Algorithms and Analytics based on Textual Data. The module comprises of NLP basics, Feature Extraction, Relationship Extraction, Text Categorization, Clustering and Topic Modelling Algorithms and Practices.

Learning Objectives

The course introduces the concepts of Text Analytics, Unstructured Information Analysis for better decision making by deriving valuable insights. The course will help the students understand the roots behind Text Mining which evolved from Machine Learning, Natural Language Processing and Statistics. Upon completion, students are expected to be able to describe basic concepts and methods of Text Mining, Information Extraction, Text Classification and Clustering, Topic Modelling.

Learning Outcomes

After the successful completion of this module, students will be able to:

- Understand approaches to Syntax and Semantics in NLP.
- Understand various methods for Statistical approaches to Machine Translation.
- Build Models which extract information from Textual Unstructured Data.
- Understand and implement Topic Modelling and Probabilistic Models for Information Extraction.
- Implement and deploy programs based on Relationship Extraction, POS Tagging and Clustering Algorithms based on NLP.

Unit I

Introduction to Text Mining

Basics of Text Mining, Natural Language Content Analysis, Core Text Mining Operations, Associations, Using Background Knowledge for Text Mining, Domain Ontologies, Domain Lexicons. Text Mining Pre- processing Techniques, Task Oriented Approaches, NLP Tasks, Tokenization, Part-of-Speech Tagging, Syntactical Parsing and Shallow Parsing.

Unit II

Extracting Features, Relations from Text

Finding Implicit Features, Finding Opinion Phrases and their Polarity, Context-Specific Word Semantic Orientation, Analysis of Word and Document Frequency, tf-idf, Zipf's Law, bind tf_idf Function, Subsequence Kernels for Relation Extraction, Capturing Relation Patterns with a String Kernel.

Unit III

Text Categorization and Clustering

Applications of Text Categorization, Document Representation, Knowledge Engineering Approach to Text Categorization, Machine Learning Approach to Text Categorization, Evaluation of Text Classifiers.

Clustering Tasks in Text Analysis, Clustering Algorithms and Clustering of Textual Data.

Unit IV

Relationships between Words

Tokenizing by N-gram, Counting and Filtering N-gram, Analysing Bigrams to provide Context in Sentiment Analysis, visualizing a Network of Bigrams using ggraph, Counting and Correlating Pairs of Words with the widyr Package, Counting and Correlating among Sections, Examining Pairwise Correlation.

Unit V

Topic Modelling and Probabilistic Models for Information Extraction

Latent Dirichlet Allocation, Word Topic Probabilities, Per-Document Classification, By-words Assignments, Alternative LDA Implementations. Hidden Markov models, Stochastic Context

Free Grammar, Conditional Random fields, Parallel Learning Algorithms.

References

1. Julia Silge, David Robinson, 2018, *Text Mining with R-A Tidy Approach*, O'Reilly
2. Matthew L. Jockers, 2014, *Text Analysis with R for Students of Literature*, Springer.
3. James Pustejovsky, Amber Stubbs, 2012, *Natural Language Annotation for Machine Learning*, O'Reilly.
4. Steve R. Poteet, 2007, *Natural Language Processing with Text Mining*, Springer.
5. James Sanger, Ronen Feldman, 2002, *The Text Mining Handbook: Advanced Approaches in Analysing Unstructured Data*, Cambridge.

Module 8: Machine Learning and Artificial Intelligence Module

Overview

This module comprises of conceptual, statistical and Machine Learning algorithms. It covers all the necessary models pertaining to Machine Learning such as Regression, Decision Trees, Support Vectors, Clustering, Association Analysis and Dimensionality Reduction.

Learning Objectives

After this course students will gain critical knowledge and understanding about major Data Mining procedures like Decision Tree, Cluster Analysis, Neural Networks, Support Vector Machine, Bayesian Networks and Machine Learning fundamentals. Students will be able to apply and practice this gained knowledge in variety of Business Scenarios.

Learning Outcomes

Upon successful completion of this module, students should be able to:

- Understand and employ a wide variety of Statistical and Machine Learning Algorithms.
- Identify the characteristics of Datasets, Problem Statement and develop Machine Learning programs with reference to known Computing Techniques.
- Understand the Model Performance Evaluation and select the best one based on the solution.
- Implement Machine Learning techniques and the Programming Framework to obtain acceptable decisions for the Real-World problems.

Unit I

Classification and Regression Tree

Classification & Regression, working of a Decision Tree, Attribute Selection Measures, Information Gain, Gain Ratio, Gini Index, Building Decision Trees, CART, C5.0, and CHAID Trees, Prediction by Decision Tree, Advantages and Disadvantages of Decision Trees, Model Overfitting, Building Decision Trees in R. **Unit II**

Clustering

Cluster Analysis versus Factor Analysis, Overview of Basic Clustering Methods, Agglomerative Hierarchical Clustering, Within-Group Linkage, Nearest Neighbour or Single Linkage, Furthest Neighbour or Complete Linkage, Centroid Clustering, Ward's Method, K-Means Algorithm, Dendrogram, Profiling of Cluster, Cluster Evaluation.

Unit III

Support Vector Machine

Decision Boundaries for Support Vector Machine, Maximum Margin Hyperplanes, Structural Risk Minimization, Linear SVM-Separable Case, Linear SVM-Non-Separable Case, Kernel Function, Kernel Trick, Kernel Hilbert Space, Model Evaluation.

Unit IV

Market Basket Analysis

Market Basket Analysis and Association Analysis, Market Basket Data, Stores, Customers, Orders, Items, Order Characteristics, Product Popularity, Tracking Marketing Interventions, Association Rules, Support, Confidence, Lift, Chi-Square Value, Sequential Pattern Analysis.

Unit V

Introduction to Artificial Intelligence

Current Trends in AI, Intelligent Agents, Environments, Problem Solving Agents, Searching Techniques, Knowledge and Reasoning in AI, Forms of Learning, Structure of a Neural Network, Analogy with Biological Neural Network, Activation Functions, Gradient Descent, Model Accuracy.

References

1. Kevin Knight, Elaine Rich, B.Nair, 2017, *Artificial Intelligence*, McGraw.
2. Han, Jiawei and Kamber, Micheline, 2012, *Data Mining: Concepts and Techniques*, Morgan Kaufman Publishers.
3. AnandRajaraman, 2011, *Mining of Massive Datasets*, Cambridge University Press.

4. Mitchell, 2013, *Machine Learning*, McGraw Hill.
5. Stuart Russell, Peter Norvig, 2004, *Artificial Intelligence – A Modern Approach*, Pearson.

CIMA Syllabus 2019

Note: Please refer the detailed prospectus of CIMA for further detail

The CIMA Syllabus

| | | | |
|--|--|--|--|
| Strategic (Decide) <ul style="list-style-type: none"> • Make strategic decisions. • Formulate and create strategy whilst managing the associated risks. | E3: Strategic Management <ul style="list-style-type: none"> A. The strategy process B. Analysing the organisational ecosystem C. Generating strategic options D. Making strategic choices E. Strategic control F. Digital strategy | P3: Risk Management <ul style="list-style-type: none"> A. Enterprise risk B. Strategic risk C. Internal controls D. Cyber risks | F3: Financial Strategy <ul style="list-style-type: none"> A. Financial policy decisions B. Sources of long-term funds C. Financial risks D. Business valuation |
| Management (Monitor) <ul style="list-style-type: none"> • Monitor implementation of decisions. • Monitor, manage and analyse performance. | E2: Managing Performance <ul style="list-style-type: none"> A. Business models and value creation B. Managing people performance C. Managing projects | P2: Advanced Management Accounting <ul style="list-style-type: none"> A. Managing the costs of creating value B. Capital investment decision-making C. Managing and controlling the performance of organisational units D. Risk and control | F2: Advanced Financial Reporting <ul style="list-style-type: none"> A. Financing capital projects B. Financial reporting standards C. Group accounts D. Integrated reporting E. Analysing financial statements |
| Operational (Implement) <ul style="list-style-type: none"> • Implementation of decisions. • Translate medium-term decisions into short-term actionable plans; then report on performance. | E1: Managing Finance in a Digital World <ul style="list-style-type: none"> A. Role of the finance function B. Technology in a digital world C. Data and information in a digital world D. Shape and structure of the finance function E. Finance interacting with the organisation | P1: Management Accounting <ul style="list-style-type: none"> A. Cost accounting for decision and control B. Budgeting and budgetary control C. Short-term commercial decision-making D. Risk and uncertainty in the short term | F1: Financial Reporting <ul style="list-style-type: none"> A. Regulatory environment of financial reporting B. Financial statements C. Principles of taxation D. Managing cash and working capital |

**DWARAKA DOSS GOVERDHAN DOSS
VAISHNAV COLLEGE**

DEPARTMENT OF MA HRM



SYLLABUS

(2022 -23)

CHOICE BASED CREDIT SYSTEM

CBCS

OUTCOME BASED EDUCATION (OBE)

INSTITUTION

VISION

To impart value-based quality academia; to empower students with wisdom and to charge them with rich Indian traditions and Culture; to invoke the self, to broaden the same towards Nation building, harmony and Universal brotherhood.

MISSION

To ensure sustained progress and development in imparting quality education, to pioneer new avenues of teaching and research and to emerge as an institution with potential for excellence

DEPARTMENT OF M.A HRM

Vision

To impart a quality and value-based education and professional HR training that enables a holistic development in terms of HR competencies, conceptual knowledge and experiential learning compatible to the Institution and Industry requirement.

Mission

Educate and facilitate professional training of students through multiple approaches that nourish professional competency and self-development.
Build a strong interface between HR aspirants and HR professionals through network with Industry and instilling a sense of integrity,

PROGRAMME EDUCATIONAL OBJECTIVES

1. To produce Postgraduates professionally trained in Human Resource Management.
2. To establish HR Departments and independently, manage basic HR functions.
3. To get the Post graduates in Human Resource Management as industry ready resources for managing HR functions in Industry.
4. To equip graduates for decision making in all types and levels of HR functions.
5. To facilitate Human Resource Management for independent entrepreneurial ventures in HR business fields.
6. To develop vital skills in Human relations and team work in business organizations.
7. To make data driven decisions for effective management of HR in Industries.

8. To develop leadership qualities with human dimensions of empathy, trust, values, ethics in Organizations through HR practices.
9. To demonstrate scholarly attitude to pursue higher education and research in HRD and allied subjects.
10. To develop and maintain peace, harmony and human relations through scientific methods of Industrial relations.
11. To advice and guard the interest of employers and employees through appropriate knowledge on Labour Legislation.

Programme Outcomes and Graduate Attributes

Scholarship Knowledge

Get deep knowledge of professional Human Resource Management subjects through behavioural, social and other allied disciplines with the competency to use the acquired knowledge for the benefit of Organisations.

Critical Thinking

Understand labour problems critically, discriminate causative factors drawing appropriate conclusions and offering tactical HR solutions.

Problem Solving

Think scientifically and independently, conceptualize effective redressal of problem and offer wide range of HR solutions in a feasible manner with due consideration of interest to employer, employees and society.

Research Skills

Collect information specific to unique HR needs and problems through review of literature, experimentation, applying suitable research methodologies, techniques, tools, design, sample studies, analyse and interpret data, display, demonstrate and present findings for broader perspective and decision making.

Usage of Modern Tools

Develop, choose, learn and apply techniques, resources for prediction, refinement, modeling and understanding of the HR issues.

Collaborative and Multidisciplinary work

Have knowledge and understanding of individual and group behavior, take up opportunities and contribute positively for team work, cross functional work, diverse workforce, receptiveness, accommodative for achieving organizational goals.

Communication

Develop skills to receive, send, interpret, evaluate employee information and effectively communicate on complex HR issues within and outside the organizations write effective reports, design documentation, make effective presentations, give and receive clear instructions and maintaining societal communication.

Life Long learning

Maintain and prove scholarly attitude to pursue a career in HRD and Research with a zeal and vision to engage oneself for lifelong learning amidst constant and continuously emerging economical, technological, organizational and socio-political changes.

Ethical Practices and Social Responsibility

Develop ideas and solutions for practical problems and approach the same with bend of moral and social responsibilities.

Independent and Reflective learning

Develop professional skills in the disciplinary, inter disciplinary and multi-disciplinary areas of management sciences and professional associations.

Programme Specific Outcome

1. Scientifically study, critically evaluate, analyse, interpret and effectively apply the basic theories labour laws, principles, process of methods used in the fields of HRD.
2. Apply the knowledge of Human Resource Management in the areas of research, education practice, entrepreneurship and organizations.
3. Solve complex problems in the field of human relations, industrial relations, HRM with an understanding on tools to be used, analytical skills

to be applied with appropriate insight on human behavior, social dynamics, organisational development, industry safety, statutory compliances and socio-cultural aspects.

4. Apply the knowledge of people management to appreciate, develop and test the theoretical models of application in HR practices.
5. Use standardized tools and techniques, modern and classical methods to carryout structured experiences and develop skills to interpret explain and validate scientific data for intended objectives.

PEO TO MISSION STATEMENT MAPPING

| Mission | PEO 1 | PEO 2 | PEO 3 | PEO 4 | PEO 5 | PEO 6 | PEO 7 | PEO 8 | PEO 9 | PEO 10 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| M 1 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 |
| M 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| M 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |

MAPPING OF PEO TO PO

| PEO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|--------|------|------|------|------|------|------|------|------|------|-------|
| PEO 1 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |
| PEO 2 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |
| PEO 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |
| PEO 4 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |
| PEO 5 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 3 |
| PEO 6 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 |
| PEO 7 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 |
| PEO 8 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |
| PEO 9 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |
| PEO 10 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |

SCHEME ON EXAMINATIONS

As per the University Regulation the following split up of marks for Theory, practical and project are to be followed.

(i) SPLIT UP FOR INTERNAL AND EXTERNAL MARKS FOR THEORY AND PRATICAL PAPER:

| S.No | Paper | Internal | External | Total |
|------|-----------|----------|----------|-------|
| 1 | Theory | 40 | 60 | 100 |
| 2 | Practical | 40 | 60 | 100 |

(ii) SPLIT UP FOR INTERNAL ASSESSMENT MARKS (40) FOR THEORY:

CIE- Continuous Internal Evaluation (40 Marks)

| Blooms Category | Test | Assignments | Quizes | Current Affairs |
|-----------------|------|-------------|--------|-----------------|
| Remember | 20 | 5 | 5 | 10 |
| Understand | | 5 | | |
| Apply | 10 | | | 10 |
| Analyze | 5 | | | |
| Evaluate | 5 | | | |
| Create | | | | |

| Blooms Category | Weightage % |
|-----------------|-------------|
| Remember | 20 |
| Understand | 20 |
| Apply | 30 |
| Analyse | 10 |
| Evaluate | 15 |
| Create | 5 |

DEPARTMENT OF MA HRM

Choice Based Credit System (2022 -23)

| Course Component | Name of the Course 2022 -23 | Allocation of Hours and Credits | |
|---------------------|---|---------------------------------|----|
| Semester - I | <i>Learning and Development</i> | 4 | 60 |
| | <i>Labour laws relating Industrial relations and Social Security</i> | 4 | 60 |
| | <i>Fundamentals of Human Resource Management</i> | 4 | 60 |
| | <i>Organisational Counselling or Workplace Ergonomics</i> | 3 | 45 |
| | <i>Soft Skill – I</i> | 2 | 30 |
| | <i>Internship (Service Sector)</i> | 4 | |
| Semester -II | <i>Industrial Relations and Employee Welfare</i> | 4 | 60 |
| | <i>Organisational Behaviour</i> | 4 | 60 |
| | <i>Performance Management System</i> | 4 | 60 |
| | <i>Specialized Course - Human Resource and Compensation Management</i> | 3 | 45 |
| Internal Elective | <i>Internal Elective - Total Quality Management or Entrepreneurship in Business HRM</i> | 3 | 45 |
| | <i>Internship (Manufacturing)</i> | 4 | |
| | <i>Soft skill– II</i> | 2 | 30 |
| III | | | |
| | <i>Research Methodology</i> | 4 | 60 |
| | <i>Labour Laws relating to working and Service Conditions</i> | 4 | 60 |
| | <i>Corporate Social Responsibility</i> | 4 | 60 |
| | <i>Open Elective -Organisational Soft skill</i> | 3 | 45 |

| | | | |
|----|--|---|----|
| | Artificial Intelligence in HR Practices | 4 | 60 |
| | <i>Soft Skill – II</i> | 2 | 30 |
| | <i>Internship (Summer)</i> | 4 | |
| | <i>Value Added Course – Professional Values and Etiquettes for HR Managers</i> | 2 | 30 |
| | <i>Internship(Summer)</i> | 4 | |
| IV | <i>Organisational Development</i> | 4 | 60 |
| | <i>Human Resource Development</i> | 4 | 60 |
| | Global and Strategic HRM | 4 | 30 |
| | Project | 4 | |
| | Soft Skill | 2 | |

SEMESTER - I
LEARNING & DEVELOPMENT

| | | | |
|----------------------------|---------------------------|-------------------------------|---|
| Department: M.A.HRM | | Academic Semester: ODD | |
| Semester: I | Section: 2020-2022 | | Course: LEARNING AND DEVELOPMENT |
| | | Contact Hours /week: | No. of credits: 4 |
| CIA: 40 | | ESE : 60 | Exam Hours: 03 |

Course Outcome

| | |
|-----|--|
| CO1 | Differentiate the concepts of Learning, Training & Development and explain the relevance of Training in Human Resource Development |
| CO2 | Compare and apply the Adult Learning theories for employee training and productivity in organizations. |
| CO3 | Describe the various aspects of Training process such as training need analysis, training design, training environment, training content, trainer capabilities, training methodologies and training evaluation for Training and Development functions in any groups or organizations. Design, evaluate and deliver training programmes effectively using various models of training and development. |
| CO4 | Classify and critically evaluate different methods of Management Development Programmes for executive development. |
| CO5 | Analyze the importance of HR professional bodies (eg: ISTD, NHRD), avail membership and participate in their professional meets. |
| CO6 | Compare the various technological advancements and tools in Training and development and explain the latest trends and government initiatives in the field. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 |
| CO6 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|-------------|-------------|-------------|-------------|-------------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 3 |
| CO6 | 3 | 3 | 3 | 3 | 3 |

Correlation levels: 1- Weak

2-Medium

3-High

(60 hours)

Objectives

- To orient the student on the concepts of training, development and learning.
- To develop skills in planning and organizing training programs.
- To know the significance of Training for HRD and HRM practice

UNIT- I (CO1)

Definition – Learning – Differences on Training and Development and Learning and Education – Training need analysis – Preparing Training calendars – Skill Matrix.

UNIT II (CO2)

Learning & Training Characteristics and Principles of Learning, Bloom's Taxonomy – Adult learning theories: Andragogy and Pedagogy - Facilitation Theory Experiential Learning - Action learning Blended learning and Problem-Based learning – Project Based learning Enhancement Factors – Return on Investment.

UNIT-III (CO3)

Training Types - on the Job - of the Job. Training Environment and Transfer of learning – Training Evaluation – Donald Kirkpatrick's Evaluation Model.- Training Effectiveness Feedback system LOCF

UNIT -IV (CO4)

Executive coaching – Train the trainer – Succession Planning – Career Management - Talent Management - Professional bodies/ Training organizations in India – Evolution and Importance : ISTD, NHRD

UNIT- V (CO5)

E-learning – emergence – importance – Tools and Software used for training - Government Initiatives in the field of learning, training and development eg: Skill India, Swayam and new initiatives.

Reference

1. Aswathappa, K. Human Resource Management – Text and Cases. New Delhi. Tata McGraw Hill, 2010.
2. Anderson Katie., Learning to Lead, Leading to Learn: Lessons from Toyota, 2020.
3. Dessler, Gary et al., Human Resource Management (15th ed.) India, Pearson Education, 2017.
4. Gupta C.B. Human Resource Management Text and Cases (19th ed.)India – Sultan Chand and Sons, 2018.
5. Gibb Stephen., Learning and Development, Palgrave Macmillan., 2020.
6. [Kathy Beevers](#) et al., Learning and Development Practice in the Workplace, CIPD - Kogan Page, 2019.
7. Pandu Naik, G. Training and Development – Text, Research and Cases, New Delhi, Excel Books, 2007.
8. [Rebecca Page-Tickell](#), Learning and Development: A Practical Introduction, Rebecca page- Tickell, 2018
9. Rishi pal. Training and Development Methods, India Sultan Chand and Sons, 2011.
10. Tracy Richardson and Ernie Richardson., **the Toyota Engagement Equation**, 2017.
11. [Zubin Rashid](#), Learning and Development: From Cost Center to Business Partner, Kindle edition, 2020

LABOUR LAWS RELATING TO INDUSTRIAL RELATIONS AND SOCIAL SECURITY(60 hours)

| | | | |
|---------------------|--------------------|------------------------|----------------------------|
| Department: M.A.HRM | | Academic Semester: ODD | |
| Semester: I | Section: 2020-2022 | | Course: Labour Legislation |
| | | Contact Hours /week: 5 | No. of credits: 4 |
| CIA: 40 | | ESE : 60 | Exam Hours: 03 |

COURSE OUTCOME

| | |
|-----|---|
| CO1 | Understand and evaluate the industrial dispute measures and process followed in the industry. |
| CO2 | Compare the safety measures followed for women worker, rights and duties of labour in the industries. |
| CO3 | Evaluate the social security measures and its life changing practices, methods and procedures practiced and its role in employee wellbeing. |
| CO4 | Create compensation methods that suits and retain labour force. |
| CO5 | Find out employee engagement practices by monetary and non-monetary methods. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO5 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 3 | 3 |

Objectives:

- ❖ To understand the Historical development of Labour legislations
- ❖ To review the importance of labour legislations strengthening employee relations
- ❖ To evaluate administrative and enforcement of labour legislation relating to social security of employees

Unit- I:CO1

History of Labour Legislation – The Industrial Disputes Act, 1947 – Scope – objects – Industry – Public Utility Services - Industrial Dispute – Lay off – Lock out – Retrenchment – Closure – Workman – Types of disputes – Conciliation Machinery – Unfair Labour Practices – Adjudication – Notice of change – Arbitration - Adjudication – Awards – Strike – Service conditions not to be altered during the pendency of conciliation proceedings – Recovery of money from the employer

Unit II :CO2

The Industrial Employment (Standing Orders) Act 1946 – The Trade Union Act, 1926 – The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 - The Employee Compensation Act, 1923

Unit III : CO3

The Employees Provident Funds and Miscellaneous Provisions Act, 1952 – The Maternity Benefit Act, 1961 - Employees State Insurance Act, 1948 -

Unit IV :CO4

The Equal Remuneration Act, 1976 - The Payment of Wages Act, 1936 – The Minimum Wages Act, 1948 -

Unit V :CO5

The Payment of Bonus Act, 1972 – The Payment of Gratuity Act, 1972 – The Tamil Nādu Labour Welfare Fund Act, 1972 -The Regulations of case laws in respect of each of the above Acts

Reference:

1. Dr.V.GGoswami : Labour& Industrial Laws (Central Law Agency) 2020 Revised edition.
2. N.D Kapoor : Handbook of Industrial laws – (Sultan Chand & Sons) 2020 Revised edition.
3. S.C Srivastava: Industrial Relations and Labour Laws (Vikas Publishing House) - 2020 Revised edition.
4. N.S Zad : Industrial Labour& General laws (Taxmann publication) -2019 edition.
5. V.K Kharbhandra & Vipul Kharbanda : New Industrial &Labour codes (Law Publishing House) – 2020 Revised edition.
6. Dr. H K Saharay : Labour& Industrial Law (Universal Law Publishing) – 2020 Revised edition.
7. Labour Law Journals – Labour& Industrial cases, Factories Journal Report – Latest Reports

FUNDAMENTALS OF HUMAN RESOURCE MANAGEMENT (60 hours)

| | | | |
|--------------------|----------|------------------------|---|
| Department:M.A.HRM | | Academic Semester: ODD | |
| Semester:II | Section: | Course Code: | Course: FUNDAMENTALS OF HUMAN RESOURCE MANAGEMENT |
| | | Contact Hours /week:4 | No. of credits:4 |
| CIA:40 | | ESE :60 | Exam Hours: 03 |

| | |
|-----|---|
| CO1 | Explain the importance of Human resource and their effective management of the organization of different sectors in this contemporary environment and the ability to solve the problems arising in the organization. |
| CO2 | Demonstrate the ability to prepare a recruitment and selection strategy for matching the organizational needs and skills of potential and perspective candidates. This includes searching and researching the different sources of recruitment, the advantages and disadvantages of each type that will best suit the organization. |
| CO3 | Develop, analyze, organize, conduct and evaluate different training and development methods in a cost effective way to suffice the needs of the organization and employees. |
| CO4 | Summarize the fundamental concepts, principles, techniques, Judgments in supply and demand forecasting in determining manpower planning. |
| CO5 | Compare and contrast the different methods of performance appraisal and to identify the best unbiased method to evaluate the performance of the employees to provide feedback for enhanced performance and productivity in the future. |

Course outcome

Objectives:

1. Understand the Principles, policies and requisite skills needed for an HR professional.
2. Focus on the contemporary issues faced by an HR professional.
3. To integrate HR strategy to Business Strategy and substantiate with suitable concepts models and theories

UNIT - I (CO1)

Introduction to Management - Nature and Scope of Management - Principles of Management - Fayol Principle of Management - Scientific Principle of Management - Evolution of Management Thought - Roles and responsibilities of Manager - Skills required for a manager.

UNIT II (CO2)

Definition, Nature, Scope and Functions of Human Resource Manager - Operational & Managerial, Objectives of Human Resource Management, HRM Models, Difference between Human Resource Management and Personnel Management.

UNIT III (CO3, CO4)

Human Resource Planning and Designing of Jobs: Nature and Importance of Human Resource planning, Factors affecting Human Resource Planning, The planning process, Long-term and Short-term planning, Barriers to Human Resource Planning

UNIT –IV (CO4)

Recruitment and Selection: Recruitment - Process& types., Evaluation and Control, Placement, Interview, Induction, Selection process- Psychometric and Aptitude test, Barriers for effective selection; Separation – Exit Interview: Its Advantages and Disadvantages.

UNIT –V (CO5)

Training&Development, Performance Appraisal: Types and functions; Performance Appraisal-Appraisal process, Challenges on Performance Appraisal, Incentives and Benefits; Job Evaluation and its process, Alternatives to Job evaluation. - HR as a business Partner.

Reference

1. Fundamentals of Human Resource Management, Robert N Lussier, 2019, Sage Publications.
2. Human Resource Planning in the 21st Century, JoseineFahed, 2018, InfoTech Open,
3. Fundamentals of Human Resource Management, 2017, Raymond Goyce, McGraw Hill
4. Fundamentals of Human Resource Management, Talya Bauer, 2019, Sage Publications

WORKPLACE ERGONOMICS (45 hours)

| | | | |
|----------------------------|-----------------|-------------------------------|-------------------------------------|
| Department: M.A.HRM | | Academic Semester: ODD | |
| Semester: II | Section: | | Course: Workplace Ergonomics |
| | | Contact Hours /week: 4 | No. of credits: 4 |
| CIA: 40 | | ESE : 60 | Exam Hours: 03 |

Course outcome

| | |
|-----|--|
| CO1 | Explain the significance of ergonomics in recent times as well as the scope of the subject in relation to other disciplines. |
| CO2 | Demonstrate the different types of Ergonomics and its relevance to modern day organizations. |
| CO3 | Develop and analyze the role of ergonomics and the steps that could enhance the employee safety. |
| CO4 | Summarize the fundamental concepts such as span of attention, work flow and cost reduction. |
| CO5 | Establish an assessment methodology for Ergonomics. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 2 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 2 |

Unit - I - Introduction to Ergonomics - CO1

Definition, Significance and Evolution of Ergonomics and its recent phenomena. Scope of Ergonomics with Psychology, Sociology and Human Resource Management. Principles of Ergonomics.

Unit - II - Types of Ergonomics (CO2)

Physical Ergonomics: Posture, Occupational Environment, Occupational injuries and Disorders.

Cognitive Ergonomics: Machine and human interaction, perception, memory, reasoning, decision making, mental workload, work stress.

Organizational Ergonomics: Organisational Structure, policies, processes, communication, work design, designing of work timing, virtual organisation

Unit - III - Ergonomics and Employee Safety(CO3)

Occupational health, expected injuries, repetitive stress, disability, employer's intervention and solutions - MSD risk factors - Ergonomics management System -planning, support, performance evaluation, improvement, continual improvement

Unit - IV - Ergonomics and Productivity (CO4)

Span of attention, steps to improve the span of attention of employees, workflow, cost reduction intervention, reduction of repetitive tasks . Workplace Ergonomics at Home Environment.

Unit - V - Assessment Methodology (CO5)

Process of Assessment - Review, establishing a standard, objective assessment and feedback.

Reference:

1. Design for Ergonomics, Francesca Tosi, Springer Nature, 2019.
2. Office Ergonomics and Human Factors, CelienMcKeown, CRC press, 2018
3. Ergonomics for the Layman, PrabirMukhopadyay, CRC Press, 2020.
4. Transforming Ergonomics with Personalized Health and Intelligent Workplace, Vega Barbas, IOS Press, 2019.
5. Handbook of Research on Ergonomics, Juan Luis, 2018, IGI Global

ORGANISATIONAL COUNSELLING (45 hours)

| | | | |
|----------------------------|-----------------|-------------------------------|---|
| Department: M.A.HRM | | Academic Semester: ODD | |
| Semester: II | Section: | | Course: ORGANISATIONAL COUNSELLING |
| | | Contact Hours /week:4 | No. of credits:3 |
| CIA:40 | | ESE :60 | Exam Hours: 03 |

COURSE OUTCOMES: At the end of the Course, the Student will be able to:

| | |
|-----|--|
| CO1 | Exhibit the values and ethics of counseling goals and practices of counseling method. |
| CO2 | Identify and apply various counseling theories and models to interpret the psychological and emotional needs of the employees at workplace. |
| CO3 | Assess different psychosocial problems of the employees at workplace and to devise a plan to help them to overcome their problems through various counseling approaches and also to preserve and promote Mental Health at workplace by using counseling methods. |
| CO4 | Develop and utilize the skills of Organizational Counseling such as active listening, paraphrasing, summarizing, counseling therapies, etc in the counseling process. |
| CO5 | Establish and run effective professional counseling service in the industries. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 2 |

Objectives:

1. To approach the employee related problems with human touch.
2. To get oriented in basic counseling knowledge and skills.
3. To integrate counseling methods into HRD and HRM practices

UNIT - I (CO1)

Introduction to counseling – Definitions – Difference between Counseling and guidance– Ethics and values of counseling, counseling goals – Evolution of Counseling; Role of Counsellor; Skills involved in Counselling.

UNIT – II (CO2)

Counseling Theories: Psychoanalytical - Behavioral Approach - Carl Roger’s Client Centered Theory - Cognitive Behavior therapy - Eclectic model - Existential theory - Gestalt theory.

UNIT – III (CO3)

Counseling process and skills: Counseling process: stages from intake to termination, Counseling relationship – Components of Counseling – Active Listening: Paraphrasing, Summarizing, Clarifying, Questioning and reflecting -Counseling Therapies- Individual VS Group counseling.

UNIT - IV (CO4)

Models of Workplace Counseling - Workplace Counseling: Target Clients- Readiness for Employee Counseling, Counseling & Employees Growth - Ethical Issues in Workplace Counseling d. Stress and Workplace Counseling - Work-Life Balance.

UNIT -V (CO5)

Impact of Organizations on Work Place Counseling a. Setting up counseling at workplace b. Systemic approaches to organizations c. Organizational culture and counseling d. Employee assistance programs (EAP), Promotion counseling, Preretirement counseling. Counseling for displaced employees,

Reference:

1. Counselling with Reality Therapy, 2017, Robert Wubbolding Taylor and Francis.
2. Professional Practice in Counselling and Psychotherapy, Peter Jekins, Sage Publications, 2017.
3. Psychosocial Occupational Therapy, 2019, Nancy Carson, Elsevier Health Services.
4. Working with Risk in Counselling and Psychotherapy, 2015, Andrew Reeves, Sage Publications

Soft Skill I
(Handled by Department of English)

ABOUT SERVICE SECTOR INTERNSHIP

The two years intensive course which has three internships, ensures real industrial experience to the budding HRs along with enhancing the students' ability to adapt to different organizational culture. Service Sector Internship is the first internship for I M.A. HRM students of Dwaraka Doss Goverdhan Doss Vaishnav College. In service sector internship, the focus is on HR Development, HR Management and policy making. Students were placed in Top MNC companies in various background. The students imbibe the culture and gain an understanding of competitive tactics and strategies. Service sector internship was scheduled for the month of October – November. Assistant Professor Shivashankari was the faculty coordinator for Service Sector Internship. The students were placed in companies offering diverse services ranging from health care (hospitals), hotels, consultancy, retail and non-banking financial services. Pupils understood how a corporate company works and the role of HR amongst the white collar employees. The nature of work was observed and the students helped the employees in the organisation. The students were given a real time experience

INDUSTRIAL RELATIONS AND EMPLOYEE WELFARE - 60 hrs

| | | | |
|-----------------------------|------------------------|--------------------------------|--|
| Department: M.A. HRM | | Academic Semester: EVEN | |
| Semester: II | Section: I year | | Course:INDUSTRIAL RELATION AND EMPLOYEE WELFARE |
| | | Contact Hours /week:4 | No. of credits:3 |
| CIA:40 | | ESE :60 | Exam Hours: 03 |

COURSE OUTCOMES: At the end of the Course, the Student will be able to:

| | |
|-----|---|
| CO1 | Able to emphatically listen and prepare root cause analysis of industrial relation issues and able to develop measures to solve it. |
| CO2 | Understanding the overview of establishment of Trade Union movements in India. Procedures to establish Trade Union and functions. |
| CO3 | Enriching collective bargaining method and negation skills. |
| CO4 | Aware of industrial accident and precautionary measures to be followed. Emphatic listening to counsel the employees. |
| CO5 | Equipping grievance handling skill with the understanding of welfare practiced as Monetary and non-monetary with respective industries. |

Mapping of CO v/s PO:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|-------------|-------------|-------------|-------------|-------------|
| CO1 | 2 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 2 |

Course Objective:

- ❖ To Review the concept of Industrial Relations
- ❖ To understand the Industrial conflict and industrial conflict
- ❖ To review the functioning of department related to IR

Unit I : Industrial Relations CO1

Concepts - Importance – Nature – Scope – Factors hindering industrial relations – Role of State in industrial relations – Impact of IR and production activities – Five-year plans and industrial relations – National commission on Labour and industrial relations- Approaches to IR – Human Relations Approach - Social –Psychological – Gandhian – Marxist.

Unit II : Trade Union CO2

Growth of Trade Union Movement in India – Objectives – Importance – Functions - Non statutory code of discipline in industry – Problem of trade unions in India – Trade unions in informal sectors - Trade union classification – Trade union structure – Leadership.

Unit III : Collective Bargaining CO3

Concept –Nature & Scope - Importance – Prerequisites of Collective Bargaining – Factors hindering Collective Bargaining in India- process of Collective Bargaining – Levels of Collective Bargaining - Favorable conditions for Collective Bargaining – Collective Bargaining Agreement – Negotiation process – Negotiation skills.

UNIT -IV: Environment, Health & Safety CO4

EHS (Environment ,Health & Safety) Concept – Importance - Causes of Accidents– Problems and Prevention – Safety norms & provisions – Reporting procedures in case of hazards and accidents- – Basic Ergonomic principles - Factors leading to sustainable development growth – Occupational hazards – Diseases – Psychological problems – Counseling – Risk Management – Regulatory compliance . Employee Health and Safety. Factors leading to sustainable growth

Unit V : Employee Welfare & Grievance CO5

Concept – Nature – Scope of Welfare – Role of State in employee welfare – Functions of employee Welfare – Agencies of employee welfare – Welfare and productivity - Functions of Employee Welfare Board in Tamil Nādu - Grievance – Concept – Approach to grievance machinery – Nature – Grievance procedure – Domestic enquiry

Reference:

1. P.R.N Sinha, InduBalaSinha, SeemaPriyadarshiniShekhar : Industrial Relations ,Trade Union and Labour Legislation(Pearson Publication) 2020 Revised edition.
 - 2 ArunMonappa, RanjeetNambudiri, PatturajaSelvaraj : Industrial Relations and Labour Law McGraw Hill Publication) 2020 Revised edition.
 - 3 N.D Kapoor : Handbook of Industrial laws – N.D Kapoor(Sultan Chand & Sons) 2020 Revised edition.
 - 4 K.P Chakravarti : Domestic Enquiry & Punishment (Eastern Law House) 2020 Revised edition.
 - 5 S.CSrivastava : Industrial Relations and Labour Laws (Vikas Publishing House) - 2020 Revised edition.
 - 6 N.SZad : Industrial Labour& General laws (Taxmann publication) -2019 edition
 - 7 V.KKharbhand& VipulKharbhand : New Industrial &Labour codes (Law Publishing House) – 2021.
-
1. Dr.H K Saharay : Labour& Industrial Law (Universal Law Publishing) – 2020 Revised edition

ORGANIZATIONAL BEHAVIOUR (60 Hours)

| | | | |
|---------------------------|------------------------|-------------------------------|---|
| Semester: II | Section: I year | | Course: Organizational Behaviour |
| Course Instructor: | | Contact Hours /week: 5 | No. of credits: 4 |
| CIA :50 | | ESE : 50 | Exam Hours: 03 |

COURSE OUTCOMES: At the end of the Course, the Student will be able to:

| | |
|-----|--|
| CO1 | The HR person can able to manage and lead work groups and teams with knowledge of Individual behaviour, attitude and its impacts in organizational functions. |
| CO2 | Establishing Organization Design and Structure and able to understand the challenges in designing an Organisation structure. Understanding organization culture and climate. |
| CO3 | The person will be able to design and execute effective communication channel to handle Group Dynamics and channelizing the functional groups. |
| CO4 | Functioning as an efficient team player with the positive behaviour and attitude. |
| CO5 | Can able create Motivational model and activities based on motivational theories and training given during the course of time. |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 2 | 3 | 2 | 3 |
| CO3 | 2 | 2 | 1 | 3 | 1 |
| CO4 | 3 | 3 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 2 | 2 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Objectives:

1. The course develops in-depth knowledge of organizational; behaviour implication to organizational culture and climate from a psychological perspective.
2. Provides an understanding of social system, culture, status and organisational development.

UNIT - I CO 1

Introduction to Organisational Behaviour: Concept of Organizational Behaviour (OB) - Importance of Organizational Behaviour - Key Elements of Organizational Behavior, Role of Managers in OB - Interpersonal Roles - Informational Roles - Decisional Roles, Foundations or Approaches to Organizational Behavior, Challenges and Opportunities for OB.

UNIT - II CO 2

Introduction to Organization Design : Meaning of Organization Design and Structure, Basic elements of Organization Structure, Types of Organization Design - Organisational design and Employee behaviour. , challenges in designing an Organisation structure. Organisational Culture and climate. Organisational Culture from International Perspective - Characteristics and construction of standardized psychological tests; Types of psychological tests; - Intelligent Quotient and Aptitude Tests.

UNIT -III CO 3

Group Dynamics – Classification of groups, Stages of group development, Group Behaviour, Communication in Groups and Group Decision making. Organisational Dynamics – Power and Politics

UNIT-IV CO4

Leadership - trait, Behavioural and contingency theories; Power and Politics; Trait, Behavioural Analysis (T.A.); Work stress, Significance of Emotional & Social intelligence, PLOT Analysis

UNIT-V CO5

Motivation –Definition- Meaning – Types of Motivation- Process of motivation; Theories of motivation - need hierarchy theory, theory X and theory Y, two factor theory, Alderfer's ERG theory, McClelland's learned need theory, Victor Vroom's expectancy theory, Stacy Adams equity theory.

Reference:

1. Organizational Behaviour, 2017, Dipak Kumar Bhattacharya, Sultan Chand Publications Ltd.
2. Organizational Theory, Design and Change | Seventh Edition, 2017, Joseph Gareth. Pearson,
3. Organisational Behaviour and Analysis: An Integrated Approach, 2018, Derek Rollinson, Prentice Hall.
4. Organisation Behaviour, 2018, Dr. F.C Sharma, Sahityabawan
5. Introduction to work and organizational behaviour, 2015, John Bratton, Palgrave Macmillan

PERFORMANCE MANAGEMENT SYSTEM - 60 hours

| | | | |
|--------------|-----------------|-------------------------|---------------------------------------|
| Semester: II | Section: I year | Course Code: | Course: Performance Management System |
| | | Contact Hours /week: 50 | No. of credits: 4 |
| | | ESE : | Exam Hours: 03 |

COURSE OUTCOMES: At the end of the Course, the Student will be able to:

| | |
|-----|--|
| CO1 | Appreciate the relation of the Performance management system to HR Processes |
| CO2 | Recognise the Performance management planning process; Mid-cycle and End cycle review process |
| CO3 | Develop role profile and objective setting |
| CO4 | Demonstrate the different approaches to assesment and also recognise the various performance review issues |
| CO5 | Explain the reality of Performance Management in the current scenario |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

UNIT - I (CO 1)

Definition of the Performance management system; Relation of the Performance management system to HR Processes; Evolution of Performance Management System; Different types of Performance Management System; Aims and Dimension of Performance Management System; Biases – Different types, Training to avoid biases.

UNIT - II (CO2)

Performance management planning process; Mid-cycle and End cycle review process; Goal theory of Performance Management System; Control theory; Social justice theory; Organizational justice theory.

UNIT - III (CO3)

Performance and development planning; Role profiles; Objective setting; Performance measures and assessment; Performance planning; Development planning; The performance agreement; Performance review meeting; Managing performance throughout the year; The continuing process of performance management; Updating objectives and work plans; Managing continuous learning; Coaching and Mentoring

UNIT -IV (CO4)

Approach to assessment; Factors affecting assessments; Methods of assessment; Overall analysis of performance; Narrative assessment; Rating; Forced distribution; Forced ranking; Quota systems; 360-degree feedback; Types of Measures: KPI, Balanced Scorecard, Field Review Method, Confidential Reports, Narrative Self- Assessment, Rating Scale.

The performance review meeting; Performance review difficulties; Performance review issues; Organizational issues; Focus, criteria and impact of Performance review; Using reviews as a communication channel; Balancing past performance against future potential; Performance review problems; Self-assessment; Giving feedback. 720 degree feedback

UNIT – V CO5

The Reality of Performance Management – Overall Findings of the Research, Best practice, Views about Performance Management – Problem, Issues Identified by Field Visits – Key to Success.

Reference:

1. Business Performance Through Strategic People Management by Michael Armstrong (2020) – Kogan Page
2. Managing Employee Performance and Reward: Systems, Practices and Prospects by Sarah Kaine (2020) - Cambridge University Press
3. Kaplan, R. S. & Norton, D. P., Using the Balanced Scorecard as a Strategic Management System, Harvard Business Review, January – February 1996, 0Review%20article%20BSC.pdf
4. Kaplan, R. S. & Norton, D. P., Transforming the Balanced Scorecard from Performance Measurement to Strategic Management: Part I, American Accounting Association
5. Lipe, M. G. & Salterio, S., A note on the Judgmental Effects of the Balanced Scorecard's Information Organization, Accounting, Organization and Society 27, 2002
6. Malina, M. A. & Selto, F. H., Causality in a Performance Measurement Model, Atkinson School of Administrative Studies, Working Paper Series, 2007.
7. Robert, L. C. (2011). Performance Management Concepts Skills and Exercises, New York: M.E. Sharpe Publications.
8. Rao, N.S., (2017). Compensation System and Performance Management. New Delhi: Himalaya Publishing House.

HUMAN RESOURCE AND COMPENSATION MANAGEMENT (60 hours)

| | | | |
|--------------|-----------------|-------------------------|---|
| Semester: II | Section: I year | Course Code: | Course: Human Resource Compensation Management |
| | | Contact Hours /week: 50 | No. of credits: 4 |
| | | ESE : | Exam Hours: 03 |

COURSE OUTCOMES: At the end of the Course, the Student will be able to:

| | |
|-----|--|
| CO1 | Appreciate the significance and components of compensation |
| CO2 | Recognise the pay variation amongst the blue color workers and also the CEO to Worker pay ratio |
| CO3 | Develop and design pay packages for employee and employee taking into consideration the various theories of compensation |
| CO4 | Demonstrate the various steps involved in payroll processing and also pay fixing methods for expatriates and parent host country nationals |
| CO5 | Explain the compensation practices across various countries and also the various approaches involved in fixing compensation |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Objectives:

1. To enable student to understand the meaning and components of Compensation Management.
2. To throw insight into the different salary fixation method practiced by Organisations.
3. To facilitate the understanding and evaluate different theories of Compensation.
4. To focus on the role of HR interns of promoting effective compensation system

UNIT - I CO1

Introduction: Compensation Management - Meaning, Objectives of Compensation Management - Need and Significance - Components of compensation - significant factors affecting compensation policy, 3 Ps of Compensation.

UNIT - II CO2

Functions of Compensation Management - Role and Skill needed for a compensation manager - Concept of WPI – CPI - Blue and white color jobs salary fixing method – incentives schemes – concept, methods and impact, CEO to Worker pay ratio. Compensation Bench Marking

UNIT - III CO3

Theories of Compensation & Employee Benefit: Expectancy Theory - Equity Theory - Agency Theory. Classification of employee benefit, Designing a Benefit package, Implication to employer and employee.

UNIT IV CO4

Pay roll management – meaning - steps involved in payroll processing - benefits of payroll management – authorized deductions – Employee Stock Option – Fringe benefits – Pay variation for expatriates, parent, host countries nationals. Introduction to payroll software

UNIT V CO5

Role of Compensation in retaining and attracting top talent - pay transparency - communication training for compensation. Forms of Compensation practices across different countries. Various approaches to internal compensation - Expatriates - Host Country National, Parent country National

Reference:

1. Compensation Management by R C Sharma Sulabh Sharma, Jan 2020, Sage Publications India Pvt Ltd,
 2. Compensation Management, Dipak Bhattacharya, 2014, Oxford Publications
 3. Compensation and Reward Management, Biswanath Gosh, 2018, Sterling Publications Pvt Ltd.
 4. Compensation And Organizational Performance: Theory Research And Practice by Luis R. Gomez-Mejia, 2019, Yes Dee Publishing
- Compensation Management, 2019, Notion Press.

TOTAL QUALITY MANAGEMENT

Hours: 45

| | | | |
|--------------|-----------------|-------------------------|----------------------------------|
| Semester: II | Section: I year | Course Code: | Course: Total Quality Management |
| | | Contact Hours /week: 50 | No. of credits: 4 |
| | | ESE : | Exam Hours: 03 |

COURSE OUTCOME

| | |
|-----|--|
| CO1 | Appreciate the significance and components of compensation |
| CO2 | Recognise the pay variation amongst the blue color workers and also the CEO to Worker pay ratio |
| CO3 | Develop and design pay packages for employee and employee taking into consideration the various theories of compensation |
| CO4 | Demonstrate the various steps involved in payroll processing and also pay fixing methods for expatriates and parent host country nationals |
| CO5 | Explain the compensation practices across various countries and also the various approaches involved in fixing compensation |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Objectives

- To understand the Basics of Total Quality Management. Gain insight on tools and techniques of TQM.
- To understand the importance of Quality Circles, ISO certifications and Awards

Unit- 1 CO1

Definition of Quality - Need for Quality – Evolution of Quality - Dimensions of Product and service quality – Basic Concepts of TQM: Definition, Framework and characteristics of TQM Reasons for adopting TQM and Barriers to TQM - Quality Gurus and their contributions.

Unit – II CO2

TQM Principles - TQM Leadership: Quality Statements- Customer Satisfaction-Employee Involvement - Process approach Continuous Process Improvement- Supplier Partnership - Performance Measures: Cost of Quality and Quality Awards.

Unit – III CO3

TQM tools & Techniques: Seven basic tools of quality - Six Sigma – Business Process Benchmarking – Best Practice adoption - PPM Model. Maturity Model.

Unit –IV CO4

Quality circles - Quality Function Deployment (QFD) – Taguchi quality loss function – Total Productive Maintenance - JQM Awards – Lean Methodology on Quality.

Unit –V CO5

Quality Management Systems: Recent trends and Quality Initiatives in organizations.
ISO 140001 – Its preparations

Reference

1. Bester field Dale H., Total Quality Management, (3rd ed.). India, Pearson Education, 2011.
2. Besterfield Dale H et al., Total Quality Management, Pearson Education, 2018.
3. .Evans. James R., Total Quality Management, India, Cengage Learning, 2007.
4. Jayakumar, V. Total Quality Management for MBA Students, Chennai, Lakshmi Publications, 2017.
5. **Dr. Kiran, Total Quality Management : An Integrated Approach, BSP, 2016.**
6. Naagarazan R.S., and Arivalagar A.A., Total Quality Management. New Delhi, New Age International, 2011.
7. [Poornima M. Charantimath](#) Total Quality Management Paperback, Pearson publication, 2017
8. SubburajRamasamy., Total Quality Management, New Delhi, Tata McGraw-Hill Education Private Limited, 2012.

ENTREPRENEURSHIP AND BUSINESS HRM (45 hours)

| | | | |
|--------------------|-----------------|------------------------|---|
| Semester: II | Section: I year | | Course: Entrepreneurship and Business HRM |
| Course Instructor: | | Contact Hours /week: 5 | No. of credits: 4 |
| CIA :50 | | ESE : 50 | Exam Hours: 03 |

COURSE OUTCOME

| | |
|-----|--|
| CO1 | Understand the types of entrepreneurs and the characteristics of entrepreneurs |
| CO2 | Develop an understanding with regard to Joint venture, Merger and also about family businesses |
| CO3 | Demonstrate with regard to Start-ups Project Formulation and also steps involved in setting up a new business |
| CO4 | Develop a clear understanding about GST and also working capital |
| CO5 | Appreciate an understanding about Government Policy for Small Scale Enterprises and growth Strategies in small industry. |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

UNIT – I: (CO1) ENTREPRENEURSHIP:

Definition –Types of entrepreneurships - Characteristics of successful entrepreneur - .
Innovation -Factors of motivation that makes an Entrepreneur - Entrepreneurial scenario in India - Case histories of successful entrepreneurs. Difference between entrepreneur and Intrapreneur.

UNIT – II: (CO2) DIFFERENT TYPES OF SECTORS

Types of businesses – Family – partnership – Startups in detail - Cost Analysis and Customer Relationship. Joint venture, Merger, acquiring business units. Challenges and opportunities.

UNIT – III (CO3) SETTING OF SMALL BUSINESS ENTERPRISE

Small Enterprises – Definition, Classification – Characteristics, Ownership Structures – Start-ups Project Formulation – Steps involved in setting up a new business – Preparation of Preliminary Project Reports – Project Appraisal

UNIT - IV (CO4) FINANCING AND ACCOUNTING.

Need – Sources of Finance, Financial Institution, Management of working Capital,
Introduction to Taxation – Income Tax, basic introduction of GST

UNIT V: (CO4, CO3) SUPPORT TO ENTREPRENEURS

Sickness in small Business – Causes and Consequences, Corrective Measures – Government Policy for Small Scale Enterprises – Growth Strategies in small industry – Expansion, Diversification, Joint Venture, Merger and Sub Contracting

References

1. Hisrich R D, Peters M P, “Entrepreneurship” 8th Edition, Tata McGraw-Hill, 2013.
2. Mathew J Manimala, “Entrepreneurship theory at cross roads: paradigms and praxis” 2nd Edition Dream tech, 2005.
3. Rajeev Roy, ‘Entrepreneurship’ 2nd Edition, Oxford University Press, 2011. EDII “Faculty and External Experts – A Hand Book for New Entrepreneurs Publishers: Entrepreneurship.
4. Khanka. S.S., “Entrepreneurial Development” S.Chand& Co. Ltd., Ram Nagar, New Delhi, 2013.
5. Donald F Kuratko, “ Entrepreneurship – Theory, Process and Practice”, 9th Edition, Cengage Learning 2014.

ABOUT MANUFACTURING SECTOR INTERNSHIP

The two years intensive course with three internships ensures real industrial experience to the budding HRs and enhances the students' ability to adapt to different organizational cultures. Manufacturing Internship is the second internship for I M.A. HRM students of Dwaraka Doss Goverdhan Doss Vaishnav College. The focus of the internship is on learning the nuances that are exclusive to the sector. Students were placed across different and diverse manufacturing concerns including automobiles, electrical equipment, medical equipment, auto parts, clothing, cement, etc... in companies such as Schneider Electric, Valeo, Ashok Leyland, TVS Lucas, Hyundai, Polycab, Salcomp, TI Cycles, Wheels India India Cements Ltd, etc... It was scheduled for a period of one month under the guidance of any of the Faculty Coordinator. The students had the opportunity to understand the dynamics of the industry, observe and obtain knowledge regarding the HR functions of different roles such as Industrial Relations, Safety, Welfare, Plant Layout and understand the nature of work performed.

Soft Skill II
(Handled by Department of English)

III SEMESTER

RESEARCH METHODOLOGY - 60 hours

COURSE OUTCOME

| | |
|-----|--|
| CO1 | Illustrate different types of Research in practice |
| CO2 | Construct Hypothesis and decide the sampling procedures to ensure originality in research. |
| CO3 | Analyze and choose right method for data collection and scales used for measuring data validity and reliability. |
| CO4 | Appraisal with regard to technical skill and software's available for data analysis. |
| CO5 | Measure the data with the appropriate methods. |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Objectives

- To understand the nature and importance of the scientific method and appreciate the principles of HRM research.
- To develop the capacity to independently conceptualize a problem and execute research.
- To develop technical competence to assess and analyze problems, needs and services in the field of HRM.

Unit- I CO1

Research meaning, scope and objectives – Types of research and research design - exploratory, descriptive, experimental, explanatory / Diagnostic Design - Case Study as a method of research and tool of data collection. Problem - definition - research problem - Relevance of research for decision making in various functional areas of management. Qualitative Research: Definition, Characteristic features, and Tools: In Depth Interview, FGD and Ethnography.

Unit – II CO2

Hypothesis – Concept - Meaning – Importance. Types of hypotheses - Uses and Requirements- Testing of Hypothesis. Variable – Definition and understanding. Sample and Population – Principles of Sampling - Sampling techniques and sample size determination for research.

Unit –III CO3

Data– Definition –Types- Primary and Secondary data- Merits and Limitations. Data collection – Tools of Data Collection: Observation, Questionnaire & interview schedule. Scales of measurement / Types of Scales: Nominal, Ordinal, ratio, interval. Validity - Reliability. Scaling techniques: comparative – non-comparative scales (Continuous – itemized, rating, staged/attitudinal scale and its types.

Unit – IV CO4

Data analysis - Editing and coding of data Univariate, bivariate, multivariate analysis – SPSS - Chi-Square test – Correlation and regression analysis, multiple regression analysis – Single and two factor analysis of variance (ANOVA) Application and use of statistical tests – Parametric t-test (t – test) and non-parametric - Interpretation of test results

Unit – V CO5

Presentation of Research Results: Tabulation – need, nature and guidelines – Ungrouped and grouped frequency tables, charts and diagram- Organizing a research report: Use of executive summary, appendix and bibliography.

References

1. Babbie, E., "The Practice of Social Research" Thomson Learning Academic Resource Center, 2001.
2. Bhattacharyya, D K., Research Methodology, Excel Books, New Delhi, 2009.
3. Dawson Catherine. Dr., Introduction to Research Methods, 5th ed., Little, Brown Book Group, 2019
4. D.K. Lal Das., "Practice of Social Research" Rawat Publications, Jaipur, 2004.
5. **John W. Creswell** et al., Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, Sage Publications, 2018.
6. Khan APH., Research Methodology, Publishing Corporation, New Delhi, 2011.
7. Kothari, C. R., Research Methodology: Methods and Techniques, New Age International Publishers, 2013.
8. Uma Sekaran, and Roger Bougie., Research Methods for Business: A Skill Building Approach, John Wiley & Sons, New Delhi, 2010.
9. Ranjit Kumar., Research Methodology: A Step-by-Step Guide for Beginners, Sage Publications, New Delhi, 2010.
10. Panneerselvam, R., Research Methodology, Prentice Hall of India Pvt Ltd, New Delhi, 2004.
11. Prashanth Sarangi, Research Methodology, Taxman's Publications, 2010.

LABOUR LAWS RELATING TO WORKING AND SERVICE CONDITIONS 60 hrs

COURSE OUTCOME

| | |
|-----|--|
| CO1 | Develop an insight regarding constitution and labour law. |
| CO2 | Understand and to gain practical knowledge in The Factories Act, 1948 The Contract Labour (Regulation and Abolition) Act, 1970 The Plantation Labour Act, 1951 The Motor Transport Workers Act, 1961 |
| CO3 | Demonstrate the applicability of ACTS that govern the operation of Industries Gain clarity about the Mines Act 1952, Child Labour Act Act, 1986, The Inter-State Migrant Workmen Act, 1979. |
| CO4 | Gain critical understanding of The Tamil Nādu Shops and Establishment Act, 1947, The Tamil Nādu Catering and Establishment Ac 1958, The Building and other construction workers Act, 1996 |
| CO5 | Gain insight regarding The Beedi and Cigar workers Act 1966 , The Working Journalists and other Newspaper Employees Act, 1955 |

Objectives:

- ❖ To understand the constitutional rights and legal frame work
- ❖ To review the importance of labour law
- ❖ To evaluate the working and service conditions

Unit- I : CO1

Constitution and labour law – Objectives – Importance - Fundamental right in relating to law – Equality before law and its application in labour law – Reservation policies – Article 16, 19 , 21 , 23 and 24 and its implication – Salient features of Labour codes- The code on wages , 2019 - Industrial Relations code – 2020 – Occupational Safety Health and Working Conditions code, 2020 – Code on Social Security, 2020

Unit II : CO2

The Factories Act, 1948 – The Contract Labour(Regulation and Abolition) Act, 1970 – The Plantation Labour Act, 1951 - The Motor Transport Workers Act, 1961

Unit III : CO3

The Mines Act, 1952 – The Child Labour (Prohibition and Regulation) Act, 1986- The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979.

Unit IV :CO4

The Tamil Nādu Shops and Establishment Act, 1947 – The Tamil Nādu Catering and Establishment Act, 1958 - The Building and other construction workers (Regulations of Employment and Conditions of Service) Act, 1996.

Unit V : CO5

The Beedi and Cigar workers (conditions of employment) Act – 1966 - The Working Journalists and other Newspaper Employees (conditions of service and Miscellaneous Provisions) Act, 1955

The Regulations of case laws in respect of each of the above Acts

Reference:

1. N.D Kapoor : Handbook of Industrial laws – N.D Kapoor (Sultan Chand & Sons) 2020 Revised edition.
2. S.C Srivastava : Industrial Relations and Labour Laws (Vikas Publishing House) - 2020 Revised edition.
- 3 . N.S Zad : Industrial Labour& General laws (Taxmann publication) -2019 edition.
- 4 .K Kharbhanda&VipulKharbada : New Industrial &Labour codes (Law Publishing House) - 2021 Revised edition.
5. Dr.H K Saharay: Labour& Industrial Law (Universal Law Publishing) – 7th edition- 2020 Revised edition

CORPORATE SOCIAL RESPONSIBILITY - 60 hours

COURSE OUTCOME

| | |
|-----|---|
| CO1 | Develop an understanding about the nature and types of social responsibilities |
| CO2 | Demonstrate an understanding about the CSR in Indian perspective |
| CO3 | Gain clarity about the guidelines issued by Public Sector Undertaking |
| CO4 | Understand about the Principles of corporate governance and strategic applications of CSR |
| CO5 | Gain clarity about the sustainable development |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

UNIT – 1 CO1

Corporate Responsibility –Meaning, Types and nature of Social Responsibilities; Corporate Social Responsibility - Meaning, CSR principles and Models of CSR; Best practices of CSR; Need and importance of CSR; CSR in Indian perspective. Business Ethics; National and International CSR; Changing concepts of Social Responsibility

UNIT - II CO2

Government policies for CSR: Voluntary guidelines for CSR by Ministry of Corporate Affairs, CSR guidelines for PSU by Ministry of Heavy Industries and Public Enterprises, CSR in Public Sector. Government Partnership

UNIT - III CO3

Social auditing – Meaning, Uses, Principles, Stages; Social book keeping; Social Accounting; Social Auditing – Methodology and process of Social Auditing; The International Organization for Standardization (ISO) standards – The Accountability AA1000 Series, The Social Accountability International SA8000 standard, The ISO 26000 Guidance Standard on Social Responsibility. MDG's(Millennium Development Goals) and CSR; GRI (Global Reporting Initiative)

UNIT – IV CO4

CSR and Strategy: The Objectives of Business; Role of the Business Manager; Principles of Corporate Governance; Systems of Corporate Governance; Strategic Applications of CSR; Corporate role in Environmental Sustainability and Innovation; Techniques.

UNIT - V CO4.CO3

CSR and Leadership: Globalization and Corporate Social Responsibility; Corporate Sustainability – Definition, Strategic imperatives for Sustainable development. Concept and role of partnership.

Reference:

1. Emiliani M L (2006) Improving Management Education.
2. Ghoshal S & Moran P (2005) Towards a Good theory of Management in Sumantra Ghoshal on Management ed. Birkinshaw J & Piramal G Prentice Hall
3. Beeslory, Michel and Evens, Corporate Social Responsibility
4. Bob Doppelt Leading Change Toward Sustainability: A Change-Management Guide for Business, Government and Civil Society 2003
5. Philip Kotler, Nancy Lee Corporate Social Responsibility: Doing The Most Good For Your Company And Your Cause 2008
6. Ugly Subhabratha Bobby Banerjee Corporate Social Responsibility: The Good, the Bad and the 2009
7. Corporate Social Responsibility: Balancing Tomorrow's Sustainability and Today's Profitability David.E.Hakins 2006
8. Darcy E Hitchcock, Marshall L. Willard The Business Guide to Sustainability: Practical Strategies and Tools for Organizations 2009
9. Michael Hophins Corporate Social Responsibility and International Development: Is Business the Solution? 2007.
10. Susan Hunnicutt Corporate Social Responsibility Earthscan, 2007

ORGANISATIONAL SOFTSKILLS

Objectives

1. To elucidate the significance of career planning and decision making.
2. To illustrate the steps involved in Career Development.
3. To identify the skillsets / strategies required for Job sustenance.

Unit-I

Introduction: Career definition- Planning for a career- Career ladder – Decision Making - Process of Decision making

Unit II

Preparations for a Job Search – Organizing portfolios – Preparing a C.V- Job Portals- Creation of Profiles in Job Portals – Usage and its effectiveness – Understanding Job description and Job Specification

Unit III

Self Motivation - Aptitude – Leadership Skills – Teamwork – Communication –Problem Solving Skills – Persuasive Skills- Network skills

Unit IV(9 Hours)

Interviews – Group Discussions- HR rounds – Physical and Mental preparations for attending an Interview.

Unit V

Campus to Corporate – E mail writing, Grooming skills, Joining formalities – Adjustments to work place – Adherence to Company policy. Professional etiquette,Dining etiquette.

Reference

1. Rajendra Pal & J.S. Korlahalli, Essentials of Business Communication - Sultan Chand & Sons - New Delhi.
2. Shirley Taylor, Communication for Business - Pearson Publications - New Delhi. •
3. Bovee, Thill, Schatzman, Business Communication Today - Pearson Education Private Ltd - New Delhi.
4. Penrose, Rasbery, Myers, Advanced Business Communication - Bangalore.
5. Simon Collin, Doing Business on the Internet - Kogan Page Ltd - London.
6. Mary Ellen Guffey, Business Communication – Process and Product International Thomson Publishing - Ohio.

Artificial Intelligence in HR Practices (45)

| | | | |
|----------------------------|-----------------|--------------------------------|--|
| Department: M.A.HRM | | Academic Semester: EVEN | |
| Semester: III | Section: | Course Code: | Course: Artificial Intelligence in HR Practices |
| Course Instructor: | | Contact Hours /week: 3 | No. of credits: 4 |
| CIA: 50 | | ESE : 50 | Exam Hours: 03 |

| | |
|--------------------------|---|
| Content delivery: | Chalk and Talk, Power Point Presentation, Quiz and Assignments, Google Classroom, Seminar, Group Discussion and Practical Session |
|--------------------------|---|

COURSE OUTCOMES: At the end of the Course, the Student will be able to:

| | |
|-----|---|
| CO1 | Understand the basics of Artificial Intelligence and its usage in Decision making |
| CO2 | Describe the concepts of Artificial Intelligence, benefits of automation and role of chatbots, voice bots in various sectors. |
| CO3 | Analyse and Evaluate the AI assisted HR functions - Challenges in Applying Artificial Intelligence. |
| CO4 | Practical Session on Basics of Artificial Intelligence |
| CO5 | Practical Session on Artificial Intelligence in HR functions |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|-------------|-------------|-------------|-------------|-------------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

SUBJECT NAME: ARTIFICIAL INTELLIGENCE IN HR PRACTICES

Theory

UNIT I

Introduction–Definition & Meaning of Artificial Intelligence – Emerging Technology in HR – Need and Use of Automation – Understanding Data Structure – Role of data in machine learning - Problem Solving and Decision Making with the help of AI. – AI a boon or bane for HR.

UNIT II

Evolution of Artificial Intelligence - Concepts related to the AI application – Tools of HR automation – Overview of SAP, ERP, Power BI, Chatbot - limitations of using data in HR decisions – Benefits of HR Automation – Role of Chatbots in Onboarding- Voice bots and its uses in different sectors.

UNIT III

AI to streamline all HR functions – Employee Engagement with Conversational AI – Implementation of HR Tools in HR process – Cost & Benefit Analysis in implementation of AI - HR Challenges in Applying AI.

Practical

UNIT IV

Basic understanding of AI and HR functions

UNIT V APPLICATIONS

Chatbots – Role of Artificial Intelligence from NEO to Exit - AI governance strategy

References

1. AI Revolution in HRM – Ashwani Kumar Upadhyay, Komal Khandelwal, Jayanthi Iyengar – Sage Publication.
2. Digital HR Strategy Achieving Sustainable Transformation in the Digital Age 2020 Edition by Soumyasanto Sen , Kogan Publication.
3. Handbook of Research on Artificial Intelligence in Human Resource Management Edited by Stefan Strohmeier, Saarland University, Edwar Elgar Publication, Germany.
4. Data-Driven HR , Bernard Marr, Kogan Page Ltd.
5. Artificial Intelligence for HR, Ben Eubanks, Kogan Page Ltd.

PROFESSIONAL VALUES AND ETIQUETTES FOR HR MANAGERS (30 hours)

| | | | |
|---------------------------|-------------------------|-------------------------------|--|
| Semester: III | Section: II year | | Course: Prof. Values and Etiquettes for HR Managers |
| Course Instructor: | | Contact Hours /week: 5 | No. of credits: 2 |
| CIA :50 | | ESE : 50 | Exam Hours: 03 |

COURSE OUTCOME

| | |
|------------|---|
| CO1 | Organize oneself for higher standard of professional values |
| CO2 | Analyse the concept of Moral Values and Universal Moral values |
| CO3 | Illustrate an understanding regarding professional ethics in work place. |
| CO4 | Recognize about the ethical dilemmas in work place and role of HR in developing ethical environment in organization |
| CO5 | Discuss regarding work place etiquette and its importance |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------------|-------------|-------------|-------------|-------------|-------------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Objectives

- To identify the importance of professional and moral values for sustained professional growth.
- To understand the professional ethics and its need in work place.
- To realize/ explain the challenges in handling ethical dilemmas in management.
- To develop/ propose appropriate professional and business etiquettes for professionalism and personal development.

UNIT I: Professional Values and Moral Values: - CO1

Professional Values -Concept of professional Values, Importance of Professional Values. Universal professional Values- Commitment, Ethics, Responsibility , Respect. Loyalty, Adaptability, Honesty. Individualism. Professional secrecy, Inclusion, Social responsibility, Tolerance. Trust, Humility, Delegate.

UNIT II

Moral Values-Definition and Concept of Moral Values – Need and Importance – Universal Moral Values- Integrity, Work Ethic, Self Confidence, Moral Autonomy, Consensus and Controversy, Professional and Professionalism, Professional Virtues.

UNIT III: Professional Ethics in HR Practice: - CO2

Definition and Concept of Professional Ethics-Need and Importance- Ethics and Organizations, Employee Duties and Rights, Anti discriminatory and Pre-judicial Employee Practices, Natural Acceptance of Human Values. Accountability, Collegiality, Royalty, Respect for Authority, Professional Rights, Intellectual Property Rights, Honesty, Moral Leadership, Code of Conduct.

UNIT IV: - Ethical Dilemmas in HR Practice: - CO3

Handling Ethical Dilemmas at Work Place -Role Conflict, Organization Change, Accuracy in reporting, Unfair Labour practices by Employer and Employee –Dilemmas in Decision Making-Remuneration and Reward Management, Health and Safety, Performance Appraisal, promotion and transfer. Role of HR in developing ethical codes and conduct in organization.

UNIT V: Workplace Etiquette: - CO4

Need and Importance of Workplace Etiquette-Etiquette for Personal Contact- Personal Appearance, Gestures, Postures, Facial Expressions, Eye-contact, Space distancing. **Multi-Cultural Challenges:** Cultural Differences and their Effects on Work Place Etiquette- POSH - Gender Sensitization

Reference:

1. John R Boatright, Ethics and The Conduct of Business, 8th Edition, Pearson Education, 2017, Noida.
2. R.C.Sekhar, Ethical Choices in Business, 2nd Edition, SAGE Publications, 2002, New Delhi.
3. Richard T. De George, Business Ethics, 5th Edition, McMillan Publishing, 2009, New Delhi.
4. M. Govindarajan ,S Senthil Kumar, M.S. Natarajan , Professional Ethics and Human Values, PHI Learning private limited, 2010, New Delhi.
5. Barbara Pachter, Marjorie Brody. Complete Business Etiquette Handbook. Prentice Hall, 2015.
6. Nancy Mitchell. Etiquette Rules : A Field Guide to Modern Manners. Wellfleet Press, 2015.
7. Raghu Palat, Indian Business Etiquette, Jaico Books, 2015.
8. Pease, Allan and Barbara Pease. The Definitive Book of Body Language. New Delhi: Manjul Publishing House, 2005.

Soft Skill
(Handled by Department of English)

ABOUT SUMMER SECTOR INTERNSHIP

The two years intensive course with three internships ensures real industrial experience to the budding HRs and enhances the students' ability to adapt to different organizational cultures. The Summer Internship is our third internship for I M.A. HRM students of Dwaraka Doss Goverdhan Doss Vaishnav College. This internship spans over a period of 30 days, giving our students great deal of time (considerable amount of time) to gain experience that equips our budding HRs with essential skills to thrive in the dynamic job market conditions. The focus of this internship is to bring awareness about the culture and gain an understanding of competitive tactics and strategies and helping them learn the nuances that are inclusive to both the sectors. The students were given an option to intern either in a manufacturing sector or a service sector. Compared to the previous two internships which was limited with the walls of Chennai, this internship presented our students the opportunity to be placed across various companies, all over India. Thus, their knowledge of HR functions is not restricted to just Chennai companies' culture, but they are also exposed to the variety of cultures that exist in companies across other Indian states. With the exposure to various cultures, they can recognize the multiple ways the HR functions can be carried out. This internship provides a general understanding of theoretical aspects of HR functions in correlation to practical knowledge. In this internship, students were placed in companies belonging to either manufacturing or service sector.

ORGANISATIONAL DEVELOPMENT - 60 hours

COURSE OUTCOME

| | |
|-----|---|
| CO1 | Appreciate the theories of Organisational Development and evolution of organisational development |
| CO2 | Diagnose the leadership model and organisational model and its relevance to the modern times |
| CO3 | Recognise the role, competencies and scope of Organizational Development and its interventions and challenges |
| CO4 | Explain the determinants and Components of Organisational Development |
| CO5 | Demonstrate seven steps of Initiating Organizational Learning and evaluation of Organizational Development. |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

UNIT I CO1

Introduction to Organizational Development; Organization theory and Design; Evolution of Organizational Development – Characteristics, organizational effectiveness; Process of Organizational Development; Critical Thinking and problem solving – Real Organizational Development examples – Role play (Classify problems into Culture change, structure change, strategic change, process change, team change, leadership change; Phases in OD; OD intervention

UNIT – II CO2

Diagnosing the system, its sub-units and processes; Diagnosing using six-box model; Organization analysis and diagnosis evaluation; Organizational Development Interventions (Behavior, non-behavior and miscellaneous); Grid leadership model developed by Robert R. Blake and Jane Mouton, situational leadership and Facilitation theories; Theories of Planned Change (Action research model, Lewin's change model, Positive model)

UNIT – III CO3

Organizational Development Practitioner – role, competencies, scope; Characteristics of Organizational Development Interventions; Challenges in Interventions; Ethics in Organizational Development; Work groups and teams; Career stage model

UNIT – IV CO4

Organizational design – Determinants, Components, Types and Challenges of the design; Organization Culture Intervention; Team Intervention; Strategic Intervention; Techno Structural Intervention, Socio- Technical Intervention

UNIT – V CO5

Learning Organization; Senge's Approach Nonaka& Takeuchi's Approach; Seven Steps of Initiating Organizational Learning; Evaluation of Organizational Development; Change Agents: Skills, Resistance to change; Managerial resistance; Levin's change model; Organizational reality.

Reference:

1. Nilakant, V. and Ramnaryan, S., Managing Organisational Change, Response Books, New Delhi.
2. Beckhanrd, Richard and Harris, Reuben T., Organisational Transitions: Managing Complex Change, Addison, - Wesley, Mass
3. Pattanayak, Biswajeet and Kumar Pravash, Change for Growth, Wheeler Publications, New Delhi
4. Organization Development and Change - Thomas G. Cummings, Christopher G. Worley - 2019 –Cengage Learning.
5. Organisation Development Systems - VinayshilGautam, SurinderBatra - 2011 – Concept Publishing Company Pvt Ltd, New Delhi.
6. The Best Place To work: The Art and Science of creating an extraordinary workplace, Ron Friedman – 2014 -Tarcher Perigee
7. The Culture Code: The Secrets of Highly Successful Groups, Daniel Coyle – 2018 - Bantam
8. Measure what matters, John.E.Doerr -2018 -Penguin
9. Nine Lies About Work: A Freethinking Leader's Guide to the Real World, Marcus Buckingham, Ashley Goodall - 2019 – Harvard Business School
10. Embracing Organisational Development and Change, Van Nistelrooij, Antonie – 2020 – Springer
11. Kavitha Singh Organisational change and Development, Excel Books New Delhi, 2010

HUMAN RESOURCE DEVELOPMENT

COURSE OUTCOME

| | |
|-----|---|
| CO1 | Develop an understanding about Manpower processes and an understanding about organisational goals |
| CO2 | Demonstrate an understanding about Competency profiling, Balance score card and HR analytics |
| CO3 | Elucidate clarity about MC Elory Model and Instructional Design , Evolution and its theories |
| CO4 | Recognise the significance of Job rotation , equality and diversity |
| CO5 | Appreciate about Global factors on HRD. |

Mapping CO vs PO

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | 3 | 2 |

Correlation levels: 1- Weak 2-Medium 3-High

Objectives

- To gain a deep insight into the subject matter so that the student is able to develop suitable understanding on the topic.
- To integrate the theoretical understanding with practical application to the field.
- To build a knowledge base appropriate to Human Resource development.
- To enable the student to develop the attitude required for the successful application of Human Resource development in industries.

Unit-I CO1

Human Capital Management - Definition- Purpose; Manpower Planning Process - Understanding Organizational goals and Objectives; Career Development - Initiatives - Kaleidoscope career model; Leadership and Power Leadership theories – Contemporary Leadership issues – Role of HR in Leadership.

Unit- II CO2

Competency Mapping /Building – Profiling and architecture; Balanced Score Card (BSC) – Perspectives - Principles; Strategic Management tool - Steps; HR Metrics – Measurements; Workforce Analytics; Emotional Intelligence – Importance – Application.

Unit- III CO3

Knowledge Management - MC Elory Model; Instructional Design – Evolution – Theories; HR Audit – Definitions Purpose - Levels – Process;

Unit – IV CO4

Job rotation – Definition – Benefits - Advantages - Characteristics; Managing Diversity – Steps – Diversity and Value – Equality and Diversity - Diversity programs; Cross cultural management – Meaning – Cultural differences – Communication across culture - Global Leadership Cross cultural training.

Unit – V CO5

Global indicating factors on HRD – Happiness indicator – Introduction – Tools – Locus of Control - Indian Policies on HRD

Reference:

1. Ashok Kumar Sannigrahi., Human Resource Development, New India Pub. Agency, 2011.
- 2.
3. Elwood F. Holton III and Richard A. Swanson, Foundations of Human Resource Development (2nd Ed), 2011.
4. Jon M. Werner and Randy L. DeSimone, Human Resource Development Publication 2011 | ISBN-10: 0538480998 | ISBN-13: 978-0538480994.
5. Rao., T.V., Future of HRD, Macmillan Publications, 2003.
6. Rick Bellingham, contributing editor Russ Campanello HR Optimisation, 2010.
7. Sanjivkumarsingh, Human Resource Development: HRD—IR Interface Approach, 2013.
8. SubhashRajoria Dr., Fundamentals of Human Resource Development, Red'shine publication pvt.ltd, 2019.
9. Santosh Gupta Human Resource Development: Concepts and Practices Deep and Deep Publications, 2008.

GLOBAL AND STRATEGIC HUMAN RESOURCE MANAGEMENT

Course Objective

To understand the nature of International HRM and appreciate how and why International HRM has become so critical to competitiveness and to our society's wellbeing. To understand SHRM, and strategies of SHRM

(60 Hours)

| | | | |
|----------------------------|-----------------|--------------------------------|---|
| Department: M.A.HRM | | Academic Semester: EVEN | |
| Semester: IV | Section: | Course Code: | Course: Global & Strategic HRM |
| Course Instructor: | | Contact Hours /Week: 4 | No. of credits:4 |
| CIA:50 | | ESE :50 | Exam Hours: 03 |

COURSE OUTCOMES: At the end of the Course, the Student will be able to:

| | |
|-----|---|
| CO1 | Understand Globalization and Global Impact on Indian Economy across Sectors. Modes of Entry strategies. |
| CO2 | Illustrate the International Business Environment, GATT and WTO, Understanding International cultural aspects, Values and norms, religion and ethics, language, education impact of cultural differences on business |
| CO3 | Explain the International HRM(IHRM) Definition, Difference between IHRM and Domestic HRM, Models of IHRM- 5P Model European Model. |
| CO4 | Analyse and Evaluate SHRM process, difference between SHRM and Traditional HRM Benefits and Role. |
| CO5 | Analyse and evaluate various recruitment, retention and training and development strategies and choose the appropriate ones for a given situation. Describe the management trends and use the new strategic management tools in industries to gain a competitive advantage. |

Co vs Po

| COURSE OUTCOME | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| CO1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 |

Mapping of CO v/s PS

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|-------------|-------------|-------------|-------------|-------------|
| CO1 | 3 | 2 | 3 | 3 | 2 |
| CO2 | 2 | 2 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 2 | 2 |

| S.NO | CONTENTS | HOURS | OUTCOME |
|------|---|-------|---------|
| 1 | Globalization and the Indian Business Environment: Meaning and Implications, Phases, Global Impact on Indian Economy across Sectors. Modes of Entry strategies. | 9 | CO 1 |
| 2 | International Business Environment: Review of the global economy, the global recession, Business environment in Developed and Developing Countries. International trade theories. GATT and WTO: Agreements and Implications. International cultural aspects- Values and norms, religion and ethics, language, education, impact of cultural differences on business. | 9 | CO 2 |
| 3 | International HRM(IHRM) Definition, reasons for going global, Approaches to IHRM, Differences between IHRM and Domestic HRM, Reasons for emergence of IHRM, Models of IHRM-Matching model, Harvard Model, Contextual Model, 5P Model European Model, Models - The Challenges of International Human Resource Management. – Overview of International Compliances, Tax, Work Permit, Visa Process and Offshoring business. | 9 | CO 3 |
| 4 | Definition, Meaning -SHRM - Process - Types of Corporate Strategies - Difference between SHRM and HRM, - Porter's generic model - Benefits of SHRM, Role of HR in Strategic Human Resource. | 9 | CO 4 |
| 5 | HR strategies – Recruitment, Retention, Training & Development, and Retrenchment Strategies, Strategic management tools and recent trends in SHRM. | 9 | CO 5 |

Reference

1. Aswathappa, K. (2010) *Human Resource Management – Text and Cases*. New Delhi. Tata McGraw Hill.
2. Dessler, Gary & Varkkey, B. (2017). *Human Resource Management* (15th ed.)India, Pearson Education. Gupta C.B. (2018) *Human Resource Management Text and Cases* (19th ed.)India – Sultan Chand and Sons.
3. Gyanchandani Rajni,(2014) *Strategic Human Resource Management*. Nirali Prakashan. Reference Books. Jack Lawrence .R & Glueck William F(2008)-*Strategic Human ResourceManagement*-Tata Mc Graw Hill Publishing Company Ltd.
4. Dr.B.RathanReddy(2015)*EffectiveHumanResourceTrainingandDevelopment Strategy*, (3rd ed.).Mumbai,Himalaya PublishingHouse.
5. Armstrong Micheal (2011),*Armstrong's Handbook of Strategic Human Resource Management* (5th ed.). London, Kogan Page Ltd.
6. K. Aswathappa(2017), “International Human Resource Management” published by McGraw Hill Education, ISBN-13: 978-0071077941
7. P. Subba Rao(2015), “International Human Resource Management” published by Himalaya Publishing House, SBN-13: 978-9352028375 2018-20 Page 58 Reference Books:
8. Dr. S. C. Gupta(2014), “International Human Resource Management” published by Laxmi Publications, SBN-13: 978-0230330795
9. Vance (2013), “Managing a Global Workforce Challenges and Opportunities in International Human Resource Management” published by Prentice Hall India Learning Private Limited, ISBN-13: 978-8120347946 3.

Research Project – I

Credits : 4

Total Internal: 150 Marks

Duration: 90days

Viva–voce External: 50 Marks

Objectives:

- To orient the students to field research.
- To develop their skills in research problem formulation and research field/area identification.
- To train them in developing tool of data collection.
- To align students Human Resource Management practice and decision making through scientific study.

UNIT-I: (30days) 1*50

- a) Research area identification (In the area of specialization chosen)
- b) Research problem formulation – research gap–Need of the study– Abstract submission – determining objective of the study.

UNIT-II: (30days) 1*50

- c) Completion of introductory Chapter(Chapter I)
- d) Completion of Review of Literature (Chapter II)

UNIT-III (30days) 1*50

- e) Identification of research field /agency & obtaining necessary approval /permission to conduct research.
- f) Working out appropriate Research Methodology (Research design) (Chapter III)
- g) Construction of tool of data collection
- h) Submission of typed copy of report on the above components & obtaining approval from the research supervisor.

Soft Skill
(Handled by Department of English)



DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE

(Autonomous)

College with Potential for Excellence, Linguistic Minority Institution

Affiliated to University of Madras

Arumbakkam, Chennai – 600 106

B.COM [HONOURS]

PROGRAMME CODE :35

OUTCOME BASED EDUCATION (OBE) SYLLABUS

CHOICE BASED CREDIT SYSTEM (CBCS)

Approved by Board of Studies on 18th May, 2021

EFFECTIVE FROM ACADEMIC YEAR

2021 - 2022

COURSE TITLE: FINANCIAL ACCOUNTING – I

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 6:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To combine theoretical knowledge and practice in the subject
2. To gain the ability to prepare financial statements for profit & Non- profit organization.
Also, able to determine the depreciation & insurance claim

Course Outcomes: At the end of the Course

| | |
|------------|---|
| CO1 | Students can able to prepare financial statements of sole -trading concern and Non- Profit Organization in accordance with an appropriate manner. (K3) |
| CO2 | Students can compute the value of depreciation under different methods and compare the same. (K5) |
| CO3 | Students can able to ascertain the profit and loss of a business (when it doesn't have complete accounting data). (K5) |
| CO4 | Students can assess the amount of claim to be made to the insurance company on the occurrence of fire. (K5) |
| CO5 | Students can able to define the concept of Green Accounting, Social Accounting and Cloud Accounting (K1) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 2 | 3 | 3 | 3 | | 3 | 3 | 3 | | | 3 | | 3 | 3 | 3 |
| CO 2 | 3 | | 2 | 3 | 3 | 3 | | 3 | 3 | 3 | | | | | 3 | 3 | 3 |
| CO 3 | 3 | | 3 | 3 | 3 | 3 | | 3 | 3 | 3 | | | 3 | | 3 | 3 | 3 |
| CO 4 | 3 | | 3 | 3 | 3 | 3 | | 3 | 3 | 3 | | | | | 3 | 3 | 3 |
| CO 5 | 2 | | 2 | 3 | | | 1 | 3 | | 3 | | | | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|---------|
| 1 | (# Unit for Compulsory Question) Preparations of Final Accounts - Sole Trading Concern – Adjustments – Closing Stock, Outstanding and Prepaid items, Depreciation, Provision for Bad Debts, Provision for Discount on Debtors, Interest on Capital and Drawings, Loss of Stock by Fire. | 13 | CO1 |
| 2 | Preparation of Final Accounts of Non-trading Organization - Preparations of Receipt and Payments Accounts – Distinction between Revenue and Capital items - Income and Expenditure Account and Balance Sheet of Non-Trading Organizations. | 15 | CO1 |
| 3 | Depreciation – * <i>Meaning, Causes</i> , Types – Straight-Line Method (SLM) – Written down Value method (WDV) – Sinking Fund Method – Change of depreciation from SLM to WDV / WDV to SLM with/without retrospective effect. (with reference to IND AS 16) | 15 | CO2 |
| 4 | (# Unit for Compulsory Question) Accounting from Incomplete Records – Meaning, Features, Defects, * <i>Differences between Single Entry and Double Entry System</i> – Statement of Affairs Method –Conversion Method. | 20 | CO 3 |
| 5 | Accounting for Insurance Claims – Loss of Stock- Average clause - Loss of Profit (Simple Problems Only). An Overview of Green Accounting, Social Accounting Cloud Accounting and robotics in accounting | 12 | CO4 & 5 |

***Self- Study Portion**

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 5 | 5 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 4 | 6 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 0 | 4 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question

RECOMMENDED BOOKS

1. Gupta R.L & Gupta V.K, *Financial Accounting*, Sultan Chand publication
2. Jain & Narang, *Financial Accounting*, Kalyani Publishers
3. Tulsian P.C, *Financial Accounting*, TATA McGraw Hill Publishers
4. Manikandan S, Rakesh Shankar R, *Financial Accounting*, Scitech Publications
5. Reddy T.S & Murthy A, *Financial Accounting*, Margham Publications

E-RESOURCE

<https://corporatefinanceinstitute.com>

COURSE TITLE: FINANCIAL PLANNING AND PERFORMANCE [CMA1B]

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To acquire expertise knowledge in the field of budgeting and standard costing
2. To apply the profitability analysis in business concern

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students will be able to understand strategic planning and budgeting and recall the models of strategic planning with the process (K2) |
| CO2 | Students will be able to classify forecasting techniques and demonstrate the budget (K2 &K3) |
| CO3 | Students will be able to make use of the budget to prepare an annual profit plan (K3 &K6) |
| CO4 | Students will be able to analyze performance by using flexible budgets and compare actual results to planned results (K4) |
| CO5 | Students will be able to explain the importance and use of standard cost systems (K2) |
| CO6 | Students will be able to propose performance measures and discuss key performance indicators (K3 &K6) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | | | | 3 | | | | | | | 3 | | 3 |
| CO 2 | 3 | 2 | | 3 | | 2 | | 3 | 3 | 3 | 3 | | | | 3 | 3 | |
| CO 3 | 3 | | | 3 | 3 | 2 | | 3 | | | 3 | | | 3 | 3 | | |
| CO 4 | 3 | 1 | 3 | 3 | 2 | | | 3 | 3 | | 3 | 3 | | | 3 | 3 | 3 |
| CO 5 | 3 | | 1 | 3 | | 2 | | 3 | | | 3 | 3 | | 3 | 3 | 3 | |
| CO 6 | 3 | | | 3 | 3 | 2 | | 3 | | | 3 | | 3 | 3 | 3 | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|----------|
| 1 | Strategic planning - Analysis of external and internal factors affecting strategy - Long-term mission and goals - Alignment of tactics with long-term strategic goals - Strategic planning models and analytical techniques - <i>*Characteristics of successful strategic planning process.</i> | 10 | CO 1 |
| 2 | (# Unit for Compulsory Question) Budgeting concepts - Operations and performance goals <i>*Characteristics of a successful budget process</i> - Resource allocation - Other budgeting concepts. Budgeting methodologies - Annual business plans (master budgets) - Project budgeting - Activity-based budgeting - Zero-based budgeting - Continuous (rolling) budgets – Flexible budgeting. | 15 | CO 2 |
| 3 | Annual profit plan and supporting schedules - Operational budgets - Financial budgets - Capital budget. Top-level planning and analysis - Pro forma income - Financial statement projections - Cash flow projections. | 10 | CO 3 |
| 4 | Cost and variance measures - Comparison of actual to planned results - Use of flexible budgets to analyze performance - Management by exception - Use of standard cost systems - Analysis of variation from standard cost expectations. Responsibility centers and reporting segments - Types of responsibility centers - Transfer pricing - Reporting of organizational segments. | 10 | CO 4 & 5 |
| 5 | (# Unit for Compulsory Question) Performance measures - Product profitability analysis - Business Unit profitability analysis - Customer profitability analysis - Return on investment - Residual income - Investment base issues - Key performance indicators (KPIs) - Balanced scorecard. | 15 | CO 6 |

****Self-Study Portion***

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 5 | 5 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 6 | 4 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 3 | 1 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Jack Alexander, *Financial Planning & Analysis and Performance Management*, Wiley
2. Wiley CMA excel Learning System, Part 1: *Financial Reporting, Planning, Performance & Control*
3. Blocher, Edward, J., Stout, David E., Juras, Paul E., and Cokins, Gary, *Cost Management: A Strategic Emphasis*, 7th edition, New York, McGraw Hill, 2013.
4. Horngren, Charles T., Datar, Srikant, Rajan, Madhav, *Cost Accounting: A Managerial Emphasis*, 16th edition, Prentice-Hall, 2012.

COURSE TITLE: MODERN BANKING

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To get familiarized with the concept of banking and role played by RBI
2. To gain knowledge on E-Banking techniques

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to apply the knowledge of banking in practical life. (K3) |
| CO2 | Students can able to identify the various sources of lending and know the procedure to apply for it. (K3) |
| CO3 | Students can able to measure the credit-control techniques used by RBI. (K5) |
| CO4 | Students can able to know how to utilize the various types of Negotiable instruments. (K3) |
| CO5 | Students can able to lodge grievances and know the proceedings of it. (K3 &K6) |
| CO6 | Students can able to select and apply appropriate E-banking techniques based on the nature of transactions. (K5) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | | | 2 | | 3 | 3 | | | 3 | | | | 3 |
| CO 2 | 3 | | 3 | 3 | 1 | | | | 3 | | | | 3 | 3 | 3 | | 3 |
| CO 3 | 3 | 3 | 3 | 3 | | 1 | | | 3 | | | | 3 | | | | |
| CO 4 | 3 | | | 3 | | | | 3 | 3 | | 3 | | 3 | | | | 3 |
| CO 5 | 3 | | 3 | 3 | 2 | 1 | | | 3 | | 3 | | 3 | | | | |
| CO 6 | 3 | | | 3 | | | | | 3 | 3 | 3 | | 3 | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|---------|
| 1 | Commercial banking – definition – classification of banking system– universal banking – functions – <i>*role of commercial banks in economic development</i> –central banking– definition–need–principles– <i>*central banking Vs commercial banking</i> – functions and role – RBI- functions and working – objectives – legal framework. | 12 | CO 1 |
| 2 | (# Unit for Compulsory Question) Opening bank accounts – type of bank accounts – KYC Norms - <i>*FDR- Pay-in-slip book, Withdrawal forms</i> – special type of customers – bank lending – sources and factors of lending – Application procedure – Assessment and evaluation of customer profile and credit worthiness of the applicant for loan – CIBIL Records and Reference. | 13 | CO2 & 3 |
| 3 | Negotiable instruments – meaning – definition – types – distinction between cheque, promissory note and bills of exchange - <i>*CTS Cheques – meaning – advantages.</i> Endorsement – meaning – types - Crossing – definition – need – types – consequences – opening of crossing – marking of cheques - dishonoring of a cheque – payment in a crossed cheque – material alteration – statutory protection. | 13 | CO 4 |
| 4 | (# Unit for Compulsory Question) Paying Banker – meaning duties and liabilities of paying banker - Collecting banker – meaning – collecting banker’s role – collecting banker’s duty – collection of bills of exchange – Agent for collection – paying banker Vs collecting banker. Customer grievances – grievances redressal mechanism structure in banks – Banking Ombudsman. | 10 | CO 5 |
| 5 | E-banking – meaning – services – <i>*Internet banking – Internet banking Vs. traditional banking – Limitations of internet banking</i> – Mobile banking- UPI Mobile Applications– BHIM, G pay, Jio-pay, amazon pay, pay tm, phone pe, Samsung pay, Aadhar enabled Payments System (AEPS) and National Automated Clearing House (NACH) and Functions of National Payments Corporation of India (NPCI), Video Banking-ATM- CDM - Electronic Funds Transfer (NEFT - RTGS – IMPS- SWIFT) – Indian Financial Network (INFINET) – IFSC - MICR – MMID. | 12 | CO 6 |

** Self- Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|---------------------------------------|-------------------------|----------------------------|----------------------------|--------------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question

RECOMMENDED BOOKS

1. Dr. Gurusamy S, *Banking Theory Law & Practice, New Delhi, Tata McGraw Hill*
2. Sundharam K.P.M, Varshney P.N, *Banking Theory Law & Practice, Sultan Chand & Sons*
3. Khan, M.Y, *Indian Financial System– Theory and Practice. Vikas Publishing House*
4. Santhanam B, *Banking–Theory, Law & Practice, Margham Publications*
5. Shekhar K C & Lekshmy Shekhar, *Banking Theory and Practice, Kindle Store*

E-RESOURCES

<https://www.rbi.org.in/>

<https://www.msuniv.ac.in/Download/Pdf/8c0dacb8731e495>

COURSE TITLE: BUSINESS ECONOMICS

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To understand the economic theories in business applications
2. To analyze operations of the market under varying competitive conditions

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to explain basic economic philosophies relating wealth, welfare, scarcity and growth developed by various economists. (K2) |
| CO2 | Students can able to analyze how households (Demand) and business (Supply) interact in various market structure to determine the price and quantity of goods produced. (K4) |
| CO3 | Students can able to apply the utility analysis in practical situations. (K3) |
| CO4 | Students can able to analyze the impact of cost in production. (K4) |
| CO5 | Students can able to determine the price and output level to maximize profit under different competitive market structure. (K5) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | | | | 3 | | | | | | | | | | | | | |
| CO 2 | | 2 | | 3 | | 2 | | | 3 | | | | 3 | | | 3 | 3 |
| CO 3 | 1 | | | 3 | | 2 | | | 3 | | | | | | | | |
| CO 4 | 1 | | | 3 | | | | 3 | 3 | 3 | 3 | | | | | 3 | 3 |
| CO 5 | 1 | 2 | | 3 | | | | | 3 | | 3 | | | | | 3 | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|------|
| 1 | Introduction to Economics – Wealth, Welfare, Scarcity and Growth Views on Economics – <i>*Positive and Normative Economics – Scope and Importance of Business Economics.</i> Concepts: Production possibility frontiers – Opportunity Cost – Accounting Profit and Economic Profit – Incremental and Marginal Concepts. | 10 | CO 1 |
| 2 | (# Unit for Compulsory Question) Demand Function – Meaning of Demand – Determinants and Distinctions of demand – Law of Demand – Slope & Elasticity of Demand– Shifts in the demand curves. Movement along the demand curve- <i>*Demand Forecasting.</i> Supply Function –Meaning of Supply– Determinants of Supply– Law of Supply–Slope & Elasticity of Supply– shifts in the supply curve Vs. movement along the supply curve- Concept of Equilibrium. | 15 | CO 2 |
| 3 | Consumer Behavior - Indifference Curve – Definition, Properties and equilibrium - Law of Diminishing Marginal utility – Equi-marginal utility – Consumer surplus and producer surplus. | 10 | CO 3 |
| 4 | (# Unit for Compulsory Question) Production Function -Factors of Production-Law of Variable proportion-Laws of Returns to Scale-Costs of production-total cost, fixed cost, variable cost, average cost, marginal cost, short run and long run costs-Revenue Analysis-Producer’s equilibrium-Economies of scale-Break Even Analysis. | 15 | CO 4 |
| 5 | Product pricing – profit policy -price and output determination under perfect competition - profit maximization, monopoly - price discrimination, monopolistic competition, oligopoly-collusion and cartels- <i>*pricing objectives and methods.</i> | 10 | CO 5 |

** Self- Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Ahuja, H.L. *Business Economics. 13th Edition, New Delhi, Sultan Chand Publishers, 2019.*
2. Mehta, P.L. *Managerial Economics - Analysis, Problems and Cases. 21st Revised Edition, New Delhi, Sultan Chand & Sons, 2016.*
3. Jhingan, M.L. *Micro Economics : Theory and Applications. 8th Edition, New Delhi, Vrinda Publications, 2016.*
4. Sankaran, S. *Business Economics. Chennai, Margham Publications, 2016.*
5. Chaudhary, C.M. *Business Economics. Jaipur, RBSA Publishers, 2000*

E-RESOURCE

<https://www.geektonight.com/business-economics-notes-pdf/>

COURSE TITLE: CORPORATE COMMUNICATION (NME-I)

| | |
|-------------------------|-----------------------|
| Course Code: | Credits : 02 |
| L:T:P:S: 2:0:0:0 | CIE Marks : 50 |
| Exam Hours: 03 | ESE Marks : 50 |

Learning Objectives:

1. To provide an outline to effective organizational communication
2. To enhance the quality of effective business writings.

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to know how to overcome the barriers while communicating (K2) |
| CO2 | Students can able to utilize modern tools of communication. (K3) |
| CO3 | Students can able to draft letters for the business correspondence. (K5) |
| CO4 | Students can able to present themselves appropriately in a public domain. (K3) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | 1 | 2 | 3 | 3 | | 2 | | 3 | 3 | | 3 | 3 | 3 | | | |
| CO 2 | 3 | 1 | 1 | 3 | 3 | 2 | 2 | | 3 | 3 | | | 3 | 3 | | | 3 |
| CO 3 | 3 | 1 | 2 | 3 | 3 | | 2 | | | 3 | | | 3 | 3 | | | |
| CO 4 | 3 | 1 | 2 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 | 3 | 3 | | | |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|------|
| 1 | Introduction to Communication -Meaning and Definition-Process-Functions- <i>*Objectives-Importance</i> - Essentials of effective communication-Communication barriers- Overcoming communication barriers. | 6 | CO 1 |
| 2 | Types of Communication - <i>*Written - Oral - Face-to-face - Silence - Merits and limitations</i> – modern methods of communication- E-Mail, Video Conferencing – <i>*Social Corporate Networking</i> - Types, Uses & Ethics to be followed, E-mail and online meeting etiquette. | 6 | CO 2 |
| 3 | Business Letters - Need and functions of business letters - Planning & layout of business letter - Kinds of business letters. | 6 | CO 3 |
| 4 | Drafting of business letters - Enquiries and replies - Sales letters – Circular letters. Internal- Communication - Preparation of Memos & Notes. | 6 | CO 3 |
| 5 | Application of Communication Skills - Group Decision-Making - Presentation - Speeches – Customer Care/Customers Relations - Public Relations. | 6 | CO 4 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Bhatia R.C, *Business Communication, New Delhi, Ane Books Pvt Ltd, 2018*
2. Raghunathan N.S & Santhanam B, *Business Communication, Chennai , Margham Publications, 2013*
3. Rajendra Pal, *Essentials of Business Communication, New Delhi, Sultan Chand Publishers, 2012*

E-RESOURCE

<https://freebcomnotes.blogspot.com/p/businesscommunication.html>

COURSE TITLE: INTERNSHIP

| | |
|---------------------------------|----------------------|
| Course Code: | Credits : 02 |
| Duration : 2 Weeks | Internal : 75 |
| Exam : Viva & Report | External : 25 |

Learning Objective:

To apply the theoretical knowledge gained through classes in a practical corporate life

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can explore career alternatives prior to graduation |
| CO2 | Students can assess interest & ability in their field of study |
| CO3 | Students can able to develop work habits and attitudes necessary for job success |
| CO4 | Students can acquire employment contacts, which leads directly to a full -time job post-graduation from college. |
| CO5 | Students can able to apply their theoretical knowledge in practical. |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | | | 3 | | | | 3 |
| CO 2 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | | | | | 3 |
| CO 3 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | 3 | | | | 3 |
| CO 4 | 3 | | 3 | 3 | 2 | 2 | 3 | 3 | | 3 | | | | | | | 3 |
| CO 5 | 3 | | 3 | 3 | 2 | 1 | 3 | 3 | | 3 | | | | | | | 3 |

COURSE TITLE: FINANCIAL ACCOUNTING - II

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 6:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To accurately prepare an organization- financial accounts for a specific period
2. To demonstrate an appropriate mastery of the knowledge, skills & tools of financial accounting and its principles

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to assess the amount of interest to be paid while purchase made on Hire purchase system and Installment. (K4) |
| CO2 | Students can able to prepare different Branch account for different types of branches. (K6) |
| CO3 | Students can able to reconstitute the Books of accounts during Admission, Retirement, Death of a Partnership Firm. (K5) |
| CO4 | Knowing the procedures that students can able to make the settlement to the external and internal liability as per the Indian Partnership Act, 1932. (K2) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | 3 | | | 3 | 3 | | | 3 | 3 | | | | |
| CO 2 | 3 | | | 3 | 3 | | | 3 | 3 | | | | | | | | 3 |
| CO 3 | 3 | | 3 | 3 | 3 | | | 3 | 3 | | | | 3 | | | 3 | |
| CO 4 | 3 | | | 3 | 3 | | | 3 | 3 | | 3 | 3 | | | | 3 | |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|------|
| 1 | Hire Purchase System – Introduction – Accounting Procedure for high value goods – Default and Repossession – Accounting treatment for goods of small value – Hire Purchase Trading Account – Installment Purchase System –Meaning – Accounting Treatment. | 10 | CO 1 |
| 2 | (# Unit for Compulsory Question) Branch Accounting – Debtor’s system, Stock and debtor’s system, Independent branch (Foreign Branches excluded) – Branch final accounts system and whole sale basis system - Departmental accounts – inter- departmental transfers. | 15 | CO 2 |
| 3 | Partnership – Introduction – Appropriation of profits – Partner’s Capital Account - Manager converted into Partner. – past adjustments and guarantee-LLP | 15 | CO 3 |
| 4 | (# Unit for Compulsory Question) Partnership Accounts – Admission, Retirement and Death of Partner(s) – Computation of Revised profit-sharing ratios - Accounting for Goodwill – Treatment of Reserves – Revaluation of Assets and Liabilities – Preparation of Balance Sheet of Reconstituted firm. | 20 | CO 3 |
| 5 | Partnership Accounts - Dissolution of Partnership – Insolvency of a partner – Garner Vs Murray – Insolvency of one or more partners – Insolvency of all partners - piecemeal Distribution – Proportionate Capital Method and Maximum Loss method. | 15 | CO 4 |

***Self- Study Portion**

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 5 | 5 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 4 | 6 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 0 | 4 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS:

1. Gupta R.L & Gupta V.K, *Financial Accounting, New Delhi, Sultan Chand Publishers*
2. Jain & Narang, *Financial Accounting, Kalyani Publishers*
3. Tulsian P.C, *Financial Accounting, TATA McGraw Hill Publishers*
4. Shukla & Grewal, *Advanced Accountancy, Vol I, S.Chand &Co.*
5. Manikandan S, Rakesh Shankar R, *Financial Accounting, Scitech Publications*
6. Reddy T.S & Murthy A, *Financial Accounting, Margham Publications*

E-RESOURCE <https://corporatefinanceinstitute.com>

COURSE TITLE: FINANCIAL ANALYTICS & CONTROL (CMA1A)

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To define the cost behavior and costing systems in business
2. To understand the data analytics and visualization

Course Outcomes: At the end of the Course,

| | |
|------------|--|
| CO1 | Students will be able to define cost behavior and types of costs (K1) |
| CO2 | Students will be able to classify costing systems and compare different types of costs. (K2&K4) |
| CO3 | Students will be able to solve problems in supply chain management (K3) |
| CO4 | Students will be able to conclude and criticize on the basis of internal auditing (K5) |
| CO5 | Students will be able to develop and create a business continuity plan (K6) |
| CO6 | Students will be able to understand information systems and data control (K2) |
| CO7 | Students will be able to understand data analytics and visualization (K2) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | | | | 3 | | | | | | | 3 | | |
| CO 2 | 3 | | 1 | 3 | | | | 3 | 2 | | | | | | 3 | | |
| CO 3 | 3 | | 2 | 3 | | | | | 2 | | | | | | 3 | | 3 |
| CO 4 | 3 | | 3 | 3 | | 3 | | 3 | | 3 | | | 2 | | 3 | | 3 |
| CO 5 | 3 | | 2 | 3 | 3 | | | 3 | 3 | 3 | 3 | | | | 3 | | 3 |
| CO 6 | 3 | | 1 | 3 | | | | 2 | | 2 | | | | | 3 | | 2 |
| CO 7 | 3 | | 1 | 3 | | | | 2 | | 2 | | | | | | | 2 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|----------|
| 1 | (# Unit for Compulsory Question) Costing concepts - Cost behavior and cost objects - Actual and normal costs - Standard costs - Absorption (full) costing - Variable (direct) costing - Joint and by-product costing - Job order costing - Process costing - Activity-based costing - Life-cycle costing - Fixed and variable overhead expenses - Plant-wide versus departmental overhead - Determination of allocation base - Allocation of service department costs | 15 | CO 1 & 2 |
| 2 | Supply chain management and Business process improvement - Lean manufacturing - Enterprise resource planning (ERP) - Theory of constraints and throughput costing - Capacity management and analysis - Value chain analysis - Value-added concepts - Process analysis - Activity-based management - Continuous improvement concepts - Best practice analysis - Cost of quality analysis - Efficient accounting processes | 10 | CO 3 |
| 3 | (# Unit for Compulsory Question) Internal controls & Systems Control & measures - Internal control structure and management philosophy - Internal control policies for safeguarding and assurance - Internal control risk - Corporate governance - External audit requirements - Internal auditing - General accounting system controls - Application and transaction controls - Network controls Backup controls – Business continuity planning | 15 | CO 4 & 5 |
| 4 | Information systems and data control - Define enterprise resource planning (ERP)- data warehouse- define data governance- demonstrate a general understanding of data governance frameworks- identify the stages of the data life cycle | 10 | CO 6 |
| 5 | Technology-enabled finance transformation and Data analytics - Business intelligence- define Big Data- explain the four Vs- describe the progression of data- define data mining- explain how query tools are used- Analytic tools- Monte Carlo technique- Visualization | 10 | CO 7 |

****Self- Study Portion***

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 5 | 5 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 4 | 6 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 0 | 4 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Blocher, Edward, J., Stout, David E., Juras, Paul E., and Cokins, Gary, *Cost Management: A Strategic Emphasis, 7th edition, New York, McGraw Hill, 2013.*
2. Horngren, Charles T., Datar, Srikant, Rajan, Madhav, *Cost Accounting: A Managerial Emphasis, 16th edition, Prentice-Hall, Upper Saddle River, NJ, 2012.*
3. Simkin, Mark G., Rose, Jacob M., Norman, Carolyn S., *Core Concepts of Accounting Information Systems, 13th edition, John Wiley & Sons, Hoboken, NJ, 2012.*
4. Bodnar, George, H., and Hopwood, William S., *Accounting Information Systems, 10th edition, Prentice-Hall, Upper Saddle River, NJ, 2010.*
5. Sawyer's *Guide for Internal Auditors, 6th edition, The Institute of Internal Auditors Research Foundation (IIARF), Altamonte Springs, FL, 2012.*

COURSE TITLE: PRINCIPLES OF MANAGEMENT

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To get awareness on emerging trends in management
2. To specify how the various management tasks are executed in various circumstances

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can discuss and communicate the evolution and philosophies of management. (K2) |
| CO2 | Students can able to practice the process of core management functions viz planning, Organizing, leading, controlling etc., (K3) |
| CO3 | Students can able to use the motivational theories in their business to evoke the best performance of the employees. (K3) |
| CO4 | Students can evaluate the various leadership styles & adopt the best one in their business at different situation. (K5) |
| CO5 | Students can outline the latest management techniques which help them to select and apply the best technique to manage their business effectively and efficiently. (K2/K5) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | | | | 3 | 3 | | | 3 | | 3 | 3 | | 3 | | | 3 | |
| CO 2 | 3 | | 2 | 3 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | 3 |
| CO 3 | 3 | 2 | 2 | 3 | 3 | | 2 | 3 | 3 | 3 | 3 | 3 | 3 | | | 3 | 3 |
| CO 4 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | 3 | 3 |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | | | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs. | Cos |
|----|--|------|-------------|
| 1 | Management - definition, importance, functions; * <i>Nature-as profession, science and art, universality of management</i> ; * <i>Levels of management</i> - managerial tasks and skills Classical School- contributions of Taylor, Henry Fayol and Elton Mayo, Different schools of management thought – Approaches in Management -Behavioral, Scientific, Systems and Contingency, * <i>Introduction to Indian management Gurus</i> - Management thoughts in Indian Philosophy – An Overview. | 10 | CO 1 |
| 2 | (# Unit for Compulsory Question) Planning - concept, importance, types, steps, premises, * <i>Barriers to effective planning</i> and remedial measures. MBO, MBE- Strategic Planning-concept. Forecasting -concept – techniques. Decision-making – Meaning, Advantages and Disadvantages, process, problems in Decision making. | 12 | CO 2 |
| 3 | Organizing - concept, importance, principles, different organization models - Line & Staff, Functional, Product, Matrix, Geographical, Virtual, Organizations, Networks- Types of Network Organizations/Clusters Organizational Designs for Change and Innovation * <i>Departmentation – need, basis, principles</i> - Delegation of Authority - elements – steps – barriers- Centralization and Decentralization of Authority - Span of Management –concept - Types and factors. | 12 | CO 2 |
| 4 | (# Unit for Compulsory Question) Motivation : concept, importance, contributions of McGregor, Maslow, and Herzberg. Leadership : concept, importance, types, leadership traits. Co-ordination : concept, significance, principles, and techniques Control : concept and steps, Control Techniques. | 14 | CO 2, 3 & 4 |
| 5 | Emerging Trends in Management - Knowledge management, technology management, Employee energy management, Process & change management- project quality standards – six sigma, CMM, CMMI, PCMM, Impact of IT quality management systems, learning organizations. | 12 | CO 5 |

****Self -Study Portion***

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|---------------------------------------|-------------------------|----------------------------|----------------------------|--------------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Prasad L.M., *Principles & Practice of management, SultanChand Publishers 2019*
2. Gupta.C.B, *Business Management, NewDelhi, Sultan Chand Publishers, 2018*
3. Stoner.A.F and Freeman.R.E., *Management, Prentice Hall of India 2018*
4. Chhabra, T.N. *Principles and Practice of Management 2018*
5. Koontz Harold and Heinz Wehrich , *Essentials of Management , TATA McGrawHill 2015*

E-RESOURCE

<https://theintactone.com/2019/09/01/ccsub-com-c-203-principles-of-business-management/>

COURSE TITLE: BUSINESS POLICY & ENVIRONMENT

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To gain knowledge of business policy and the impact of external and internal business environment
2. To familiarize with ethical principles to commit professional ethics and responsibilities in according with the norms of business policies.

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to apply the knowledge of business policy and also enable them to understand the importance of looking at the organization as a unified whole. (K3) |
| CO2 | Students can able to forecast the environment which affects the future trends of the business. (K3/K4) |
| CO3 | Students can able to discuss and define the factors that shape the SWOT analysis of a firm and develop an environment appraisal that will lead to the formulation of strategic plans. (K2/K6) |
| CO4 | Students can able to give Managerial Response to Changes in the External Business Environment. (K5) |
| CO5 | Students can able to apply ethical principles to commit professional ethics and responsibilities in accordance with the norms of business policies. (K3) |
| CO6 | Students can able to suggest the management to utilize the driving forces optimally to enter into a foreign country to expand the business. (K5) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | 2 | | 3 | 2 | | | 2 | | | 3 | | | | | | 2 |
| CO 2 | 3 | | 2 | 3 | 3 | | | | 3 | | 3 | | | | | | |
| CO 3 | 3 | 1 | 3 | 3 | 2 | 3 | | 3 | 3 | | | | | | | | 3 |
| CO 4 | 3 | | 2 | 3 | 2 | 2 | | | 3 | | 3 | | | | | | 3 |
| CO 5 | 3 | | 3 | 3 | 3 | 2 | 2 | 3 | | | 3 | 3 | | | | | |
| CO 6 | 3 | 2 | 3 | 3 | 3 | 2 | | 3 | 3 | | | | 3 | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|----------|
| 1 | Business Policy – Meaning, Scope, overview of Business Policies, Importance of business policies, Definition of Policy, Procedures, Process and programmes, types of policies, business policy statements, corporate culture, relationship between business, government and law. | 10 | CO 1 |
| 2 | Business Environment – Meaning, Dimensions of Business Environment – Overview of Business Environment- <i>*Natural Environment</i> – Environmental Analysis – Need – Importance – Approaches and Forecasting techniques. | 10 | CO 2 |
| 3 | (# Unit for Compulsory Question) Internal Business Environment Organizational Analysis –Need- Approaches–ETOP Analysis-SWOT Analysis - McKinsey’s7SFramework,. | 15 | CO 3 |
| 4 | (# Unit for Compulsory Question) External Environment - Political – Cultural – Legal – Demographic Governmental – Technological - Global Environment – Globalization – significance, strategies for globalization, Economic Environment, Social Environment– <i>*Business and society</i> -Ethical issues in Business- Corporate Code of Ethics: Accountability and Responsibility– Corporate Social Responsibility-Social Audit- Ecological Environment. | 15 | CO 4 & 5 |
| 5 | Globalization - Significance- Strategies for globalization Introduction to International Business – importance, nature & Scope of international business–modes of entry into international business, internationalization process and managerial implications – Multinational corporations and their involvement in international business. | 10 | CO 6 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Francis Cherunilam, *Business Environment, Mumbai, Himalaya Publishing House*
2. Aswathappa. K, *Essentials of Business Management, Mumbai, Himalaya Publishing House*
3. Michael V.P.M, *Business Policy and Environment, New-Delhi, S. Chand& co*
4. Joseph R, *Business Policy and Environment, Anmol Publications Private Limited*
5. Paul, *Business Environment, TATA McGraw Hill Publishing*

E-RESOURCE

<http://mgcub.ac.in/pdf/material/202004030023548064508d80.pdf>

Course Title: CUSTOMER RELATIONSHIP MANAGEMENT (NME-II)

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 02 |
| L:T:P:S : 2:0:0:0 | CIA Marks : 50 |
| Exam Hours : 03 | ESE Marks : 50 |

Learning Objectives :

1. To analyze the behavior of customers and their values
2. To simplify marketing and sales process in such a way that there is improved quality communication and networking

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | An outline and revision on concepts regarding CRM. |
| CO2 | Students can segment their customers and also maintain long-term relationship with their customers by using success chain formula. |
| CO3 | Students can plan to build loyalty among the customers through best campaigning methods. |
| CO4 | Students can design and implement fair reward system in their business. |
| CO5 | Integrate and implement various technology utilized for the development of CRM. |

Mapping of Course Outcomes to Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | 1 | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | | | 3 | 2 | | | | | 3 | | | | 3 | 3 | | 3 |
| CO 3 | 3 | | 2 | 3 | 3 | | | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | 3 | 3 |
| CO 4 | 3 | | | 3 | | | | | 3 | 3 | 3 | | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 1 | 2 | 3 | 3 | 2 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|-----|
| 1 | (# Unit for Compulsory Question) Introduction to CRM and - Meaning – Definition – CRM technology - components, customer life style Customer Loyalty – customer interaction- Customer Satisfaction Analysis – e – CRM – Meaning- <i>*features of e CRM</i> – Transformation from CRM to e-CRM – transformation process and benefits. | 6 | CO1 |
| 2 | Communication in CRM – Communication Process – Customer Relationship Marketing – meaning, structure, process – Success Chain in CRM – Target Formulation – Customer Segmentation. | 6 | CO2 |
| 3 | Customer Loyalty – Meaning –building customer loyalty in CRM – marketing campaign, campaign planning and management, business analytic tools. | 6 | CO3 |
| 4 | Implementing CRM - Pre implementation, kick off meeting, requirements gathering, detailed proposal generation, development, training, roll out, ongoing support, system, follow up – Relationship marketing reward systems (An Overview). | 6 | CO4 |
| 5 | (# Unit for Compulsory Question) Technology for CRM – Components – Creating value for customers – Customization of technology – critical areas – customer care – call centre – Technological solutions – Integration of ERP. | 6 | CO5 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. John Egan, “*Relationship Marketing, Exploring Relational Strategies In Marketing*”, Prentice Hall . 2011
2. John Anton, “*Customer Relationship Management*”, Prentice Hall. 2002
3. Anderson, “*Customer Relationship management*”, Tata McGraw Hill 2001
4. David Strutton; Lou E. Pelton; James R. Lumpkin, “*Marketing Channels: A Relationship Management Approach*”, McGraw-Hill Higher Education. 2001
5. Jagdish N Sheth and Atul Parvatiyar, “*Handbook of Relationship Marketing*”, Response Books 1999

E-RESOURCE

https://www.brainkart.com/subject/Customer-Relationship-Management_77/

COURSE TITLE: INTERNSHIP

| | |
|---------------------------------|----------------------|
| Course Code: | Credits : 04 |
| Duration : 4 Weeks | Internal : 75 |
| Exam : Viva & Report | External : 25 |

Learning Objective:

To apply the theoretical knowledge gained through classes in a practical corporate life

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can explore career alternatives prior to graduation |
| CO2 | Students can assess interest & ability in their field of study |
| CO3 | Students can able to develop work habits and attitudes necessary for job success |
| CO4 | Students can acquire employment contacts, which leads directly to a full -time job post-graduation from college. |
| CO5 | Students can able to apply their theoretical knowledge in practical. |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | | | 3 | | | | 3 |
| CO 2 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | | | | | 3 |
| CO 3 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | 3 | | | | 3 |
| CO 4 | 3 | | 3 | 3 | 2 | 2 | 3 | 3 | | 3 | | | | | | | 3 |
| CO 5 | 3 | | 3 | 3 | 2 | 1 | 3 | 3 | | 3 | | | | | | | 3 |

COURSE TITLE: BUSINESS MATHEMATICS

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 6:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. On taking this course the student will be able to attain solid foundation for preparing to Competitive exams
2. To enhance the Quantitative aptitude and problem -solving skills
3. To summarize the arithmetic progression, Geometric progression and Harmonic progression with illustrations
4. To discuss the applications of, matrices and interest calculation on real time situations through secondary data

Course Outcomes: At the end of the Course Students will be able to

| | |
|------------|--|
| CO1 | Distinguish between H.C.F & L.C.M of numbers. Solve Problems on Numbers, Profit & Loss and Percentage. (K2, K3 & K4) |
| CO2 | Demonstrate and solve certain real time business problems using ratios, proportion, Chain rule, allegations, permutations and combinations. (K2, K3 & K5) |
| CO3 | Distinguish and solve the arithmetic progression, Geometric progression and Harmonic progression. (K2, K3 & K4) |
| CO4 | Acquire skills of Solving Problems on Pipes and Cisterns- Time and Work, Time and Distance, Boats and Streams, Problems on Trains (K3, K4 & K5) |
| CO5 | Explain the meaning of simple interest, compound interest and annuity through secondary data. Restate the matrix and explain the different types of matrices using examples. Solve the system of linear and equations by matrix method. (K2, K3 & K4) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | | | 3 | | | | | | | |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | | | 3 | | | | | | | |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | | | 3 | | | | | | | |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | | | 3 | | | | | | | |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | | 2 | | | | | | | |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|-----|
| 1 | Number System - H.C.F & L.C.M of Numbers - Problems on Numbers – Percentage- Profit and Loss | 15 | CO1 |
| 2 | Ratio and Proportion- Chain- Rule. -allegations or Mixture - Problems on Ages - Permutations and Combinations. | 15 | CO2 |
| 3 | (# Unit for Compulsory Question) Pipes and Cisterns- Time and Work - Time and Distance- Boats and Streams- Problems on Trains | 15 | CO3 |
| 4 | Binomial theorem - Arithmetic, Geometric and Harmonic progressions | 15 | CO4 |
| 5 | (# Unit for Compulsory Question) Simple Interest, Compound Interest and Annuity - Matrices - Meaning and Operations -Matrix inversion - Solutions to linear equations. | 15 | CO5 |

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question. **No Theory questions to ask.**

RECOMMENDED BOOKS

1. Dr. Agarwal R.S, *Quantitative Aptitude, S. Chand & Company Ltd*
2. Vittal P.R, *Business Mathematics, Chennai, Margham Publications*
3. Sancheti D.C & Kapoor V.K, *Business Mathematics, New Delhi, Sultan Chand Publication*
4. Agarwal B.M, *Business Mathematics, Kalyani Publishers*
5. Soni R.S, *Business Mathematics, Pitambar Publishing house*
6. Singh. J.K., *Business Mathematics, Himalaya Publishing house.*

E-RESOURCES

Quantitative Aptitude RS Aggarwal
<https://www.faceprep.in>
<https://questions.ascenteducation.com>
<https://iim-cat-questions-answers.2iim.com>

COURSE TITLE: FINANCIAL REPORTING (CMA1C)

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To understand how to prepare financial statement according US GAAP & IFRS
2. To apply accounting standards to measure assets and liability

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students will be able to understand the line items of financial statements and prepare financial statements according to US GAAP and IFRS. (K2 & K3) |
| CO2 | Students will be able to apply the accounting standards in measuring assets (K3) |
| CO3 | Students will be able to apply the accounting standards in measuring liabilities (K3) |
| CO4 | Students will be able to develop conceptual understanding on equity transactions (K3 & K6) |
| CO5 | Students will be able to develop conceptual understanding on revenue recognition principles (K3 & K6) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | | 1 | | 3 | | 3 | | | | | 3 | | 3 |
| CO 2 | 3 | | | 3 | 2 | 1 | | 3 | | | | | | | 3 | | 3 |
| CO 3 | 3 | | | 3 | 2 | 1 | | 3 | | 3 | | | | | 3 | | 3 |
| CO 4 | 3 | | | 3 | | 1 | | 3 | | 3 | 3 | | | | 3 | | |
| CO 5 | 3 | | | 3 | | 1 | | 3 | 3 | 3 | 3 | | | | 3 | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|------|
| 1 | (# Unit for Compulsory Question) Financial Reporting – Meaning & Types Financial Statement - Income statement - Statement of comprehensive income - Balance sheet - Statement of changes in equity - Statement of cash flows - Notes to the financial statements | 12 | CO 1 |
| 2 | Asset Valuation - Fair value standards and measurements - Accounts receivable - Inventory – Investment in marketable securities - Property, plant & equipment - Depreciation Methods - Impairment - Intangible assets - Deferred tax assets - Leasehold assets | 12 | CO 2 |
| 3 | Valuation of Liabilities - Current liabilities - Contingencies - Long term liabilities and bonds payable – Warranties - Off-balance sheet financing - Deferred tax liabilities - Lease liabilities | 12 | CO 3 |
| 4 | Equity Transactions - Paid-in capital - Retained earnings - Accumulated other comprehensive income - Stock dividends and stock splits - Stock options. | 12 | CO 4 |
| 5 | (# Unit for Compulsory Question) Revenue Recognition - principles - Percentage-of-completion versus completed-contract method - Matching principle - Comprehensive income - Major differences between US GAAP and IFRS | 12 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 5 | 5 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 4 | 6 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 0 | 4 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Bruce Mackenzie & Others, *IFRS2012: Interpretation and Application of International Financial Reporting Standards*
2. Wiley Loftus, *Financial Reporting*, Wiley
3. Kieso, Donald E., Weygandt, Jerry J., and Warfield, Terry D., *Intermediate Accounting*, 16th edition, Wiley & Sons, Hoboken, NJ, 2011.
4. Nikolai, Loren A., Bazley John D., and Jones, Jefferson P., *Intermediate Accounting*, 11th edition, South-Western Cengage Learning, Mason, OH, 2010.
5. Hoyle, Joe B., Schaefer Thomas F., and Douppnik Timothy S., *Advanced Accounting*, 11th edition, McGraw Hill, New York, NY, 2013.
6. Wiley CMAexcel Learning System, Part 1: *Financial Reporting, Planning, Performance & Control*.

COURSE TITLE: STRATEGIC FINANCIAL MANAGEMENT - I (CMA2A)

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To solve the complex problem to support financial decision making
2. To understand how to formulate financial strategy taking account of various stake holders & their interest

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students will be able to understand a Common size financial statement and recall and relate the financial ratios(K1& K2) |
| CO2 | Students will be able to identify the relationship between risk and return and utilize the knowledge of long -term financial management. (K2) |
| CO3 | Students will be able to examine financial markets and regulations and analyze working capital management (K4) |
| CO4 | Students will be able to explain mergers and acquisitions, bankruptcy, and corporate restructuring(K2) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | 2 | 2 | | 3 | | | | | | | 3 | | |
| CO 2 | 3 | | 3 | 3 | 2 | 3 | | 3 | | 3 | 3 | | | | 3 | | 3 |
| CO 3 | 3 | 2 | 3 | 3 | 2 | 3 | | 3 | | 3 | | | | | 3 | | 3 |
| CO 4 | 3 | 2 | 3 | 3 | 1 | 2 | | 3 | | 3 | | | 3 | | 3 | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | (# Unit for Compulsory Question) Financial Statements -Common size financial statements - Common base year financial statements - Financial Ratios (liquidity, leverage, activity, profitability, market) - Profitability analysis (income measurement analysis, revenue analysis, cost of sales analysis, expense analysis, variation analysis) - Impact of foreign operations - Effects of changing prices and inflation - Impact of changes in accounting treatment - Accounting and economic concepts of value and income - Earnings quality | 12 | CO 1 |
| 2 | Working Capital Management - Working capital terminology - Cash management - Marketable securities management - Accounts receivable management - Inventory management - Types of short-term credit - Short-term credit management | 12 | CO 2 |
| 3 | (# Unit for Compulsory Question) Financial Management - Calculating return - Types of risk - Relationship between risk and return - Term structure of interest rates - Types of financial instruments - Cost of capital - Valuation of financial instruments | 12 | CO 3 |
| 4 | Raising Capital - Financial markets and regulation - Market efficiency - Financial institutions - Initial and secondary public offerings - Dividend policy and share re-purchases - Lease financing | 12 | CO 4 |
| 5 | Corporate Restructuring and International Finance - Mergers and acquisitions – Bankruptcy - Other forms of restructuring - Fixed, flexible, and floating exchange rates – Managing transaction exposure - Financing international trade - Tax implications of transfer pricing | 12 | CO 4 |

**Self -Study Portion*

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 5 | 5 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 5 | 5 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 2 | 2 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Wiley CMAexcel Learning System, Part 2: Strategic Financial Management
2. Mackenzie, Bruce, Coetsee, Danie, Njikizana, Tapiwa, Chamboko, Raymond, Colyvas, Blaise and Hanekom, Brandon, *2012 Interpretation and Application of International Financial Reporting Standards*, John Wiley & Sons, Hoboken, NJ, 2017.
3. Gibson, Charles H., *Financial Reporting & Analysis, 13th edition*, South-Western Cengage Learning, Mason, OH, 2013.
4. Subramanyam, K.R., and Wild, John L., *Financial Statement Analysis, 11th edition*, McGraw Hill, New York, NY, 2009.
5. Brealey, Richard, A., Myers, Stewart C., and Allen, Franklin, *Principles of Corporate Finance, 12th edition*, McGraw Hill, New York, NY, 2011.

COURSE TITLE: BUSINESS LAWS

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To provide practical legal knowledge of general business law issues
2. To explain the parties entering and discharging of contract in business

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to identify essential elements required for a valid contract. (K3) |
| CO2 | Students can able to discuss about the capacity of parties to entering a contract. (K2) |
| CO3 | Students can able to explain the various modes involved in discharging of contract. (K2) |
| CO4 | Students can able to explain the relationship between principal and agent relating to agency contract, use information technology for entering into a contract. (K2& K3) |
| CO5 | Students can able to highlight the process of complaining and redressing under consumer protection act. (K2) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | | | | 3 | 3 | | | | | | | | 3 | | 3 | | 3 |
| CO 2 | 1 | | | 3 | 2 | | | | 3 | | 3 | | 3 | | | | 3 |
| CO 3 | | | | 3 | 1 | | | | | | 3 | | 3 | | | | 3 |
| CO 4 | 1 | | | 3 | 2 | | | | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 |
| CO 5 | | | 3 | 3 | | 3 | | | 3 | | 3 | | 2 | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|------|
| 1 | (# Unit for Compulsory Question) The Indian Contract Act, 1872 - Introduction - Essential elements of a valid contract - classification of contract - Offer and Acceptance – meaning - Rules relating to valid offer and acceptance - communication of offer and acceptance - Revocation of offer and acceptance - Consideration - definition - essential elements - types of consideration - “No consideration No contract”. | 12 | CO 1 |
| 2 | (# Unit for Compulsory Question) Capacity of Parties - Competency to contract – minor - persons of unsound mind - persons disqualified by other laws- Consent - definition of consent and free consent – coercion - undue influence. <i>*Fraud; misrepresentation - mistake - Void and Voidable Agreements</i> – definitions - distinction between void and illegal agreement - wagering agreement. | 12 | CO 2 |
| 3 | Performance of contract – Joint Performance – Rights and Liability of Joint Promisor & Promisee - Impossibility of Performance - Discharge of contract – Breach of Contract - Remedies for Breach of contract – Damages - Contingent Contracts - Quasi contracts. | 10 | CO 3 |
| 4 | Contract of Agency – Creation – classification of Agents – Principal Agent relationships – Delegation of authority – Personal liability of agent – Termination of agency Information Technology Act 2008 – <i>*Scope, Objectives</i> , Electronic Contracting, electronic records and digital signatures, cyber offences. | 12 | CO 4 |
| 5 | Competition Act, 2002 -Objectives of the Act - <i>*salient features</i> - anti-competitive agreements - prevention of abuse of dominant position, combination - competition advocacy- Competition Commission of India Consumer Protection Act 1986 -Introduction - Important definitions - complaint and redressal procedure | 14 | CO 5 |

****Self -Study Portion***

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Tulsian P.C, *Business Laws, 2nd Edition, New Delhi, Tata Mcgraw Hill, 2020*
2. Kapoor N.D, *Business Laws, Sulthan Chand & co 2019*
3. Kapoor N.D, *Elements of mercantile law, Sultan Chand & co 2019*
4. Dr. Sreenivasan M.R, *Business Law 2nd Edition, Chennai, Margham Publication, 2012*
5. Pillai R.S.N and Bhagavathi, *Business Law, 3rd Edition, New Delhi, S.Chand & Co., 2007*

E-RESOURCE

<http://mydunotes.blogspot.com/p/business-law.html>

COURSE TITLE: E - ACCOUNTING

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 0:0:5:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To train the students in computerized accounting using tally
2. To equip the students to pursue their career in this sector

Course Outcomes: At the end of the Course :

| | |
|------------|---|
| CO1 | Students can outline the latest management techniques which helps them to select and apply best technique to manage their business effectively and efficiently. (K1) |
| CO2 | Students can able to make journals in proper heads & ledgers in proper group. They also can create and alter group as per organizations requirements. (K6) |
| CO3 | Students can able to make vouchers and prepare financial statements of an organization by using accounting software. (K6) |
| CO4 | Students can reconcile bank statement with cash book and rectify the errors if any. (K6) |
| CO5 | Students can able to prepare stock report using accounting software. (K6) |
| CO6 | Students can able to calculate professional tax as per slab deductions and payment procedures. (K6) |
| CO7 | Students can able to create employee database. (K6) |
| CO8 | Students can able to design bill at the time of sale. (K6) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | 2 | | 2 | 3 | 3 | 3 | 3 | | | | 3 | | 3 |
| CO 2 | 3 | | | 3 | 2 | | 1 | 3 | 3 | 3 | 3 | | | | 3 | | 3 |
| CO 3 | 3 | | | 3 | 2 | | 2 | 3 | 3 | 3 | 3 | | 3 | | 3 | | 3 |
| CO 4 | 3 | | 3 | 3 | 2 | | 2 | 3 | 3 | 3 | 3 | | | | 3 | | 3 |
| CO 5 | 3 | | | 3 | 3 | | 2 | 3 | 3 | 3 | 3 | | | | 3 | | 3 |
| CO 6 | 3 | | | 3 | 2 | | 1 | 3 | 3 | 3 | 3 | | | | 3 | | 3 |
| CO 7 | 3 | | | 3 | 3 | | 2 | 3 | 3 | 3 | 3 | | | | 3 | | 3 |
| CO 8 | 3 | | | 3 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | | | | 3 | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|---------|
| 1 | Company creation, modification and other entries – Journal entries & Ledger creation and its modifications – Group creation. | 17 | CO1&2 |
| 2 | Preparation of voucher – Payment Receipts, journal, Purchase, Sales, Contra, Return- inwards and Return Outwards. | 8 | CO3 |
| 3 | (# Unit for Compulsory Question) Preparation of trading account, Profit & Loss account, Income & Expenditure account, Receipts and Payments account and Balance Sheet. | 16 | CO3 |
| 4 | Preparation of Bank Reconciliation Statement – Stock Management – Stock group creation, Stock category, Godown management, Units-creation, Stock ledger creation and maintenance | 10 | CO4&5 |
| 5 | Price Level Changes at Point of Sale (POS) –Necessary activation, Journal entries, Bill design/ Preparation/ Generation. Payroll – Basic concepts, Employee creation, Group creation, Attendance, Voucher type creation, Payroll entries - Tax Deducted at Sources (TDS) | 14 | CO6,7&8 |

| | | | |
|--------------------------|----|-------------------------|---------------|
| Practical Internal Marks | 40 | Practical ESE Marks | 60 |
| CIA – Test Marks | 30 | 2 Problems | 30 marks each |
| Record | 10 | 1 problem is compulsory | |

RECOMMENDED BOOKS:

1. Soumya Ranjan Behera *Learn Tally ERP 9*
2. Ashok K Nadhani *Tally ERP 9*
3. Hanif & Mukherjee *Financial Accounting*

COURSE TITLE: GREEN BUSINESS DEVELOPMENTS

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To understand the concept of green business
2. To adopt the eco-friendly method effectively to design environmentally sustainable products & services

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students will be able to discuss the concept of green business, and also able to justify the importance of Environment audit of the business. (K2) |
| CO2 | Students will be able to apply sustainability approach in the business environment and also able to evaluate the negative impact of business on ecology and environment- health and safety issues. (K3) |
| CO3 | Students will be able to apply CSR compliance for business (K3) |
| CO4 | Students will be able to use the eco -friendly method effectively to design environmentally sustainable products & services. (K3 & K4) |
| CO5 | Students will be able to plan and execute the green business strategies effectively and also to evaluate the challenges and opportunities of green business. (K6) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | | 3 | | 3 | 3 | | 2 | 2 | | | | | | | | 2 | 2 |
| CO 2 | | 3 | 3 | 3 | 3 | | 2 | 3 | 3 | 3 | 3 | | | 3 | 3 | | |
| CO 3 | | 3 | 3 | 3 | 3 | | 2 | 3 | 3 | 3 | 3 | | | | 3 | 3 | 3 |
| CO 4 | | 3 | | 3 | 3 | | 2 | 3 | 3 | | 3 | | 3 | 3 | | 3 | 3 |
| CO 5 | | 3 | 2 | 3 | 3 | | 2 | 3 | 3 | | 3 | | 3 | 3 | 3 | 3 | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | Introduction to Green business: Meaning - Profit and purpose - Eco-efficiency for business and the environment - environmental audit of the business. | 10 | CO 1 |
| 2 | (# Unit for Compulsory Question) Sustainability Approaches & Indicators of Sustainability - Sustainable Ecosystem Management for Green Business - negative impact of businesses on ecology and environment-health and safety issues. | 15 | CO 2 |
| 3 | Corporate Social Responsibility - Compliance for Business CSR & Environmental Reporting - Government Regulation and Public Policy for Sustainability- Governments incentives to industries to use greener technologies and products | 10 | CO 3 |
| 4 | Green Management - Green Financing and Investment Green Management - <i>*Green Products Management</i> –tools and methods that organizations can use to design and implement environmentally sustainable products & services. | 10 | CO 4 |
| 5 | (# Unit for Compulsory Question) Green Business Strategies - Green marketing mix - Importance, Objectives –challenges and opportunities- <i>*Green building strategies</i> – Leadership in Energy and Environment Design (LEED)- Lifecycle Analysis (LCA) - Green Hat Thinking strategy – Ecomagination – Green consumerism and movement. | 15 | CO 5 |

****Self -Study Portion***

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Suresh K, *Green Business: An Introduction*, ICFAI Publication, 2000
2. Ottman Jacquelyn A., *The New Rules of Green Marketing: Strategies, Tools, and Inspiration for Sustainable Branding*, Berrett-Koehler Publishers, Inc., 2011

E-RESOURCE

http://crectirupati.com/sites/default/files/lecture_notes/GBM_notes.pdf

COURSE TITLE: INTERNSHIP

| | |
|---------------------------------|----------------------|
| Course Code: | Credits : 02 |
| Duration : 2 Weeks | Internal : 75 |
| Exam : Viva & Report | External : 25 |

Learning Objective:

To apply the theoretical knowledge gained through classes in a practical corporate life

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can explore career alternatives prior to graduation |
| CO2 | Students can assess interest & ability in their field of study |
| CO3 | Students can able to develop work habits and attitudes necessary for job success |
| CO4 | Students can acquire employment contacts, which leads directly to a full -time job post-graduation from college. |
| CO5 | Students can able to apply their theoretical knowledge in practical. |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | | | 3 | | | | 3 |
| CO 2 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | | | | | 3 |
| CO 3 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | 3 | | | | 3 |
| CO 4 | 3 | | 3 | 3 | 2 | 2 | 3 | 3 | | 3 | | | | | | | 3 |
| CO 5 | 3 | | 3 | 3 | 2 | 1 | 3 | 3 | | 3 | | | | | | | 3 |

COURSE TITLE: BUSINESS STATISTICS & OPERATIONS RESEARCH

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 6:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To distinguish univariate and bivariate analysis in statistics
2. To point out the importance of testing the hypothesis of large and small samples through survey
3. To solve the real time industrial problems using Simplex method, Transportation model and Assignment model

Course Outcomes: At the end of the Course Students can able to

| | |
|------------|--|
| CO1 | <ul style="list-style-type: none"> • Identify the strength and direction of a linear relationship between two variables by using correlation and regression analysis • Solve real time problems based on primary and secondary data. (K1, K3) |
| CO2 | <ul style="list-style-type: none"> • Explain the meaning of the terms namely hypothesis, Null & Alternative hypothesis, Type I and Type II error, one tail test, two tail test, level of significance, Number of degrees of freedom, accept region, reject region, small sample, large sample, non- parametric test. • Summarize the logic and framework of the inference of hypothesis testing. • Solve problems on large sample test for a specified mean, test for equality of two means, test for a single proportion and test for equality of two proportions. (K2, K3) |
| CO3 | <ul style="list-style-type: none"> • Demonstrate the various types of small samples tests viz. t test, F test, Chi square test and analysis of variance with given illustrations. (K2, K3) |
| CO4 | <ul style="list-style-type: none"> • Identify and explain the mathematical background of LPP to develop operational research models from the verbal description to the real system. • Explain basic concepts of optimization, modelling and linear modeling. • Distinguish the feasible solution, optimal solution and basic feasible solution. • Formulate a given simplified description of a suitable real-world problem as a linear programming model in general, standard and canonical forms. • Solve a two-dimensional linear programming problem graphically. • Explain the theory of Simplex Algorithm and approach. • Use the Simplex method to solve linear programming models for 2 decision variables and 3 decision variables. (K1,K2,K3,K4) |

| | |
|------------|---|
| CO5 | <ul style="list-style-type: none"> • Identify the special features of the transportation balanced and unbalanced problems for minimization and maximization cases. • Demonstrating the optimal solution by Modified Distribution (MODI) Method. • Point out the importance of degeneracy situations in transportation model. Restate the Assignment mathematical model. • Explain the theory of assignment problem and Uses Hungarian method for solving assignment problem. • Distinguish between a transportation and an assignment problem with suitable examples. (K1,K2,K3,K4) |
|------------|---|

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 3 | | 2 | | | | | 3 | 1 |
| CO 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 3 | | 2 | | 1 | | | 3 | 1 |
| CO 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 3 | | 2 | | | | | 3 | 2 |
| CO 4 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 3 | | 3 | | | | | 1 | 3 |
| CO 5 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 3 | | 2 | | | | | 1 | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | Measures of Relationship - Correlation – Meaning - Types – Karl Pearson’s co-efficient of Correlation – Rank Correlation – Concurrent Deviation - Regression analysis (Simple Problems). | 10 | CO 1 |
| 2 | Testing of Hypothesis – Large Samples Test – test for specified mean, equality of means, test for specified proportion and equality of proportions – Small samples – t – test for specified mean, equality of means, paired t-test. | 15 | CO 2 |
| 3 | (# Unit for Compulsory Question) Test for Equality of Variances – F Test, Chi-square test – Test of attributes, Test for Goodness of Fit – Analysis of Variances – One Way, Two Way Classification. | 15 | CO 3 |
| 4 | Introduction to Operations Research (OR) - Meaning & scope - <i>*characteristics</i> – models in OR – Linear Programming Problem – formulation – graphical method - Simplex method (Simple Problems). | 15 | CO 4 |
| 5 | (# Unit for Compulsory Question) Transportation model – Balanced and unbalanced transportation problem- minimization and maximization - basic feasible solution – formulation, Solving Transportation using North West Corner Rule, Least Cost Method – Vogel’s Approximation method – MODI Method - Assignment models- Balanced and Unbalanced – Maximization and Minimization – Hungarian Method. | 20 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question. **No Theory questions to ask.**

RECOMMENDED BOOKS:

1. Vittal P.R, *Business Mathematics & Statistics*, Margham Publications
2. Gupta S.C and Kapoor V.K, *Business Statistics*, S.Chand & Co.
3. Hamdy A Taha, *Operation Research – An introduction*, New Delhi, Prentice Hall of India
4. Gupta P.K & Man Mohan, *Problems in Operations Research*, New Delhi, Sultan Chand & Sons
5. Gupta S.P, *Statistical Methods*, Sultan Chand Publishers.

COURSE TITLE: STRATEGIC FINANCIAL MANAGEMENT - II (CMA2B)

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To apply the financial analysis techniques for managing finance in business
2. To suggest the right project proposals using capital budgeting

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students will be able to define marginal, sunk and opportunity costs and recall cost volume profit analysis.(K1) |
| CO2 | Students will be able to demonstrate understanding of pricing methodologies (K3) |
| CO3 | Students will be able to demonstrate understanding of enterprise risk management (K3) |
| CO4 | Students will be able to identify a system of investment decision and develop stages of capital budgeting (K2) |
| CO5 | Students will be able to understand the importance of ethics for management accounting and financial management professionals (K2) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | | | | 3 | 3 | | | | | | 3 | | 3 |
| CO 2 | 3 | | 2 | 3 | 2 | | | 3 | 3 | | | | 3 | | 3 | | 3 |
| CO 3 | 3 | | 3 | 3 | 3 | 2 | | 3 | 3 | 3 | 3 | | 3 | | 3 | | 3 |
| CO 4 | 3 | 2 | 3 | 3 | 2 | | | 3 | | 3 | 3 | | | | 3 | | 3 |
| CO 5 | 3 | | 2 | 3 | 3 | 2 | | 3 | 3 | | | 3 | | | 3 | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | (# Unit for Compulsory Question) Decision Analysis -Cost/volume/profit analysis - Breakeven analysis - Profit performance and alternative operating levels - Analysis of multiple products - Sunk costs, opportunity costs and other related concepts - Marginal costs and marginal revenue- Special orders and pricing - Make versus buy - Sell or process further- Add or drop a segment - Capacity considerations | 14 | CO 1 |
| 2 | Pricing - Pricing methodologies - Target costing - Elasticity of demand - Product life cycle considerations - Market structure considerations | 10 | CO 2 |
| 3 | Enterprise Risk Management - Risk-Types of risk - Risk identification and assessment - Risk mitigation strategies - Managing risk | 10 | CO 3 |
| 4 | Investment Decision -Capital budgeting process - Stages of capital budgeting - Incremental cash flows - Income tax considerations - Discounted cash flow analysis (net present value, internal rate of return, comparison of NPV and IRR) - Payback and discounted payback - Risk analysis in capital investment | 13 | CO 4 |
| 5 | (# Unit for Compulsory Question) Professional Ethics - Ethical considerations for management accounting and financial management professionals (IMA's "Statement of Ethical Professional Practice", fraud triangle, evaluation and resolution of ethical issues) - Ethical considerations for the organization (IMA's Statement on Management Accounting, "Values and Ethics: From Inception to Practice", U.S. Foreign Corrupt Practices Act, corporate responsibility for ethical conduct) | 13 | CO 5 |

***Self -Study Portion**

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 8 | 2 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 5 | 5 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 0 | 4 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS:

1. Wiley CMAexcel Learning System, Part 2: Strategic Financial Management
2. Mackenzie, Bruce, Coetsee, Danie, Njikizana, Tapiwa, Chamboko, Raymond, Colyvas, Blaise and Hanekom, Brandon, *2012 Interpretation and Application of International Financial Reporting Standards*, John Wiley & Sons, Hoboken, NJ, 2017.
3. Gibson, Charles H., *Financial Reporting & Analysis, 13th edition*, South-Western Cengage Learning, Mason, OH, 2013.
4. Subramanyam, K.R., and Wild, John L., *Financial Statement Analysis, 11th edition*, McGraw Hill, New York, NY, 2009.
5. Brealey, Richard, A., Myers, Stewart C., and Allen, Franklin, *Principles of Corporate Finance, 12th edition*, McGraw Hill, New York, NY, 20

COURSE TITLE: HUMAN RESOURCE MANAGEMENT

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To understand the concept of human resource management – function and relevance in every organization
2. To build relevant skills for addressing issues on human resources

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to analyze the role of human resources in supporting organizational strategy. (K4) |
| CO2 | Students can able to design best recruitment and selection policy to achieve the organizational goal. (K6) |
| CO3 | Students can able to evaluate the performance of human resources in the context of organizational strategy. (K5) |
| CO4 | Students can able to articulate method for human resources to participate in organizational planning and implementation. (K6) |
| CO5 | Students can able to evaluate the various training and development program followed by the corporate and also able to select the best program / design a new program for their business. (K5 / K6) |
| CO6 | Students can able to create a system that comply with the provisions of union and state employment laws for the management of labour relations. (K6) |
| CO7 | Students can apply their innovative skills towards the key functional areas of human resources. (K3) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | | | | 3 | | 3 | | 3 | | 3 | | | 3 |
| CO 2 | 3 | | 3 | 3 | 1 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | 3 |
| CO 3 | 3 | | 2 | 3 | 1 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 |
| CO 4 | 3 | | 3 | 3 | 2 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 |
| CO 5 | 3 | | 3 | 3 | 2 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 |
| CO 6 | 3 | 3 | 3 | 3 | 2 | 2 | | | 3 | | 3 | 3 | | 3 | | | 3 |
| CO 7 | 3 | | 3 | 3 | 2 | 3 | | 3 | 3 | 3 | 3 | 3 | | 3 | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|---------|
| 1 | Human Resource Management - <i>*Nature and Scope of the HRM-</i> Managerial and Operating Functions - Difference between Personal management and HRM - <i>*Emerging Horizons in Human Resource Management</i> ; Human Resource Information System - e-HRM. | 10 | CO 1 |
| 2 | Acquisition of Human Resource – Human Resource Planning - Quantitative and Qualitative dimensions - job analysis – job description and job specification – Job Evaluation Recruitment – Concept and sources; selection – Concept and process - test and interview – placement - induction. | 12 | CO2,3&4 |
| 3 | (# Unit for Compulsory Question) Training and Development - concept and importance - identifying training and development needs - designing training programmes - role specific and competency-based training - evaluating training effectiveness - career development. | 12 | CO 5 |
| 4 | Performance Appraisal System - <i>*nature and objectives</i> - techniques of performance appraisal - potential appraisal - transfers and promotions. Compensation – concept - policies and administration - methods of wage payments and incentive plans - Fixed Pay and Variable Pay - fringe benefits- Pension Schemes- Competitive rate of Scales – ESOP. | 14 | CO 6 |
| 5 | (# Unit for Compulsory Question) Employee Retention Strategies - employee health and safety - employee welfare - social security - <i>*Grievance handling and redressal</i> - worker’s participation in management - collective bargaining. | 12 | CO 7 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Rao V.S.P – *Human Resource Management, Excel Books*
2. Ashwathappa - *Human Resource Management, TATA McGraw Hill Publications*
3. Gupta C.B - *Human Resource Management, Sultan Chand Publishers*
4. Prasad L.M - *Human Resource Management, Sultan Chand Publishers*
5. Tripathi P.C - *Human Resource Management, Jain Book Publications*

E-RESOURCE

<https://brauss.in/hrm-basic-notes.pdf>

COURSE TITLE: COMPANY LAW

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To prepare the necessary documents for the company
2. To apply the company law matters in various business circumstances

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to list out the various documents required for the commencement of the business. (K3) |
| CO2 | Students can able to design the essential documents – MOA, AOA, Prospectus as per the provisions of Companies Act, 2013. (K6) |
| CO3 | Students can able to discuss legal provisions relating to raising up of capital, membership and meetings of a company. (K3) |
| CO4 | Students can able to explain various modes of winding up and also the significance of company law tribunals towards winding up. (K2) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | 3 | 1 | | 2 | 2 | 2 | 2 | | 3 | 3 | 3 | | 3 |
| CO 2 | 3 | | | 3 | 3 | 1 | | 3 | 3 | 2 | 3 | | 2 | | 3 | 2 | 3 |
| CO 3 | 3 | | 1 | 3 | 2 | 1 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | | 1 | 3 | 1 | 1 | | 3 | 3 | 2 | 3 | | 3 | | 3 | 2 | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | <p>(# Unit for Compulsory Question) Introduction-Definition of Company–Characteristics– Types of Company– One Person Company (OPC)– Dormant Company – Small Company - Lifting of the Corporate Veil - Formation of Company – Incorporation Procedures– <i>*Documents/E forms to be filed with Registrar for registration of Companies</i>– Certificate of Incorporation– Certificate of Commencement of Business- Preliminary Contracts- Procedure for conversion of Partnership/ HUF to OPC, Private Ltd to Public Ltd</p> | 12 | CO 1 |
| 2 | <p>Incorporation Documents - Memorandum of Association – Articles of Association – Contents – Alterations – Promoters – Preliminary or Pre-incorporation contracts. Prospectus – Contents – Mis-statement in prospectus and their consequences – Statement in lieu of prospectus – Abridged Prospectus – Shelf- Prospectus – Red - herring Prospectus - Issue of Securities by the companies (An Overview)</p> | 12 | CO 2 |
| 3 | <p>Share Capital – Issue Procedures – Rights Issue – Private Placement – Bonus Shares - alteration of share capital– Transfer of shares - <i>*Dematerialization of shares</i>- Transmission of shares– Registration of Charge</p> | 10 | CO 3 |
| 4 | <p>Members and Shareholders – Mode of acquiring membership – Rights and privileges of Members, Register of Members- Voting Rights. Company Meetings - <i>*Annual General Meeting – Extraordinary General Meeting – Class Meeting</i> –Meetings of Board- Special and Ordinary business resolution – resolution on special notice - convening and conduct of meetings.</p> | 12 | CO 3 |
| 5 | <p>(# Unit for Compulsory Question) Administration - Key Managerial Personnel – Women Directors – Independent Directors – Roles and Responsibilities- Appointment, <i>*Remuneration of Key Managerial Personnel</i> Winding up of companies - <i>*Types of winding - up</i>– Appointment, duties and remuneration of liquidators– Shareholder’s Democracy – special provisions with regard to small shareholders – Board of Company Law Administration - <i>*National company Law Tribunal and appellate Tribunal.</i></p> | 14 | CO 4 |

****Self -Study Portion***

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|---------------------------------------|-------------------------|----------------------------|----------------------------|--------------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Kapoor N.D, *Company Law, Sultan Chand Publishers*
2. Gogna P.P.S, *A Text Book of Company Law, S.Chand &Co.*
3. Majumdar A.K and Kapoor G.K, *Company Law & Practice, Taxman Publications*
4. Dr. Sreenivasan M.R, *Company Law, Chennai, Margham Publications*
5. Pillai R.S.N & Bagavathi, *Company Law, S.Chand &Co.*

E-RESOURCES

https://www.icai.org/post.html?post_id=17256

<http://www.mca.gov.in/>

COURSE TITLE: FINANCIAL SERVICES

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To gain knowledge on financial services in day today's life
2. To familiarize with the concept of factoring, mutual fund, consumer funds etc.,

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to apply the knowledge of financial services in day today's life. (K3) |
| CO2 | Students can able to analyze and investigate the contemporary issues pertaining to debit and credit cards usage. (K5) |
| CO3 | Students can able to locate various types of consumer finances and also know how to use it effectively. (K3) |
| CO4 | Students can able to use effectively the factoring concept in the business. (K3) |
| CO5 | Students can able to compare and contrast the various schemes of mutual funds. (K5) |
| CO6 | Students can able to plan for better portfolio management. (K6) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | | | 3 | | 3 | 3 | 3 | | 3 | | | | 3 |
| CO 2 | 3 | 2 | 3 | 3 | | | 1 | | 3 | | 3 | | | | | | 3 |
| CO 3 | 3 | 1 | | 3 | 1 | | | 3 | 3 | | | | 3 | 3 | | | 3 |
| CO 4 | 3 | | 1 | 3 | 3 | | | 2 | 2 | | | | 2 | 3 | | | 3 |
| CO 5 | 3 | 2 | 2 | 3 | | | 1 | | 3 | | 2 | 2 | | | | | |
| CO 6 | 3 | 2 | 3 | 3 | 2 | | | 2 | 3 | | 3 | | 3 | | | | |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|----------|
| 1 | Financial Services - An Overview – functions – financial services market – credit cards - concept – features, facilities and services - benefits and drawbacks – Credit card frauds – Credit Information Bureau (CIB) – <i>*Debit Cards: Concept and mechanism – dangers and precautions in the use of debit cards.</i> NBFC – Micro Banking Financial Institution. | 12 | CO 1 & 2 |
| 2 | (# Unit for Compulsory Question) Credit rating – features and advantages – major issues – <i>*credit rating agencies</i> – regulatory framework – major factors in credit rating – equity rating – Commercial Bill Financing - meaning of commercial bills – features and advantages of commercial bill financing – precautions by a banker – steps in discounting and purchasing of bill. Consumer finance - meaning – <i>*types</i> – pricing of consumer finance – marketing of consumer finance – consumer credit scoring. | 14 | CO 3 |
| 3 | Factoring - definition – mechanism – characteristics – types – advantages and disadvantages – players in factoring services – functions of a factor – factoring costs – factoring Vs bills discounting – cost – benefit analysis of factoring – Forfeiting (An Overview) Leasing - Concept – characteristics – types – financial lease Vs Operating lease – tests for financial lease - leasing process – services of a lessor – <i>*advantages – limitations</i> – Sale and Lease back – concepts – tax implications. | 12 | CO 4 |
| 4 | Merchant banking - definition – functions – code of conduct – regulatory framework. Mutual funds - definition – products and schemes - working mechanism of mutual funds –regulatory structure of mutual funds in India - Asset Management Company (AMC) – SEBI requirements on AMC – functions of AMC — Association of Mutual Funds of India (AMFI). | 12 | CO 5 |
| 5 | (# Unit for Compulsory Question) Securitization - definition – pass through certificates – features – need – mechanism – purposes – asset characteristics – application – benefits – economic functions – limitations – Securitization as a risk management tool. Book – building - concept – characteristics – process – allocation procedure. | 10 | CO 6 |

****Self -Study Portion***

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|---------------------------------------|-------------------------|----------------------------|----------------------------|--------------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Gurusamy.S, *Financial services, Tata McGraw Hill*
2. Gurusamy.S, *Merchant Banking and Financial Services, Tata McGraw Hill*
3. Khan M Y, *Financial Services, Tata McGraw Hill*
4. Kothari, Vinod *Lease financing & Hire Purchase including consumer credit, Wadhwa and company*
5. Santhanam B, *Financial Services, Chennai, Margham Publications*

E-RESOURCES

- <https://www.britannica.com/>
- <https://.economictimes.com/wealth>

COURSE TITLE: INDIRECT TAXATION

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 5:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To understand the various terms under Goods and Service Tax (GST) and Customs Duty and tax liability under the same acts.
2. To familiarize with forward charge mechanism and input tax credit

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to suggest various documents requires for GST registration. (K4) |
| CO2 | Students can able to identify the different types of supply relating to GST. (K4) |
| CO3 | Students can able to advice the assessee regarding the essential documents to be maintained by them. (K5) |
| CO4 | Students can able to calculate the GST payable and also able to set off input tax credit. (K3) |
| CO5 | Students can able to file GST returns. (K6) |
| CO6 | Students can able to ascertain the duty payable under customs act by understanding the provisions of such act. (K4) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | 2 | | | 3 | | 3 | | | | 3 | 3 | | 3 |
| CO 2 | 3 | | | 3 | 2 | | | 3 | | 3 | | | | 3 | 3 | | 3 |
| CO 3 | 3 | | | 3 | 3 | | | 3 | | 2 | | | 3 | 3 | 3 | | 3 |
| CO 4 | 3 | | 2 | 3 | 3 | 2 | | 3 | 3 | 3 | | | | 3 | 3 | | 3 |
| CO 5 | 3 | | 2 | 3 | | | | 3 | 3 | 3 | | | | 3 | 3 | | 3 |
| CO 6 | 3 | | | 3 | 1 | 1 | | 3 | 3 | 3 | | | | 3 | 3 | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|----------|
| 1 | Indirect Taxes – Introduction – Origin of GST – One Nation, One Tax, One Market ideology – Structure and types of GST, GST Council – Composition, functions, powers GST Network, GST Practitioners – Qualifications and Enrollment Procedures. Registration under GST – procedures and formalities – E-forms – GSTIN – Amendment and Cancellation of Registration. | 14 | CO 1 |
| 2 | Taxable Event – Supply of goods and Services – Classification of goods and services – Composite and Mixed Supplies – – Time of Supply – Levy of GST – Regular and Composition Scheme – Documents and Registers to be maintained by Assessee. | 13 | CO 2 & 3 |
| 3 | (# Unit for Compulsory Question) Valuation in GST – Transaction Value–Mode of Payment– Reverse Charge Mechanism–Due dates of Filing Return– Types of Returns and Forms. Simple problems in calculation of GST Payable and Set off Input Tax Credit. | 13 | CO 4 |
| 4 | Customs Act – objectives – Basic concepts of customs law, Territorial waters, high seas - levy and collection– classification of goods – procedure for assessment & payment of customs duty – types of customs duty – valuation of goods – clearance of goods. | 12 | CO 5 |
| 5 | (# Unit for Compulsory Question) Customs Procedures, Import and Export Procedures, Baggage, Exemptions – Simple problems in computation of assessable value and Customs Duty. (FOB, CIF Values, Insurance Charges, Landing Charges etc.) | 13 | CO 6 |

***Self- Study Portion**

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 6 | 4 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 6 | 4 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 2 | 2 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. *Study Material on GST – The Institute of Chartered Accountants of India / The Institute of Cost Accountants of India.*

E-RESOURCE

<https://cbic-gst.gov.in/CGST-bill-e.html>

COURSE TITLE: INTERNSHIP

| | |
|---------------------------------|----------------------|
| Course Code: | Credits : 04 |
| Duration : 4 Weeks | Internal : 75 |
| Exam : Viva & Report | External : 25 |

Learning Objective:

To apply the theoretical knowledge gained through classes in a practical corporate life

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can explore career alternatives prior to graduation |
| CO2 | Students can assess interest & ability in their field of study |
| CO3 | Students can able to develop work habits and attitudes necessary for job success |
| CO4 | Students can acquire employment contacts, which leads directly to a full -time job post-graduation from college. |
| CO5 | Students can able to apply their theoretical knowledge in practical. |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | | | 3 | | | | 3 |
| CO 2 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | | | | | 3 |
| CO 3 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | 3 | | | | 3 |
| CO 4 | 3 | | 3 | 3 | 2 | 2 | 3 | 3 | | 3 | | | | | | | 3 |
| CO 5 | 3 | | 3 | 3 | 2 | 1 | 3 | 3 | | 3 | | | | | | | 3 |

COURSE TITLE: COST ACCOUNTING

| | |
|-------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L:T:P:S: 6:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To apply cost control & cost reduction techniques for better decision making.
2. To make the students to understand the process of preparing contract account

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to discuss the concepts on costing. (K2) |
| CO2 | Students can able to fix the selling price by preparing a cost sheet and also be able to quote the best possible price for the tender. (K6) |
| CO3 | Students can able to apply most feasible labour payment policy in their business. (K3) |
| CO4 | Students able to calculate notional profits for various contracts (K5) |
| CO5 | Students can able to examine the purpose of transfer pricing and identify the responsibility of a division as responsibility centre. (K2 & K4) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | 2 | | | | 3 | | | 3 | | | | | |
| CO 2 | 3 | 2 | 3 | 3 | 1 | 2 | | | 3 | | | 3 | | | | | |
| CO 3 | 3 | 2 | 3 | 3 | 3 | 2 | | 3 | 3 | | | | 3 | | | | |
| CO 4 | 3 | 3 | 3 | 3 | | 2 | | 3 | 3 | 3 | 3 | 3 | 2 | | 3 | | 3 |
| CO 5 | 3 | | | 3 | | 2 | | 3 | 3 | | 3 | | 2 | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | Introduction to Cost Accounting – Meaning - Objectives and advantages of cost accounting, <i>*Relationship between cost accounting and financial accounting.</i> Cost concepts and classifications - Role of a cost accountant in an organization. | 15 | CO 1 |
| 2 | (# Unit for Compulsory Question) Elements of Cost – Preparation of cost sheets – Tenders and quotations. (Reference to Cost Accounting Standard (CAS)– 1 | 15 | CO 2 |
| 3 | Labour Cost – Attendance and payroll procedures, Overview of statutory requirements, Overtime, Idle time and – Labour turnover – Remuneration systems and incentive schemes. (Reference to CAS – 7) | 15 | CO 3 |
| 4 | (# Unit for Compulsory Question) Contract Costing- Definition - <i>*Features of Contract Costing</i> - Calculation of Profit on Contracts - Cost plus Contract - Contract Costing Vs Job costing - Preparation of Contract A/c. | 15 | CO 4 |
| 5 | Transfer Pricing – Introduction – Objectives of Transfer Pricing – Methods of Transfer pricing – Transfer Pricing and Performance Measurement and Compensation Issues - Conflict between division and Company – Congruence | 15 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 5 | 5 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 4 | 6 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 1 | 3 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Jain S.P and Narang K.L, *Cost Accounting, Kalyani Publishers.*
2. Dr. Maheswari S.N, *Principles of Cost Accounting, Sultan Chand Publications*
3. Saxena V.K and Vashist C.D, *Cost Accounting, Sultan Chand Publications*
4. Pillai R.S.N and Bagavathi V, *Cost Accounting, S.Chand*
5. Reddy T.S and Hari Prasad Reddy Y, *Cost Accounting, Margham Publications*

E-RESOURCE

https://www.icai.org/post.html?post_id=16949

COURSE TITLE: DIRECT TAXATION - I

| | |
|-------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L:T:P:S: 6:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To determine the residential status and taxable income of an individual
2. To compute the Income under Salary, House Property and Business & Profession

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to determine the Individual's (Person's) residential status and also able to calculate the taxable income for different types of resident (K4) |
| CO2 | Students can able to identify the taxable and exempted incomes. (K2) |
| CO3 | Students can able to calculate Income from salary, house property, Business & Profession with respective deductions. (K5) |
| CO4 | Students can analyze and determine the best possible way of showing self - occupied & let out house property. (K4) |
| CO5 | Students can able to outline the powers of assessing officer and central board of direct taxes. (K1) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | 2 | | 3 | | | | 3 | | 3 | | | | 3 | 3 | | |
| CO 2 | 3 | 2 | 2 | 3 | | | | 3 | | 3 | | | | 3 | 3 | | |
| CO 3 | 3 | 2 | | 3 | | | | 3 | 3 | 3 | | | | 3 | 3 | | |
| CO 4 | 3 | 2 | 3 | 3 | | 3 | | 3 | 3 | 3 | | | | 3 | 3 | | |
| CO 5 | 3 | 2 | 2 | 3 | 2 | | | 3 | | 3 | | | | 3 | 3 | | |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|------|
| 1 | Indian Income Tax - *Objectives & Scopes- Meaning of Income – Important definitions under the Income Tax Act - scope of total income – Residential Status and Incidence of tax of an individual - Incomes Exempt from tax. | 12 | CO 1 |
| 2 | (# Unit for Compulsory Question) Income from Salaries – scope of salary income – Allowances, Perquisites and its valuation – Deduction from salary income. | 20 | CO 2 |
| 3 | Income from House Property – Basis of charges – Self Occupied Property – Deemed to be let-out – Let-out - Computation of Annual value – Deductions from annual Value. | 15 | CO 3 |
| 4 | (# Unit for Compulsory Question) Income from Business or Profession – Basic Principles of arriving at business income – Losses incidental to trade – specific deductions in computing income from business – General deductions – Deemed business profits chargeable to tax – compulsory maintenance of account – Audit of accounts of certain persons – specific provisions for computing incomes on estimated basis under sec44AD, AE, AF (An Overview). | 20 | CO 4 |
| 5 | Income Tax Authorities – Powers of Assessing Officers, Powers of Central Board of Direct Taxes, Powers of Income Tax Commissioner | 8 | CO 5 |

***Self -Study Portion**

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 6 | 4 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 4 | 6 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 2 | 2 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Dr. Vinod K. Singhania, *Students Guide to Income Tax*. Taxman publications Pvt. Ltd.
2. Gaur P & Narang D.B, *Income Tax Law and Practice*, Kalyani Publications.
3. Manoharan T.N, *Income Tax – Law & Practice*, Snow White Publishers.

E-RESOURCE

<https://www.incometaxindia.gov.in>

COURSE TITLE: CORPORATE ETHICS & GOVERNANCE

| | |
|-------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L:T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To recognize the legal and ethical issues when making business decision and improve analytical problem solving
2. To apply the concepts of corporate ethics and governance practically in corporate sector

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to compare the importance of ethical behavior with role of business ethics (K5) |
| CO2 | Students can able to differentiate between Morals & Ethics (K2) |
| CO3 | Students can able to summarize recent corporate scandals /scams and the regulatory body reaction (K1) |
| CO4 | Students can able to identify the key players in corporate governance and their responsibilities (K4) |
| CO5 | Students can able to identify the significance of other drivers in corporate governance such as capital market, SEBI, shareholders, Accountant, Auditors (K4) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | | | 3 | 3 | 3 | | 2 | | | | 3 | | | | | | |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | | | | 2 | | | | | | |
| CO 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | | | | | | | 2 | | |
| CO 4 | 3 | | 1 | 3 | 3 | | 2 | 2 | | | 3 | | 3 | | | | 3 |
| CO 5 | 3 | 2 | 1 | 3 | 3 | | 2 | 3 | 2 | 2 | | 3 | | | 2 | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | Concept of Ethics – sources – ethics and morals -ethical dilemma -- justice – fairness – values – relevance of business ethics – arguments for and against – business values for 21 st century – ethics in Indian business – <i>*Ethics in Indian Epics (Mahabharata, Arthasasthram) – an Overview.</i> | 10 | CO 1 |
| 2 | (# Unit for Compulsory Question) Ethical Management – strengthening of personal and organizational integrity – complexity and group dynamic – spiritual core of leadership – leaders and the value reference – corporate scams and its effects – law as an instrument of ethics. | 14 | CO 2 |
| 3 | Corporate Social Responsibility – meaning – promoting – stakeholders’ satisfaction – corporate responsiveness – managing socially responsible business – environment responsibility – ethics and ecology – advertisement and information disclosure- ethics at work place and professionalism. | 12 | CO 3 |
| 4 | Corporate Governance – meaning, scope – transparency – disclosures share holders’ welfare vs. stakeholders- approach — Disclosure requirements – Director’s Responsibility Statement. | 12 | CO 4 |
| 5 | (# Unit for Compulsory Question) SEBI and Corporate Governance – Clause 49 A of SEBI listing agreement –Committees under Listing agreement - Governance committees – Audit committees – Shareholder’s grievances committee – Investor protection – shareholders information – Disclosure requirements – Role of Accountants and Auditors – accountability – professional Code & values. | 12 | CO 5 |

****Self- Study Portion***

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. *Corporate Governance and business Ethics by All India Management Association – Excel Books*
2. William H. Shaw, *Business Ethics – Thomson Publications*
3. Balasubramanyan N, *Corporate boards and Governance, Sterling publishers*
4. *Reference on corporate governance and director's duties and responsibilities, publication of Institute of Company secretaries of India*
5. Neville Bain & David Band “*winning ways through corporate governance*”, *Macmillan publishers*

E-RESOURCE

<https://www.bbvaopenmind.com>

<https://shodhganga.inflibnet.ac.in>

COURSE TITLE: ENTREPRENEURIAL DEVELOPMENT

| | |
|-------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L:T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To understand the role and importance of entrepreneurship for economic development
2. To adopt the key steps in the elaboration of business ideas

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to Discuss and explain the concept of entrepreneurship and its classification. (K1 & K2) |
| CO2 | Students can able to Identify and understand the problems faced by women entrepreneurs. Suggest various remedial measures through micro financing. (K2 & K3) |
| CO3 | Students can able to prepare a business plan. (K6) |
| CO4 | Students can able to Compare and utilize the services rendered by various institutions like IDBI, IFCI, IIBI, SIPCOT etc. (K4 & K5) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | 3 | | 1 | | | | | | | | | 3 | |
| CO 2 | 3 | 2 | 3 | 3 | 3 | | 1 | | 3 | | | | 3 | | | 3 | |
| CO 3 | 3 | | 3 | 3 | 3 | 3 | 1 | 3 | 3 | | 3 | 3 | 3 | 3 | | 3 | 3 |
| CO 4 | 3 | | 3 | 3 | 3 | | 1 | | | 3 | | | | | 3 | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | Concept of Entrepreneurship – definition – traits – types – classification of entrepreneurs - factors influencing entrepreneurship – Entrepreneurs in India. | 8 | CO 1 |
| 2 | Women Entrepreneurs – definition – problems – <i>*Development of women entrepreneurship</i> – Women Entrepreneurs and Self-Help Group (SHG's) – Micro Finance - rural entrepreneurship – problems – <i>*relationship between rural and urban markets</i> . Strategic Approaches: Niche strategy – Networking – Geographic Concentration. | 12 | CO 2 |
| 3 | (# Unit for Compulsory Question) Business Idea - Search for business idea – Project Proposal - sources of project identification – formalities of setting up a Unit – project selection – project evaluation - project formulation – feasibility analysis – projects report – types. | 12 | CO 3 |
| 4 | Institutional Finance to Entrepreneurs – <i>*commercial banks</i> , Development banks and autonomous organizations – IDBI – IFCI – IIBI – SIDBI – LIC – SIC – NSIC - Khadi and village industries corporation – DIC - SFC - Venture capital & Private equity- Angel Investing- E-Merge - SME Exchange. | 16 | CO 4 |
| 5 | (# Unit for Compulsory Question) Entrepreneurial Development Program – Role and Relevance – role of Government and Non - Governmental Organizations (NGO) – SIPCOT, SIDC, MSME, TCO, SIDO. | 12 | CO 4 |

** Self- Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Gupta C.B and Srinivasan S.P, *Entrepreneurial Development*, Sultan Chand Publishers
2. Khanka S, *Entrepreneurial Development*, S.Chand & Co.
3. Ramachandran K, *Entrepreneurial Development*, TATA McGraw Hill Publishers
4. Jayashree Suresh, *Entrepreneurial Development*, Chennai, Margham Publications
5. Chalam K.S, *Women Entrepreneurs and Socio-Economic Development*, Serials Publications

E-RESOURCE

<https://www.britannica.com>

<https://shodhganga.inflibnet.ac.in>

COURSE TITLE: RESEARCH METHODOLOGY

| | |
|-------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L:T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To understand the concept of research and its methodologies
2. To prepare a research project using appropriate research methodologies

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to apply the knowledge of research in various/different fields. (K3) |
| CO2 | Students can able to formulate hypothesis for the identified research problem and select the most appropriate sampling technique. (K3 & K4) |
| CO3 | Students can able to adopt different styles for research data collection. (K3) |
| CO4 | Students can able to use the appropriate statistical tool for analyzing the data. (K3 & K4) |
| CO5 | Students can able to draft a research report based on the outcome of the research. (K6) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO 3 | | | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO 4 | 2 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 |
| CO 5 | 2 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | Introduction to Research Methodology – meaning and purpose – Types of Research - steps involved in research - <i>*Research Application in Business Decisions</i> - formulation of a research problem for social science. | 12 | CO 1 |
| 2 | (# Unit for Compulsory Question) Research Design - Types of Research Design - Hypothesis – Types – concept and procedures of testing of Hypothesis – Sampling Design- <i>*sampling techniques</i> – sampling error and sample size. | 12 | CO 2 |
| 3 | Measurement & scaling techniques – Data – Meaning – Information & Data - Data collection – methods – testing validity and reliability. | 11 | CO 3 |
| 4 | (# Unit for Compulsory Question) Processing of Data – <i>Editing, coding, classification & tabulation</i> , analysis of data – outline of statistical analysis – elements of processing through computers - Application of Excel and SPSS (Theoretical concepts). | 14 | CO 4 |
| 5 | Interpretation and Report Writing – meaning & precautions in interpretation, types of reports – style & conventions in reporting – steps in drafting of report. | 11 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Dr. Ranganatha M, *Business Research Methods, Himalayas Publishing*
2. William C Emory, *Business Research Methods, R.D. Irwin Incorp.*
3. Robert G Murdick, *Business Research – Concepts & Practice, International text book company*
4. Kothari C.R., *Research Methodology, Vikas Publishing Ltd*
5. Ravilochanan, *Research Methodology, Margham Publications.*

E-RESOURCE

<http://14.139.185.6/website/SDE/sde578.pdf>

COURSE TITLE: STRATEGIC PLANNING & MANAGEMENT (ELECTIVE- I)

| | |
|-------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L:T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To gain knowledge on strategic planning and also enable them to take decisions strategically
2. To familiarize regarding the formulation and implementation of strategy from holistic and multi -functional perspectives

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Student can able to understand the strategic decisions that organizations make and have an ability to engage in strategic planning. (K2) |
| CO2 | Student can able to explain the importance of implementation of corporate policy. (K2 & K3) |
| CO3 | Student can able to analyze and evaluate critically real -life company situations and develop creative solutions, using a strategic management perspective. (K5) |
| CO4 | Student can able to integrate and apply knowledge gained in basic courses to the Formulation and implementation of strategy from holistic and multi-functional perspectives. (K2 & K3) |
| CO5 | Student can able to evaluate the strategic performance with the target or bench marking performance. (K5) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 1 | 3 | 2 | | | 3 | 3 | | | 3 | 3 | | | 3 | |
| CO 2 | 3 | | 2 | 3 | 2 | 2 | | 3 | 3 | | 3 | 3 | 3 | | | | |
| CO 3 | 3 | 2 | 3 | 3 | 3 | 3 | | 3 | | | 3 | | | | 3 | 3 | |
| CO 4 | 3 | | 3 | 3 | 3 | 2 | 1 | 3 | | | | 3 | 3 | | 3 | | 3 |
| CO 5 | 3 | | 3 | 3 | 2 | 2 | | 3 | | | 3 | | 3 | | 3 | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | Introduction - Strategy – Strategic Management Process – Developing a Strategic Vision – Mission- Setting Objectives– Strategies and Tactics – <i>*Importance of Corporate Strategy</i> – the 7-S Framework- Corporate Governance – Board of Directors: Role and Functions – Board Functioning – Top Management: Role and Skills | 11 | CO 1 |
| 2 | (# Unit for Compulsory Question) Strategic Planning : Nature and Purpose - Corporate Policy and Planning in India - Importance – Characteristics – Objectives - Policy Formulation and Development – Types of Business Policies - Implementation of Policies. Society and Business: Social Responsibility of Business – Corporate Governance and Ethical Responsibility. | 12 | CO 2 |
| 3 | Strategy Formulation and Analysis - Strategy Formulation – Strategic Factors Analysis Summary Matrix (SFAS) Portfolio Analysis – Business Strategy- TOWS Matrix– Corporate Strategy – Functional Strategy – Strategic Choice – Generic, Competitive Strategies. | 12 | CO 3 |
| 4 | Strategy Implementation - Strategy Implementation - <i>*Corporate Culture</i> – Matching Organisation Structure to Strategy – Mergers and Acquisitions and Diversifications - Du Pont’s Control Model – Balanced Score Card – <i>*Michael Porter’s Framework for Strategic Management.</i> | 12 | CO 4 |
| 5 | (# Unit for Compulsory Question) Strategic Evaluation and Control - Establishing strategic controls - Measuring performance – appropriate measures- Role of the strategist – using qualitative and quantitative benchmarking to evaluate performance - strategic information systems – problems in measuring performance – Strategic surveillance - <i>*strategic audit</i> | 13 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Dess, G., Lumpkin, G.T. and Eisner, A., *Strategic Management, Tata McGraw Hill*
2. Hill, C.W.L. and Jones, G.R., *Strategic Management: An Integrated Approach*
3. Hitt, Ireland, Hoskisson and Manikuttu, *Strategic Management*
4. Kazmi, A., *Strategic Management and Business Policy, Tata McGraw Hill*
5. Pearce II, J., Robinson, R.B. and Mittal, A., *Strategic Management: Formulation, Implementation and Control, McGraw Hill*

E-RESOURCES

http://www.crectirupati.com/sites/default/files/lecture_notes/Strategic%20Management%20Notes-CREC.pdf

http://www.sasurieengg.com/e-course-material/MBA/II-Year-Sem-3/BA7032%20STRATEGIC_MANAGEMENT.pdf

COURSE TITLE: LOGISTICS AND SUPPLY CHAIN MANAGEMENT (ELECTIVE I)

| | |
|-------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L:T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To apply the operational tactical and strategic aspects in Logistics & SCM
2. To incorporate and learn the critical elements of Logistics & SCM

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can analyze and improve supply chain process in their business (K4) |
| CO2 | Students can critically examine the role of logistics as it relevance to transportation and warehouse. (K5) |
| CO3 | Students can able to apply knowledge to evaluate and manage supply chain. (K5) |
| CO4 | Students can identify and analyze the competitive advantage of logistic management. (K2 & K4) |
| CO5 | Students can able to align the management of supply chain with corporate goal and strategy. (K3) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | 3 | | | 3 | 3 | 3 | 3 | | | | | | 3 |
| CO 2 | 3 | | 3 | 3 | 3 | 3 | | 3 | 3 | 3 | 3 | | | | | | 3 |
| CO 3 | 3 | | 2 | 3 | 2 | | | 3 | 3 | 3 | | | | | | | 3 |
| CO 4 | 3 | | 3 | 3 | 3 | | | 3 | 3 | 3 | | | | | | | 3 |
| CO 5 | 3 | 2 | 3 | 3 | 3 | | | 3 | 3 | 3 | | | | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|------|
| 1 | Concepts of Logistics – Evolution – <i>*Nature and Importance</i> – Components of Logistics Management – Competitive advantages of Logistics – <i>*Functions of logistics management</i> – Principles – Logistics Network – Integrated Logistics system. Supply chain management – Nature and Concepts – Value chain – Functions – Supply chain effectiveness – Outsourcing – 3PLs and 4PLs – supply chain relationships – Customer services - Issues and challenges for developing countries in Logistics and Supply Chain Management. | 12 | CO 1 |
| 2 | (# Unit for Compulsory Question) Elements of Logistics and Supply Chain Management – Inventory carrying – Warehousing – Material handling – order processing – <i>*Transportation – Demand Forecasting</i> – Impact of Forecasts on Logistics and Supply chain management - Performance measurements. | 12 | CO 2 |
| 3 | Transportation – Position of Transportation in Logistics and Supply chain management – <i>*Road, Rail, Ocean, Air, Transport multi-model transport</i> –Components of a logistic system – Ocean transport – ships – types – measurement of capacity of ships – shipping information. | 12 | CO 3 |
| 4 | Containerization – CFS – ICDS – Selection of transportation mode – Transportation Network and Decision – Insurance Aspects of logistics. Logistical Information System (LIS) – Operations – Integrated IT solution for Logistics and Supply chain management – Emerging technologies in Logistics and Supply Chain management. | 12 | CO 4 |
| 5 | (# Unit for Compulsory Question) Export Procedures – Exporting General Merchandise – Documents for exporting - Containerized cargo for export through Inland container Depots – Infrastructure development – Comparative evaluation of transport system – Decision Criteria | 12 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Martin Christopher, *'Logistics and Supply chain management'*, Pearson Education, 2016
2. Krishnaveni Muthjiah, *'Logistics Management and Seaborne Trade'*, Himalaya Publishing House, 2015
3. Agarwal D.K, *'Textbook of Logistics and Supply chain management'*, Macmillan India Ltd, 2015
4. Coyle, *Managing Supply Chain Management –A Logistics Approach*, CINGAGE Learning, 2013
5. Ronald H.Ballou, *'Business Logistics and Supply Chain management'*, Pearson Education, 2007

E-RESOURCE

<https://theintactone.com/2019/05/25/kmbom01-supply-chain-logistics-management/>

COURSE TITLE: INTERNSHIP

| | |
|---------------------------------|----------------------|
| Course Code: | Credits : 02 |
| Duration : 2 Weeks | Internal : 75 |
| Exam : Viva & Report | External : 25 |

Learning Objective:

To apply the theoretical knowledge gained through classes in a practical corporate life

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can explore career alternatives prior to graduation |
| CO2 | Students can assess interest & ability in their field of study |
| CO3 | Students can able to develop work habits and attitudes necessary for job success |
| CO4 | Students can acquire employment contacts, which leads directly to a full -time job post-graduation from college. |
| CO5 | Students can able to apply their theoretical knowledge in practical. |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | | | 3 | | | | 3 |
| CO 2 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | | | | | 3 |
| CO 3 | 3 | | 3 | 3 | 2 | 1 | 3 | | | 3 | 3 | 3 | 3 | | | | 3 |
| CO 4 | 3 | | 3 | 3 | 2 | 2 | 3 | 3 | | 3 | | | | | | | 3 |
| CO 5 | 3 | | 3 | 3 | 2 | 1 | 3 | 3 | | 3 | | | | | | | 3 |

COURSE TITLE: PRACTICAL AUDITING

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 5:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To outline the concept of practical auditing
2. To apply learned things practically while undergoing an audit

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to prepare audit plan, strategy and program for their audit work. (K3) |
| CO2 | Students can able to apply their knowledge towards maintenance of audit note book, audit working paper, Audit file etc. (K3) |
| CO3 | Students can able to evaluate the significance of internal control system in audit. (K5) |
| CO4 | Students can able to analyze the reliability of audit result when the audit evidence are acquired through sampling technique. (K4) |
| CO5 | Students can able to examine the process of maintaining the books of accounts of a company. (K5) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 3 | 3 | 3 | 2 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | | 3 | 3 | 3 | 2 | | | | 3 | 3 | | | 3 | 3 | | 3 |
| CO 3 | 3 | | 2 | 3 | 3 | 3 | | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | 3 | 3 |
| CO 4 | 3 | | 2 | 3 | 3 | 3 | | | 3 | 3 | 3 | | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | | 1 | 3 | 1 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | Auditing Concepts - Nature and limitations of Auditing, Basic Principles governing an audit, Ethical principles and concept of Auditor's Independence, <i>*Relationship of auditing with other disciplines.</i> | 10 | CO 1 |
| 2 | Planning and Conduct of Audit – Audit Planning – Audit Program. Audit Documentation - Audit Note Book – Audit Working Papers – Audit Files. Audit Evidence - Audit procedures for obtaining evidence, Sources of evidence, Reliability of audit evidence, Methods of obtaining audit evidence, Physical verification, Direct confirmation, Re-computation, Analytical review techniques, Representation by management. (SA 500 -599) | 14 | CO 2 |
| 3 | Internal Control - Elements of internal control, Review and documentation, Evaluation of internal control system, <i>*Internal control questionnaire, Internal control check list</i> , Tests of control, Application of concept of materiality and audit risk, Concept of internal audit- Risk Based Internal Audit (RBIA)- Basics concepts of CAAT (Computer aided auditing techniques). | 12 | CO 3 |
| 4 | (# Unit for Compulsory Question) Audit Sampling. - Types of sampling, Test checking, Techniques of test checks. Vouching - Audit of Payments, Audit of receipts, Audit of Purchases, Audit of Sales, Audit of suppliers' ledger and the debtors' ledger, Audit of impersonal ledger, Audit of assets and liabilities. | 12 | CO 4 |
| 5 | (# Unit for Compulsory Question) Company Auditor – Qualification, Disqualification, Appointment, Rights, Duties, Ceiling Limit and Liabilities of an auditor. Audit- Report – Characteristics – types of opinion – preparation of reports and certificates, disclosures, <i>*Latest Trends in Auditing</i> – Information System Audit. (SA 700-709) SA - Standards on Auditing issued by the Institute of Chartered Accountants of India | 12 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

- 1 Sharma T.R, *Auditing, Agra, Sahitya Bhawan, 2019*
- 2 Dinkar Pagare, *Principles and Practices of Auditing, New Delhi, Sultan Chand and Sons, 2016*
- 3 Tandon B.L, *Auditing, 2015*
- 4 Vengadamani S, *Practical Auditing, Margham Publications, 2012*
- 5 Kamal Gupta and Ashok Arora, *Fundamentals of Auditing, Tata McGraw Hill Publishing Company, 1996*

E-RESOURCE

https://freebcomnotes.blogspot.com/p/auditing_3.html

COURSE TITLE: DIRECT TAXATION - II

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 6:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To compute the Income under Capital Gains and Other Sources
2. To file the returns to the income tax department and also helps to understand the concept of TDS & TCS

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to calculate the short & long- term capital gains and income from other sources by considering the relevant deductions. (K3) |
| CO2 | Students will be able to compile all 5 heads of income and set off the losses. Also -able to club the income of family members as per income tax act 1961 (K6) |
| CO3 | Students can able to assess the net tax liability to be payable by an assessee (Individual) (K5) |
| CO4 | Students can able to demonstrate and follow the assessment procedure while filling returns (K2) |
| CO5 | Students can communicate about various types of filing returns & their due dates (K2) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | 2 | | | 3 | 3 | 3 | | | | 3 | 3 | | |
| CO 2 | 3 | | 3 | 3 | 2 | | | 3 | 3 | 3 | | | | 3 | 3 | | |
| CO 3 | 3 | | 3 | 3 | 2 | 1 | | 3 | 3 | 3 | | | | 3 | 3 | | |
| CO 4 | 3 | | 2 | 3 | 3 | 2 | | 3 | | 3 | | | | 3 | 3 | | |
| CO 5 | 3 | | 2 | 3 | 3 | | | 3 | | 3 | | | | 3 | 3 | | |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | (# Unit for Compulsory Question) Capital Gains – Short term and Long -Term gains – Transfer of Capital asset – Certain transactions that do not constitute transfer – Computation of capital gains – exempted capital gains. | 18 | CO 1 |
| 2 | Income from other sources – General income – Specific income - computation of Income from Other Sources – Deductions in computation of income from other sources. | 15 | CO 2 |
| 3 | Clubbing of income - Set off and carry forward of losses – Intra and Inter Source Adjustments. | 17 | CO 3 |
| 4 | (# Unit for Compulsory Question) Permissible deductions from Gross Total Income with reference to an individual - Assessment of individual's total income – Assessment Procedures - Types of Assessment. | 15 | CO 4 |
| 5 | *E-Filing - Tax Deducted at Source – Tax Collected at Source – Types of Returns – Due Dates on Filing Returns – Advance Payment of Tax | 10 | CO 5 |

****Self- Study Portion***

| End Semester Questions Pattern | Theory | Practical Problems | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|--------|--------------------|------------------|---------------------|---------------------|-------------|
| Section A | 6 | 4 | Q1 - Q10 | 10 | 2 | 20 |
| Section B | 4 | 6 | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | 0 | 1 | Q16 | 1 | 15 | 15 |
| Section C (ii) | 2 | 2 | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Dr. Vinod K. Singhania, *Students Guide to Income Tax. Taxman publications Pvt. Ltd, New Delhi*
2. Gaur P, Narang D.B, *Income Tax Law and Practice, Kalyani Publications.*
3. Manoharan T.N, *Income Tax – Law & Practice, Snow White Publishers.*

E-RESOURCE

<https://www.incometaxindia.gov.in>

COURSE TITLE: MARKETING

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 5:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To gain knowledge on various concepts like branding, packing & labeling
2. To understand the concept of service marketing vs product marketing

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to apply modern and trending marketing mix in their business. (K3) |
| CO2 | Students can able to analyze the target market and classify them based on branding, packing and labeling& design the pricing strategies in order to promote the product using destructive promotion mix. (K4 & K6) |
| CO3 | Students can able to formulate the efficient distribution channels to reach the ultimate customers effectively. (K5& K6) |
| CO4 | Students can able to explain the nature and scope of service marketing and also to differentiate between the product marketing and service marketing. (K2) |
| CO5 | Students can able to introduce / create a specialized- services in banking/ financial/ Hospitals/ Insurance/ Tourism. (K6) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | 2 | 3 | 3 | | | | 3 | 3 | 3 | | 3 | 3 | 3 | | 3 |
| CO 2 | 3 | | 2 | 3 | 2 | 2 | | | 3 | | | | 3 | 3 | 3 | | 3 |
| CO 3 | 3 | | 3 | 3 | 2 | 1 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | | 2 | 3 | 2 | 1 | | | 3 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | 2 | 3 | 3 | 3 | 2 | | | 3 | | | | | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|--|-----|------|
| 1 | Introduction - <i>*Nature, scope and importance of marketing</i> - Evolution of marketing concepts - Core Concepts of Marketing, Functions of Marketing, Marketing Orientations - Marketing environment - <i>*Environmental Scanning</i> - Differences between Micro and Macro Environment - Marketing Mix-The Traditional 4P's – the modern 7P's- concept of Neuro Marketing. | 13 | CO 1 |
| 2 | (# Unit for Compulsory Question) Market Selection - Market segmentation – concept, importance and bases; Target market selection - Positioning concept, importance and bases - Product differentiation Vs. Market Segmentation. Product - Meaning and importance - Product classifications - Concept of product mix - Branding, packaging and labelling - Post-sales services - Product life-cycle - New Product Development. Pricing - Significance - Factors affecting price of a product - Pricing policies and strategies. | 15 | CO 2 |
| 3 | Promotion: Nature and importance of promotion - Communication process - Types of promotion <i>*advertising, personal selling, public relations & sales promotion</i> , and their distinctive characteristics - Promotion Mix. Distribution - Channels of distribution - meaning and importance; Types of distribution channels | 13 | CO 3 |
| 4 | Introduction of Service Marketing - evolution and growth of service sector - characteristics of services - <i>*Distinction between goods and services</i> - classification of services. Service Marketing Mix - Elements: Service Products, Pricing in Services, Service Promotion. Place in Services, and People in Services, Managing Service Quality, Relationship Marketing - Concept, - Application - Marketing Strategy. | 14 | CO 4 |
| 5 | (# Unit for Compulsory Question) Marketing of Services – Banking Services – Financial Services – Insurance Service Marketing - Application of Service Marketing to Hospitals & Health Care Industry. | 10 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Philip Kotler, *Principles of Marketing, Eastern Economy Edition, Prentice- Hall of India, 2018*
2. Gupta C.B &Dr. Rajan Nair, *Marketing Management, New Delhi, Sultan Chand Publishers, 2018*
3. William J Stanton, *Marketing, Economy Edition, Prentice Hall of India, 2017*
4. Majaro Simon, *The Essence of Marketing, New Delhi, Prentice Hall, 1993*

E-RESOURCE

https://edurev.in/courses/10505_Principles-of-Marketing-Notes--Videos

COURSE TITLE: INTERNATIONAL TRADE

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 5:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To understand the theoretical concepts & policies regarding international trade
2. To apply economic analysis for knowing the international trade aspects globally

Course Outcomes: At the end of the Course:

| | |
|------------|---|
| CO1 | Students can able to Compare and contrast various International Trade related theories. (K4) |
| CO2 | Students can able to Understanding the concepts of BOT& BOP in order to correct the disequilibrium caused when formulating the fixed and floating exchange rates. (K2) |
| CO3 | Students can able to Prepare and compute necessary export documentation and its procedures. (K6) |
| CO4 | Students can able to Discussing the different IEO and its functions. India's relationship with IBSA FORUM OPEC and G-20 (K2) |
| CO5 | Students can able to Evaluate critically the position of WTO, TRIPS and TRIMS in the functioning of Indian Patent Laws. (K5) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | 1 | 3 | 3 | | | | | | | | | | | | | 3 |
| CO 2 | 3 | 2 | | 3 | 1 | | | | 3 | | 3 | | 3 | | | | |
| CO 3 | 3 | 2 | 3 | 3 | | | | | 3 | | 3 | 3 | 3 | | | | 3 |
| CO 4 | 3 | | | 3 | | | | | 3 | | | | 3 | | | | |
| CO 5 | 3 | | 2 | 3 | 3 | | | 3 | | 3 | | | | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | International Trade – <i>*Importance of International Trade</i> , Theories of Foreign Trade: - Theories of Adam Smith, Ricardo, Haberler’s Hechsher –Ohlin. | 11 | CO 1 |
| 2 | (# Unit for Compulsory Question) Balance of Trade, Balance of Payment – Concepts – Causes of Disequilibrium, Methods to Correct Disequilibrium – Fixed and Floating Exchange Rates – Euro – Dollar Marketing (An Overview). | 12 | CO 2 |
| 3 | Export Management – <i>*Export Procedure and Documents</i> – Export Finance – Export Promotion – Export Credit Guarantee Corporation (ECGC). Import Management- need for importation- methods, procedures & documentations- Promotional-measures for effecting | 13 | CO 3 |
| 4 | International Economic Organizations and its Functions -IMF, IDA, IFC, IBRD, ADB, JICA. India’s relationship with IBSA FORUM OPEC and G-20 | 16 | CO 4 |
| 5 | (# Unit for Compulsory Question) WTO and Trade Liberalization – Liberalization of Trade in Manufacturing and in Agricultural Trade – TRIPS, TRIMS - IPR. | 13 | CO 5 |

****Self -Study Portion***

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Francis Cherunilam, *International Trade and Export Management*, Himalaya Publishing House
2. Paul. R. Krugman, *International Economics (Theory and Policy)*, Pearson Education
3. Robert J. Carbaugh, *International Economics*, Thomson Information Publishing Group
4. Mannur H.G, *International Economics*, Vikas Publishing House (P) Ltd
5. Sankaran, *International Trade & Economics*, Chennai, Margham Publications

E-RESOURCES

<https://www.britannica.com>
<https://dea.gov.in>

COURSE TITLE: ORGANIZATIONAL BEHAVIOUR (ELECTIVE –II)

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To familiarize with the concept of organizational behavior and enable to understand its relevance to the workplace
2. To cultivate and coordinate group decision making with proper communication process

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to describe the concept of organizational behavior and discuss its relevance to the workplace (K1 & K2) |
| CO2 | Students can able to make psycho analysis on individual's perception, attributions and attitude. (K4) |
| CO3 | Students can able to cultivate and integrate group decision making with proper communication process. (K3 & K6) |
| CO4 | Students can able to discuss strategies for managing conflict and negotiation in the workplace (K2) |
| CO5 | Students can able to explain the importance of managing stress and emotions in the workplace (K2) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | | | 3 | 3 | | | | 3 | 3 | 3 | | 3 | 3 | 3 | | 3 |
| CO 2 | 3 | | 3 | 3 | 3 | | 1 | | 3 | | | | 3 | 3 | 3 | | 3 |
| CO 3 | 3 | | 3 | 3 | 3 | | 1 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 4 | 3 | | 3 | 3 | 3 | 2 | 1 | | 3 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 5 | 3 | | | 3 | 3 | 2 | 2 | | 3 | | | | | | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|------|
| 1 | Introduction to Organizational Behavior: Historical background of OB -Concept Relevance of OB – Contributing disciplines - to the field of OB, challenges and opportunities for OB, foundations of Individual Behavior. Theory – social theory | 10 | CO 1 |
| 2 | Individual Behavior -Individual Difference - Personality – concept and determinants of personality – theories of personality – type of theories – trait theory – psycho analytic theory - social learning theory. Perception and Attribution- Concept – Nature – process – Importance – Management and behavioral application of perception. Attitudes and Values: – Components, Attitude – Behavior relationship, formation, values, Perception – Learning. | 14 | CO 2 |
| 3 | (# Unit for Compulsory Question) Group Behavior -Group Dynamics – Foundations of Group Behavior – Group and Team - Stages of Group Development–Factors affecting Group and Team Performance - Group Decision making. | 11 | CO 3 |
| 4 | Conflict – Concept – Sources – Types – Functionality and Dysfunctionality of Conflict – Classification of Conflict - Intra – Individual – Interpersonal – Inter Group – Organizational - Resolution of Conflict | 10 | CO 4 |
| 5 | (# Unit for Compulsory Question) Organizational Effectiveness – Organizational Culture – Concepts – Characteristics – Importance - Elements – Implications – Process - Creating and Sustaining Culture. Organizational Climate - Concept and Importance. Emotional Intelligence, Work Life Integration Practices. | 15 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Luthans, *Organization Behavior*, McGraw Hill
2. Robbins & Vohra, *Organization behavior*, Pearson Education, India
3. Stephen P Robbins, *Organization Behavior*, Pearson Education, India
4. Dr. Jayasankar J, *Organization behavior*, Margham Publication
5. Dr. Sivakumar M, *Organization behavior*, Lakshmi Publication

E-RESOURCES

<https://old.mu.ac.in/wp-content/uploads/2014/04/Management-PAPER-II-Organizational-Behavior-final-book.pdf>

file:///C:/Users/admin/Downloads/lecture_note_92311150135560.pdf

COURSE TITLE: INSURANCE AND RISK MANAGEMENT (ELECTIVE –II)

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 04 |
| L: T:P:S: 4:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Learning Objectives:

1. To understand the principles and practices of risk management in an organization
2. To suggest the appropriate insurance policy for individual and businessman

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to explain the concept of insurance and various principles pertaining to it. (K2) |
| CO2 | Students can explain the concept of life and general insurance (K2) |
| CO3 | Students can analyze various policies under life and general insurance (K4) |
| CO4 | Students can analyze the role of actuaries in risk management. (K4) |
| CO5 | Students can able to identify various risks faced by the business and also know how to manage it. (K1 & K2) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 2 | | | 3 | 2 | | | 3 | | 3 | 3 | | 3 | 3 | | | 3 |
| CO 2 | | | | 3 | | | | 3 | | 3 | 3 | | 3 | 3 | | | 3 |
| CO 3 | | | 2 | 3 | 1 | | | 3 | 3 | 3 | 3 | | | 3 | | | 3 |
| CO 4 | 3 | | 3 | 3 | 2 | 2 | | 3 | 3 | 3 | 3 | | | 3 | | | 3 |
| CO 5 | 2 | | 1 | 3 | 3 | | 1 | 3 | | 3 | 3 | | | 3 | | | 3 |

| NO | CONTENTS OF MODULE | Hrs | Cos |
|----|---|-----|----------|
| 1 | Insurance - Definition – Purpose & need of Insurance - Insurance as risk transfer & risk sharing mechanism - Benefits & Cost of insurance to society - Insurance as contract- Essential elements, Fundamental principles of insurance - Utmost good faith - Insurable Interest - Indemnity - Proximate cause – Subrogation - Mitigation of loss- Concepts of Insuretech. | 12 | CO 1 |
| 2 | (# Unit for Compulsory Question) Life Insurance – Meaning, Characteristics, Principles - Types of Policies in Life and General Insurance. Premium – Meaning - Types of premium - Factors for determination of premium - Mortality table - Nomination and assignments, Claims Management - types of documents needed in various types of claims – Life Insurance Agents & Advisors – Regulations of IRDA for Agents. | 14 | CO 2 & 3 |
| 3 | General Insurance (Fire, Marine and Health) – Meaning, Characteristics, Principles - Types of Policies. - Types of premium - Factors for determination of premium - Claims Management - types of documents needed in various types of claims. Composite Insurance Agents & Advisors – Regulations of IRDA for Agents. | 14 | CO 2 & 3 |
| 4 | Insurance Underwriting – need for insurance underwriting, factors that affect the activities performed by the underwriter, steps involved in the process of insurance underwriting, Introduction to Actuarial Science - Role of Actuaries in risk management. | 10 | CO 4 |
| 5 | (# Unit for Compulsory Question) Risk – meaning – types - risk management process – risk identification – evaluation – risk management techniques – significance of risk management function within business organizations. | 10 | CO 5 |

**Self -Study Portion*

| End Semester Questions Pattern | Question Numbers | To Answer Questions | Marks Per Questions | Total Marks |
|--------------------------------|------------------|---------------------|---------------------|-------------|
| Section A | Q1 - Q10 | 10 | 2 | 20 |
| Section B | Q11 – Q15 | 5 | 7 | 35 |
| Section C (i) | Q16 | 1 | 15 | 15 |
| Section C (ii) | Q17 – Q18 | 2 | 15 | 30 |

NOTE: Q11 – Q15 and Q17 – Q18 are Internal Choice Questions (A or B pattern). Q16 is a Compulsory Question from specified module and it is a case study based question.

RECOMMENDED BOOKS

1. Murthy A, *Principles and Practice of Insurance*, Margham Publications 2019
2. Mishra M.N, *Insurance–Principles and Practices*, S.Chand & Co, 2016
3. Dorfman, “*Introduction to Risk Management and Insurance*, Prentice Hall, 2015
4. Sengupta Mrinal Chandra, *Insurance Finance*, New Delhi, Progressive Publishers, 1997
5. Williams Heins, “*Risk Management and Insurance*”, TATA McGraw Hill Publishers, 1989

E-RESOURCE

<https://www.slideshare.net/mdrtindia/risk-management-and-insurance-14010813>

COURSE TITLE: PROJECT WORK

| | |
|--------------------------|-----------------------|
| Course Code: | Credits : 08 |
| L: T:P:S: 5:0:0:0 | CIE Marks : 40 |
| Exam Hours: 03 | ESE Marks : 60 |

Course Outcomes: At the end of the Course:

| | |
|------------|--|
| CO1 | Students can able to analyze the practical applications of theoretical models in commerce, economics, business administration etc. (K4) |
| CO2 | Students can able to differentiate clearly about qualitative & quantitative methods of research while drafting research report (K4& K5) |
| CO3 | Students can able to acquire the skills of writing bibliography of research citing reference from various sources. (K3) |
| CO4 | This course develops logical reasoning skill & confidence among the students while answering any question on their topic. (K6) |
| CO5 | Students can able to use statistical technique for a real- world problem to bring solution for it. (K3) |

Mapping of Course Outcomes to Program Outcomes & Program Specific Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | | | 3 | | | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | | | | 3 | | | 3 | |
| CO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | 3 | | | 3 | |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | 3 | | | 3 | |
| CO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | | | 3 | 3 | | 3 | |

**DAWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE
(AUTONOMOUS)**



**DEPARTMENT OF MATHEMATICS WITH
COMPUTER APPLICATIONS
(B.Sc. Mathematics with Computer Applications)
Programme Code : 36**

**CURRICULUM AND SCHEME OF EXAMINATIONS
Choice Based Credit System (CBCS)
(with effect from the academic year 2021-2022)**

Signature of the HOD

Head

Department of Mathematics with
Computer Application
Dwaraka Doss Goverdhan Doss
Vaishnav College (Shift II)
Arumbakkam, Chennai-600 106.

Signature of the Principal

Dr.S.Santhosh Baboo, M.Sc., Ph.D.
Principal
Dwaraka Doss Goverdhan Doss
Vaishnav College (Autonomous)
Arumbakkam, Chennai-600 106.

COURSE STRUCTURE

FIRST SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext.Marks | Total |
|-----------------------|--|-----------------|----------------|-------------------|------------------|--------------|
| Part – I | Language Paper -I | 5 | 3 | 40 | 60 | 100 |
| Part - II | English Paper -I | 4 | 3 | 40 | 60 | 100 |
| Part - III | Core Paper-I: Algebra and Trigonometry | 5 | 4 | 40 | 60 | 100 |
| | Core Paper-II: Differential Calculus | 4 | 4 | 40 | 60 | 100 |
| | Core Paper-III: Programming with Python | 9 | 4 | 40 | 60 | 100 |
| | Core Paper-IV: Python Programming – Lab | | 4 | 40 | 60 | 100 |
| Part - IV | Basic Tamil/Adv. Tamil/ Non Major Elective -I | 1 | 2 | 40 | 60 | 100 |
| | Soft Skills -I | 2 | 3 | 50 | 50 | 100 |

SECOND SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext.Marks | Total |
|-----------------------|--|-----------------|----------------|-------------------|------------------|--------------|
| Part – I | Language Paper -II | 5 | 3 | 40 | 60 | 100 |
| Part - II | English Paper -II | 5 | 3 | 40 | 60 | 100 |
| Part - III | Core Paper-V: Analytical Geometry | 4 | 4 | 40 | 60 | 100 |
| | Core Paper-VI: Integral Calculus and Vector Analysis | 5 | 4 | 40 | 60 | 100 |
| | Core Paper-VII: Java and Data Structures | 9 | 4 | 40 | 60 | 100 |
| | Core Paper-VIII: Data Structures using Java – Lab | | 4 | 40 | 60 | 100 |
| Part - IV | Basic Tamil/Adv. Tamil/ Non Major Elective -II | 1 | 2 | 40 | 60 | 100 |
| | Soft Skills -II | 1 | 3 | 50 | 50 | 100 |

THIRD SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext.Marks | Total |
|----------------|--|----------|---------|-------------------------|-----------|-------|
| Part – I | Language Paper -III | 5 | 3 | 40 | 60 | 100 |
| Part - II | English Paper -III | 5 | 3 | 40 | 60 | 100 |
| Part - III | Core Paper-IX: Differential Equations | 5 | 4 | 40 | 60 | 100 |
| | Core Paper-X: Operating Systems | 4 | 4 | 40 | 60 | 100 |
| | Allied Paper- I-Probability and statistics-I | 9 | 5 | 40 | 60 | 100 |
| Part - IV | Environmental Studies | 1 | | EXAM IN THE IV SEMESTER | | |
| | Soft Skills -III | 1 | 3 | 50 | 50 | 100 |
| | Extra disciplinary | | 2 | | | |

FOURTH SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext.Marks | Total |
|----------------|--|----------|---------|------------|-----------|-------|
| Part – I | Language Paper -IV | 5 | 3 | 40 | 60 | 100 |
| Part - II | English Paper -IV | 5 | 3 | 40 | 60 | 100 |
| Part - III | Core Paper-XI: Integral Transforms | 4 | 4 | 40 | 60 | 100 |
| | Core Paper-XII: Discrete Mathematics | 5 | 4 | 40 | 60 | 100 |
| | Allied Paper- II-Probability and statistics-II | 9 | 5 | 40 | 60 | 100 |
| | Internship | | 2 | | | |
| Part - IV | Environmental Studies | 1 | 2 | 40 | 60 | 100 |
| | Soft Skills -IV | 1 | 3 | 50 | 50 | 100 |
| | Extra disciplinary | | 2 | | | |
| | Value added course | | 2 | | | |

FIFTH SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext. Marks | Total |
|-----------------------|--|-----------------|----------------|-------------------|-------------------|--------------|
| Part - III | Core Paper-XIII: Algebraic Structures | 6 | 4 | 40 | 60 | 100 |
| | Core Paper -XIV: Real Analysis-I | 6 | 4 | 40 | 60 | 100 |
| | Core Paper-XV: Mechanics | 6 | 4 | 40 | 60 | 100 |
| | Core Paper – XVI: Operations Research | 6 | 4 | 40 | 60 | 100 |
| | Core Paper - XVII: Web Technology | 6 | 4 | 40 | 60 | 100 |
| | Core Paper - XVIII: Web Technology – Lab | | 4 | 40 | 60 | 100 |
| | Project | | 2 | | | |
| Part - IV | Value Education | | 2 | 40 | 60 | 100 |
| | Value added course | | 2 | | | |

SIXTH SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext. Marks | Total |
|-----------------------|---|-----------------|----------------|-------------------|-------------------|--------------|
| Part - III | Core Paper-XIX: Linear Algebra | 6 | 4 | 40 | 60 | 100 |
| | Core Paper -XX: Real Analysis-II | 6 | 4 | 40 | 60 | 100 |
| | Core Paper-XXI: Functions of Complex variables | 6 | 4 | 40 | 60 | 100 |
| | Core Paper-XXII: Machine Learning with R | 5 | 5 | 40 | 60 | 100 |
| | Core Paper-XXIII: Open Source Technologies | 7 | 5 | 40 | 60 | 100 |
| | Core Paper-XXIV: Open Source Technologies – Lab | | 5 | 40 | 60 | 100 |
| Part - V | Extension Activity | | 1 | | | |

Extra Disciplinary Course

- Financial Mathematics with R
- Numerical Methods

Project

Tally Table:

| Subject | No. of Subjects | Total Marks | credits |
|----------------------------------|-----------------|-------------|---------|
| Core – Theory Papers | 24 | 2400 | 99 |
| Allied Papers | 2 | 200 | 10 |
| Language | 4 | 400 | 12 |
| English | 4 | 400 | 12 |
| Soft skills | 4 | 400 | 12 |
| Non Major electives/ Basic Tamil | 2 | 200 | 4 |
| Environmental Science | 1 | 100 | 2 |
| Value Education | 1 | 100 | 2 |
| Extension Activity | 1 | 100 | 1 |
| Internship | 1 | | 2 |
| Project | 1 | | 2 |
| Value added course | 2 | | 4 |
| Grand Total | 39 | 3900 | 162 |

- 40 % CIA is applicable to all subjects except JOC, COP and SWAYAM courses which are considered as extra creditcourses.
- The students are advised to complete a **SWAYAM-MOOC** before the completion of the 3rd semester and the course completed should certificate be submitted to the HOD. Two credits will be given to the candidates who have successfully completed.
- A **Field Trip** preferably relevant to the course should be undertaken every year.

Components of Continuous Internal Assessment

| Components | | Marks | Total |
|------------------|----|------------------|-------|
| Theory | | | |
| CIA I | 50 | (50+50 = 100*.3) | 50 |
| CIA II | 50 | 30 | |
| Generic Activity | | 10 | |
| Attendance | | 5 | |

Question paper pattern for End Semester Examinations

| Knowledge Level | Section | Marks |
|-----------------|--|------------------|
| K1 | Section A Answer all the 10 Questions. | 10x2 = 20 Marks |
| K2 | Section B Answer all the 5 Questions (Each unit 2 questions either or pattern) | 5x7 = 35Marks |
| K3 and K4 | Section C Q.No.16 is compulsory. Remaining two questions either or pattern. | 3x15 = 45 Marks |
| Total | | 100 Marks |

❖ Question Paper pattern for Continuous Assessment Test, Modes of assessment for Generic activity and Value added course :

| | | |
|--------------------|--|-------------|
| CIA Tests -I | Multiple choice questions | |
| CIA- II | Descriptive: Section A: | 7 x 2 = 14 |
| | (Answer any 7 out of 10) | |
| | Section B: | 3 x 7 = 21 |
| | (Answer any 3 out of 5) | |
| | Section C : | 1 x 15 = 15 |
| | (Answer any 1 out of 3) | |
| | Total | 50 marks |
| Generic Activity | Conducting Seminars or Micro projects or Group discussion or Problem solving or Assignments. | |
| Value Added Course | Conducting Group discussion or Paper Presentation or Seminars or viva. | |

FIRST SEMESTER

(SYLLABUS)

Course Title: Core Paper-I: Algebra and Trigonometry

.....

| | |
|------------------------------------|-----------------------|
| Course Code : 2 1 3 6 1 0 1 | Credits 04 |
| L:T:P:S : | CIA Marks : 50 |
| Exam Hours : 03 | ESE Marks : 50 |

Course objectives

- **To know about various methods to find the roots of the polynomial equations.**
- **To develop the ability to use binomial, exponential and logarithmic series.**
- **To develop the skills of the students in the area of matrices.**
- **To acquire the basic knowledge of circular and hyperbolic trigonometric functions,**
- **To understand how to separate a complex function into its real and imaginary parts and also various methods for the summation of series.**

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Evaluate summation of series using binomial, exponential and logarithmic series |
| CO2 | Evaluate the sum of the powers of the given equation and also the relation between the roots and coefficients of an equation |
| CO3 | Solve polynomial equations using Newton's Method and Horner's Method, Compute inverse of the matrix using Cayley Hamilton theorem and also obtain eigen values and eigen vectors of different types of matrices. |
| CO4 | Expand $\sin\theta$, $\cos\theta$ and $\tan\theta$ in terms of θ , $\sin n\theta$, $\cos n\theta$ in multiples of θ |
| CO5 | Classify relation between circular and hyperbolic functions and solve problems using hyperbolic & inverse – hyperbolic functions |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Theory of Equations: Polynomial equations with Imaginary and irrational roots- Relation between roots and coefficients- Symmetric functions of roots in terms of coefficients. Reciprocal equations - Standard form -Increase or Decrease the roots of the given equation -Removal of terms Approximate solutions of roots of polynomials by Newton's method, Horner's method. | 12 | CO1 |
| 2. | Summation of Series: Binomial- Exponential -Logarithmic series (Theorems without proof) | 12 | CO2 |
| 3. | Symmetric- Skew Symmetric- Hermitian- Skew Hermitian- Orthogonal Matrices- Eigen values & Eigen Vectors- Similar matrices- Cayley - Hamilton Theorem, Diagonalization. | 12 | CO3 |
| 4. | Expansions of powers of $\sin \theta$, $\cos \theta$ - Expansions of $\cos^n \theta$, $\sin^n \theta$, $\cos^m \theta \sin^n \theta$. Expansions of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\tan (\theta_1+\theta_2 +\dots+\theta_n)$ - Expansions of $\sin x$, $\cos x$, $\tan x$ in terms of x - Sum of roots of trigonometric equations – Formation of equation with trigonometric roots. | 15 | CO4 |
| 5. | Hyperbolic functions-Relation between circular and hyperbolic functions- Formulas in hyperbolic functions – Inverse hyperbolic functions. Inverse function of exponential functions – Values of $\log(u+iv)$ - Complex index. Sums of Trigonometric series – Applications of binomial, exponential, logarithmic and Gregory's series - Difference method. | 12 | CO5 |

Text Book:

1. T.Natarajan, K.S.Ganapathy, Viswanathan Publication 2007. Unit – 1 and 2.
2. Algebra, Volume II by T. K. Manicavachagom Pillay, T.Natarajan, K.S.Ganapathy, Viswanathan Publication 2008. Unit – 3, 4 and 5.
3. Trigonometry by P. Duraipandian and Kayalal Pachaiyappa, Muhil Publishers.

Reference books:

1. Algebra by S. Arumugam (New Gama publishing house, Palayamkottai).
2. Algebra and Trigonometry, Volume I and II by P.R.Vittal, V.Malini (Margham Publishers).
3. Trigonometry, Calculus, Dr. P.R. Vittal, Margham Publications, Chennai.
4. Trigonometry by T.K. Manickavachagam Pillay.S.Viswanathan (Printers and Publishers) Pvt. Ltd.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| CO1 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 |
| CO4 | 3 | 3 | 1 | 3 | 2 | 3 | 1 | 3 | 3 | 2 |
| CO5 | 3 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 2 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation 0

**FIRST SEMESTER
(SYLLABUS)**

Course Title: Core Paper-II: Differential Calculus

.....

| | |
|------------------------------------|-----------------------|
| Course Code : 2 1 3 6 1 0 2 | Credits : 04 |
| L:T:P:S : | CIA Marks : 50 |
| Exam Hours : 03 | ESE Marks : 50 |

Course objectives

- **To develop the ability to use Leibnitz Rule**
- **To know about the method to find the maxima and minima**
- **To develop the skills of the students in the area of Curvature**
- **To learn methods and techniques of finding asymptotes.**

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Evaluate the nth derivative Using Leibnitz Rule |
| CO2 | Finding the maxima and minima for the functions of two variables |
| CO3 | Calculate the Envelope, Evolute, radius of curvature and circle of curvature |
| CO4 | Finding the angle between radius vector and tangent. |
| CO5 | Calculate the asymptotes of the curve |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Successive differentiation - n^{th} derivative- standard results – Trigonometrical transformation – formation of equations using derivatives - Leibnitz's theorem and its applications Chapter 3 section 1.1 to 1.6, 2.1 and 2.2 | 12 | CO1 |
| 2. | Total differential of a function – special cases – implicit functions - partial derivatives of a function of two functions - Maxima and Minima of functions of two variables- Lagrange's method of undetermined multipliers. Chapter 8 : Section 1.3 to 1.5 and 1.7, Section 4, 4.1 and 5. | 12 | CO2 |
| 3. | Envelopes – method of finding envelopes – Curvature- circle, radius and centre of curvature- Cartesian formula for radius of curvature – coordinates of the centre of curvature – evolute-and involute - radius of curvature and centre of curvature in polar coordinates – p-r equation Chapter 10 Section 1.1 to 1.4 and Section 2.1 to 2.7 | 12 | CO3 |
| 4. | Polar coordinates - angle between the radius vector and the tangent – slope of the tangent in the polar coordinates – the angle of intersection of two curves in polar coordinates- polar sub tangent and polar sub normal – the length of arc in polar coordinates. Chapter 9 Section 4.1 to 4.6 | 12 | CO4 |
| 5. | Definition- Asymptotes parallel to the axes – special cases – another method for finding asymptotes -asymptotes by inspection – intersection of a curve with an asymptote. Chapter 11 - Section 1 to 7. | 12 | CO5 |

Text Book:

1. “Calculus”, Volume - 1 by S. Narayanan and T.K. Manicavachagompillay S.Viswanathan publishers – 2006.

Reference books:

1. Calculus, Dr. P.R. Vittal & Dr. V. Malini, Margham Publications, Chennai.
2. Calculus by Thomas and Fenny, Pearson Publication. Calculus by Stewart

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 2 | 2 | 1 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 2 | 2 | 2 | 1 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation 0

**FIRST SEMESTER
(SYLLABUS)**

Course Title: Core Paper-III: Programming with Python

.....

| | |
|------------------------------------|-----------------------|
| Course Code : 2 1 3 6 1 0 3 | Credits : 04 |
| L:T:P:S : | CIA Marks : 50 |
| Exam Hours : 03 | ESE Marks : 50 |

Course objectives

- **To make students understand the concepts of PYTHON programming.**
- **To apply the OOPs concept in PYTHON programming.**
- **To make the students learn best practices in PYTHON programming.**

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Understand the concept of operators, data types in python programming. |
| CO2 | Understand control statements and Looping |
| CO3 | Apply the concept of functions in python programming. |
| CO4 | Understand the concept of formatting operator and strings |
| CO5 | Analyze the structures of list, tuples and maintaining dictionaries |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Basics of Python Programming: Features – History – Future – Python Interpreter and Interactive Mode – Writing and Executing First Python Programme – Values and Types – Data Types – Operators and Expressions – Operations on Strings – Type Conversion – Comments – Functions and Modules. Chapter 2: Section 2.1 – 2.22 | 12 | CO1 |
| 2. | Control Flow Statements: Introduction to Decision Control Statements – Conditional Branching –Loops Structures – Nested Loops – Break – Continue – Pass – Else Statement Used with Loops. Chapter 3: Section 3.1 – 3.8 | 12 | CO2 |
| 3. | Functions: Introduction – Defining a function– Function Call – Variable Scope and Lifetime – Fruitful Function –Lambda – Function Composition – Documentation Strings –Recursive Functions Chapter 4: Section 4.1 – 4.8, 4.10 (Omit 4.9) | 12 | CO3 |
| 4. | Strings: Concatenating, Appending, and Multiplying Strings – Immutable – Formatting Operator – Built-in String Methods and Functions – Slice Operation – Comparing Strings – Iterating String. Lists, Tuples and Dictionaries: Sequence – Lists. Chapter 5: Section 5.1 – 5.5, 5.8, 5.9 (Omit 5.6, 5.7) Chapter 6: Section 6.1 to 6.2 | 12 | CO4 |
| 5. | Lists, Tuples and Dictionaries: Tuple – Dictionaries File Handling: Opening and Closing Files – Reading and Writing Files. Error and Exception Handling: Introduction – Handling Exceptions. Chapter 6: Section 6.4 to 6.5 (Omit 6.3) Chapter 7: Section 7.4, 7.5 Chapter 8: Section 8.1, 8.2 | 12 | CO5 |

Text Book:

1. “Problem Solving and Programming with Python”, by ReemaThareja (Second Edition, 2019, OXFORD University Press)

Reference books:

1. Problem Solving and Python Programming” by Mr. Ashok NamdevKamthane and Mr.Amit Ashok Kamthane (McGraw Hill Education (India) Private Limited).
2. “Python Programming” by Ch.Sathyanaarayana, M.Radhika

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 1 | 0 | 0 | 3 | 2 | 3 | 1 | 2 |
| CO2 | 1 | 2 | 2 | 0 | 0 | 2 | 1 | 2 | 3 | 3 |
| CO3 | 3 | 1 | 2 | 0 | 0 | 1 | 2 | 3 | 2 | 2 |
| CO4 | 2 | 3 | 1 | 0 | 0 | 2 | 2 | 1 | 2 | 1 |
| CO5 | 3 | 2 | 2 | 0 | 0 | 1 | 1 | 2 | 1 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

**FIRST SEMESTER
(SYLLABUS)**

**Course Title: Core Paper-IV: Python Programming – Lab
Course Code : 2 1 3 6 1 0 5**

Write a Python Program for the following

1. Compute the Area and Circumference of a Circle
2. To find the greatest among three numbers
3. Program to calculate roots of a quadratic equation
4. Determine the given number is an Armstrong number
5. Compute the G.C.D. of two Numbers
6. Sum the series:
 $1/1+2^2/2+3^2/3+\dots+n^2/n$
7. Finding Factorial of a number
8. To print the Fibonacci Series using recursion
9. Count the occurrences of a character in a string
10. Program to reverse a string
11. Calculate distance between two points
12. To add two matrices
13. Print a histogram of frequencies of characters occurring in a message
14. Generate Floyd's triangle.
15. Implement Tower of Hanoi problem

**FIRST SEMESTER
(SYLLABUS)
Course Title: Part IV Paper: Non – Major Elective-I**

.....

| | |
|------------------------------------|-----------------------|
| Course Code : 2 1 3 6 1 0 4 | Credits 02 |
| L:T:P:S : | CIA Marks : 50 |
| Exam Hours : 1.30Hrs. | ESE Marks : 50 |

Course objectives

- **On taking this course the student will be able to attain solid foundation for preparing to Competitive exams.**
- **To enhance the Quantitative aptitude and problem solving skills.**

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Solve real time problems on Ratio and Proportion. |
| CO2 | Determine percentages effectively. |
| CO3 | Expound Profit and loss and Discounts |
| CO4 | Compute Simple Interest, and Compound Interest through secondary data. |
| CO5 | Efficiently solve equations and problems on Ages and Numbers. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | Ratio and Proportion | 12 | CO1 |
| 2. | Percentages | 12 | CO2 |
| 3. | Profit and Loss, Discounts | 12 | CO3 |
| 4. | Simple Interest and Compound interest | 12 | CO4 |
| 5. | Solutions of Simultaneous equations, Problems on Ages and Numbers. | 12 | CO5 |

Text Book:

1. Quantitative Aptitude- R.S. Agarwal.

Reference books:

1. Analytical Reasoning by M K Panday.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | 3 | 1 | 2 | 2 | 2 | 3 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 3 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 2 | 2 | 1 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 2 | 2 | 2 | 1 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation 0

SECOND SEMESTER

(SYLLABUS)

Course Title: Core Paper-V: Analytical Geometry

.....

| | | |
|-----------------------------|-----------|------|
| Course Code : 2 1 3 6 2 1 0 | Credits | 04 |
| L:T:P:S : | CIA Marks | : 50 |
| Exam Hours : 03 | ESE Marks | : 50 |

Course objectives

- To gain knowledge in evaluating chord of contact, polar equation.
- To develop the concept of system of planes, angle between the line and plane.
- To develop the idea of the equation of sphere and cone.

Course Outcomes: At the end of the course, students will be able to

| | |
|-----|--|
| CO1 | Understand the concept of equation of straight line, circle, conic, chord and tangent, normal equations of hyperbola |
| CO2 | Solve the problems in System of Planes - Length of the perpendicular – Orthogonal projection |
| CO3 | Estimate the angle between the line and plane, coplanar lines and shortest distance to skewness. |
| CO4 | Understand the concept of equation of sphere and its applications |
| CO5 | Understand the concept of equation of cone and its types |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | Chord of contact – polar and pole, conjugate points and conjugate lines. Polar coordinates: General polar equation of straight line – Polar equation of a circle on A_1A_2 as diameter, Equation of a straight line, circle, conic – Equation of chord, tangent, normal. Equations of the asymptotes of a hyperbola. | 12 | CO1 |
| 2. | Introduction – System of Planes - Length of the perpendicular – Orthogonal projection. | 12 | CO2 |
| 3. | Representation of line – angle between a line and a plane- co-planar lines- shortest distance to skewlines- Length of the perpendicular- intersection of three planes | 12 | CO3 |
| 4. | Equation of a sphere - general equation - section of a sphere by a plane - equation of the circle -tangent plane - angle of intersection of two spheres- condition for the orthogonality -radical plane. | 13 | CO4 |
| 5. | Equation of a cone with vertex as origin, Equation of a quadric cone given the vertex and the guiding curve, Condition for a general equation of second degree to represent a cone, equation of right circular cone given the vertex, axis and semi vertical angle, equation of the enveloping cone of a sphere with centre at origin. | 12 | CO5 |

Text Book:

1. Analytical Geometry of 2D by P.Durai Pandian- Muhil publishers for Unit – 1
2. Analytical Solid Geometry of 3D by Shanthi Narayan and Dr.P.K. Mittal-S.Chand& Co.Pvt.Ltd.- for Unit – 2 to 5

Reference books:

1. Trigonometry by T.K. Manickavachagam Pillay. S.Viswanathan (Printers and Publishers) Pvt. Ltd.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 1 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | 2 | 1 |
| CO4 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 2 |
| CO5 | 3 | 3 | 1 | 3 | 2 | 3 | 3 | 3 | 1 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation 0

SECOND SEMESTER

(SYLLABUS)

Course Title: Core Paper-VI: Integral Calculus and Vector Analysis

.....

| | |
|-----------------------------|----------------|
| Course Code : 2 1 3 6 2 1 1 | Credits : 04 |
| L:T:P:S : | CIA Marks : 50 |
| Exam Hours : 03 | ESE Marks : 50 |

Course objectives

- To develop the ability to use Reduction formula
- To know about the method to find the Volume
- To develop the skills of the students in the Indefinite Integral.
- To learn methods and techniques of solving line and surface Integral.

Course Outcomes: At the end of the course, students will be able to

| | |
|-----|---|
| CO1 | Evaluate the Integral using Reduction formula |
| CO2 | Calculate Area and Volume using double and triple Integral |
| CO3 | Evaluate the Indefinite Integral using the properties of Beta and Gamma function. |
| CO4 | Calculate directional derivatives, Curl, divergence. |
| CO5 | Solve Line and Surface Integral using Greens, stokes and Gauss theorem |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | Reduction formulae–Types, $\int x^n e^{ax} dx$, $\int x^n \cos ax dx$, $\int x^n \sin ax dx$, $\int \cos^n x dx$, $\int \sin^n x dx$, $\int \sin^m x \cos^n x dx$, $\int \tan^n x dx$, $\int \cot^n x dx$, $\int \sec^n x dx$, $\int \operatorname{cosec}^n x dx$, $\int (\log x)^m dx$ -Bernoulli's formula. Chapter 1 Section 13, 13.1 to 13.10,14,15.1. | 12 | CO1 |
| 2. | Multiple Integrals- definition of the double integrals- evaluation of the double integrals- double integrals in polar coordinates – triple integrals – applications of multiple integrals – volumes of solids of revolution – areas of curved surfaces – change of variables – Jacobians. Chapter 5 Section 1, 2.1, 2.2, 3.1, 4, 6.1, 6.2, 6.3, 7 Chapter 6 Section 1.1, 1.2, 2.1 to 2.4 | 12 | CO2 |
| 3. | Beta and Gamma functions - infinite integral –definitions – recurrence formula of Gamma functions -properties of Gamma-functions - relation between Beta and Gamma functions. Evaluation of double and triple integrals using Beta gamma functions. | 12 | CO3 |
| 4. | Introduction - directional derivative- Gradient- divergence- curl- Laplacian Differential Operator. Chapter 2 Sections 2.1 - 2.13. | 13 | CO4 |
| 5. | Line, surface and volume integrals - Integral Theorems - Gauss, Greens and Stokes (Without proof) –Problems. Chapter 3 Sections 3.1 to 3.6 and Chapter 4 Sections 4.1 to 4.5. | 12 | CO5 |

Text Book:

1. “Calculus”, Vol-II by S.Narayanan and T.K.Manicavachagampilla S. Viswanathan publishers– 2007 for Unit 1, Unit 2, Unit 3.
2. “Vector Analysis” by P.Duraipandian and Kayalal Pachaiyappa, S.Chand For Unit 4, Unit 5.

Reference books:

1. Integral Calculus and differential equations: Dipak Chatterjee (TATA McGrawHill Publishing company Ltd.).
2. Vector Algebra and Analysis by Narayanan and T.K.Manickvachagam Pillay S. Viswanathan Publishers.
Vector Analysis: Murray Spiegel (Schaum Publishing Company, New York).

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

SECOND SEMESTER

(SYLLABUS)

Course Title: Core Paper-VII: Java and Data Structures

.....

| | |
|--------------------------------|-----------------------|
| Course Code : 3 6 2 1 2 | Credits 04 |
| L:T:P:S : | CIA Marks : 50 |
| Exam Hours : 03 | ESE Marks : 50 |

Course objectives

- Explaining the concept of data structures and its applications.
- Structuring the Applications of Arrays, Searching Techniques.
- Emphasizing the types of Linked Lists and Polynomials.
- Explaining the Types of Trees.
- Elaborating the concepts of Graphs, Dijkstra's Shortest Path

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Knows the reason about the evolution of Java its development. Study the basic of Java and to develop code. Importance of Java comparing the other language. |
| CO2 | Develop program using constructors and its types. Definition of inheritance and Writing programmed related to it. Differentiate string class and string buffer. |
| CO3 | Concept of packages, interface, threads. Implementing the concept Exception handling various application. Significance of exception handling. Life cycle of thread. |
| CO4 | To Demonstrate the Definition and Classification of Arrays. To elaborate the operations and applications of Stack. To impart the applications of Queues and operations on the Queues. |
| CO5 | To elaborate the Addition of Polynomials. To study the Operations on Linked Lists. Representation of Binary Trees and Tree Traversal. To Point out the Importance of Graphs, Traversals and Algorithms. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | History and Evolution of Java - Features of Java - Object Oriented Concepts - Bytecode - Lexical Issues- Data Types – Variables-Type Conversion and Casting- Operators - Arithmetic Operators-Bitwise - Relational Operators - Assignment Operator -The conditional Operator - Operator Precedence- Control Statements - Arrays. | 12 | CO1 |
| 2. | Classes - Objects - Constructors - Overloading method - Static and fixed methods - Inner Classes - String Class- Overriding methods - Using super-Abstract class - this keyword – finalize() method – Garbage Collection. | 12 | CO2 |
| 3. | Packages - Access Protection - Importing Packages - Interfaces - Exception Handling - Throw and Throws-The Java Thread Model- Creating a Thread and Multiple Threads - Thread Priorities Synchronization-Inter thread Communication - Deadlock - Suspending, Resuming and stopping threads– Multithreading-I/O Streams - File Streams – Applets | 12 | CO3 |
| 4. | Data Structures: Definition of a Data structure – primitive and composite Data Types, Arrays, Operations on Arrays, Order lists. Stacks – Operations on stack - Applications of Stack - Infix to Postfix Conversion – Evaluation of postfix expression; Recursion. Queues - Circular Queue - Operations on Queues, Queue Applications. | 13 | CO4 |
| 5. | Singly Linked List -Operations, Application -Representation of a Polynomial, Polynomial Addition; Doubly Linked List OperTrees: Binary Trees – definitions ations. Tree Traversals, Graph - Definition, Types of Graphs - Graph traversal. | 12 | CO5 |

Text Book:

1. E.Balagurusamy, “*Programming with Java: A Primer*”, Tata McGraw Hill 2014, 5th Edition.
2. Mark Allen Weiss, “*Data Structures and Algorithms Analysis in C++*”, Person Education 2014, 4th Edition.

Reference books:

1. Herbert Schildt, “*JAVA 2: The Complete Reference*”, McGraw Hill, 2018, 11th Edition.
2. Aho, Hopcroft and Ullman, “*Data Structures and Algorithms*”, Pearson Education 2003.
3. S. Sahni, “*Data Structures, Algorithms and Applications in JAVA*”, Universities Press 2005, 2nd Edition.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| CO1 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

SECOND SEMESTER

(SYLLABUS)

Course Title: Core Paper-VIII: Data Structures using Java – Lab
Course Code: 36214

List of Exercises:

1. Write a Java program to implement the Stack ADT using a singly linked list.
2. Write a Java program to implement the Queue ADT using a singly linked list.
3. Write a Java program that reads an infix expression, converts into postfix form
4. Write a Java program to evaluate the postfix expression (use stack ADT).
5. Write a Java program to an Insert, delete an element into a binary search tree.
6. Write a Java program to search for a key element in a binary search tree.
7. Write a Java program for the implementation of BFS for a given graph.
8. Write a Java program for the implementation of DFS for a given graph

**SECOND SEMESTER
(SYLLABUS)
Course Title: Non – Major Elective Paper II-Functional
Mathematics-II**

.....
.....

| | | |
|------------------------------------|------------------|-------------|
| Course Code : 2 1 3 6 2 1 3 | Credits | 02 |
| L:T:P:S : | CIA Marks | : 50 |
| Exam Hours : 1.30 Hrs. | ESE Marks | : 50 |

Course objectives

- **On taking this course the student will be able to attain solid foundation for preparing to Competitive exams.**
- **To enhance the Quantitative aptitude and problem solving skills.**

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Acquire skills of Solving Problems on Time & work and Pipes and Cisterns |
| CO2 | Determine Time and Distance, Relative speeds efficiently. |
| CO3 | solve problems on Area and volume of 3 dimensional objects |
| CO4 | Untangle problems on Polygons, their interior angle and diagonals |
| CO5 | expound problems on Stocks and shares. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | Time and work – Pipes and cisterns- Problem | 12 | CO1 |
| 2. | Time and Distance, Relative speeds- Problems on Races, Boats and Trains. | 12 | CO2 |
| 3. | Mensuration – Problems | 12 | CO3 |
| 4. | Polygons – Interior angles- Number of diagonals- Regular Polygons-Problems | 12 | CO4 |
| 5. | Stocks and Shares – Problems | 12 | CO5 |

Text Book:

1. Quantitative Aptitude- R.S. Agarwal.
2. Functional Mathematics, M. Sivananda Rani, Margham Publications, Chennai.

Reference books:

Analytical Reasoning by M K Panday

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 3 |
| CO2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 3 |
| CO4 | 3 | 2 | 1 | 2 | 2 | 2 | 1 | 3 | 2 | 3 |
| CO5 | 3 | 2 | 3 | 2 | 2 | 2 | 1 | 3 | 2 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlat

THIRD SEMESTER

(SYLLABUS)

Course Title: Core Paper – IX Differential Equations

.....

| | | |
|-----------------------------|-----------|------|
| Course Code : 2 1 3 6 3 2 0 | Credits | 04 |
| L:T:P:S : | CIA Marks | : 50 |
| Exam Hours : 03 | ESE Marks | : 50 |

Course Objective:

- To solve first order Ordinary differential equations
- To evaluate particular integrals of special forms
- To solve non homogeneous simultaneous linear differential equations
- To compute complete, singular and general integrals of partial differential equations
- To apply Charpits method

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|---|
| CO1 | Solve linear differential equation and Demonstrate Bernoulli's equation and exactness of first order differential equations |
| CO2 | Exhibit Clairaut's form and solve linear differential equations with constant coefficients |
| CO3 | Apply variation of parameter method to solve second order differential equations |
| CO4 | Demonstrate Partial differential equations and its solutions |
| CO5 | Implement Charpit's method |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Ordinary Differential Equations: Concept of existence and uniqueness . Variable separable-Homogeneous Equation-Non-Homogeneous Equations of first degree in x and y-Linear Equation-Bernoulli's Equation-Exact differential equations. Chapter 2: Section 1 to 6. | 12 | CO1 |
| 2. | Equation of first order but not of higher degree: Equation solvable for dy/dx- Equation solvable for y- Equation solvable for x- Clairauts form- Linear Equations with constant coefficients-Particular integrals e^{ax} , $\sin ax$, $\cos ax$, x^m , Ve^{ax} where V is $\sin ax$ or $\cos ax$ or x^m . Chapter 4: Section 1, 2.1, 2.2, 3.1, Chapter 5: Section 4. | 12 | CO2 |
| 3. | Simultaneous linear differential equations- Linear Equations of the Second Order -Complete solution in terms of a known integrals-Reduction to the Normal form- Change of the Independent Variable - Method of Variation of Parameters. Chapter 6: Section- 6 ,Chapter 8:Section- 1,2,3,4. | 11 | CO3 |
| 4. | Partial differential equation: Formation of PDE by Eliminating arbitrary constants and arbitrary functions-complete integral-singular integral-General integral- Lagrange's Linear Equations $Pp+Qq=R$. Chapter 12: Section- 1, 2, 3.1, 3.2, 4. | 15 | CO4 |
| 5. | Special methods - Standard forms - Charpit's Methods - Related problems Chapter 12: Section-5.1, 5.2, 5.3, 5.4, 6. | 10 | CO5 |

TEXT BOOK:

“Differential Equations and its applications”, by

S.Narayanan, T.K.Manikavachagam Pillay — S.Viswanathan (Printers and Publishers) Pvt. Ltd(2006).

Reference books:

1. Mathematics for B.Sc-Branch-I Volume –III by P.Kandasamy ,K.Thilagavathy S.Chand Publications.
2. Differential equations with applications and historical notes by George F.Simmons, 2ndEd,TataMcgraw Hill Publications
3. Differential Equations by ShepleyL.Ross, 3 rdEd ,JohnWiely and sons 1984.4
4. Differential Equations by N.P.Bali,Laxmi Publications Ltd,New Delhi-2004. Ordinary and Partial differential Equation by Dr.M.D.Raisinghaniania ,S.Chand.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| CO1 | 2 | 2 | 2 | | | 2 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 3 | 2 | | | 1 | 2 | 1 | 2 | 2 |
| CO3 | 2 | 2 | 1 | | | 2 | 2 | 2 | 3 | 2 |
| CO4 | 1 | 2 | 2 | | | 2 | 3 | 3 | 2 | 3 |
| CO5 | 3 | 2 | 3 | | | 2 | 2 | 2 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

THIRD SEMESTER

(SYLLABUS)

Course Title: Allied Paper- PROBABILITY AND STATISTICS – I

.....

| | | |
|-----------------------------|-----------|------|
| Course Code : 2 1 3 6 3 2 2 | Credits | 05 |
| L:T:P:S : | CIA Marks | : 50 |
| Exam Hours : 03 | ESE Marks | : 50 |

Course Objective:

Students will acquire knowledge of

- The laws of Probability and Baye's theorem.
- Measures of Location, Dispersion, Correlation and Regression
- The Discrete and Continuous Probability Distribution

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Illustrate and describe sample spaces and events for random experiments. and calculate probabilities of event in discrete sample spaces and conditional probabilities of events using Baye's theorem. |
| CO2 | Calculate the expected value of a probability distribution, obtain moments and its generating function and also obtain probability generating function |
| CO3 | Apply the concepts of characteristic function and Chebychev's Inequality and demonstrate the theorems related to convergence in probability |
| CO4 | Study the relationship between two or more variables |
| CO5 | Illustrate the concept of a probability distribution and sketch the same to real world problems involving various distributions like Binomial, Poisson and Normal distribution, Uniform distributions Geometric, Exponential, Gamma, Beta distributions and identify the Inter relationship between distributions. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | UNIT-I: Concept of sample space – Events – Definition of Probability (classical, Statistical & Axiomatic) – Addition and Multiplication laws of Probability for 2 events – Extension of Addition and Multiplication laws of events (Statement only) – Independence – Conditional Probability – Baye’s theorem - Simple Problems | 12 | CO1 |
| 2. | UNIT- II: Random Variables (Discrete and Continuous) Distribution function- Expected values and Moments- Moment generating function – Probability generating function- Examples | 12 | CO2 |
| 3. | UNIT–III: Characteristic function- Uniqueness and Inversion theorems (Statements and applications only)- Cumulants - Chebychev’s Inequality – Simple Problems. Convergence in probability, Weak Law of large numbers with numerical examples, Central Limit Theorem | 11 | CO3 |
| 4. | UNIT-IV: Concepts of bivariate distributions- Correlation and Regression- Linear Prediction- Rank Correlation coefficient, Intra class correlation coefficient, Concepts of partial and multiple correlation coefficients- Simple problems. | 15 | CO4 |
| 5. | UNIT-V: Standard Distributions – Bernoulli Distribution, Binomial- Poisson- Normal- Uniform distributions- Geometric- Exponential- Gamma -Beta distributions- Inter relationship between distributions. | 10 | CO5 |

TEXT BOOK:

Elements of Mathematical Statistics, by S.C.Gupta &V.K.Kapoor, Sultan Chand & Sons, New Delhi.

Reference books:

1. Hogg R.V. & Craig A.T. (1988) : Introduction to Mathematical Statistics, McMillan.
2. Mood A.M. & Graybill F.A. & Boes D.G. (1974): Introduction to theory of Statistics, McGraw Hill.
3. Snedecor G.W. & Cochran W.G(1967) : Statistical Methods, Oxford and IBH.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 3 | 2 | 1 | 2 | 2 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 2 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

THIRD SEMESTER

(SYLLABUS)

Course Title: Core Paper – X Operating Systems

.....

| | |
|-----------------------------|----------------|
| Course Code : 2 1 3 6 3 2 1 | Credits 04 |
| L:T:P:S : | CIA Marks : 50 |
| Exam Hours : 03 | ESE Marks : 50 |

Course Objective:

- To state the services provided to the user and hardware by operating system.
- To learn the mechanisms of OS to handle processes and threads and their communication.
- To communicate with the process through system calls.
- To define deadlocks and identify its presence in the system.
- To design appropriate memory management scheme.
- To explores various techniques of allocating memory to processes.
- To discuss file system including access methods, file locking, and directory structures.
- To describe the details of implementing local file systems and directory structures
- To discuss the goals and principles of protection in a modern computer system.

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|---|
| CO1 | Describe the basic structure and functionality of operating system. Inter process communication. |
| CO2 | Allocation of process through scheduling algorithms. Define critical section problems and its usage. |
| CO3 | Prevention of multiple process execution through the concept of semaphores. Apply the deadlock handling mechanisms to solve the given problem. Understand various techniques of allocating memory to processes. |
| CO4 | Understand the strategies of memory management schemes and the usage of virtual memory. Apply suitable page replacement algorithms to avoid thrashing. Understand the structure and organization of the file system |
| CO5 | Understand the principles of protection and security mechanisms |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | Unit 1 Introduction: Views-Types of system- OS Structure-Operations-Services-Interface-systemcalls -system structure-system design and implementation process management ;process -process scheduling-interprocess communication. CPU scheduling; CPU schedulers-Scheduling criteria-scheduling algorithm | 12 | CO1 |
| 2. | Unit 2 Process Synchronization: Critical-Section Problem Synchronization Hardware Semaphores-Classical Problems of Synchronization Monitors. Deadlocks: Characterization- Methods for Handling Deadlocks Deadlock Prevention- Avoidance-Detection-Recovery. | 12 | CO2 |
| 3. | Unit 3 Memory Management: Hardware- Address Binding–Address Space Dynamic Loading and Linking– Swapping – Contiguous Allocation-Segmentation - Paging– Structure of the Page Table. | 11 | CO3 |
| 4. | Unit 4 Virtual Memory Management: Demand Paging- Page Replacement Algorithms-Thrashing. File System: File Concept Access Methods-Directory and Disk Structure-Protection-File System Structures-Allocation Methods-Free Space Management. | 15 | CO4 |
| 5. | Unit 5 I/O Systems: Overview- I/O Hardware- Application I/O Interface-Kernel I/O Subsystem-Transforming I/O Requests to Hardware Operations-Performance. System Protection: Goals-Domain-Access matrix. System Security: The Security Problem- Threats–Encryption-User Authentication. | 10 | CO5 |

TEXT BOOK:

Abraham Silberschatz, Peter B Galvin, Gerg Gagne, “*Operating System Concepts*”, Wiley India Pvt.Ltd. 2018, 9th Edition.

Reference books:

1. William Stallings, “*Operating Systems Internals and Design Principles*”, Pearson, 2018, 9th Edition.
2. Andrew S. Tanenbaum, Herbert Bos, “*Modern Operating Systems*”, Pearson 2014, 4th Edition.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | 2 | | | 2 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 3 | 2 | | | 1 | 2 | 1 | 2 | 2 |
| CO3 | 2 | 2 | 1 | | | 2 | 2 | 2 | 3 | 2 |
| CO4 | 1 | 2 | 2 | | | 2 | 3 | 3 | 2 | 3 |
| CO5 | 3 | 2 | 3 | | | 2 | 2 | 2 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

FOURTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XI **Integral Transforms**

.....

| | |
|------------------------------------|-----------------------|
| Course Code : 2 1 3 6 4 2 7 | Credits 04 |
| L:T:P:S : | CIA Marks : 50 |
| Exam Hours : 03 | ESE Marks : 50 |

Course Objective:

- **To understand Laplace Transform**
- **To apply Laplace transform to solve differential equations**
- **To analyse Fourier series and its applicability**
- **To compute Fourier Transform**
- **To apply Z Transforms to difference equations**

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Analyse Laplace transform and the conditions of existence of Laplace transform |
| CO2 | Implement the Laplace transform technique to solve differential equations |
| CO3 | Study the expansion of periodic functions using Fourier Series |
| CO4 | Demonstrate the Fourier transform and its properties |
| CO5 | Apply Z transform for difference equations |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Unit I: The Laplace Transforms-Definitions-Sufficient conditions for the existence of the Laplace transform(without proof)-Laplace transform of periodic functions-some general theorems-evaluation of integrals using Laplace transform-Problems. Chapter 5: Section-1 to 5. | 12 | CO1 |
| 2. | Unit II: The inverse Laplace Transforms- Applications of Laplace Transforms to ordinary differential equations with constant co-efficients and variable co-efficients, simultaneous equations and equations involving integrals-Problems. Chapter 5: Section-6 to 12. | 12 | CO2 |
| 3. | Unit III: Fourier series- Expansion of periodic functions of period 2π -Expansion of even and odd functions, Half range Fourier series-Change of intervals –Problems. Chapter 6: Section-1 to 6 | 11 | CO3 |
| 4. | Unit IV: Fourier Transform- Infinite Fourier Transform(Complex form) – Properties of Fourier Transform – Fourier cosine and Fourier sine Transform – Properties – Parseval’s identity – Convolution theorem - Problems. Chapter 6: Section-8 to 15. | 15 | CO4 |
| 5. | Unit V: Z Transforms: Definition of Z-Transform and its properties - Z-Transforms of some basic functions- Formation of difference equations – Solution of difference equations using Z – transform- Examples and simple problems | 10 | CO5 |

TEXT BOOK:

1. “Calculus-Volume III” – S.Narayanan and T.K.ManicavachagamPillai. (Ananda Book Depot)
2. “Engineering Mathematics for Semester III- Third Edition – T.Veerarajan (Tata McGraw-Hill Publishing Company Ltd, New Delhi) (for Unit-V)

Reference books:

1. Engineering Mathematics Volume III – P.Kandasamy and others (S.Chand and Co.)
2. Advanced Engineering Mathematics- Stanley Grossman and William R.Devit.
3. Engineering Mathematics III-A.Singaravelu, Meenakshi Agency, Chenani, 2008

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | | | 2 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 3 | 1 | | | 1 | 2 | 1 | 2 | 2 |
| CO3 | 2 | 2 | 2 | | | 2 | 2 | 2 | 3 | 2 |
| CO4 | 2 | 3 | 2 | | | 2 | 3 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 2 | | | 2 | 2 | 2 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

FOURTH SEMESTER

(SYLLABUS)

Course Title: Allied Paper II- PROBABILITY AND STATISTICS – II

.....

| | |
|-----------------------------|----------------|
| Course Code : 2 1 3 6 4 2 9 | Credits : 05 |
| L:T:P:S : | CIA Marks : 50 |
| Exam Hours : 03 | ESE Marks : 50 |

Course Objective:

Students will acquire knowledge

- To provide the foundation of statistical analysis used in varied application of Sampling methods
- Tests of significance and testing of hypothesis.

Course Outcomes: At the end of the course, students will be able to

| | |
|-----|---|
| CO1 | Identify a statistic and point out its importance in application and summarize the theoretical aspect of normal and non-normal populations. |
| CO2 | Explain the bound for defining most efficient estimates derived from Rao Cramer inequality and compare the process of finding interval estimation with the process of finding point estimation. |
| CO3 | Fit best approximation for a given set of data and also compare and analyze whether two sets of data are coming from same population or different population |
| CO4 | Analyze the variability of samples under the given distributions and also obtain its confidence intervals |
| CO5 | Point out the existence of most powerful test by summarizing the theoretical aspects of Neymann Pearson result. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | UNIT-I: Sampling Distributions – Concept of Standard error – Sampling distribution based on normal distribution- t, z, Chi Square and F distributions. | 12 | CO1 |
| 2. | UNIT- II Point estimation – Concepts of unbiasedness – consistency – efficiency and sufficiency- Cramer Rao inequality – Methods of estimation- Maximum likelihood- moments - minimum square and their properties (Statement only). | 12 | CO2 |
| 3. | UNIT–III: Test of significance – Standard error- Large sample test, Exact test based on normal, t, chi-square and F idistribution with respect to population mean/means, proportion/proportions, variance and correlation coefficient. Test of independence of attributes based on contingency tables- Goodness of fit based on chi-square. | 11 | CO3 |
| 4. | UNIT-IV: Analysis of Variance: One way, two way classification concepts & Problems. Interval estimation – Confidence intervals for population mean/means- Proportion/proportions and variances based on t, Chi-Square and F. | 15 | CO4 |
| 5. | UNIT-V: Test of hypothesis- Type I and II errors- Power of test – Neymann Pearson lemma- Likelihood ratio test-concepts of most powerful test- statements and results only-simple problems, Concept of p-value, Power of test. | 10 | CO5 |

TEXT BOOK:

Elements of Mathematical Statistics, by S.C.Gupta & V.K.Kapoor, Sultan Chand & Sons, New Delhi.

Reference books:

1. Hogg R.V. & Craig A.T. (1988): Introduction to Mathematical Statistics, McMillan.
2. Mood A.M. & Graybill F.A. & Boes D.G. (1974): Introduction to theory of Statistics, McGraw Hill.
3. Snedecor G.W. & Cochran W.G (1967) : Statistical Methods, Oxford and IBH.
4. Hoel P.G. (1971) : Introduction to Mathematical Statistics, Wiley.
5. Wilks S.S. Elementary Statistical Analysis, Oxford and IBH.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 1 | 1 | 1 | 3 | 3 | 2 | 2 |
| CO3 | 2 | 3 | 3 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 2 |
| CO5 | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

FOURTH SEMESTER

(SYLLABUS)

Course Title: Core Paper XII- DISCRETE MATHEMATICS

.....

| | | |
|-----------------------------|-----------|------|
| Course Code : 2 1 3 6 4 2 8 | Credits | 04 |
| L:T:P:S : | CIA Marks | : 50 |
| Exam Hours : 03 | ESE Marks | : 50 |

Course Objective:

Students will acquire knowledge

- To apply tools and ideas in Mathematics for solving Applied Problems.
- To Evaluate Boolean functions and to express a logic sentence in terms of predicates, quantifiers, and logical connectives.

Course Outcomes: At the end of the course, students will be able to

| | |
|-----|---|
| CO1 | Analyse the divisibility of integer and also representation of |
| CO2 | Apply Boolean algebra concepts in disjunctive and conjunctive normal form |
| CO3 | Identifying, designing and analyzing circuits, logical gates and combinatorial circuits |
| CO4 | Demonstrate recursive function and classify homogeneous and non-homogeneous linear recurrence relations |
| CO5 | Demonstrate Proportional logic and Predicate logic |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | UNIT-I: Integers: Set, some basic properties of integers, Mathematical induction, divisibility of integers, representation of positive integers Chapter 1 - Sections 1.1 to 1.5 | 12 | CO1 |
| 2. | UNIT- II: Boolean algebra & Applications: Boolean algebra, two element Boolean algebra, Disjunctive normal form, Conjunctive normal form Chapter 5 - Sections 5.1 to 5.4 | 12 | CO2 |
| 3. | UNIT-III: Application, Simplification of circuits, Designing of switching circuits, Logical Gates and Combinatorial circuits. Chapter 5 - Section 5.5, 5.6 | 11 | CO3 |
| 4. | UNIT-IV: Recurrence relations and Generating functions: Sequence and recurrence relation, Solving recurrence relations by iteration method, Modeling of counting problems by recurrence relations, Linear (difference equations) recurrence relations with constant coefficients, Generating functions, Sum and product of two generating functions, Useful generating functions, Combinatorial problems. Chapter 6 - Section 6.1 to 6.6 | 15 | CO4 |
| 5. | UNIT-V: Proportional logic and Predicate logic: Proportional logic, Adequate system of connectives, Translation of sentences in a Natural Language into Statement Formula, Logical validity of arguments, Predicate Logic, Negation of a statement obtained by qualification of a predicate, Logical operations on predicates or quantified predicates, Symbolization of sentences by using predicates, Quantifiers and connectives, Logical validity of arguments. Chapter 8 - Sections 8.1, 8.5 to 8.8 (Omit Section 8.2 to 8.4) | 10 | CO5 |

TEXT BOOK:

“Introduction to Discrete Mathematics”, 2nd edition, 2002 by M.K. Sen and B. C. Chakraborty, Books and Allied Private Ltd., Kolkata.

Reference books:

1. Discrete mathematics for computer scientists and mathematicians by J. LMertt, AbrahamKendel and T. P. Baker prentice-hall, India.
2. Discrete mathematics for computer scientists by John Truss- Addison Wesley.
3. Elements of Discrete Mathematics, C. L. Liu, New York McGraw- Hill, 1977.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| CO2 | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| CO4 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 |
| CO5 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

FIFTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XIII ALGEBRAIC STRUCTURES

.....

| | | |
|----------------------|-----------|------|
| Course Code: 2136535 | Credits | 05 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: 03 | ESE Marks | : 50 |

Course Objective:

- Students will acquire knowledge about the concepts of Sets, Groups and Rings.

Course Outcomes: At the end of the course, students will be able to

| | |
|-----|--|
| CO1 | Summarize the structure of Group, Subgroups and Demonstrate operations satisfying various properties in group structure. |
| CO2 | Explain normal subgroups, quotient groups, homomorphism, automorphism and demonstrate with an example. |
| CO3 | Explain Cayley's theorem, the permutations groups with an example. |
| CO4 | Define Rings, some special classes of rings with an example and Explain ideals and quotient Rings |
| CO5 | Illustrate Imbedding of Integral domain over Field and demonstrate the Euclidean Rings. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | Introduction to groups- Subgroups- cyclic groups and properties of cyclic groups- Lagrange's Theorem- A counting principle. Chapter 2 Section 2.4 and 2.5. | 12 | CO1 |
| 2. | Normal subgroups and Quotient group- Homomorphism- Automorphism. Chapter 2 Section 2.6 to 2.8. | 12 | CO2 |
| 3. | Cayley's Theorem- Permutation groups. Chapter 2 Section 2.9 and 2.10. | 11 | CO3 |
| 4. | Definition and examples of ring- Some special classes of rings- homomorphism of rings- Ideals and quotient rings- More ideals and quotient rings. Chapter 3 Section 3.1 to 3.5. | 15 | CO4 |
| 5. | The field of quotients of an integral domain- Euclidean Rings- The particular Euclidean ring. Section 3.6 to 3.8. | 10 | CO5 |

TEXT BOOK:

"Topics in Algebra" – I. N. Herstein, Wiley Eastern Ltd.

Reference books:

1. Modern Algebra by M.L. Santiago, McGraw Hill Education India pvt Ltd.
2. Modern Algebra by S. Arumugam and others, New Gamma publishing House, Palayamkottai.
3. Modern Algebra by Visvanathan Nayak, Emerald Publishers, Reprint 1992.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 2 |
| CO4 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

FIFTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XIV Real Analysis-I

.....

| | | |
|----------------------|-----------|------|
| Course Code: 2136536 | Credits | 05 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: 03 | ESE Marks | : 50 |

Course Objective:

- To make the students capable of analysing any given sequence and series
- To calculate limit superior, limit inferior and the limit of a sequence
- To learn certain proof techniques and write precise proof of theorems
- To recognize alternating, conditionally convergent and absolutely convergent series

Course Outcomes: At the end of the course, students will be able to

| | |
|-----|--|
| CO1 | Describe the fundamental properties of the real numbers that lead to the formal development of real analysis and recognize the basic properties of the field of real numbers, cardinality of a sets. |
| CO2 | Demonstrate the concepts of limits in sequences and examine the basic principles of convergence and conditions of the convergent, divergent of a sequence. |
| CO3 | Estimate the limit superior, limit inferior, limit of a sequence and explain Cauchy sequence. |
| CO4 | Construct mathematical proofs of convergence test of a sequence and distinguish between conditional convergence and absolute convergence. Explain and demonstrate the basic concepts of absolute convergence of a sequence and derive the 'test for convergence' using summation by parts. |
| CO5 | Explain the Euclidian distance function and the geometric meaning of each of the metric space properties and point out whether a given distance function is a metric. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Unit I: Sets and Functions: Sets and elements- Operations on sets- functions- real valued functions- equivalence- countability - real numbers- least upper bounds. | 12 | CO1 |
| 2. | Unit II: Sequences of Real Numbers: Definition of a sequence and subsequence- limit of a sequence- convergent sequences- divergent sequences- bounded sequences- monotone sequences | 12 | CO2 |
| 3. | Unit III: Operations on convergent sequences- operations on divergent sequences- limit superior and limit inferior- Cauchy sequences. | 11 | CO3 |
| 4. | Unit IV: Series of Real Numbers: Convergence and divergence- series with non-negative terms- alternating series- conditional convergence and absolute convergence- tests for absolute convergence- series whose terms form a non-increasing sequence- the class l^2 . | 15 | CO4 |
| 5. | Unit V: Limits and Metric Spaces: Limit of a function on a real line-. Metric spaces - Limits in metric spaces. Continuous Functions on Metric Spaces: Function continuous at a point on the real line-Reformulation- Function continuous on a metric space. | 10 | CO5 |

TEXT BOOK:

“Methods of Real Analysis”: Richard R. Goldberg (Oxford and IBH Publishing Co.).

Reference books:

- 1.Principles of Mathematical Analysis by Walter Rudin,TataMcGrawHill.
- 2.Mathematical Analysis Tom M Apostol, Narosa Publishing House.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 | 2 |
| CO3 | 2 | 2 | 2 | 1 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | 3 |
| CO5 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

FIFTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XV MECHANICS

.....

| | |
|-----------------------------------|-----------------------|
| Course Code: 2 1 3 6 5 3 7 | Credits 05 |
| L: T:P:S : | CIA Marks : 50 |
| Exam Hours: 03 | ESE Marks : 50 |

Course Objective:

Students will acquire knowledge about

- Particles or body in rest under the given forces.
- Forces, equilibrium of a particle and centre of mass of various bodies.
- The motion of bodies under the influence of forces.
- Rectilinear motion of particles, Projectiles, Impact and Moment of Inertia of Particles

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|---|
| CO1 | Recall the basic definitions of forces, Newtons laws of motion, Distinguish problems under moments, parallel forces and couples. |
| CO2 | Explain Equilibrium of a rigid body under three coplanar forces, Centre of mass, hanging body in equilibrium and demonstrate problems under hanging strings. |
| CO3 | Recall the basic definitions of work, conservative field of force, power, simple harmonic motion and demonstrate problems under work, Simple harmonic motion |
| CO4 | Recall concepts of projectiles, differentiate time of flight, horizontal range in an inclined plane and evaluate problems under Impact. |
| CO5 | Define circular motion, central orbits, Explain moment of Inertia of simple bodies and theorems of parallel and perpendicular axes and evaluate various problems under moments of Inertia |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | Unit 1 Force- Newtons laws of motion - resultant of two forces on a particle- Equilibrium of a particle. Forces on a rigid body – moment of a force – general motion of a rigid body- equivalent systems of forces – parallel forces – forces along the sides of a triangle – couples. Chapter 2 - Section 2 .1 , 2.2 , Chapter 3 - Section 3.1. Chapter 4 - Section 4 .1 to 4.6. | 12 | CO1 |
| 2. | Unit 2 Resultant of several coplanar forces- equation of the line of action of the resultant- Equilibrium of a rigid body under three coplanar forces . Centre of mass – finding mass centre – a hanging body in equilibrium, Hanging strings- equilibrium of a uniform homogeneous string – suspension bridge Chapter 4 - Section 4.7 to 4.9 Chapter 6 - Section 6.1 to 6.3. Chapter 9 - Section 9.1, 9.2. | 12 | CO2 |
| 3. | Unit 3 Kinematics -Basic units – velocity – acceleration- coplanar motion . Work, Energy and power – work – conservative field of force – power – Rectilinear motion under varying Force: Simple harmonic motion (S.H.M.) – S.H.M. along a horizontal line- S.H.M. along a vertical line Chapter 1 - Section 1.1 to 1.4 Chapter 11 - Section 11.1 to 11.3 , Chapter 12 - Section 12.1 to 12.3 | 11 | CO3 |
| 4. | Unit 4 Projectiles -Forces on a projectile- projectile projected on an inclined plane. Impact: Impulsive force - impact of sphere - impact of two smooth spheres – impact of a smooth sphere on a plane – oblique impact of two smooth spheres Chapter 13 - Section 13.1, 13.2 Chapter 14 - Section 14.1, 14.5 | 15 | CO4 |
| 5. | Unit 5 Circular motion – Conical pendulum – simple pendulum – central orbits - general orbits - central orbits-conic as centered orbit. Moment of inertia, Perpendicular and parallel axes theorem Chapter 15 - Section 15.1, 15.2, 15.6 Chapter 16 - Section 16.1 to 16.3 Chapter 17 -Section 17.1, 17.1.1 | 10 | CO5 |

TEXT BOOK:

“Mechanics” by P. Duraipandian ,LaxmiDuraipandian , MuthamizhJayapragasham, S. Chand and Co limited 2008 .

Reference books:

1. Dynamics – K. ViswanathaNaik and M. S. Kasi, Emerald Publishers.
2. Dynamics – A. V. Dharmapadam, S. Viswanathan Publishers.
3. Mechanics – Walter Grenier

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| CO1 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 2 |
| CO4 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1 - Low Correlation

FIFTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XVI OPERATIONS RESEARCH

.....

| | |
|-----------------------------------|-----------------------|
| Course Code: 2 1 3 6 5 3 8 | Credits 05 |
| L: T:P:S : | CIA Marks : 50 |
| Exam Hours: 03 | ESE Marks : 50 |

Course Objective:

Students will acquire knowledge about

- To formulate and analyzing the Linear Programming Problem from the real-world problems.
- Develop mathematical skills to analyze and solve network models arising from a wide range of applications.
- The student get knowledge about the scope and application of operations research in business and industry.

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Able to formulate linear programming problems and solve using Graphical, Simplex method. |
| CO2 | Able to analyze and solve Transportation using appropriate method. |
| CO3 | Able to analyze and solve Assignment problems and Game theory. |
| CO4 | Able to design and solve Networks Models using CPM, PERT. |
| CO5 | Estimate optimum solution for sequencing problems. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | Unit 1: Linear programming – Formulation – Graphical solution – Simplex method – Simple applications. Big-M method. | 12 | CO1 |
| 2. | Unit 2: Linear programming - Principle of Duality – Primal – Dual relation - Dual simplex method – Simple applications. Transportation Problem: Finding initial solution by North West Corner Rule – Vogel’s Approximation method and Matrix minimum method – Procedure for finding optimal solution – Both minimisation and maximisation cases – Unbalanced and degenerate transportation problems. | 12 | CO2 |
| 3. | Unit 3: Assignment Problem: Formulation – Minimisation cases – procedure for getting optimum solution – Unbalanced problem – Maximisation problem – Problems with restrictions. Game Theory: Two Person Zero-Sum game with saddle point – without saddle point – dominance rule – Solving 2 x n or m x 2 game by graphical method. | 11 | CO3 |
| 4. | Unit 4: Networks: Rules for network construction – Critical Path Method - Time calculations in PERT – PERT algorithm (Crashing excluded) – Related problems. | 15 | CO4 |
| 5. | Unit 5: Sequencing Problem – n jobs through 2 machines – n jobs through 3 machines – n jobs through m machines. Graphical method. | 10 | CO5 |

TEXT BOOK:

P.K. Gupta and D. S. Hira, Operations Research, S. Chand & Co.

Reference books:

1. *Kanthy Swaroop, P.K. Gupta, Manmohan, Operations Research – Sultan Chand & sons.*
2. *H.A. Taha, Operations Research Prentice Hall of India, New Delhi*
3. *Sundaresan, Ganapathy Subramanian, Ganesan., Resource Management Technique – Meenakshi Agency.*

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 3 | 2 | 1 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

FIFTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XVII WEB TECHNOLOGY

.....

| | | |
|-----------------------------|------------------|-------------|
| Course Code: 2136539 | Credits | 05 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: 03 | ESE Marks | : 50 |

Course Objective:

- To build web applications using HTML Graphics, CSS and JavaScript for client-side script technologies.
- Detailed description for Internet Domains and establishing Connectivity Internet.
- Structuring the HTML tags, Lists, Tables, Frames, Forms and Forms elements.
- Emphasizing the DHTML Style Sheets, Linking a Style Sheet and Web page designing.
- Explaining the concepts of JavaScript, Functions and Looping constructs.
- Elaborating the concept of JavaScript Document Object Model and Cookies

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|---|
| CO1 | To Demonstrate Internet Basic concepts and Internet Domains To Study about Internet Server Identities To impart the concepts of Establishing Connectivity on the Internet |
| CO2 | To classify the HTML Tags. To impart Lists, Frames and Tables and its attributes. To study the Graphics, Forms and Forms Elements. |
| CO3 | To elaborate CSS Style Sheets and Element of the Style. To impart Linking a style sheet to a html documents and Web page designing. |
| CO4 | Representation of JavaScript Data types, Control and Looping and Functions. To point out the knowledge about the Dialog Boxes. |
| CO5 | Representation of JavaScript Document Object Model and Event Handling. To point out Form objects, User Defined Object and Cookies. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Unit 1 Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables | 12 | CO1 |
| 2. | Unit 2 Data types – Using Constants – Manipulating Variables with Operators. Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements | 12 | CO2 |
| 3. | Unit 3 Repeating Action with Loops – Working with String and Numeric Functions. Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations. | 11 | CO3 |
| 4. | Unit 4 Using Arrays with Forms - Working with Array Functions – Working with Dates and Times Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. | 15 | CO4 |
| 5. | Unit 5 Working with Files and Directories: Reading Files-Writing Files- Processing Directories. | 10 | CO5 |

TEXT BOOK:

1. “*PHP A Beginner's Guide*”, VikramVaswani, Tata McGraw Hill 2008.

Reference books:

1. Steven Holzner , “*The PHP Complete Reference*”, Tata McGraw Hill, 2007.
2. Steven Holzer , “*Spring into PHP*”, Tata McGraw Hill 2011, 5thEdition.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 2 |
| CO4 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 1 | 2 |

Strong Correlation 2- Medium Correlation 1- Low Correlation

FIFTH SEMESTER

(SYLLABUS)

Course Title: Core Practical– XVIII WEB TECHNOLOGY LAB

| | | |
|-----------------------------------|------------------|-------------|
| Course Code: 2 1 3 6 5 4 0 | Credits | 02 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: 03 | ESE Marks | : 50 |

List of Practicals

1. Write a PHP program which adds up columns and rows of given table
2. Write a PHP program to compute the sum of first n given prime numbers
3. Write a PHP program to find valid an email address
4. Write a PHP program to convert a number written in words to digit.
5. Write a PHP script to delay the program execution for the given number of seconds.
6. Write a PHP script, which changes the colour of the first character of a word
7. Write a PHP program to find multiplication table of a number.
8. Write a PHP program to calculate Factorial of a number.

FIFTH SEMESTER

(SYLLABUS)

PROJECT

| | | |
|---|------------------|-------------|
| Course Code: 2 1 3 6 5 4 1 | Credits | 02 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: - (internal Viva-Voce) | ESE Marks | : 50 |

Students have to undergo project during the fifth semester and are required to submit the report towards end of the fifth semester.

SIXTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XIX LINEAR ALGEBRA

.....

| | | |
|----------------------------|-----------|------|
| Course Code: 2 1 3 5 6 4 2 | Credits | 05 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: 03 | ESE Marks | : 50 |

Course Objective:

- Students will acquire knowledge about the Vector Spaces, Dual spaces, Inner product spaces and linear transformations

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|---|
| CO1 | Define vector space, Linear span, linearly independent and dependent with illustrations, explain the existence theorem for basis of finitely generated vector space and evaluate dimension of vector space. |
| CO2 | Explain linear transformation, dual spaces, demonstrate Rank – Nullity theorem with an illustration. |
| CO3 | Demonstrate and evaluate minimal polynomial, matrix of a linear transformation, Eigen values and Eigen vectors of linear transformation. |
| CO4 | Define Norm, Inner Product Space, Discuss orthogonal and orthonormal basis, Explain the Gram-Schmidt Orthogonalizations process, and construct orthogonal and orthonormal basis for a given basis. |
| CO5 | Discuss adjoint operators and their properties with an illustration. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Unit – I: Vector spaces Vector spaces, subspaces, Linear span, Linearly Independent and dependent subsets of a vector space. Finitely generated vector space, Existence theorem for basis of a finitely generated vector space, Dimensions, Quotient space and its dimension. | 12 | CO1 |
| 2. | Unit- II: Homomorphism and Isomorphism of Vector Spaces Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vector spaces, Dual Spaces, Null Space, Range space of a linear transformation, Rank - Nullity Theorem. | 12 | CO2 |
| 3. | Unit–III: Algebra of Linear Transformation Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations, Matrix of a linear Transformation, Change of basis, Eigen values and Eigen vectors of linear transformations. | 11 | CO3 |
| 4. | Unit – IV: Inner Product Spaces Inner product spaces and norms, Cauchy-Schwarz inequality, Orthogonal sets and Basis, Orthonormal basis, Gram-Schmidt orthogonalization process, Orthogonal complements, Bessel’s inequality. | 15 | CO4 |
| 5. | Unit – V: Adjoint Operators and their Properties The adjoint of a linear operator, Least squares approximation, Minimal solutions to systems of linear equations, Normal, Self - adjoint, Unitary and orthogonal operators and their properties. | 10 | CO5 |

TEXT BOOK:

Friedberg, Stephen H., Insel, Arnold J., & Spence, Lawrence E. (2003). Linear Algebra (4th ed.). Prentice-Hall of India Pvt. Ltd. New Delhi

Reference books:

1. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
2. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East–West press, Reprint 2005.
3. Andrilli, S., & Hecker, D. (2016). Elementary Linear Algebra (5th ed.). Academic Press, Elsevier India Private Limited.
4. Kolman, Bernard, & Hill, David R. (2001). Introductory Linear Algebra with Applications (7th ed.). Pearson Education, Delhi. First Indian Reprint 2003.
5. Lay, David C., Lay, Steven R., & McDonald, Judi J. (2016). Linear Algebra and its Applications (5th ed.). Pearson Education.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| CO1 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 2 |
| CO4 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

SIXTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XX: REAL ANALYSIS-II

.....

| | | |
|----------------------------|-----------|------|
| Course Code: 2 1 3 6 6 4 3 | Credits | 05 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: 03 | ESE Marks | : 50 |

Course Objective:

- To write clear and precise proof of theorems.
- Introduce the concepts of Riemann integrable and properties of Riemann integrable.
- To identify the correct theorems to deal with unknown problems.

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Examine the continuity of a functions via open and closed sets and give the definition of concepts related to metric spaces, such as continuity, compactness, completeness and connectedness |
| CO2 | Describe about bounded, unbounded sets and distinguish between compact and complete metric spaces. |
| CO3 | Determine the Riemann integrability of a bounded function, identify the size of a sets by outer measure and choose the Riemann integral properties to find the value of the integrals. |
| CO4 | <i>Demonstrate the usage of the Mean Value Theorem, Fundamental theorem of Calculus to problems in the context of real analysis and</i> Roll's theorem, Mean value theorem for differentiable functions. |
| CO5 | Distinguish between point wise and uniform convergence of a sequence of functions and illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Unit I: Continuous Functions on Metric Spaces: Open sets- closed sets- Discontinuous function on \mathbb{R}^1 . Connectedness, Completeness and Compactness: More about open sets- Connected sets. | 12 | CO1 |
| 2. | Unit II: Bounded sets and totally bounded sets -Complete metric spaces- compact metric spaces, continuous functions on a compact metric space, continuity of inverse functions, uniform continuity. | 12 | CO2 |
| 3. | Unit III: Calculus: Sets of measure zero, definition of the Riemann integral, - properties of Riemann integral. | 11 | CO3 |
| 4. | Unit IV: Derivatives- Rolle's theorem, Law of mean, Fundamental theorems of calculus. | 15 | CO4 |
| 5. | Unit V: Taylor's theorem- Pointwise convergence of sequences of functions, uniform convergence of sequences of functions. | 10 | CO5 |

TEXT BOOK:

Richard R. Goldberg. Methods of Real Analysis. Oxford and IBH Publishing Co)

Reference books:

1. Principles of Mathematical Analysis by Walter Rudin, TataMcGrawHill.
2. Mathematical Analysis Tom M Apostol, Narosa Publishing House.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 2 | 1 | 1 | 2 | 1 | 3 | 2 | 3 |
| CO3 | 2 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 3 |
| CO5 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

SIXTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XXI FUNCTIONS OF COMPLEX VARIABLES

.....

| | | |
|----------------------------|-----------|------|
| Course Code: 2 1 3 6 6 4 4 | Credits | 05 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: 03 | ESE Marks | : 50 |

Course Objective:

- Explain the fundamental concepts of the functions of a complex variable and their role in modern mathematics and applied contexts.
- Demonstrate understanding by analysing, proving and explaining concepts from complex analysis.
- Relate the algebraic and geometric properties of conformal mappings, and apply these to determine the properties of analytic functions.
- Calculate series expansions for analytical complex-valued functions, evaluate contour integrals and definite integrals.

Course Outcomes: At the end of the course, students will be able to

| | |
|-----|---|
| CO1 | Derive Cauchy Riemann equation and identify analytic functions. |
| CO2 | Discuss Bilinear transformation and various standard transformations. |
| CO3 | Evaluate value of the function using Cauchy's integral theorem. |
| CO4 | <i>Represent the given function in a series form valid in a domain.</i> |
| CO5 | Evaluate Improper real integrals using residues. |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | Unit 1 Analytic Functions: Functions of a Complex Variable – Limit- Theorems on Limits – Continuous functions- Differentiability – Cauchy – Riemann equations – Analytic functions- Harmonic functions – Conformal mapping. Chapter 1 – sec 2.1 to 2.9. | 12 | CO1 |
| 2. | Unit 2 Bilinear Transformations: Elementary transformations – Bilinear transformations – Cross ratio- Fixed Points of Bilinear Transformations – Mapping by Elementary Functions - The Mapping $w = z^2, z^n$, n is a positive integer, $w = e^z, \sin z, \cos z$. Chapter 3 – sec 3.1 to 3.4 , Chapter 5 – sec 5.1 to 5.5 | 12 | CO2 |
| 3. | Unit 3 Complex Integration – definite integral – Cauchy’s Theorem – Cauchy’s integral formula – Higher derivatives. Chapter 6 – sec 6.1 to 6.4 | 11 | CO3 |
| 4. | Unit 4 Series expansions – Taylor’s series – Laurent’s Series – Zeroes of analytic functions- Singularities. Chapter 7 – 7.1 to 7.4 | 15 | CO4 |
| 5. | Unit 5 Residues – Cauchy’s Residue Theorem – Evaluation of definite integrals. Chapter 8 – 8.1 to 8.3. | 10 | CO5 |

TEXT BOOK:

“Complex Analysis” by S.Arumugam, Thangapandi Isaac, A.Somasundaram, SciTech publications (India) Pvt Ltd,2002.

Reference books:

1. Complex variables and Applications (Sixth Edition) by James Ward Brown and Ruel V.Churchill, Mc.Grawhill Inc.
2. Complex Analysis by P.Duraipandian, Kayalak Pachaiyappa, S.Chand & Co Pvt.Ltd.
3. Complex Analysis, T.K.Manickavachagom Pillay, S.Viswanathan Publishers Pvt. Ltd.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| CO1 | 3 | 3 | 2 | - | - | 2 | 2 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 2 | - | - | 2 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 2 | - | - | 2 | 2 | 3 | 2 | 3 |
| CO4 | 3 | 3 | 2 | - | - | 2 | 2 | 3 | 2 | 3 |
| CO5 | 3 | 3 | 2 | - | - | 2 | 2 | 3 | 2 | 3 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

SIXTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XXII MACHINE LEARNING WITH R

.....

| | | |
|----------------------|-----------|------|
| Course Code: 2136645 | Credits | 05 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: 03 | ESE Marks | : 50 |

Course Objective:

- To understand the need for machine learning for various problem solving
- To understand the latest trends in machine learning
- To design appropriate machine learning algorithms for problem solving

Course Outcomes: At the end of the course, students will be able to

| | |
|-----|--|
| CO1 | Differentiate various learning approaches, and to interpret the concepts of supervised learning, unsupervised learning |
| CO2 | Understand Bayesian Decision theory and Multivariate Method |
| CO3 | Apply Clustering & Regression techniques |
| CO4 | <i>Understand Neural Networks and Multilayer Perceptrons</i> |
| CO5 | Understand local models, Assessing and Comparing Classification Algorithms |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|---|-----|-----|
| 1. | UNIT 1: INTRODUCTION TO MACHINE LEARNING Machine learning – examples of machine learning applications – Learning associations – Classification – Regression Unsupervised learning – Supervised learning- Learning class from examples- PAC learning – Noise, model selection and generalization – Dimension of supervised machine learning algorithm. | 12 | CO1 |
| 2. | UNIT-II: DECISION THEORY Bayesian Decision theory – Introduction – Classification – Discriminant function – Bayesian networks -Association rule - Parametric Methods – Introduction – Estimation -Classification - Regression – Multivariate Methods – Data Parameter estimation - Classification – Complexity – Features – Dimensionality Reduction – Analysis – Multidimensional scaling – Linear discriminant analysis. | 12 | CO2 |
| 3. | UNIT-III: CLUSTERING & REGRESSION Clustering – Mixture densities – k-means clustering – Supervised Learning after clustering – Hierarchical clustering – Nonparametric Methods – Density estimation – Generalization of multivariate data – Classification – Regression – Smoothing models – Decision Trees – Univariate trees – Multivariate trees – Learning rules from data – Linear Discrimination. | 11 | CO3 |
| 4. | UNIT-IV: MULTILAYER PERCEPTRONS Structure of brain – Neural networks as a parallel processing - Perceptron – Multilayer perceptron – Back propagation- Training procedures – Tuning the network size – Learning time. | 15 | CO4 |
| 5. | UNIT-V: LOCAL MODELS Competitive learning -Adaptive resonance theory – Self organizing map – Basis functions – Learning vector quantization – Assessing and Comparing Classification Algorithms – Combining Multiple Learners – Reinforcement Learning. | 10 | CO5 |

TEXT BOOK:

1. Ethem alpaydin, “Introduction to Machine Learning”, MIT Press,2004.
2. Tom Mitchell, “Machine Learning”, McGraw Hill, 1997.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 1 | 2 | 1 | - | - | 3 | 2 | 1 | 1 | 2 |
| CO2 | 1 | 2 | 2 | - | - | 2 | 1 | 2 | 3 | 3 |
| CO3 | 3 | 1 | 2 | - | - | 1 | 2 | 3 | 1 | 2 |
| CO4 | 2 | 1 | 1 | - | - | 2 | 3 | 1 | 2 | 1 |
| CO5 | 2 | 3 | 2 | - | - | 1 | 1 | 2 | 1 | 1 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

SIXTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XXIII OPEN SOURCE TECHNOLOGIES

.....

| | |
|-----------------------------|-----------------------|
| Course Code: 2136646 | Credits 05 |
| L: T:P:S : | CIA Marks : 50 |
| Exam Hours: 03 | ESE Marks : 50 |

Course Objective:

- To provide a basic idea of Open source technology, their software development process
- To understand the role and future of open source software.
- To understand the use of open source software in the industry
- To understand the impact of legal, economic and social issues for such software

Course Outcomes: At the end of the course, students will be able to

| | |
|------------|--|
| CO1 | Learn the basics, principals and standards of using open source software. |
| CO2 | Understand about Licenses, copy right, Copy left, Patent. |
| CO3 | Understand the strategies by applying different case studies like APACHE, Linux and Mozilla |
| CO4 | <i>Starting and Maintaining of Open source software.</i> |
| CO5 | Understand the Open source ethics. Impact of open source technology Difference between Open source and Closed source |

| S.NO | CONTENTS OF MODULE | Hrs | COs |
|------|--|-----|-----|
| 1. | Unit 1 Introduction – Why Open Source – Open Source –Principles, Standards Requirements, Successes – Free Software – FOSS – Internet Application Projects | 12 | CO1 |
| 2. | Unit 2 Open source – Initiatives, Principles, Methodologies, Philosophy, Platform, Freedom, OSSD, Licenses – Copy right, Copy left, Patent, Zero Marginal Technologies, Income generation opportunities, Internalization | 12 | CO2 |
| 3. | Unit 3 Case Studies – Apache, BSD, Linux, Mozilla (Firefox), Wikipedia, Joomla, GCC, Open Office. | 11 | CO3 |
| 4. | Unit 4 Open Source Project –Starting, Maintaining –Open Source – Hardware, Design, Teaching & Media | 15 | CO4 |
| 5. | Unit 5 Open Source Ethics – Open Vs Closed Source – Government – Ethics – Impact of Open source Technology – Shared Software – Shared Source | 10 | CO5 |

TEXT BOOK:

1. .Kailash Vadera, Bhavyesh Gandhi, “*Open Source Technology*”, Laxmi Publications Pvt Ltd 2012, 1st Edition

REFERENCE BOOKS:

1. Fadi P. Deek and James A. M. McHugh, “*Open Source: Technology and Policy*”, Cambridge Universities Press 2007.

Mapping of Course Outcomes to Program Outcomes:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 2 |
| CO4 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| CO5 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 2 |

3-Strong Correlation 2- Medium Correlation 1- Low Correlation

SIXTH SEMESTER

(SYLLABUS)

Course Title: Core Paper – XXIII OPEN SOURCE TECHNOLOGIES LAB

.....

| | | |
|-----------------------------------|------------------|-------------|
| Course Code: 2 1 3 6 6 4 7 | Credits | 02 |
| L: T:P:S : | CIA Marks | : 50 |
| Exam Hours: 03 | ESE Marks | : 50 |

LIST OF EXERCISES

1. Study and usage of Libre Office Suite – Writer, Calc& Impress
2. Text Processing with PERL
3. Simple Applications using PHP
4. Simple Applications using Python
5. Image editing using GIMP

EXTRA DISCIPLINARY COURSE

Course Title: FINANCIAL MATHEMATICS WITH R

CREDITS :02 (Internal Exam only)

Course objectives

To enhance the basic knowledge in computational methods in financial Services via R Programming

| Units | CONTENTS OF MODULE |
|-------|--|
| 1. | Operators, Data structure, Functions, Control statements, Graphics, Reading and writing data |
| 2. | Statistical Analysis with R, Basic statistics, Probability distribution and random numbers, hypothesis testing, Regression Analysis, yield curve analysis using principal component analysis |
| 3. | Time series analysis with R-Preparation of time series data, before applying for models, The application of the AR model, Application of the time series analysis to finance |
| 4. | Interest Rate Swap and Discount Factor, Interest rate swap , Pricing of interest rate swaps and the derivation of discount factors , Valuation of interest rate swaps and their risk. |
| 5. | Discrete time model- Tree model- Single period binomial model, Multi period binomial model. |

Books for Reference:

1. R Programming and Its Applications in Financial Mathematics by Shuichi Ohsaki , Jori Ruppert- Felsot , Daisuke Yoshikawa , CRC Press , a Science publishers book.

Learning Quantitative Finance with R Dr. Param jeet, Prashant vats, Packt Publishing Ltd.

EXTRA DISCIPLINARY COURSE

Course Title: **NUMERICAL METHODS**

CREDITS :02 (Internal Exam only)

Course objectives

On taking this course the student will be able to grasp the basic elements of Numerical methods and error analysis. Compute Numerical Solution of Differentiation and Integration problems.

| Units | CONTENTS OF MODULE |
|--------------|--|
| 1. | Interpolation with unequal intervals-Divided differences and Newton's divided difference formula for interpolation and Lagrange's formula for interpolation-Lagrange's method |
| 2. | Numerical differentiation-Derivatives using Newton's forward and backward difference formula, stirling's formula,divided difference formula,Maxima and minima. |
| 3. | Numerical integration-General quadrature formula,Trapezoidal rule,Simpson's one-third rule, simson's three eighth rule, weddle's rule. |
| 4. | Difference equation-Linear homogeneous and non homogeneous difference equation with constant coefficient,particular integral for \square^{\square} , \square^{\square} , $\sin kx$, $\cos kx$, \square^{\square} |
| 5. | Numerical solution of ODE(first order only)-Taylor's series method,Euler's method,Modified Euler's method,Runge-kutta method fourth order only,predictor-corrector method-milne's method,Adams-Bashforth method. |

Recommended Text Book:

1. P. Kandasamy & K. Thilagavathy, K.Gunavathi, *Numerical Methods*, S. Chand & Co.

Reference Books1

1. S .Arumugam, A.Thangapaandi, A.Somasundaram, *Numerical Methods* Second edition ,
2. M.K.Jain, S.R.K.Iyengar, R.K.Jain, *Numerical methods for scientific and Engineering Computation* , Sixth edition (2012) ,New age International

Publishers, New Delhi.

3. H.C. Saxena, *Finite Differences and Numerical Analysis*, Fifteenth edition (2000), S.Chand&Co, New Delhi.

**DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE
(AUTONOMOUS)**

College with Potential for Excellence
Linguistic Minority Institution, Affiliated to University of Madras

DEPARTMENT OF PHYSICS (SHIFT II)

OUTCOME BASED EDUCATION SYLLABUS

**B.Sc. (PHYSICS with Computer Applications)
2021–2022 BATCH onwards**



**“Gokulbagh” 833, E.V.R. PERIYAR HIGH ROAD,
ARUMBAKKAM, CHENNAI – 600106, TAMILNADU.
Ph: 2363 5101, E-mail: www.dgvaishnavcollege.edu.in**

| CONTENTS | PAGE NO. |
|---|-----------------|
| 1. Vision, Mission and Program Educational Objectives (PEO) | 3 5 |
| 2. Program Outcomes (PO) with Graduate Attributes | 6 |
| 3. Mapping of POs with PEOs | 7 |
| SCHEME | |
| 4. Scheme of First Semester | 11 |
| 5. Scheme of Second Semester | 12 |
| 6. Scheme of Third Semester | 13 |
| 7. Scheme of Fourth Semester | 14 |
| 8. Scheme of Fifth Semester | 15 |
| 9. Scheme of Sixth Semester | 16 |
| SYLLABUS | |
| 10. Syllabus of First Semester: | |
| a) Core 1 – Mechanics & Properties of Matter | 17 |
| 11. Syllabus of Second Semester: | |
| a) Core 2 – Basic Electronics | 21 |
| b) Core Practical I | 24 |
| 12. Syllabus of Third Semester: | |
| a) Core 3 – Mathematical Physics | 27 |
| b) Core 4 – Electricity and Electromagnetism | 30 |
| 13. Syllabus of Fourth Semester: | |
| a) Core 5 – Optics | 33 |
| b) Core 6 – Quantum Mechanics | 36 |
| c) Core Practical II | 39 |
| 14. Syllabus of Fifth Semester: | |
| a) Core 7 – Thermal Physics & Acoustics | 42 |
| b) Core 8 – Solid State Physics | 46 |
| c) Open Elective I – Space Science | 50 |
| 15. Syllabus of Sixth Semester: | |
| a) Core 9 – Nuclear and Particle Physics | 53 |
| b) Core 10 – Atomic Physics | 56 |
| c) Elective I Integrated Electronics | 59 |
| d) Elective II Microprocessor Fundamentals | 62 |
| e) Computer Core 6 – Digital Electronics | 65 |
| f) Core Practical III General | 68 |
| g) Core Practical IV Electronics | 71 |
| h) Core Practical V Applied | 74 |
| Appendix A Outcome Based Education | 83 |
| Appendix B Graduate Attributes | 84 |
| Appendix C Bloom’s Taxonomy | 85 |
| Appendix D | 86 96 |

Institution

VISION

To impart knowledge by escalating to active learning from rote learning that

- ❖ Ignites Wisdom
- ❖ Challenges Status Quo
- ❖ Strengthens Social Equality
- ❖ Elevates Human Values and Universal Oneness
- ❖ Recognizes Indian Tradition and Culture

MISSION

- ❖ Curriculum that makes student competent to contribute economically and intellectually
- ❖ Offer an environment of learning that encourages innovation and excellence
- ❖ Promote research and development
- ❖ Best of facilities with the Best of technology
- ❖ Provide an environment for all round growth of the student
- ❖ Quality in every activity undertaken by the student and the faculty
- ❖ Instilling pride in serving the society and in being the citizen of this country

DEPARTMENT OF PHYSICS (SHIFT II)

VISION

- ❖ Provide online education as a means of increasing efficiency, increasing student learning.
- ❖ Seek support for our research and graduate programs through research grants and contracts.
- ❖ Create a strong sense of belonging, pride, and common purpose within and between our students, and our faculty.
- ❖ Offer professional development opportunities like interview skills, certificate courses within the college and connect students to professional organizations.
- ❖ Engage alumni to interact with the students to share their experiences and provide moral support. The Physics association of the Department is OMICRON. The objectives of this association are to develop a scientific aptitude in the students, to promote close understanding of the subject through discussions, to provide opportunities to get in touch with the latest developments in Physics, by arranging seminars.
- ❖ The Physics Department with the objective of developing the academic and cultural talents of the students, improving their capabilities to work as a team and raising their level of self-confidence in interacting with fellow students and peers organizes every year an Intercollegiate competition.
- ❖ In order to give practical exposure to students, the Department every year arranges for Industrial visit/Educational tour to various places.

MISSION

| | |
|----|--|
| M1 | The mission of the B.Sc. (PHYSICS WITH COMPUTER APPLICATIONS) Degree Program of Department of Physics is to provide undergraduate students an understanding of the fundamental physical concepts in Physics as well as to have a foothold in Computer Science. |
| M2 | The Department provides an environment which fosters curiosity and excitement about the physical world. To prepare undergraduate Physics majors for post-graduate studies or technical careers, and expand their career goals. |
| M3 | To educate students to be successful, ethical, and effective problem-solvers and life-long learners who will be positive, creative, sharing, and apply their knowledge to benefit humanity. |

PROGRAM EDUCATION OBJECTIVES (PEOs)

| | |
|-------------|--|
| PEO1 | Graduate will come dual professionals both in Physics and Computer Science, as the design of the course meets the specified needs of both the fields |
| PEO2 | The students will develop laboratory techniques, mathematical knowledge and computer skills |
| PEO3 | Graduates are motivated to seek higher studies, pursue research and entrepreneurship |
| PEO4 | Graduates will understand the societal and environmental issues and be responsible members of the society |
| PEO5 | Graduate acquire competencies and perspective to realise their dreams |

PEO TO MISSION STATEMENT MAPPING

| MISSION STATEMENTS | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 |
|---------------------------|-------------|-------------|-------------|-------------|-------------|
| M1 | 3 | 3 | 3 | 2 | 2 |
| M2 | 3 | 3 | 3 | 2 | 2 |
| M3 | 3 | 3 | 3 | 2 | 2 |

CORRELATION: 3 - STRONG 2 - MEDIUM 1 - LOW

PROGRAM OUTCOMES (PO) IN RELATION TO GRADUATE ATTRIBUTES

PROGRAMME OUTCOMES

At the completion of the B.Sc. Physics with Computer Applications program, the students of our Department will be able to:

| | |
|------------|---|
| PO1 | Acquired knowledge of Physics in different branches – Properties of Matter and Mechanics, Heat and Thermodynamics, Acoustics, Atomic Physics, Solid State Physics etc., |
| PO2 | The concepts in Physics are realised as real time applications, applied in the fields of Optics, Nuclear Physics, Thermal Physics, Solid State Physics, etc. |
| PO3 | Electronics is studied exhaustively as Basic Electronics, Integrated Electronics, Digital Electronics so that students are employable in the semiconductor/digital/mobile/computer-based industries. |
| PO4 | To introduce students with the architecture and operation of microprocessors. To familiarize the students with the programming and interfacing of microprocessors. |
| PO5 | General Practical's for I, II, III year of B.Sc. (PCA), Basic Electronics, Applied Electronics Practical's for III B.Sc. (PCA) sharpens the skills of the students and the theoretical aspects of Physics concepts are made understandable. |
| PO6 | Studying Web Design, C++, Operating Systems, Database Management Systems using VB and Programming in Java gives the students the requisite knowledge of computer language programming techniques leading to definite employment in computers. |
| PO7 | Students study Mathematics as an Allied paper, hence demonstrate the ability to explain and apply mathematics to represent key aspects of Physics through graphs. |
| PO8 | The student has acquired knowledge of Electricity, Electromagnetism and electromagnetic waves. In Nuclear Physics the atom, the atomic core, nuclear power, ionizing radiation and radioactivity, binding energy and decay, ionizing radiation, fission and fusion. |
| PO9 | Topics like the wave nature of light, the particle-wave duality, time dilatation, length contraction, relativistic momentum, addition of velocity, postulates of quantum mechanics, Schrodinger equation, particle in a box, in a quantum well, Orbital angular momentum operators, their commutation relations are studied to appreciate the significance of Physics |

| | |
|-------------|--|
| PO10 | To appreciate the contributions of Physics in our present day-to-day life. The necessity of the development of Physics to understand global change and sustainability. |
| PO11 | To be an ethical and professional person in the context of global, economic, environmental and societal realities while addressing relevant contemporary issues. |

Mapping of POs TO PEOs

| PEO/ PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 |
|--------------|------|------|------|------|------|------|------|------|------|-------|-------|
| PEO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| PEO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| PEO 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| PEO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| PEO 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |

3 - Strong Correlation 2 - Medium Correlation 1 - Low Correlation

PROGRAM SPECIFIC OUTCOMES

- PSO1:** Students will demonstrate an understanding of core knowledge in Physics namely Electromagnetism, Quantum Mechanics, Thermal Physics, etc., and be able to apply this knowledge to analyse a variety of physical phenomena.
- PSO2:** Students obtain proficiency in Mathematics needed for a proper understanding of Physics.
- PSO3:** Students develop strong technical skills because they are trained in programming languages.
- PSO4:** Students develop problem solving skills, which makes their conceptual foundation in the subject strong.

PSO 5: Students acquire the required skills to compete for higher studies or employment entrepreneurship.

DEPARTMENT OF PHYSICS (SHIFT II)

ELIGIBILITY FOR ADMISSION

Candidates for admission to the first year of the Degree of Bachelor of Science course in PHYSICS WITH COMPUTER APPLICATIONS shall be required to have passed the Higher Secondary Examinations (Academic or Vocational Stream) conducted by the Government of Tamil Nadu or an Examination accepted as equivalent thereof by the Syndicate of the University of Madras with Mathematics/Physics as a subject of study.

DURATION OF THE COURSE

(a) Each academic year shall be divided into two semesters. The first academic year shall comprise the first and second semesters, the second academic year the third and fourth semesters and the third academic year the fifth and sixth semester respectively.

(b) The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year. There shall be not less than 90 working days for each semester.

B.Sc. PHYSICS WITH COMPUTER APPLICATIONS CURRICULUM

The Course of Study shall comprise the study of Part-I to Part-V Courses:

PART – I: TAMIL/OTHER LANGUAGES

PART – II: ENGLISH

PART – III: CORE COURSES Comprising the study of (A) Main Subjects; (B) Allied Subjects; (C) Subject Electives.

(A) MAIN SUBJECTS: B.Sc. Degree Course in Physics with Computer Applications

(B) ALLIED SUBJECT: Mathematics

(C) SUBJECT ELECTIVES: Digital Electronics and Microprocessor Fundamentals

PART IV: ELECTIVES

(a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6th Standard).

(b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses.

(c) Others who do not come under a + b can choose non-major elective comprising of two courses.

SKILL BASED SUBJECTS

Soft Skills

Environmental Studies

PART – V: EXTENSION ACTIVITIES

Value Education

ELIGIBILITY FOR THE AWARD OF DEGREE

A candidate shall be eligible for the award of the Degree only if he /she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years, passed the examinations all the Six Semesters prescribed earning 140 Credits (in Parts-I, II, III, IV & V).

SCHEME OF EXAMINATION

As per the University Regulation the following split up of marks for Theory and Practical are to be followed.

(i) THEORY AND PRACTICAL PAPER:

| Sl. No. | Paper | Internal | External | Total |
|---------|-----------|----------|----------|-------|
| 1. | Theory | 40 | 60 | 100 |
| 2. | Practical | 40 | 60 | 100 |

(ii) INTERNAL ASSESSMENT MARKS (40) FOR THEORY: CIE -

Continuous Internal Evaluation (40 Marks)

| Bloom's Category | Tests | Attendance | Choice of Department | Choice of Department |
|-------------------|-------|------------|----------------------|----------------------|
| Marks (out of 50) | 20 | 5 | 5 | 10 |
| Remember | | | 5 | |
| Understand | | 5 | | |
| Apply | 10 | | | 5 |

| | | | | |
|----------|---|--|--|---|
| Analyze | 5 | | | |
| Evaluate | 5 | | | |
| Create | | | | 5 |

ESE - Semester End Examination (100 Marks; weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 20 |
| Understand | 20 |
| Apply | 30 |
| Analyse | 15 |
| Evaluate | 10 |
| Create | 5 |

SCHEME OF SEMESTER I

BSc PHYSICS WITH COMPUTER APPLICATION

| Sl. NO | Course category | Course Code | Course | Credit Distribution | | | | Over all Credits | Total Contact Hours/Week | Marks | | | | | |
|--------------|-----------------|-------------|---|---------------------|---|---|---|---|--------------------------|------------|------------|------------|--|--|--|
| | | | | L | T | P | S | | | CIE | SE E | Total | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 1 | Bachelors | | Language – Paper I | 4 | 0 | 0 | 0 | 3 | 4 | 40 | 60 | 100 | | | |
| 2 | | | English – Paper I | 4 | 0 | 0 | 0 | 3 | 4 | 40 | 60 | 100 | | | |
| 3 | | | PCA Core 1 – Mechanics & Properties of Matter | 4 | 3 | 0 | 0 | 4 | 7 | 40 | 60 | 100 | | | |
| 4 | | | Allied Paper I– Mathematics | 4 | 3 | 0 | 0 | 5 | 7 | 40 | 60 | 100 | | | |
| 5 | | | PCA Core Practical I | 0 | 0 | 4 | 0 | Practical Examination at the end of Semester II (4 hours) | | | | | | | |
| 6 | | | 1 (a) Basic Tamil I/(b) Adv. Tamil/(c) Non-Major Elective | 2 | 0 | 0 | 0 | 2 | 2 | 40 | 60 | 100 | | | |
| 7 | | | 2. Skill Based Elective I | 2 | 0 | 0 | 0 | 3 | 2 | 40 | 60 | 100 | | | |
| Total | | | | | | | | 20 | 30 | 280 | 420 | 700 | | | |

SCHEME OF SEMESTER II

BSc PHYSICS WITH COMPUTER APPLICATION

| Sl. No | Course Category | Course Code | Course | Credit Distribution | | | | Over all Credits | Total Contact Hours/Week | Marks | | |
|--------------|-----------------|-------------|---|---------------------|---|---|---|------------------|--------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CIE | SE E | Total |
| 1 | Bachelors | | Language – Paper II | 4 | 0 | 0 | 0 | 3 | 4 | 40 | 60 | 100 |
| 2 | | | English – Paper II | 4 | | 0 | 0 | 3 | 4 | 40 | 60 | 100 |
| 3 | | | PCA Core 2 – Basic Electronics | 4 | 3 | 0 | 0 | 4 | 7 | 40 | 60 | 100 |
| 4 | | | Allied Paper II – Mathematics | 4 | 3 | 0 | 0 | 5 | 7 | 40 | 60 | 100 |
| 5 | | | PCA Core Practical I | 0 | 0 | 4 | 0 | 4 | 3+1 | 40 | 60 | 100 |
| 6 | | | 1 (a) Basic Tamil I/(b) Adv. Tamil/(c) Non-Major Elective | 2 | 0 | 0 | 0 | 2 | 2 | 40 | 60 | 100 |
| 7 | | | 2. Skill Based Elective II | 2 | 0 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| Total | | | | | | | | 24 | 30 | 280 | 420 | 700 |

SCHEME OF SEMESTER III

BSc PHYSICS WITH COMPUTER APPLICATION

| Sl. No | Course Category | Course Code | Course | Credit Distribution | | | | Overall Credits | Total Contact Hours/Week | Marks | | | |
|--------------|-----------------|-------------|---|-----------------------|---|---|---|--|--|------------|------------|------------|-----|
| | | | | L | T | P | S | | | CIE | SEE | Total | |
| 1 | Bachelors | | PCA Core 3 – Mathematical Physics | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 | |
| 2 | | | PCA Core 4 – Electricity and Electromagnetism | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 | |
| 3 | | | <i>CC 1 – Web Design</i> | 5 | 0 | 0 | 0 | 4 | 5 | 40 | 60 | 100 | |
| 4 | | | <i>CC 2 – Programming in C++</i> | 5 | 0 | 0 | 0 | 4 | 5 | 40 | 60 | 100 | |
| 5 | | | PCA Core Practical II | 0 | 0 | 3 | 0 | Practical Examination at the end of Semester IV (3 hours) | | | | | |
| 6 | | | <i>CCP 1 – Web Design Programming</i> | 3 | 0 | 0 | 0 | 4 | 3 | 40 | 60 | 100 | |
| 7 | | | <i>CCP 2 – Programming in C++</i> | 3 | 0 | 0 | 0 | 4 | 3 | 40 | 60 | 100 | |
| 8 | | | | Soft Skill III | 2 | 0 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 9 | | | | Environmental Studies | 1 | 0 | 0 | 0 | Exam conducted at the end of Semester IV (1 hour) | | | | |
| Total | | | | | | | | 27 | 30 | 280 | 420 | 700 | |

SCHEME OF SEMESTER IV

BSc PHYSICS WITH COMPUTER APPLICATION

| Sl. No | Course Category | Course Code | Course | Credit Distribution | | | | Overall Credits | Total Contact Hours/Week | Marks | | |
|--------------|-----------------|-------------|---|-----------------------|---|---|---|-----------------|--------------------------|------------|------------|------------|
| | | | | L | T | P | S | | | CIE | SEE | Total |
| 1 | Bachelors | | PCA Core 5 – Optics | 5 | 0 | 0 | 0 | 4 | 5 | 40 | 60 | 100 |
| 2 | | | PCA Core 6 – Quantum Mechanics | 6 | 0 | 0 | 0 | 4 | 6 | 40 | 60 | 100 |
| 3 | | | <i>CC 3 – Operating System</i> | 5 | 0 | 0 | 0 | 4 | 5 | 40 | 60 | 100 |
| 4 | | | <i>CC 4 – Database Management Systems</i> | 5 | 0 | 0 | 0 | 4 | 5 | 40 | 60 | 100 |
| 5 | | | PCA Core Practical II | 0 | 0 | 3 | 0 | 4 | 3 | 40 | 60 | 100 |
| 6 | | | <i>CCP 3 – Practical RDBMS using VB</i> | 0 | 0 | 3 | 0 | 4 | 3 | 40 | 60 | 100 |
| 7 | | | Soft Skill IV | 2 | 0 | 0 | 0 | 3 | 2 | 40 | 60 | 100 |
| 8 | | | | Environmental Studies | 1 | 0 | 0 | 0 | 2 | 1 | 40 | 60 |
| Total | | | | | | | | 29 | 30 | 320 | 480 | 800 |

SCHEME OF SEMESTER V

BSc PHYSICS WITH COMPUTER APPLICATION

| Sl. No | Course Category | Course Code | Course | Credit Distribution | | | | Overall Credits | Total Contact Hours/Week | Marks | | |
|--------|-----------------|-------------|---|---------------------|---|---|---|---|--------------------------|-------|-----|-------|
| | | | | L | T | P | S | | | CIE | SEE | Total |
| 1 | Bachelors | | PCA Core 7 – Thermal Physics & Acoustics | 5 | 0 | 0 | 0 | 4 | 5 | 40 | 60 | 100 |
| 2 | | | PCA Core 8 – Solid State Physics | 5 | 0 | 0 | 0 | 4 | 5 | 40 | 60 | 100 |
| 3 | | | PCA Open Elective – I Space Science/ Optics and Photonics | 4 | 0 | 0 | 0 | 5 | 4 | 40 | 60 | 100 |
| 4 | | | <i>CC 5 – Programming in JAVA</i> | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 5 | | | <i>CCP 4 – JAVA Programming Lab</i> | 0 | 0 | 3 | 0 | 4 | 3 | 40 | 60 | 100 |
| 6 | | | PCA Core Practical III (General) | 0 | 0 | 3 | 0 | Practical Examination at the end of Semester VI (9 hours) | | | | |
| 7 | | | PCA Core Practical IV (Electronics) | 0 | 0 | 3 | 0 | | | | | |
| 8 | | | PCA Core Practical V (Applied) | 0 | 0 | 3 | 0 | | | | | |
| 9 | | | Value Education | 0 | 0 | 0 | 0 | 2 | - | 40 | 60 | 100 |

| | | | | | |
|--------------|-----------|-----------|------------|------------|------------|
| Total | 23 | 30 | 240 | 360 | 600 |
|--------------|-----------|-----------|------------|------------|------------|

SCHEME OF SEMESTER VI

BSc PHYSICS WITH COMPUTER APPLICATION

| Sl. No | Course Category | Course Code | Course | Credit Distribution | | | | Overall Credits | Total Contact Hours /Week | Marks | | |
|--------|-----------------|-------------|---|---------------------|---|---|---|-----------------|---------------------------|-------|-----|-------|
| | | | | L | T | P | S | | | CIE | SEE | Total |
| 1 | Bachelors | | PCA Core 9 – Nuclear and Particle Physics | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | | | PCA Core 10 – Atomic Physics | 4 | 0 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | | | PCA Elective I Integrated Electronics/ Bio-Physics/Applied Physics | 6 | 0 | 0 | 0 | 5 | 6 | 40 | 60 | 100 |
| 4 | | | PCA – Elective II – Microprocessor Fundamentals/ Physics of Materials/ Introduction to Astrophysics and Astronomy | 6 | 0 | 0 | 0 | 5 | 6 | 40 | 60 | 100 |
| 5 | | | <i>CC 6 – Digital Electronics (handled by Physics Department)</i> | 4 | 0 | 3 | 0 | 4 | 4 | 40 | 60 | 100 |

| | | | | | | | | | | | | |
|--------------|--|--|--|---|---|---|---|-----------|-----------|------------|------------|------------|
| 6 | | | PCA Core Practical III (General) | 0 | 0 | 2 | 0 | 4 | 2 | 40 | 60 | 100 |
| 7 | | | PCA Core Practical IV (Electronics) | 0 | 0 | 2 | 0 | 4 | 2 | 40 | 60 | 100 |
| 8 | | | PCA Core Practical V (Applied) | 0 | 0 | 2 | 0 | 4 | 2 | 40 | 60 | 100 |
| 9 | | | Extension Activities | 0 | 0 | 0 | 0 | 1 | 0 | 40 | 60 | 100 |
| Total | | | | | | | | 35 | 30 | 360 | 540 | 900 |

FIRST SEMESTER

CORE 1 MECHANICS AND PROPERTIES OF MATTER

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The students will be introduced to forces, angular momentum, velocity and acceleration. The course provides the students about the knowledge of moment of inertia and center of mass. Students will be able to articulate and describe relative motion, Inertial and non-inertial frames, Newton's laws of motion, conservation laws, hydrodynamics and elasticity of the materials.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Understand the basics of Newtonian mechanics, displacement, velocity, acceleration and Newtons laws of motion |
| CO 2 | Analyze and differentiate the simple and compound pendulum. Understand the dynamics of a system of particles |
| CO 3 | In hydrodynamics the derivation of Euler's equation, Bernoulli's theorem and its applications. |
| CO 4 | Understand the concept of surface tension, viscosity and its variation with temperature |
| CO 5 | Know the three types of strain and derive the relation between elastic constants |

| | |
|-------------|---|
| CO 6 | Determination of the rigidity modulus of the rod using static torsion method |
| CO 7 | Understand the inertial frames, Galilean invariance and postulates of special theory of relativity |
| CO 8 | Realize the consequences of Lorentz transformation, significance of mass-energy relation and four vectors Establish the non-existence of the hypothesized stationary ether through the null result of Michelson-Morley experiment |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 7 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 8 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | Cos |
|----------|--|-----------|------------|
| 1 | Introduction to Newtonian Mechanics 1.1 Displacement – velocity – acceleration – displacement time graph – velocity time graph 1.2 acceleration time graph 1.3 velocity and acceleration in Cartesian, polar, spherical, cylindrical coordinate systems 1.4 Momentum – Galileo’s concept of inertia 1.5 Newton’s laws of motion friction – impulse – impact 1.6 laws of impact – direct impact between two smooth spheres | 18 | CO1 |

| | | | |
|---|--|----|-------------|
| | 1.7 oblique impact between two smooth spheres – loss of kinetic energy 1.8 reduced mass – problems | | |
| 2 | Two Body Central Force Problem & Rigid Body Dynamics 2.1 System of particles – center of mass – two body central force problem 2.2 Kepler’s law of planetary orbits – escape velocity – orbital velocity 2.3 Equation of motion of the CM 2.4 conservation of linear, angular momentum and energy 2.5 variable mass system 2.6 Compound pendulum – theory – determination of g and k 2.7 Equivalent simple pendulum – reversibility of centers of oscillation and Suspension | 18 | CO2 |
| 3 | Hydrodynamics 3.1 Kinematics of moving fluids equation of continuity 3.2 Euler’s equation 3.3 Bernoulli’s theorem and its applications – Venturimeter – Torricelli’s theorem 3.4 Surface tension – Excess pressure-Variation of Surface Tension with temperature 3.5 Determination of S.T by Jaeger’s method 3.6 Viscosity – definition – coefficient of viscosity – critical viscosity 3.7 Poiseuille’s formula 3.8 Variation of viscosity with temperature – applications | 18 | CO3, CO4 |
| 4 | Elasticity 4.1 Hooke’s law, Stress strain diagram 4.2 Elastic moduli – relation between elastic constants 4.3 Poisson's ratio – Poisson's ratio in terms of elastic constants 4.4 Work done in stretching and twisting a wire 4.5 twisting couple on a cylinder 4.6 Rigidity modulus by static torsion 4.7 Torsional pendulum – rigidity modulus and moment of inertia | 18 | CO5, CO6 |
| 5 | Special Theory of Relativity 5.1 Inertial frames and Galilean invariance 5.2 Michelson Morley experiment 5.3 Postulates of special theory of relativity 5.4 Lorentz transformations 5.5 Length contraction and time dilation 5.6 Variation of mass with velocity – relativistic velocity addition | 18 | CO7, CO8 |

| | | | |
|--|--|--|--|
| | theorem, mass-energy equivalence 5.7 Introduction to Minkowski space – four vectors | | |
|--|--|--|--|

TEXT BOOKS:

1. Brij Lal and N. Subramaniam (1994). *Properties of Matter* (6th edn), S. Chand & Co., New Delhi, ISBN no. 9788121902809
2. R. Murugesan (2001). *Properties of Matter* (5th edn), S. Chand & Co., New Delhi, ISBN no. 9788121906050
3. Murugesan (2001). *Modern Physics* (11th edn), S. Chand & Co., New Delhi, ISBN no. 978-81-219-0320-2

REFERENCE BOOKS:

1. Narayanamoorthy (2001), *Mechanics – Part I and II*, National Publishing Company.
2. D.S. Mathur (2001). *Mechanics* (2nd edn), S. Chand & Co., ISBN no.
3. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury (2003). *Concepts of Modern Physics* (6th edn), Tata McGraw-Hill, ISBN no. 9780070151550

E-RESOURCES

https://physicscatalyst.com/heat/thermal_prop_rev.php
http://www.physics.usyd.edu.au/super/physics_tut/worksheets/regPofM.pdf
<https://www.indiastudycenter.com/Other/Syllabus/maduniv/under-graduate-courses/bachelor-of-science/Physics/Properties-of-Matter.asp>
<http://www.upcollege.org/uploads/Physics.pdf>
<https://www.bscphysicsnotes.online/>
<https://latestcontents.com/bsc-physics-mechanics-notes/>

SECOND SEMESTER
CORE 2 – BASIC ELECTRONICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The objective of the course is to appraise the students about the significance of electronics industry. To understand the significance and principles of semiconductor diodes, transistors, their characteristics and how they will operate. Teach the students about the circuit connection. To gain knowledge about oscillators and op-amps Knowledge about resistance inductor, capacitor and their graphical relationship. To understand the characteristics of FET, SCR and UJT.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Understand the concept of band gap energy and classification of materials based on it. Explain the characteristics of P-N junction diode and apply it to construct Half-wave and Full-wave rectifier |
| CO 2 | Analysis the transistor characteristics in CE and CB mode. To analyse the working of RC coupled, Class A and Class B power amplifier |

| | |
|-------------|---|
| CO 3 | Acquire knowledge about the concept of feedback and explain phase shift and Wien's bridge oscillators |
| CO 4 | Design wave shaping circuits such as clippers, clampers and multivibrators |
| CO 5 | Analyse the characteristics of special semiconductor devices such as FET, UJT and SCR and understand its real-time applications |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--------------------|-----|-----|
|-------|--------------------|-----|-----|

| | | | |
|---|--|----|-----|
| 1 | Introduction to Semiconductors and Semiconductor Diodes 1.1 Classification of materials based on band gap – Conductors, Insulators and Semiconductors 1.2 Intrinsic and extrinsic semiconductors 1.3 P-N junction, V-I characteristics 1.4 half wave rectifier – efficiency 1.5 full wave rectifier – efficiency 1.6 filter circuits – Low, High pass filters 1.7 band pass filters | 20 | CO1 |
| 2 | Transistors and its Applications 2.1 Introduction to Transistors 2.2 Transistor action CB mode and CE mode operation and its characteristics 2.3 Analysis of CE amplifier using h parameters 2.4 Expression for current gain, voltage gain 2.5 Input impedance, output impedance and power gain 2.6 RC coupled amplifier and frequency response 2.7 Classification of amplifiers and class A power amplifier 2.8 Push pull, class B power amplifier | 20 | CO2 |
| 3 | Feedback Oscillators 3.1 Concept of Feedback, Positive and negative feedback 3.2 Barkhausen condition for oscillators 3.3 Expression for frequency of oscillation Hartley Oscillator – Problems 3.4 Phase shift oscillator – Problems 3.5 Wein’s bridge oscillator – Problems | 20 | CO3 |
| 4 | Wave Shaping Circuits and Multivibrators 4.1 Introduction to Clipping circuits 4.2 Positive clipper, Biased clipper and combination clipper 4.3 Clamping circuits – Positive clamper, Negative clamper 4.4 Integrating and differentiation circuits 4.5 Multivibrator Astable 4.6 Monostable multivibrator | 20 | CO4 |

| | | | |
|--------------|---|-----------|------------|
| 5 | Special Semiconductor Devices and Applications | 10 | CO5 |
| | 5.1 Field effect Transistor (FET) Characteristics | | |
| | 5.2 Unijunction Transistor (UJT) Characteristics | | |
| | 5.3 UJT as Saw tooth generator | | |
| | 5.4 SCR characteristics | | |
| | 5.5 SCR as a switch | | |
| 5.6 Problems | | | |

TEXT BOOKS:

1. Albert Malvino and David J Bates (2017). *Electronic Principles* (7th edn), McGraw Hill India, ISBN no. 0070634246
2. Paul Horowitz (1989). *The Art of Electronics* (2nd edn), Cambridge University Press, ISBN no. 978-0-521-37095-0
3. David A. Bell (2004). *Electronic Devices and Circuits* (1st edn), Prentice Hall of India, ISBN no. 9780195693409

REFERENCE BOOKS:

1. Metha (2009). *Principles of Electronics* (3rd edn), S. Chand, ISBN no: 9789352837946
2. R. Boylestad, L. Nashelsky (2002). *Electronic Devices and Circuit Theory* (11th edn), Prentice Hall, ISBN no: 9789332542600.
3. C.M. Kachhava (2003). *Solid State Physics, Solid State Device and Electronics* (1st edn), New Age International, ISBN no: 9788122415001

CORE PRACTICAL I

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 3:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Experiment is the supreme judge of every physical theory by Lev. Landau. The student should understand that experimental work does not merely means taking simply certain set of observations. The aim or objective of the experiment and how it is to be performed is perceived. A thorough understanding of the underlying physical principles is, therefore, the first

prerequisite for an experimenter. The success of any experiment lies entirely on the possible accuracy and reliability of measurements and observations.

The experiments undertaken in the syllabi of Physics Practical I are design to achieve definite quantitative results like

1. Determination of physical constants, such as surface tension, viscosity of water, Young's modulus, Rigidity modulus, Refractive index of a liquid.
2. Measurement of a quantity or parameter connected with a particular body, like focal length of a lens, temperature coefficient of resistance, specific heat capacity of the given solid, liquid.
3. Comparison of two quantities, such as viscosities of two liquids, relative density of solid and liquid.
4. Testing of quantitative laws like stretched vibrations of a string etc.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | By getting the focal length the property of reversibility in thin lenses is understood proving that the image distance and object distance is interchangeable. |
| CO2 | Determining the Young's modulus and Rigidity modulus correlates to the Physics concept of the property of elasticity. The measurement of surface tension and viscosity of water relates to the theory of properties of liquids. |
| CO3 | Perform the procedure as per standard value and calculate the data to obtain quantitative result. |
| CO4 | Develop the skill of interpreting the results and understand the applications of the experiments. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

STRONGLY CORRELATED 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED 1

| CONTENTS OF MODULE | Hrs | COs |
|--|-----------|---------------------------------------|
| LIST OF EXPERIMENTS | | |
| 1. Young's modulus – Uniform bending – Optic lever | | |
| 2. Rigidity modulus and moment of Inertia – Torsional pendulum (with identical masses) | | |
| 3. Sonometer – Verification of laws and frequency of tuning fork | | |
| 4. Specific heat capacity of liquid – Method of mixtures (Half-time correction) | | |
| 5. Focal length, power of a concave lens | | |
| 6. Spectrometer – Refractive index of a liquid – hollow prism | | |
| 7. P.O. Box – Temperature coefficient of resistance of a coil | | |
| 8. Comparison of viscosities of two liquids | | |
| 9. Young's modulus – Non-uniform bending – Pin & microscope | | |
| 10. Rigidity modulus – Torsional pendulum (without masses) | | |
| 11. Surface tension and interfacial surface tension – drop weight method | | |
| 12. Coefficient of viscosity of liquid (radius of capillary tube by Mercury pellet method) | | |
| 13. Sonometer – Relative density of a solid and liquid | | |
| 14. Specific heat capacity of a liquid – Method of cooling | | |
| 15. Focal length of a convex lens | | |
| 16. Potentiometer – Internal resistance of Cell | | |
| | 60 | CO1, CO2, CO3, CO4 |

TEXT BOOKS:

1. D. Chattopadhyay, P.C. Rakshit, and B. Saha (2002). *An Advanced Course in Practical Physics* (6th edn), Books and Allied, Kolkata, ISBN no: 8187134208.
2. Balasubramanian. S, Ranganathan. R, Srinivasan M.N (2017). *A Textbook of Practical Physics* (2nd edn), S. Chand and Sons Pvt. Ltd, ISBN no: 81-8054-744-7
3. C.C. Ouseph, U.J. Rao, V. Vijayendran (2015). *Practical Physics* (1st edn), Viswanathan. S Printers and Publishers Pvt. Ltd., ISBN-13: 978-8187156215

REFERENCE BOOKS:

1. C.L. Arora (1985). *B.Sc. Practical Physics* (1st edn) Chand Publishing, ISBN no: 9788121909099
2. P.R. SasiKumar (2011). *Practical Physics* (1st edn), PHI Learning Pvt. Ltd, Delhi, ISBN no: 9788120344341

E-RESOURCES

<https://www.vlab.co.in/broad-area-physical-sciences>

<https://www.vlab.co.in/ba-nptel-labs-physical-science>

THIRD SEMESTER

CORE 3 MATHEMATICAL PHYSICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The purpose of the course is to introduce students to methods of mathematical physics and to develop required mathematical skills to solve problems in quantum mechanics, electrodynamics and other fields of theoretical physics problems.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|--|
| CO 1 | Evaluate the understanding of basic concept of linear vector space |
| CO 2 | Identify a range of matrix methods that are essential for solving advanced problem in theoretical Physics. |
| CO 3 | Apply special function skills to solve problems in Physics. |
| CO 4 | Remember various processes involved in understanding the vector analysis to solve the equations of motion. |
| CO 5 | Understand and evaluate the elementary complex analysis |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|----------|---|-----------|------------|
| 1 | <p>Linear Vector Space</p> <p>1.1 Axioms of vector space – examples – linear independence of vectors</p> <p>1.2 Dimension of LVS – basis – dual space – inner product – orthonormality</p> <p>1.3 Gram–Schmidt orthogonalization</p> <p>1.4 Completeness – linear transformations – operators – orthogonal and unitary transformation.</p> | 18 | CO1 |

| | | | |
|----------|---|-----------|------------|
| 2 | <p>Matrices</p> <p>2.1 Matrix as representation of operators</p> <p>2.2 Types of matrices – real, symmetric, skew symmetric, orthogonal matrices</p> <p>2.3 Characteristic equation of a matrix</p> <p>2.4 Eigen values and Eigen vectors – Hermitian and unitary matrices – properties of their Eigen values and Eigen vectors</p> <p>2.5 Diagonalisation of matrices – power of matrix – matrix exponential</p> <p>2.6 Cayley–Hamilton theorem – matrices in physics:</p> <p>2.7 Rotation matrix – Pauli matrices.</p> | 18 | CO2 |
| 3 | <p>Special Functions</p> <p>3.1 General differential equation in self-adjoint form</p> <p>3.2 Sturm–Liouville equation – linear independence of solutions – Wronskian</p> <p>3.3 Different cases of S-L equation: sine cosine functions</p> <p>3.4 Bessel equations – application in vibrations of membrane</p> <p>3.5 Legendre equations – applications in electrostatics</p> <p>3.6 Hermite polynomials – applications in harmonic oscillator.</p> | 18 | CO3 |
| 4 | <p>Vector Analysis</p> <p>4.1 Scalar and vector fields</p> <p>4.2 Gradient, divergence and curl of scalar, vector field</p> <p>4.3 Irrotational and Solenoidal vector fields</p> <p>4.4 Equations of accelerated motion in the vector notation in Cartesian coordinate systems</p> <p>4.5 Equations of accelerated motion in the vector notation in polar coordinate systems</p> | 18 | CO4 |
| 5 | <p>Elementary Complex Analysis</p> <p>5.1 Functions of a complex variable</p> <p>5.2 Continuity and differentiability</p> <p>5.3 Single and multivalued functions</p> <p>5.4 Analytic function – Cauchy–Riemann conditions (necessary and sufficient).</p> <p>5.5 Cauchy–Riemann conditions in the polar (r,θ) coordinates.</p> | 18 | CO5 |

TEXT BOOKS:

1. Sathya Prakash (1996). *Mathematical Physics* (2nd edn), Sultan Chand and Sons, New Delhi. ISBN no: 8180549283

2. E. Kreyszig (2011). *Advanced Engineering Mathematics* (10th edn), Wiley. ISBN no: 8126554231
3. Mary L Boas (2006). *Mathematical Methods in Physical Sciences* (3rd edn), Wiley, ISBN no: 8126508105

REFERENCE BOOKS:

1. A.W. Joshi (2008). *Matrices and Tensors in Physics* (2nd edn), New Age International, ISBN no: 978-0470274262
2. B.D. Gupta (1996). *Mathematical Physics* (4th edn), Vikas Publishing House Pvt. Ltd., New Delhi, ISBN no: 9788125930969
3. V. Balakrishnan (2017). *Mathematical Physics* (1st edn), Ane Books, ISBN no: 9386761114

E-RESOURCES

- https://www.physics.uu.se/digitalAssets/405/c_405910-l_1-k_notes_v3_0.pdf
<http://www.freebookcentre.net/physics-books-download/Mathematical-Physics-Lecture-Notes.html>
<http://people.uncw.edu/hermanr/phy311/MathPhysBook/index.htm>
<https://www.maths.ed.ac.uk/~jmf/Teaching/Lectures/PoMP.pdf>

CORE 4 ELECTRICITY AND ELECTROMAGNETISM

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Electricity and electromagnetism are essential not only to Physics, but to all scientific disciplines. Much of the high-technology laboratory equipment of any area of Science is largely based on the concepts of this unit. Knowledge of the ideas here will aid the student in fully understanding the interplay of electric and magnetic forces is the basis for electric motors, generators, and many other modern technologies, including the production of electromagnetic waves.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|--|
| CO 1 | In Electrostatics, study the properties and boundary conditions obeyed by Electric field, mathematical techniques to obtain electric field and their applications as Conductors, Capacitors, Dielectrics |
| CO 2 | Understand the foundations of magnetostatics, properties and boundary conditions obeyed by magnetic field, vector potential, magnetisation and applications |
| CO 3 | Acquire knowledge about AC and DC circuits and their applications |
| CO 4 | Understand Faraday's laws of electrolysis, self and mutual induction, measurement of horizontal and vertical component of Earth's magnetic field, Ballistic galvanometer and Induction coil |
| CO 5 | Understand the mathematical framework of Maxwell's equations, Electromagnetic waves, Scalar and Vector potential, Poynting's theorem, Hertz Experiment |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|----------|---|-----------|-------------|
| 1 | Electrostatics 1.1 Coloumb's law, Electric intensity and electric potential 1.2 Divergence and Curl of Electric field, Electric images 1.3 Conductors – surface charge-force on a conductor 1.4 electric intensity and potential due to an earthed conducting sphere 1.5 electric dipole – potential and intensity due to a dipole 1.6 energy of a charged capacitor – loss of energy due to sharing of charges 1.7 Polarization –Dielectrics – Electric Displacement | 20 | CO 1 |

| | | | |
|---|---|----|---------|
| | 1.8 Gauss law in presence of dielectrics | | |
| 2 | Magnetostatics 2.1 Lorentz force, Biot Sarvat law, Magnetic field due to steady current. 2.2 Divergence and Curl of Magnetic field, Magnetic vector potential, Boundary conditions. 2.3 Ampere’s law, Force and torque on current loop in presence of magnetic field. 2.4 Effect of magnetic field on atomic orbits 2.5 Magnetization | 20 | CO 2 |
| 3 | DC and AC Circuits 3.1 DC Circuits: Growth and Decay of current in circuit containing resistor and inductor, resistor and capacitor, LCR circuit. 3.2 DC Circuits: Condition for discharge to be oscillatory, Frequency of oscillation. 3.3 AC Circuits: AC Voltage and Current, Power factor, AC circuit containing LCR Circuit 3.4 AC Circuits: Series and Parallel resonant circuits, Single phase, Three phase, Electrical fuses, Circuit breakers | 20 | CO 3 |
| 4 | Electromagnetic Induction and Its Applications 4.1 Faraday’s laws of Electromagnetic induction 4.2 Determination of coefficient of self-inductance of solenoid 4.3 Mutual inductance, Experimental determination of absolute mutual inductance of a solenoid, Coefficient of coupling 4.4 Horizontal and Vertical component of Earth’s magnetic field 4.5 Calibration of Ballistic Galvanometer 4.6 Induction coil and its uses | 20 | CO 4 |
| 5 | Maxwell’s equations and Electromagnetic Theory 5.1 Faraday’s law – Displacement current 5.2 Maxwell’s equations in differential and integral form 5.3 Scalar and Vector potentials 5.4 Derivation of Maxwell’s equations in free space, Energy density of EM wave, Poynting’s theorem 5.5 Hertz experiment 5.6 Problems | 10 | CO 5 |

TEXT BOOKS:

1. Brijlal and Subrahmanyam (2000). *Electricity and Magnetism* (2nd edn), S. Chand & Co., New Delhi, ISBN no: 978-1107014022
2. D. Chattopadhyay and P.C. Rakshit (2001). *Electricity & Magnetism* (1st edn), Books and Allied (P) Ltd, ISBN no: 9788173812514
3. Edward M. Purcell, David J. Morin (2013). *Electricity and Magnetism* (3rd edn), Harvard University, Massachusetts. ISBN no: 978-1-107-01402-2

REFERENCE BOOKS:

1. R. Murugesan (2008). *Electricity and Magnetism* (10th edn), S. Chand & Co., New Delhi, ISBN no: 9789352534319
2. K.K. Tewari (2002). *Electricity & Magnetism* (11th edn), S. Chand & Co., New Delhi. ISBN no: 8121908558
3. D.J. Griffiths (2003). *Introduction to Electrodynamics* (4th edn), Prentice Hall of India, New Delhi, 2003, ISBN no: 9780138053260

E-RESOURCES

NPTEL – Introduction to Electricity and Magnetism – Prof. Manoj Harbola – Department of Physics – IIT Kanpur

NPTEL – Electromagnetic Theory – Prof. D.K. Ghosh – Department of Physics – IIT Bombay.

NPTEL – Electromagnetic field for EEE students – Dept of Electrical Engineering – IIT Madras

For the Love of Physics – Prof. Walter Lewin

Fundamentals of Physics – Prof. R. Shankar, Department of Physics – Yale University

Khan Academy

FOURTH SEMESTER

CORE 5 – OPTICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

To gain knowledge of geometrical and physical optics. Understand the natural behaviour of aberration in lenses and methods to rectify it. Theoretically obtain the relevant equations supporting the different properties of light like Interference, diffraction, polarization and realise its valuable use in our daily lives. Study the theory and experiment of interference using Air wedge, Newton's rings and Michelson interferometer. The theory and experimental past of diffraction by Fresnel's and Fraunhofer methods, production of polarization of light is discussed. To gain overall knowledge in LASERS.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | To understand the defects in lenses and methods to rectify them |
| CO 2 | Interference and related experiments |
| CO 3 | Diffraction and experimental explanations |
| CO 4 | Understand the concept of Polarisation and optical activity |
| CO 5 | Principle of LASER and its applications |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | Cos |
|----------|---|-----------|-------------|
| 1 | Geometrical Optics 1.1 Spherical aberration in lenses 1.2 Methods of minimizing spherical aberration 1.3 Condition for minimum spherical aberration in the case of two lenses | 18 | CO 1 |

| | | | |
|---|---|----|---------|
| | separated by a distance 1.4 Chromatic aberration in lenses 1.5 Condition for achromatism of two thin lenses (in and out of contact). 1.6 Dispersion produced by a thin prism 1.7 Achromatic prisms. 1.8 Combination of prisms to produce– dispersion without deviation – Deviation without dispersion | | |
| 2 | Interference 2.1 Theory of interference 2.2 Analytical treatment 2.3 Expression for intensity 2.4 Condition for maxima and minima in terms of phase and path difference 2.5 Air wedge Determination of diameter of thin wire 2.6 Test for optical flatness Haidinger’s fringes 2.7 Michelson’s interferometer 2.8 Determination of wavelength of light and thickness of thin transparent material | 18 | CO 2 |
| 3 | Diffraction 3.1 Fresnel diffraction 3.2 Diffraction at a circular aperture and straight edge 3.3 Fraunhofer diffraction Single slit, Double slit 3.4 Theory of plane transmission grating, normal incidence 3.5 Dispersive power of grating 3.6 Rayleigh’s criterion for resolution 3.7 Resolving power of telescope and microscope 3.8 Resolving power of prism and grating 3.9 Problems | 18 | CO 3 |
| 4 | Polarisation 4.1 Double refraction 4.2 Principle and Construction of Nicol prism 4.3 Huygens explanation of double refraction in uniaxial crystals 4.4 Quarter wave plate and Halfwave plate 4.5 Production and detection of plane, elliptically and circularly polarized light 4.6 Babinet’s compensator 4.7 Optical activity, Fresnel’s explanation of optical activity 4.8 Specific rotation Laurent’s half shade polarimeter | 18 | CO 4 |

| | | | |
|---------------------------|---|-----------|-----------------|
| 5 | Laser Fundamentals | 18 | CO 5 |
| | 5.1 Fundamental characteristics of lasers | | |
| | 5.2 Two-Level Laser, Three Level Laser | | |
| | 5.3 Quasi Three and four level lasers | | |
| | 5.4 Properties of laser | | |
| | 5.5 Laser modes – Resonator configuration | | |
| | 5.6 Q-switching and mode locking | | |
| | 5.7 Cavity damping | | |
| | 5.8 Types of lasers – Gas lasers | | |
| | 5.9 solid lasers | | |
| | 5.10 liquid lasers | | |
| 5.11 semiconductor lasers | | | |

TEXT BOOKS:

1. N. Subrahmanyam, Brij Lal and M.N. Avadhanulu (2006). *A Text Book of Optics*, S. Chand & Co., New Delhi, ISBN no: 9788121926119
2. R. Murugeshan and KiruthigaSivaprasath (2006). *Optics and Spectroscopy*, S. Chand & Co., New Delhi, ISBN no: 978-8121914413
3. D.R. Khanna and H.R. Gulati (1979). *Optics*, S. Chand & Co., New Delhi, ISBN no: 8180450821

REFERENCE BOOKS:

1. Aruldas (2005), *Molecular Structure and Spectroscopy*, Prentice Hall, New Delhi, ISBN no: 8120317491, 9788120317499
2. AjoyGhatak (1998). *Optics* (3rd Ed), Tata McGrawHill Publishing Co. Ltd., New Delhi, ISBN no: 0070585830, 9780070585836
3. D. Halliday, R. Resnick and J. Walker (2001). *Fundamentals of Physics Extended* (6th Ed), New York, ISBN no: 978-1-119-30685

E-RESOURCES

<https://nptel.ac.in/content/storage2/courses/102103044/pdf/mod2.pdf>

https://youtu.be/_JOchLyNO_w – How LASER work

<https://youtu.be/5b6MDuU1J8U> – Nicol Prism

<https://youtu.be/4bCUTLWycM> – Diffraction through an aperture.

CORE 6 – QUANTUM MECHANICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Understand the inconsistencies in Classical Physics. To become familiar with Blackbody radiation and hence be aware how quantum theory emerged. Gain a clear knowledge about wave properties of particles, De Broglie waves and its implications on the uncertainty principle. Study the Bohr Atom model in detail and understand about atomic excitations have grasped the idea of wave mechanics and gain the concept of Eigen values, Eigen functions. Learn the basic postulates of quantum mechanics. To find solution to Schrödinger's equation for many systems such as particle in a box, Hydrogen Atom and familiarize with different quantum numbers. Finally apply the formulation of Quantum Mechanics, through exactly solvable problems.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Find out the inconsistencies in Classical Physics while trying to understand microscopic physics |
| CO2 | Recall different laws related to Black Body Radiation – Einstein's Theory of Specific Heat – Limitations of Bohr's Model |
| CO3 | Compute the wavelength of matter waves |
| CO4 | List out different experimental evidences for wave nature of particles. |
| CO5 | Explain the postulates of Wave Mechanics and use Schrodinger's equation to compute Eigen values of physical observables |
| CO6 | Evaluate the Commutation relations of angular momentum operators and Identify Pauli matrices |
| CO7 | Solve the Schrodinger's equation for standard potentials like Hydrogen Atom |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |

| | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 7 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 8 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|--------------|--|------------|------------------|
| 1 | Origin of Quantum Theory 1.1 Interpretation of Rayleigh – Jean Law – Wien’s Displacement Law – Ultraviolet Catastrophy 1.2 Derivation of Planck’s Radiation Law 1.3 Results of Lummer – Pringsheim experiment 1.4 Interpretation of Dulong – Petit Law 1.5 Dulong Petit law as special case of Einstein’s Theory – Modification of Einstein’s theory by Debye (no derivation) – 1.6 Limitations of Rutherford Model 1.7 Bohr’s Explanation of spectrum of Hydrogen | 18 | CO1 , CO2 |
| 2 | Wave Nature of Matter 2.1 Dual Nature of Radiation and Matter – Matter waves – de Broglie’s Principle and expression 2.2 Experimental evidences: Davisson and Germer’s experiment – G.P. Thompson’s experiment 2.3 Phase and group velocity – Velocity of Matter waves – wave packet 2.4 Heisenberg’s Uncertainty Principle-Gamma microscope 2.5 Electron microscope. | 18 | CO3 , CO4 |
| 3 | Schrodinger Equation 3.1 Basic postulates of wave mechanics 3.2 properties of wave function – probability interpretation of wave function – normalization of wave function 3.3 linear operators – self adjoint operators – expectation value 3.4 Eigen values and Eigen functions – commutativity and compatibility | 18 | CO5 |
| 4 | Angular Momentum in Quantum Mechanics | 18 | CO6 |

| | | | |
|----------|--|-----------|------------|
| | 4.1 Orbital angular momentum operators and their commutation relations 4.2 Separation of three-dimensional Schrodinger equation into radial and angular parts 4.3 Elementary ideas of spin angular momentum of an electron – Pauli’s matrices. | | |
| 5 | Solutions of Schrodinger Equation 5.1 Free particle solution – particle in a box 5.2 potential well of finite depth (one dimension) 5.3 linear harmonic oscillator 5.4 rigid rotator 5.5 Hydrogen atom | 18 | CO7 |

TEXT BOOKS:

1. SatyaPrakash, Swati Sabja (2012). *Quantum Mechanics* (1st edn), KedarNath, RamNath & Co., ISBN no: 9788190701174
2. David Griffiths (2004). *Introduction to Quantum Mechanics* (2nd edn), Prentice Hall of India, ISBN no: 978-9332542891
3. V. Murugan (2004). *Quantum Mechanics* (1st edn), Pearson Education India, ISBN no: 9788131773628

REFERENCE BOOKS:

1. H.C. Verma (2012). *Quantum Physics* (2nd edn), TBS Publications, ISBN no: 978-8192571409
2. R. Murugesan and Kiruthiga Sivaprasath (2016). *Modern Physics* (18th edn), S. Chand & Co., ISBN no: 9789352533107
3. P.M. Mathews and K. Venkatesan (2017). *A Textbook of Quantum Mechanics* (2nd edn), McGraw Hill., ISBN no: 978-0070146174

E-RESOURCES

- <https://nptel.ac.in/courses/115101107/>
<https://ocw.mit.edu/courses/physics/8-04-quantum-physics-i-spring-2013/index.htm>
<https://ocw.mit.edu/courses/physics/8-04-quantum-physics-i-spring-2016/index.htm>
<https://nptel.ac.in/courses/122/106/122106034/>

CORE PRACTICAL II

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 3:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

As a student of Physics, one has to be very attentive and eager to look into its cause and effect, which gives rise to, what we call it as phenomenon. Each and every phenomenon in Physics is governed by certain laws. These laws are to be verified in the laboratory by experiments. In fact, the laws of Physics have already been verified and the physical constants have also been determined more accurately. The purpose of doing laboratory experiments by the students is to afford an opportunity to familiarize themselves with various instruments, which they read in theory and to culture the habit of taking readings carefully, so as to get the results nearer to the already determined standard values with least error. The student is made to understand the physical principles underlying the experiment undertaken. The experiments can be categorized into following categories:

1. *Determination of parameters like Young's modulus, Rigidity modulus, λ of composite light, g and k , m and B_H , μ of a glass prism.*
2. *Measurement of a property like Thermal conductivity of a bad conductor by Lee's disc method, Temperature coefficient of resistance of a coil, Carey Foster's bridge, Ac frequency.*
3. *Measurement of property of a device like Frequency of the vibrator by Melde's string, Calibration of ammeter, Figure of merit of table galvanometer.*
4. *Electronics experiments like Basic logic gates – AND, OR, NOT gates using diodes & transistors.*

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|--|
| CO 1 | Deduce the figure of merit of the given devices such as ammeter and galvanometer |
| CO 2 | Measure specific resistance, refractive index, Young's modulus, Rigidity modulus, temperature coefficient of resistance etc., as per the standard procedure |
| CO 3 | Ability to do the calculations on the data collected and compare with the standard values as required. Infer the correctness of the results from the experiment |
| CO 4 | Plotting of graphs by means of which it is clear that the manner in which one quantity called the dependent variable changes in a given physical process, when certain arbitrary values are given to a second quantity, called the independent variable, all other factors being assumed to remain unchanged |
| CO 5 | A thorough understanding of the underlying physical principles |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 1 | 3 | 3 | 1 | 3 | 1 | 3 | 1 | 1 | 1 | 3 | 3 | 3 |

| | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 2 | 1 | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 |
| CO 3 | 1 | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 |
| CO 4 | 1 | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 |
| CO 5 | 1 | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| CONTENTS OF MODULE | Hrs | COs |
|---|------------|--|
| 1. Young's modulus – cantilever – depression – Static method-Scale and telescope 2. Basic logic gates – AND, OR, NOT gates using diodes & transistors. 3. Rigidity modulus – Static torsion 4. Spectrometer – Grating N and λ – normal incidence method 5. Compound pendulum – g and k 6. Melde's string – Frequency of the vibrator 7. Thermal conductivity of a bad conductor – Lee's disc method 8. Spectrometer – Grating N and λ – minimum deviation method 9. Air wedge – Thickness of a wire 10. m and B_H – deflection magnetometer–Tan C position and vibration magnetometer 11. Carey Foster's bridge – Temperature coefficient of resistance of a coil 12. Potentiometer – Determination of specific resistance of the coil. 13. Potentiometer – Calibration of ammeter 14. Figure of merit of table galvanometer 15. Sonometer – A.C. Frequency – Using steel wire 16. Spectrometer – μ of a glass prism – i-d curve | 60 | CO1, CO2, CO3, CO4, CO5 |

TEXT BOOKS:

1. Agrawal, Jain & Sharma (2008), *B.Sc. Physics Practicals* (1st edn), Krishna Prakashan Media, ISBN no: 978-93-89242-92-8

2. A. B. Dr. BHISE , R. B. BHISE (2016), *Introduction to Practical Physics* (1st edn), ISBN 9789351644620

REFERENCE BOOKS:

1. Harnam Singh (2011). *B.Sc. Practical Physics* (1st edn), S. Chand Publishers, ISBN no: 9788121904698
2. C.L Arora (2011). *B.Sc. Practical Physics* (1st edn), S. Chand Publishers. ISBN no: 9788121909099.

E-RESOURCES

<https://pdf.wecabrio.com/bsc-second-year-physics-practical.pdf>

FIFTH SEMESTER

CORE 7 – THERMAL PHYSICS & ACOUSTICS

| | | |
|----------------------|----------------|-------------|
| Course Code : | Credits | : 04 |
|----------------------|----------------|-------------|

L:T:P:S : 5:0:0:0

Exam Hours : 03

CIA Marks : 40

ESE Marks : 60

LEARNING OBJECTIVES:

The aim of this paper is to expose the students to the fundamentals of Thermal Physics and Sound. Comprehend the basic concepts of thermodynamics, first, second law of thermodynamics, entropy and their physical interpretations. Learn about the real gas equations, Van der Waal equation of state, the Joule-Thompson effect. The working of various heat engines and determination of their efficiency is realised. Analyse waves and oscillations. Study the basic properties and production of ultrasonics by different methods. This umbrella-subject is typically designed for under graduate students and functions to provide a general introduction to sound and heat.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Concept of temperature, its measurement, knowledge in specific heat capacity of solids, liquids and gases. Understanding the benefits of low temperature physics |
| CO 2 | Become familiar with various thermodynamic process and work done in each of this process. Have a clear understanding about reversible and irreversible process, working of a Carnot engine, and knowledge |
| CO 3 | Derive the expression of thermal conductivity and know the various laws related to black body radiation |
| CO 4 | Attain the scientific knowledge about wave motion |
| CO 5 | Familiarise with important terms in acoustics like intensity, loudness, reverberation, etc., Gain knowledge about production, detection, properties and uses of ultrasonic waves |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 3 | 1 | 2 | 3 |
| CO 2 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 3 | 2 | 1 | 2 | 3 |
| CO 3 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 3 | 3 | 1 | 3 | 3 |
| CO 4 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 3 | 1 | 2 | 3 |
| CO 5 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 3 | 3 | 1 | 2 | 3 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|------|
| 1 | Thermometry, Calorimetry and Low temperature Physics 1.1 Platinum resistance thermometer Callendar and Griffith's bridge 1.2 Thermistor 1.3 Specific heat capacity of solids – Dulong and Petit's law 1.4 Specific heat capacity of liquid – method of mixtures – Barton's correction 1.5 Specific heat capacity of gases – C_p and C_v by Regnault's and Callendar & Barne's methods. 1.6 Joule–Kelvin effect – theory of porous plug experiment 1.7 Liquefaction of gases – Linde's method of liquefying air 1.8 Revision & Tests | 18 | CO 1 |
| 2 | Thermodynamics 2.1 Thermodynamic equilibrium 2.2 Zeroth law of thermodynamics 2.3 First law of thermodynamics 2.4 Reversible and irreversible processes 2.5 Second law of thermodynamics 2.6 Carnot's engine 2.7 Petrol and diesel engines 2.8 Thermodynamic scale of temperature 2.9 Entropy – temperature entropy diagram for Carnot's cycle 2.10 Third Law of thermodynamics – Nernst's heat theorem 2.11 Revision & Tests | 18 | CO 2 |

| | | | |
|----------|---|-----------|-----------------|
| 3 | <p>Conduction and Radiation</p> <p>3.1 Thermal conductivity 3.2 Thermal conductivity of a good conductor – Forbe’s method 3.3 Thermal conductivity of a bad conductor – Lee’s disc method 3.4 Blackbody radiation Wien’s law – Stefan’s law 3.6 Newton’s law of cooling from Stefan’s law 3.7 Solar constant – determination of solar constant 3.8 Pyrometry – Polarising optical pyrometer-Water flow pyroheliometer</p> | 18 | CO 3 |
| 4 | <p>Waves and Oscillations</p> <p>4.1 Wave motion – transverse and longitudinal waves 4.2 Wave velocity and particle velocity 4.3 Differential equation of wave motion 4.4 Stationary waves – properties of stationary waves 4.5 Doppler Effect – Problems based on Doppler Effect. 4.6 Simple harmonic motion – general equation of simple harmonic motion – Differential equation of SHM 4.7 Graphical representation of SHM Combination of two SHMs in a straight line Lissajous’s figures – Free, damped, forced oscillations and resonance</p> | 18 | CO 4 |
| 5 | <p>Acoustics and Ultrasonics</p> <p>5.1 Intensity of sound – Decibel and Bel – Loudness of sound 5.2 Reverberation – Sabine’s reverberation formula 5.3 Acoustic intensity 5.4 Factors affecting the acoustics of Buildings 5.5 Acoustics aspects of halls and auditoriums 5.6 Ultrasonic waves, Production of ultrasonic waves piezo electric crystal method Magnetostriction effect 5.9 Application of ultrasonic waves 5.10 Revision & Tests</p> | 18 | CO 5 |

TEXT BOOKS:

1. Brijlal, Subramanyam N (2003). *Heat & Thermodynamics* (3rd edn), S. Chand & Co, ISBN no: 9788121904179
2. Murugesan R, Kiruthiga Sivaprasath (2013). *Thermal Physics* (2nd edn), Sultan Chand & Sons, ISBN no: 9788121923910
3. Khanna V.R, Bedi R.S (2007). *Text Book of Sound* (1st edn), Kedharnaath Publishers, ISBN no: 9788172014031

REFERENCE BOOKS:

1. Mathur D.S (2010). *Heat & Thermodynamics* (5th edn), Sultan Chand & Sons, ISBN no: 8180542599
2. Bajaj N.K (1988). *Waves and Oscillations* (1st edn), Tata McGraw Hill Education,
3. ISBN no: 9780074516102
4. Ghosh S (1996). *Text Book of Sound* (1st edn), S. Chand & Co, ISBN no: 9789385676154

E-RESOURCES

<https://circuitglobe.com/platinum-resistance-thermometer.html>

https://thefactfactor.com/facts/pure_science/chemistry/physical-chemistry/dulong-petits-law-atomic-mass/12628/

<https://courses.lumenlearning.com/introchem/chapter/the-three-laws-of-thermodynamics/>

<https://www.livescience.com/50776-thermodynamics.html>

<https://keydifferences.com/difference-between-conduction-convection-and-radiation.html>

http://minerva.union.edu/newmanj/Physics100/Color,%20Eye,%20&%20Waves/oscillations_and_waves.htm

https://www.austincc.edu/mmcmgraw/files_2425/Chap_15Ha-Oscillations.pdf

http://digirit.weebly.com/uploads/1/6/6/5/16653588/acoustics__ultrasonics.pdf

CORE 8 – SOLID STATE PHYSICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Understand the basic concepts of crystal structure, its classifications force between atoms and bonding between molecules Differentiate between conductors, insulators and super conductivity. To analyze the crystal structure using X-ray diffraction methods. To acquire knowledge on the basics of magnetic phenomena on materials hence the various types of magnetization. To learn the properties of superconducting materials.

COURSE OUTCOMES: At the end of the Course, the Student would be able to:

| | |
|-------------|--|
| CO 1 | Understand the basic concepts of force between atoms and bonding thereby distinguish materials based on the type of bonding |
| CO 2 | Importance of dielectric constant. Realising that the factors dielectric constant & relative permittivity are key to the operation of capacitors and the determination of the levels of capacitance achievable |
| CO 3 | acquired knowledge on the nature of magnetic materials |
| CO 4 | clear understanding about x-ray diffraction, understand the defects in solids |
| CO 5 | Expected to gain knowledge of superconductivity, its underlying principles and its applications in modern world |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|---|----|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED 3, MODERATELY CORRELATED – 2, WEAKLY

CORRELATED 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|---------|
| 1 | Crystal Structure 1.1 Crystal lattice – primitive and unit cell 1.2 Seven classes of crystal 1.3 Bravais lattice 1.4 Miller indices 1.5 Structure of crystals 1.6 Simple cubic 1.7 Hexagonal close packed structure 1.8 Face centred cubic structure 1.9 Body centered cubic structure 1.10 Sodium chloride structure 1.11 Zinc blende structure 1.12 Diamond structure | 18 | CO 1 |
| 2 | Diffraction of X-rays and Defects in Solids 2.1 X ray diffraction 2.2 Bragg's law in one dimension 2.3 Experimental methods 2.4 Laue method 2.5 Powder crystal method 2.6 Rotating crystal method 2.7 Defects in solids 2.8 Point defects – Frenkel and Schottky defects, equilibrium concentrations 2.9 Line defects – edge dislocation and screw dislocation 2.10 Surface defects – grain boundary 2.11 Effects of crystal imperfections | 18 | CO 2 |
| 3 | Chemical Bonds and Superconductivity 3.1 Interatomic forces 3.2 Different types of chemical bonds 3.3 Ionic bond, cohesive energy of ionic crystals and Madelung constant 3.4 Covalent bond 3.5 Metallic bond 3.6 Van der Waal's bond | 18 | CO 3 |

| | | | |
|---|---|----|---------|
| | 3.7 Hydrogen bond 3.8 Superconductivity – general properties 3.9 Type I and II superconductors 3.10 Meissner effect 3.11 BCS theory 3.12 Applications of superconductors | | |
| 4 | Dielectric Materials 4.1 Dielectric materials 4.2 Polarization, susceptibility and dielectric constant 4.3 Local field or internal field 4.4 Clausius–Mossoti relation 4.5 Sources of polarizability 4.6 Electronic polarizability 4.7 Ionic polarizability 4.8 Orientational polarizability 4.9 Frequency and temperature effects on polarization 4.10 Dielectric breakdown 4.11 Properties of different types of insulating materials | 18 | CO 4 |
| 5 | Magnetic Materials 5.1 Different types of magnetic materials 5.2 Classical theory of diamagnetism (Langevin theory) 5.3 Langevin theory of paramagnetism 5.4 Weiss theory of paramagnetism 5.5 Heisenberg interpretation on internal field 5.6 Quantum theory of ferromagnetism 5.7 Antiferromagnetism Hard and soft magnetic materials | 18 | CO 5 |

TEXT BOOKS:

1. S.O. Pillai (2002). *Solid State Physics* (7th edn), New Age International (P) Ltd., ISBN no: 812241508
2. R.L. Singhal (2003). *Solid State Physics* (2th edn), Kedarnath Ram Nath & Co., Meerut, ISBN no: 9788190701150
3. P. K. Palanisamy (2004). *Solid State Physics* (1st edn), Scitech Publication (India) Pvt. Ltd., Chennai, ISBN no: 978-8188429271

REFERENCE BOOKS:

1. V. Raghavan (2004). *Materials Science and Engineering* (6th edn), Prentice Hall of India Private Limited, New Delhi, , ISBN no: 9788120350922
2. M. Arumugam (2002). *Materials Science* (2nd edn), Anuradha Agencies Publishers, ISBN no: 9788187721055
3. A. J. Dekker (1985). *Solid State Physics* (1st edn), Macmillan India, , ISBN no: 9780333918333

E-RESOURCES

<https://nptel.ac.in/courses/115/105/115105099/>

<https://nptel.ac.in/courses/115/104/115104109/>

<https://nptel.ac.in/courses/115105099/>

<https://nptel.ac.in/courses/115106061/>

<https://nptel.ac.in/courses/115/101/115101012/>

Khan academy

<https://www.studocu.com/en-gb/document/university-of-kent/electromagnetism-optics/lecture-notes/lecture-notes-lecture-part-7-dielectrics/771477/view>

<https://www.askiitians.com/iit-jee-electrostatics/dielectrics-and-polarisation/#Introduction-to-Dielectrics-and-Polarisation>

OPEN ELECTIVE I – SPACE SCIENCE

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 05 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

This course aims to explain the formation of solar systems and it also demonstrates formation of stars and in additional it also describe origin of galaxies and apprise the creation of universe.

COURSE OUTCOMES: At the end of the Course, the Student would be able to:

| | |
|------------|---|
| CO1 | Understand the basic concepts to space |
| CO2 | Discuss the laws of solar system |
| CO3 | Demonstrate formation of stellar objects |
| CO4 | Analyze evolution and origin of galaxies |
| CO5 | Summarize the basic laws of space science and formation of universe |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|---|----|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | Introduction 1.1 Introduction to Space Science 1.2 Its application 1.3 Historical development | 18 | CO1 |
| 2 | Solar System 2.1 Nebular theory of formation of our Solar System 2.2 Solar wind and nuclear reaction as the source of energy 2.3 Sun and Planets Brief description about shape size 2.5 Period of rotation about axis and period of revolution 2.6 Distance of planets from sun-Bode's law 2.7 Kepler's Laws of planetary motion Newton's deductions from Kepler's Laws Newton's Law of gravitation 2.8 Correction of Kepler's third law 2.9 determination of mass of earth 2.10 Brief description of Asteroids Satellites Comets | 18 | CO2 |
| 3 | Stars 3.1 Stellar spectra and structure, stellar evolution, nucleosynthesis and formation of elements. 3.2 Classification of stars: Harvard classification system, 3.3 Hertzsprung-Russel diagram 3.4 Luminosity of star 3.5 Variable stars 3.6 Composite stars (white dwarfs, Neutron stars, black hole, star clusters, supernova and binary stars) 3.7 Chandrasekhar limit | 18 | CO3 |
| 4 | Galaxies 4.1 Galaxies and their evolution and origin 4.2 Active galaxies 4.3 Quasars. | 18 | CO4 |
| 5 | Creation of Universe 5.1 Early history of the universe 5.2 Big-Bang and Hubble expansion model of the universe 5.3 cosmic microwave background radiation 5.4 dark matter and dark energy | 18 | CO5 |

TEXT BOOKS:

1. Baidyanath Basu, T. Chattopadhyay, S.N Biswas (2010). *An Introduction to Astrophysics* (2nd edn), PHI, ISBN no: 9788120340718
2. Abhyankar, K.D. (1999). *Astrophysics of the Solar System* (2nd edn), Universities Press, ISBN no: 9788173713811

3. Kitchin C.R. (1998). *Astrophysical Techniques* (5th edn), Bristol & Philadelphia Institute of Physics Publishing, ISBN no: 9781420082432

REFERENCE BOOKS:

1. Longair M. S. (1992). *High Energy Astrophysics* (2nd edn), Cambridge University Press, ISBN no: 9780521756181
2. Kutner, Marc L (2003). *Astronomy: A Physical Perspective* (2nd edn), Wiley, ISBN no: 9780521529273
3. Gehrels, Tom. (2007). *Survival through Evolution from Multiverse to Modern Society* (1st edn), Surge Publishing, Charleston, SC, USA, ISBN no: 1-4196-7055-7

E-RESOURCES

<http://en.wikibooks.org/wiki/Astronomy> (Book on 'Introduction to Astrophysics')

<http://en.wikipedia.org/wiki/Ionosphere> (Book on Ionosphere).

<http://www.nineplanets.org> (Material on planets and solar system objects).

<http://www-ssg.sr.unh.edu/406/index.html> (Astronomy material).

<http://ocw.mit.edu/ocwweb/web/home> (on – line courses of MIT).

<http://www-istp.gsfc.nasa.gov/Education/Intro.html> (The Exploration of the Earth's Magnetosphere).

SIXTH SEMESTER

CORE 9 – NUCLEAR AND PARTICLE PHYSICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Analyze the ideas of basics of nucleus and their energy. To study the various nuclear models and understand the historical evolution of the present-day nuclear model. Solve problems in radioactivity. Realize the procedures for nuclear fission and fusion. To understand the elementary concepts of the elementary particles.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Understand the Nuclear properties and different Nuclear Models |
| CO2 | Evaluate problems in Half life and Mean life period and also to find the age of Earth |
| CO3 | Understand the working of Radiation Detectors and Particle Accelerators |
| CO4 | Compare between different Nuclear reactors and appreciate their applications |
| CO5 | Distinguish the interaction, isospin and strangeness of different elementary particles |
| CO6 | Solve problems under Nuclear Reactions |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 2 | 1 | 2 | 1 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |
| CO 2 | 2 | 1 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 2 | 1 | 1 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO 4 | 1 | 2 | 1 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 1 | 2 | 2 | 1 | 1 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 2 |
| CO 6 | 3 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|-----|
| 1 | General Properties of Nuclei 1.1 Nuclear Size, Charge, Mass 1.2 Determination of Nuclear Radius-Mirror Nucleus Method 1.3 Mass Defect and Binding Energy-Packing Fraction 1.4 Nuclear Spin – Magnetic Dipole Moment – Electric Quadrupole Moment 1.5 Nuclear Models – Liquid Drop Model 1.6 Weizacker Semi Empirical Mass Formula 1.7 Shell Model and Magic Numbers 1.8 Collective Model-Nuclear Forces 1.9 Meson Theory of Nuclear Force (Qualitative) | 18 | CO1 |
| 2 | Radioactivity 2.1 Natural Radioactivity – Law of Disintegration 2.2 Half Life and Mean Life Period – Units of Radioactivity 2.3 Transient and Secular Equilibrium – Radiocarbon Dating – Age of Earth 2.4 Alpha Rays – Characteristics – Geiger Nuttal Law 2.5 α -ray Spectra – Gamow’s Theory of α – Decay (Qualitative Study) 2.6 Beta Rays –Characteristics – Beta Ray Spectra 2.7 Neutrino Hypothesis – Violation of Parity Conservation 2.8 Experimental Verification with CO^{60} – Gamma Rays and Internal Conversion 2.9 Nuclear Isomerism | 18 | CO2 |
| 3 | Radiation Detectors and Particle Accelerators 3.1 Principle and Working Of Ionisation Chamber 3.2 GM Counter – Quenching and Resolving Time 3.3 Scintillation Counter 3.4 Photo Multiplier Tube 3.5 Thermoluminescence – Thermoluminescence Dosimetry (TLD) 3.6 Linear Accelerator 3.7 Cyclotron 3.8 Synchrocyclotron 3.9 Betatron | 18 | CO3 |
| 4 | Nuclear Reactions 4.1 Conservation Laws – Nuclear Reaction Kinematics 4.2 Q-Value – Threshold Energy 4.3 Radioisotopes and Its Uses | 18 | CO4 |

| | | | |
|---|--|----|-------------|
| | 4.4 Classification of Neutrons – Nuclear Fission – Chain Reaction 4.5. Critical Mass and Size – Nuclear Reactor 4.6 Breeder Reactor – Transuranic Elements 4.7. Nuclear Fusion 4.8 Thermonuclear Reaction 4.9 Sources of Stellar Energy | | |
| 5 | Elementary Particles 5.1 Classification of Elementary Particles 5.2 Fundamental Interaction 5.3 Elementary Particle Quantum Numbers 5.4 Isospin and Strangeness 5.5 Conservation Laws and Symmetry 5.6 Basic Ideas About Quark 5.7 Quark Model | 18 | CO5, CO6 |

TEXT BOOKS:

1. Krane K.S. (1987). *Introductory Nuclear Physics*, Wiley, ISBN no: 9780471805533
2. Devanathan V (2016). *Nuclear Physics*, Narosa Publishing House, ISBN no: 9788184871043
3. Griffiths D, Harper, Row (1987). *Introduction to Elementary Particle Physics*, Wiley, ISBN no: 047160386

REFERENE BOOKS:

1. Roy R.R, Nigam B.P. (2008), *Nuclear Physics* (1st edition), New Age Intl. ISBN no: 9788122434101
2. Tayal D.C. (1988). *Nuclear Physics* (Fifth Edition), Himalaya Publishing House, ISBN no: 9789350978306
3. Ghoshal (1994). *Atomic and Nuclear Physics*, S. Chand & Co, ISBN no: 9788121904131

E-RESOURCES

<https://www.springer.com/gp/physics/particle-nuclear-physics>
<https://nptel.ac.in/courses/115/103/115103101/>
https://onlinecourses.nptel.ac.in/noc20_ph19/preview
<https://iopscience.iop.org/book/978-0-7503-1140-3>
<https://physics.uiowa.edu/research/nuclear-and-particle-physics>

CORE 10 – ATOMIC PHYSICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Understand the properties of positive rays, comprehend how the charge, mass of any nucleus is determined using various spectrograph. Analyse the relationship between various types of couplings. Describe theories explaining the structure of atoms and the origin of the observed spectra. Identify atomic effect such as Zeeman effect and Stark effect. List different types of atomic spectra. Explain the observed dependence of atomic spectral lines on externally applied electric and magnetic field. Understand the properties of x-rays.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Acknowledge electric and magnetic fields and positive rays |
| CO 2 | Recognize photoelectric emission, photo electric equation. Reach a conclusion how photoelectric emission is extrapolated in the construction of photoelectric cells, photo emissive cells, photo voltaic cells and photo conducting cells |
| CO 3 | Reason Pauli's exclusion principle in L-S and J-J coupling |
| CO 4 | Make out the experimental arrangement for the normal Zeeman effect. Deduce anomalous Zeeman effect, Paschen-Back effect, Stark effect |
| CO 5 | Distinguish between characteristic X-ray spectrum and continuous X-ray spectrum Realise the volume of uses of X-rays. Derive the necessary expression to understand the significance of Compton effect |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|---|----|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED 3, MODERATELY CORRELATED – 2, WEAKLY
CORRELATED 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|---------|
| 1 | Discharge Phenomenon through Gases 1.1 Detection of charged particles in electric and magnetic fields 1.2 Determination of e/m 1.3 Dunnington's method 1.4 Positive rays and its properties 1.5 Dempster's mass spectrographs 1.6 Bain bridge's mass spectrograph | 18 | CO 1 |
| 2 | Photo-electric Effect 2.1 Richardson and Compton experiment 2.2 Laws of photoelectric emission 2.3 Einstein photo electric equation 2.4 Millikan's experiment 2.5 Verification of photoelectric equation 2.6 Photoelectric cells 2.7 Photo emissive cells 2.8 Photo voltaic cells 2.9 Photo conducting cells 2.10 Photo multiplier | 18 | CO 2 |
| 3 | Atomic Structure 3.1 Vector atom model 3.2 Pauli's exclusion principle 3.3 Explanation of periodic table 3.4 Various quantum numbers 3.5 Angular momentum and magnetic moment 3.6 Coupling schemes – LS and JJ coupling 3.7 Special quantization 3.8 Bohr magneton 3.9 Stern and Gerlach experiment | 18 | CO 3 |
| 4 | Effect of Atoms in Electric and Magnetic Fields 4.1 Zeeman effect – experimental arrangement for the normal Zeeman effect 4.2 Lorentz's classical theory of normal Zeeman effect 4.3 Larmor's theorem 4.4 Quantum mechanical explanation of the normal Zeeman effect 4.5 Anamalous Zeeman effect 4.6 Paschen–Back effect 4.7 Stark effect | 18 | CO 4 |

| | | | |
|----------|--|-----------|-----------------|
| 5 | X-rays 5.1 Introduction 5.2 Characteristic X-ray spectrum 5.3 Continuous X-ray spectrum 5.4 X-ray absorption 5.5 Moseley's law 5.6 Bragg's law 5.7 Bragg's spectrometer 5.8 Uses of X-rays 5.9 Compton effect experimental verification of Compton effect | 18 | CO 5 |
|----------|--|-----------|-----------------|

TEXT BOOKS:

1. N. Subrahmanyam and Brijlal (2000). *Atomic and Nuclear Physics* (2nd edn), S. Chand & Co., New Delhi, ISBN no: 9788121904148
2. D.L. Sehgal, K.L. Chopra and N.K. Sehgal (1991). *Modern Physics* (9th edn), Sultan Chand & Sons Publication, New Delhi, ISBN no: 9788180549526
3. J.B. Rajam (2004). *Atomic Physics* (20th edn), S. Chand and Co., New Delhi, ISBN no: 978-8121918091

REFERENCE BOOKS:

1. R. Murugesan and Kiruthiga Sivaprasad (2008). *Modern Physics* (18th edn). S. Chand & Co., New Delhi, ISBN no: 9789352533107
2. Arthur Beiser (1969). *Perspectives of Modern Physics* (1st edn), Tata McGraw Hill, New Delhi, ISBN no: 07085047X
3. J.H. Hamilton and Yang (1996). *Modern Physics* (1st edn). McGraw Hill Publication, ISBN no: 978-0071148832

E-RESOURCES

<https://nptel.ac.in/courses/115/105/115105100/>

<https://nptel.ac.in/courses/113/106/113106069/>

Khan academy

ELECTIVE I – INTEGRATED ELECTRONICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 05 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Realize that the operational amplifiers are the work horse of the Electronics industry. To understand the innumerable applications of op-amp as an analog and digital device. Rationalize circuits using Op-Amp for making Summing, subtracting, differentiators and integrators. Surmise criterion for Oscillations in Oscillators and evaluation of frequency of oscillators. The applications of Timer 555 in timing circuits, the importance and construction of semiconductor memories is to be comprehended.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|--|
| CO 1 | Acquire knowledge of Operational Amplifiers and its applications |
| CO 2 | Applying Op-Amp to solve simultaneous equations and second order differential equations. Learn how the op-amp is used to construct oscillators to generate Square wave and Sine wave |
| CO 3 | Acquire the knowledge of principle, construction and working of D/A convertor and A/D converter |
| CO 4 | Express the internal architecture of 555 Timer, and familiarize with the working Timer 555 as an Astable, Monostable multivibrator and Schmitt trigger |
| CO 5 | Understand and necessitate that the semiconductor memories like RAM, ROM, EPROM, EEPROM are applicable in today’s digital world |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|---------|
| 1 | OP-AMP Fundamentals Applications 1.1 Op-AMP, block diagram, symbol and terminals 1.2 Op-AMP characteristics and parameters, comparators 1.3 Inverting and Non inverting amplifier 1.4 Unity follower, Integrator, Differentiator 1.5 Summing, Difference amplifier and Averaging amplifier | 20 | CO 1 |
| 2 | Analog Computation and Waveform Generation 2.1 Solving simultaneous equation 2.2 Solving second order differential equation 2.3 Square wave generation (astable operation) 2.4 Sine wave generation Wien's bridge oscillator | 20 | CO 2 |
| 3 | D/A and A/D Convertors 3.1 Introduction-Block diagram 3.2 D/A convertor – Binary weighted resistor 3.3 D/A convertor R – 2R ladder method 3.4 A/D convertor Counter type 3.5 A/D convertor successive approximation type 3.6 Accuracy and Resolution | 20 | CO 3 |
| 4 | 555 Timer and its Applications 4.1 555 Timer Internal block diagram 4.2 555 Time Astable multivibrator 4.3 555 Time Monostable multivibrator 4.4 555 Time Schmitt trigger | 10 | CO 4 |
| 5 | Semiconductor Memories 5.1 Classification based on principle of operation 5.2 ROM organization 5.3 PROM, EPROM, EEPROM 5.4 Random Access Memory, Static RAM, Dynamic RAM 5.5 Memory parameters | 20 | CO 5 |

TEXT BOOKS:

1. Vijayendran V (2009). *Introduction to Integrated Electronics Digital and Analog* (1st edn), Viswanathan, S., Printers & Publishers Pvt Ltd, ISBN no: 8187156058
2. Millman J, Halkias C.C. (1991). *Integrated Electronics: Analog and Digital Circuits and Systems* (48th edn), Tata McGraw Hill, ISBN no: 9780074622452
3. Dean K.J. (1967) *Integrated Electronics* (15th edn), Chapman & Hill, ISBN no: 9780412087103

REFERENCE BOOKS:

1. Carr J.J. (1990). *Integrated Electronics Operational Amplifiers and Linear ICs with Applications* (5th edn), Harcourt Brace Jovanovich, ISBN no: 9780155413603
2. Gayakwad RA (2002). *Op-amps and Linear Integrated Circuits* (5th edn), Prentice-Hall of India Private. Limited, ISBN no: 9788120320581
3. Choudhury D.R., Jain S (1991). *Linear Integrated Circuits* (15th edn), Wiley Ltd, ISBN no: 9780470217054

ELECTIVE II MICROPROCESSOR FUNDAMENTALS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 05 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

To enable the students to understand organization, architecture of Intel microprocessor 8085, its architecture, pin diagram, timing diagram, instruction set and programming in a lucid and comprehensive manner. To understand data transfer schemes and develop skill in writing programs for 8085.

COURSE OUTCOMES: At the end of the Course, the Student will be able to

| | |
|-------------|---|
| CO 1 | Familiar with the general architecture of a microcomputer system and architecture & organization of microprocessor 8085 |
| CO 2 | Recognize the instruction set of microprocessors 8085 |
| CO 3 | Describe the memory interfacing to 8085 microprocessors |
| CO 4 | Explain the concept of interrupts in 8085 microprocessors |
| CO 5 | Acquire basic knowledge on Programmable peripheral interface 8255 and explain modes of operation of 8255 |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 |
| CO 5 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED 3, MODERATELY CORRELATED – 2, WEAKLY
CORRELATED 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|---------|
| 1 | Architecture 1.1 Architecture of 8085 1.2 Registers, flags, ALU 1.3 Address and data bus, demultiplexing address/data bus 1.4 control and status signals, control bus 1.5 Programmer's model of 8085 1.6 Pin out diagram – functions of different pins | 18 | CO 1 |
| 2 | Programming Techniques 2.1 Instruction set of 8085 2.2 Data transfer and arithmetic instructions 2.3 Logic and branching instructions 2.4 Machine control group of instructions 2.5 Addressing modes, register indirect, direct addressing modes. 2.6 Immediate and implied addressing modes | 18 | CO 2 |
| 3 | Interfacing Memory to 8085 3.1 Assembly language & machine language 3.2 Programming techniques: addition, subtraction 3.3 Multiplication and division 3.4 Ascending, descending order, largest and smallest (single byte). 3.5 Memory interfacing – interfacing 2kx8 ROM and RAM 3.6 Timing diagram of 8085 (MOV R _d , R _s – MVI R _d , data(8)) | 18 | CO 3 |
| 4 | Interfacing I/O Ports to 8085 4.1 Programmable peripheral interface 8255 4.2 8255 – pin out functions, block diagram 4.3 control word 4.4 Modes of operation of 8255 4.5 Interface, I/P&O/P port to 8085 4.6 Flashing LEDs | 18 | CO 4 |
| 5 | Interrupts 5.1 Interrupts in 8085 5.2 Hardware and software interrupts 5.3 RIM instructions 5.4 SIM instructions, priorities 5.5 Simple polled data transfer 5.6 Interrupt controlled data transfer | 18 | CO 5 |

TEXT BOOKS:

1. R.S. Gaonkar (1992). *Microprocessor Architecture Programming and Application with 8085/8080A* (1st edn). Wiley Eastern Ltd., ISBN no: 978-0852262979
2. V. Vijayendran (2003). *Fundamental of Microprocessor 8085*. S. Viswanathan Publishers, Chennai, ISBN no: 9788187156130
3. B. Ram (1993). *Fundamentals of Microprocessors and Microcomputers* (4th edn). Dhanpat RAI Publication, ISBN no: 978-9383182107

REFERENCE BOOKS:

1. Aditya Mathur (1987). *Introduction to Microprocessor I* (3rd edn). Tata McGraw Hill Publishing Company Ltd., ISBN no: 978-0074602225
2. Douglas V. Hall (1983). *Microprocessor and Digital System* (2nd edn), McGraw Hill Company, ISBN no: 9780070255524
3. Senthil Kumar Saravanan, Jeevananthan (2010). *Microprocessors and Microcontrollers* (2nd edn). Oxford Univ Press, ISBN no: 9780199466597

E-RESOURCES

<http://www.engj.ulst.ac.uk/sidk/eeellla/lecture-series//microprocessor>

<https://youtu.be/ii7PCV2zvms>

https://youtu.be/zAXAb_ttazY

<https://www.youtube.com/watch?v=LxDSPFj4wgA>

Computer Core 6 DIGITAL ELECTRONICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Digital Electronics is the foundation of modern computers and digital communications. This is a comprehensive course on understanding digital electronics. The course is to learn the digital format of data and codes. The course will help the student understand Number Systems, Numeric codes, Logic Gates, Combinational Circuits, Sequential Circuits and IC technology. Simplification and construction of digital circuits by employing Boolean algebra is done. Sequential systems are constructed by choosing flip-flop as a building block and understanding how counters provide a memory is addressed. In addition, the fabrication of IC's will be discussed.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Identify and realise that different number system with different number bases play a very important part in the computer |
| CO2 | Construct basic logic gate using NAND and NOR gates. To use Boolean Algebra to design digital circuits and also minimization of gates by using Boolean laws |
| CO3 | Simplify digital circuits using Karnaugh Map and create circuits requiring lesser gates |
| CO4 | Justify that encoder, decoder, multiplexer as well as demultiplexer are combinational logic circuits as their output at any time depends upon the combination of the input signals present at that instant only |
| CO5 | To reach a conclusion that Flip-flops is a data storage element and are fundamental building blocks of digital electronics systems used in computers, communications. Identify different types of flip-flops and what led to the development of these flip-flops. |
| CO6 | Using flip-flops to construct different types of Registers and Counters and conclude how useful sequential circuits are |
| CO7 | Elucidate the fabrication steps involved in IC production |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 7 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO 8 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. NO | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|----------|
| 1 | Digital Fundamentals 1.1 Number systems – binary, octal and hexadecimal 1.2 Binary arithmetic operations – addition, subtraction, multiplication and division. Subtraction using 1’s and 2’s complement. BCD codes 1.3 Basic logic gates – NAND and NOR as universal gates 1.4 Sum of products and product of sums. 1.5 Laws of Boolean algebra 1.6 DeMorgan’s theorems | 18 | CO1, CO2 |
| 2 | Combinational Logic Design 2.1 Karnaugh map representation and simplification, pair, quad, octet (limited to four variables) 2.2 Half and full adders, half and full subtractors, BCD adder 2.3 Multiplexers, demultiplexers, decoders, encoders 2.4 Code converters (BCD-to-binary, binary-to-BCD converters) | 18 | CO3, CO4 |
| 3 | Sequential Circuits 3.1 Introduction to sequential circuits 3.2 flip flops: types of flip flops: – 1-bit memory – latch 3.3 R-S flip flop – J-K flip flop – race-around condition – 3.4 master-slave flip flop – T and D flip flops | 18 | CO5 |

| | | | |
|----------|--|-----------|------------|
| 4 | Registers and Counters 4.1 Registers: modes of operation – shift right register – shift left registers 4.2 Universal shift register 4.3 Counters (4 bit): ripple (or) asynchronous counters 4.4 Synchronous counters – up–down counters 4.5 Decade counter – BCD counter 4.6 Applications of counters | 18 | CO6 |
| 5 | Introduction to IC Technology 5.1 Basic fabrication steps: epitaxial growth, oxidation 5.2 Photolithography 5.3 Etching, diffusion, ion implantation 5.4 Film deposition and metallization 5.5 Fabrication of diodes and transistor | 18 | CO7 |

TEXT BOOKS:

1. V. Vijayendran (2005). *Introduction to Integrated Electronics*. S. Viswanathan Printers and Publishers Pvt. Ltd., Chennai, ISBN no: 9788187156055
2. Jain and Anand (1996). *Digital Electronics Practice Using Integrated Circuits* (4th edn). Tata McGraw Hill, ISBN no: 9780074516928
3. J. Millman and C. Halkias (2001). *Integrated Electronics* (2nd edn). Tata McGraw Hill, New Delhi, ISBN no: 9780070151420

REFERENCE BOOKS:

1. A.P. Malvino and D.P. Leach (1992). *Digital Principles and Application* (4th edn), Tata McGraw Hill, ISBN no: 978-0-07-014170-4
2. M Morris Mano (2004). *Digital Logic and Computer Design* (1st edn). Pearson Education, ISBN no: 978-8177584097
3. Anil K Maini (2007). *Digital Electronics*. Wiley Publications, ISBN no: 978-0-470-51051-3

E-RESOURCES

<https://nptel.ac.in/courses/108/105/108105113/>

<https://nptel.ac.in/courses/117/106/117106086/>

CORE PRACTICAL III

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

This laboratory-based course provides the “hands on” experience in a number of experimental techniques, and develops competence in handling instruments like spectrometer, potentiometer, ballistic galvanometer, magnetometer both deflection and vibration type typically used in Physics. The course assumes a familiarity with properties of matter, optics, magnetism and Electricity. Practical work facilitates learning in the classroom. Using the practical activity can help structure a lesson and improve engagement and knowledge retention. From the observed data students are encouraged to use the graph form to analyse the results and report their findings. With clear objectives and step-by-step guidance, students can grow in confidence, gaining understanding and skills that will not only enable them to work as scientists, but develop critical thinking skills helping them to become confident, independent learners.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Identify that Interference phenomena is responsible for the formation of Newton’s rings. Use the spectrometer to find the Refractive index of a glass by method of $i-i'$ realise that RI depends upon the combination of raw materials used, together with the nature of the manufacturing process |
| CO2 | Methodology to determine the Young’s modulus by Koenig’s method and Optic lever – Telescope arrangement. Correlate the experimental techniques with the relevant theory contained in Properties of Matter. Understand the necessity to record the data with high precision to result in highly accurate results |
| CO3 | Acknowledge that the current produces a magnetic field and use it to determine the approximate (<i>indicative</i>) the value of the earth's magnetism by experiment namely Field along the axis of the coil using Deflection magnetometer and Vibration magnetometer |
| CO4 | Ballistic Galvanometer is the device that is employed for assessing the amount of charge flow that is developed from the magnetic flux. It genuinely operates as an integrator calculating the amount of charge expelled from it which can be realised from experiments like Figure of merit, Internal resistance of a cell, Comparison of capacitances, Comparison of EMFs, Absolute capacitance of a capacitor – B.G. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| Sl. No. | CONTENTS OF MODULE | Hrs | COs |
|---------|---|-----|-----------------------------|
| 1. | Young's modulus – Koenig's method – Non-uniform bending. | 30 | CO1, CO2, CO3, CO4 |
| 2. | Young's modulus – Non-uniform bending – optic lever – scale and telescope. | | |
| 3. | Newton's Rings – R_1 R_2 and μ of a long focus convex lens. | | |
| 4. | Spectrometer $i-i'$ curve fixing i . | | |
| 5. | Spectrometer – Cauchy's constants. | | |
| 6. | Field along the axis of a circular coil – Deflection magnetometer – B_H and M . | | |
| 7. | Field along the axis of a circular coil – Vibration magnetic needle. | | |
| 8. | EMF of thermocouple – Potentiometer (199P method). | | |
| 9. | EMF of thermocouple – Potentiometer (108P method). | | |
| 10. | Calibration of high range voltmeter – Potentiometer. | | |
| 11. | Figure of merit – B.G. | | |
| 12. | Internal resistance of a cell – B.G. | | |
| 13. | Comparison of capacitances – B.G. | | |
| 14. | Comparison of EMFs – B.G. | | |
| 15. | Absolute capacitance of a capacitor – B.G. | | |
| 16. | Series resonance circuit – LCR – finding L , resonant frequency, bandwidth, Q . | | |
| 17. | Spectrometer – Narrow angled prism. | | |

TEXT BOOKS:

1. D. Chattopadhyay, P.C. Rakshit, and B. Saha (2002). *An Advanced Course in Practical Physics* (6th edn), Books and Allied, Kolkata, ISBN no: 8187134208.
2. C. C. Ouseph, U. J. Rao, V. Vijayendran (2015). *Practical Physics* (1st edn), Viswanathan. S Printers and Publishers Pvt. Ltd., ISBN-13 : 978-8187156215

REFERENCE BOOKS:

1. C.L Arora (2011). *B.Sc. Practical Physics* (1st edn), S. Chand Publishers. ISBN no: 9788121909099.
2. Harnam Singh (2011). *B.Sc. Practical Physics* (1st edn), S. Chand Publishers, ISBN no: 9788121904698
3. P.R. SasiKumar (2011). *Practical Physics* (1st edn), PHI Learning Pvt. Ltd, Delhi, ISBN no: 9788120344341
4. Balasubramanian. S, Ranganathan. R, Srinivasan M. N, (2017). *A Textbook of Practical Physics* (2nd edn), S. Chand and Sons Pvt. Ltd, ISBN no: 81-8054-744-7

CORE PRACTICAL IV ELECTRONICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

To gain practical knowledge by applying the experimental methods to correlate with the theory of Diodes, Transistors. To acquire the knowledge of handling, and testing the active and passive components for the construction of various electronic circuits. To construct circuits that will function as oscillators and correlate with theory that the tank circuit is responsible in determining the frequency in Hartley, Colpitts’s oscillator. An introduction to logic gates and their application in construction of combinational circuits like Half adder, Full adder Half subtractor, full subtractor and sequential logic circuits like 4-bit ripple counter is reinforced.

COURSE OUTCOMES: At the end of the Course, the Student will be able to

| | |
|------------|---|
| CO1 | Understand the properties and applications of semiconductor diodes in the form of Half wave, Full wave Bridge rectifier, Zener Regulated power supply |
| CO2 | Understand the properties and working of transistors in CB and CE mode. Understand and analyse the biasing technique in emitter follower |
| CO3 | Construct Hartley, Colpitts’s oscillator circuits using transistors, obtain the frequency of oscillation and identify that they are sinusoidal, audio-frequency oscillators |
| CO4 | Identify the IC chips of NAND and NOR are universal building block in digital circuits |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| Sl. | CONTENTS OF MODULE | Hrs | Cos |
|-----|--------------------|-----|-----|
|-----|--------------------|-----|-----|

| No. | | | |
|-----|---|-----------|---------------------------------------|
| 1. | Full wave rectifier | 30 | CO1, CO2, CO3, CO4 |
| 2. | Bridge rectifier | | |
| 3. | Zener regulated power supply – 9V – Regulation characteristics | | |
| 4. | Transistor characteristics – CB mode | | |
| 5. | Transistor characteristics – CE mode | | |
| 6. | Single stage RC coupled amplifier – gain – Frequency response. | | |
| 7. | Emitter follower | | |
| 8. | Hartley oscillator | | |
| 9. | Colpitt's oscillator | | |
| 10. | Transistor – Astable multivibrator | | |
| 11. | Regulated power supply – IC 7805 | | |
| 12. | NAND/NOR universal building blocks | | |
| 13. | De Morgan's theorem – Verification | | |
| 14. | Half adder – Full adder using IC – XOR, AND and OR gates. | | |
| 15. | Half subtractor, full subtractor using IC – XOR, AND and OR gates | | |
| 16. | 4-bit ripple counter using IC 7473 | | |
| 17. | Decade counter – IC 7490 | | |

TEXT BOOKS:

1. R K Shukla (2007), *Practical Physics* (1st edn), New Age International (P) Limited, Publishers, ISBN no: 9788122417487
2. Dr. A. B. Bhise, Dr. R. B. Bhise (2018). *Practical Physics For B.Sc. Part - I & II* (3rd edn), Nirali Prakashan, ISBN no: 9789351647591
3. D. Chattopadhyay, P.C. Rakshit, and B. Saha (2002). *An Advanced Course in Practical Physics* (6th edn), Books and Allied, Kolkata, ISBN no: 8187134208
4. C. C. Ouseph, U. J. Rao, V. Vijayendran (2015). *Practical Physics* (1st edn), Viswanathan S Printers and Publishers, Pvt. Ltd., ISBN-13: 978-8187156215

REFERENCE BOOKS:

1. G. L. Squires (2001). *Practical Physics* (4th edn), Cambridge University Press, ISBN no: 9781139632720
2. C.L Arora (2011). *B.Sc. Practical Physics* (1st edn). S. Chand Publishers. ISBN no: 9788121909099.
3. Harnam Singh (2011). *B.Sc. Practical Physics* (1st edn), S. Chand Publishers, ISBN no: 9788121904698
4. P.R. SasiKumar (2011). *Practical Physics* (1st edn), PHI Learning Pvt. Ltd, Delhi, ISBN no: 9788120344341
5. Balasubramanian. S, Ranganathan. R, Srinivasan M. N. (2017). *A Textbook of Practical Physics* (2nd edn), S. Chand and Sons Pvt. Ltd, ISBN no: 81-8054-744-7

CORE PRACTICAL V APPLIED ELECTRONICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

In Applied Electronics theory paper a number of circuits highlighting the various applications of op-amp is studied which is practically realised in the Applied electronics lab which helps to gain practical knowledge by applying the experimental methods to correlate with the theory .Operational Amplifiers for used in the construction of various electronic circuits like adders, subtractors, square wave generator, Wien's bridge oscillator, Phase Shift oscillator. Students study that ADCs and DACs function as interfaces between a completely digital system, like a computer, and the analog world. In a telecommunications system, where the usual output is audible speech if such an analog output is desired, then we need to convert the digital signal back to an analog form so the method D/A conversion by 4-bit binary weighted resistor method reflects on the above. Timer 555 is used in everything from toys to spacecraft. Due to its versatility, availability, and low cost it remains a favourite. Using TIMER 555 the circuit of Schmitt trigger and square wave generator is constructed. Realize the practical application for a RC time constant. The course objective is to introduce the basic concepts of microprocessor and to develop in students the assembly language programming skills and real time applications of Microprocessor.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|---|
| CO1 | Use operational amplifier to realise mathematical operations like addition and subtraction of voltages establishing the versatility of op-amps |
| CO2 | Realise the application of op-amp in the construction of oscillators like Wein's bridge, square wave oscillator, phase shift oscillators. Observe the calculated frequency of oscillation matches with the theoretical frequency |
| CO3 | To become familiar with the Instruction set of Intel 8085 microprocessor. To provide practical hands on experience with Assembly Language Programming. Write algorithms draw flow charts and realize Programs using Microprocessor 8085 instruction set |
| CO4 | Schmitt Triggers constructed using TIMER 555 is a fundamental circuit with several uses. One is signal processing and the hysteresis curve is a proof |
| CO5 | On completion of the experiment D/A by binary weighted resistor method the importance, significance and the various terms like full scale voltage, accuracy, resolution of D/A converters is comprehended |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| Sl. No. | CONTENTS OF MODULE | Hrs | Cos |
|---------|--|-----|-----------------------------|
| 1. | OP Amp – IC 741 – Inverting amplifier, non-inverting amplifier, unity follower | 30 | CO1, CO2, CO3, CO4 |
| 2. | OP Amp – Summing and difference amplifier | | |
| 3. | Op Amp – Differential amplifier – CMRR. | | |
| 4. | OP Amp – AC frequency response | | |
| 5. | OP Amp – Square wave generator | | |
| 6. | OP Amp – Wien's bridge oscillator | | |
| 7. | OP Amp – Phase Shift oscillator | | |
| 8. | 555 Timer – Astable multivibrator | | |
| 9. | 555 Timer – Schmitt trigger | | |
| 10. | D/A convertor – 4-bit binary weighted resistor method | | |
| 11. | μ p – 8085 8-bit addition, multiplication | | |
| 12. | μ p – 8085 8-bit subtraction, division | | |
| 13. | μ p – Sorting in ascending order – 8-bit data | | |
| 14. | μ p – Sorting in descending order – 8-bit data | | |
| 15. | μ p – Finding the largest number in an array | | |
| 16. | μ p – Finding the smallest number in an array | | |

TEXT BOOKS:

1. D. Chattopadhyay, P.C. Rakshit, and B. Saha (2002). *An Advanced Course in Practical Physics* (6th edn), Books and Allied, Kolkata, ISBN no: 8187134208
2. C. C. Ouseph, U. J. Rao, V. Vijayendran (2015). *Practical Physics* (1st edn), Viswanathan. S Printers and Publishers, Pvt. Ltd., ISBN-13: 978-8187156215
3. C.L Arora (2011). *B.Sc. Practical Physics*, (1st edn) S. Chand Publishers. ISBN No. 9788121909099.

REFERENCE BOOKS:

1. Willam H. Gothmann (2000). *Digital Electronics: An Introduction to Theory and Practice* (2nd edn), Prentice Hall of India Pvt Ltd, ISBN no: 9788120303485
2. Virendhra Kumar (2002). *Digital Electronics Theory and Experiments* (1st edn), New Age International Publishers, NewDelhi, ISBN no: 978-81-224-3892-5
3. S. Salivahanan, S. Arivazhagan (2000). *Digital Circuit and Design* (3rd edn), Vikas Publishing House PVT Limited, ISBN no: 9788125920632
4. Lab Manual, Prepared by Department Staff, Department of Physics, DGVC

ENVIRONMENTAL STUDIES

COURSE CODE:

OBJECTIVES:

Environmental education should be compulsory. Environmental education should take into account the historical perspective, the current and the potential historical issues. Environmental education should emphasise the importance of sustainable development i.e., economic development without degrading the environment. Environmental education should emphasise the necessity of seeking in environmental planning. Environmental education should lay more stress on practical activities and first-hand experiences.

OUTCOME:

1. Demonstrate a general understanding of the breadth and interdisciplinary nature of environmental issues.
2. Denote a general understanding of the qualitative and quantitative research methods to gain empirical evidence bearing on evaluation of environmentally sustainable alternatives
3. Reveal depth of critical analysis and writing of environmental problems that span popular, grey and primary publications.
4. Recall the ability to locate, interpret and apply published research and lessons from successful projects to a focused environmental solution with potential regional stakeholders.
5. Conduct and present (orally and in writing) independent research that is consistent with the highest standards and practices of research in environmental science.

EXTENSION ACTIVITY

COURSE CODE:

OBJECTIVE:

To enrich the students to handle the social relation to the public and government higher secondary students. To acquire the knowledge to solve the environmental issues. To able to handle the classes for higher secondary students both theory and practical. To create the awareness to eradicate the plastics and planted the seed saplings to our environment. To create the interest in the students about environment by planting saplings for their birthday occasion. Value Education is to teach universal values like moral values, patience, honesty, etc., to the students. The purpose of value education is the development of the personality of the student. The student should develop in all dimensions so that they can serve the nation more democratic, cohesive, socially and responsibly. The full development of student's personality in its physical, mental, emotional and spiritual aspects. Development of good manners, responsibility, way of thinking and living should be developing at the democratic level. Developing patience, honesty, moral values etc.

COURSE OUTCOME:

1. Able to handle the social relation between the public and students.
2. Familiarize the students to handle the environmental issues.
3. According to the need for higher secondary students, educate the school students both theory and practical.
4. Eradicate the plastics in and around the school and college.
5. The value education helps the student to develop

- ✓ **Character development**
- ✓ **Personality development and**
- ✓ **Citizenship education**

Non-Major Elective 1 – DIGITAL ELECTRONICS

| | | |
|--------------------------|------------------|-------------|
| Course Code : | Credits | : 05 |
| L:T:P:S : 2:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

LEARNING OBJECTIVES:

Students will be able to articulate the different number system like binary octal and hexadecimal. Establish the relation Boolean Algebra and Logic Gates and effectively apply the Boolean laws as well as Karnaugh map to achieve Gate Level Minimization.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|--|
| CO 1 | Review of Number Systems and Codes: Binary, Octal and hexadecimal conversions |
| CO 2 | Solving problems to perform binary addition and subtraction by 1's complement and 2's complement method |
| CO 3 | Identify basic logic Gates. Justified that Universal Gates are NAND and NOR because the construction of all other gates are realised |
| CO 4 | Recall laws of Boolean algebra, De Morgan's Theorem and construction of Truth Tables |
| CO 5 | Calculate the Min term and Max term to simplify Boolean expressions using Karnaugh Map |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | | PSO | | | | |
|-------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|--|-----|------|
| 1 | Review of Number Systems and Codes: Binary, Octal and hexadecimal conversions | 8 | CO 1 |
| 2 | Binary addition and subtraction 1's complement and 2's complement arithmetic | 8 | CO 2 |
| 3 | Basic Logic Gates: Basic Gates and realization NAND and NOR as universal gates | 8 | CO 3 |
| 4 | Boolean Algebra: Rules and laws of Boolean algebra De-Morgan's Theorems Boolean Expressions and Truth Tables | 8 | CO 4 |
| 5 | Minterm and Maxterms Simplification of Boolean Expressions using Karnaugh Map | 8 | CO 5 |

TEXT BOOKS:

1. Floyd T.L. (2011). *Digital Fundamentals* (10th edn), Pearson Education, ISBN No: 9780132359238
2. C.H. Roth and L.L. Kimney (2013). *Fundamentals of Logic Design* (7th edn), Cengage Learning, ISBN no: 781285633022
3. Donald P. Leach, Albert Paul Malvino and GoutamSaha (1986). *Digital Principles and Applications* (8th edn), Mc Graw Hill. ISBN no: 9789339203405

REFERENCE BOOKS:

1. Mano M.M. (2007). *Logic and Computer Design Fundamentals* (4th edn), Pearson Education, ISBN no: 978-1-292-02468-4
2. R.J. Tocci, N.S. Widmer (2011). *Digital Systems, Principles and Applications* (11th edn), Pearson Education, ISBN no: 0135103827
3. John F. Wakerly (2005). *Digital Design: Principles and Practices* (4th edn), Pearson, ISBN no: 8131713660

E-RESOURCES

https://en.wikipedia.org/wiki/Digital_electronics
<https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/>
<https://learnabout-electronics.org/Digital/dig10.php>
<https://www.allaboutcircuits.com/textbook/digital/>
<https://www.javatpoint.com/digital-electronics>

Non-Major Elective 2 – LASER PHYSICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 05 |
| L:T:P:S : 2:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

This introductory course is intended for students across all disciplines to understand the basic principles of how lasers work and discern their main features. It also presents the different types of lasers available today. The lesson plan is designed such that to begin with the process of stimulated emission, metastable state is explained necessary to understand the fundamental working of the laser, next the different types of laser available and their construction is discussed, followed by an account of the wide range applications in various fields like industry, medicine and communication. So finally, the students will be able to articulate on fundamentals, production and applications of LASER.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Identify that the process of population inversion, optical pumping are necessary for the functioning of LASER |
| CO 2 | Analyze the different types of LASER |
| CO 3 | Comprehend the industrial applications of LASER |
| CO 4 | Assimilate the medicinal applications of LASER and appreciate how it useful to the society |
| CO 5 | Envision how LASER is revolutionising the field of Communication |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 |
| CO 1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 5 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY
CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|------|
| 1 | 1.1 Fundamentals of LASER 1.2 Spontaneous emission, stimulated emission 1.3 meta stable state, Population inversion, pumping 1.4 Laser Characteristics | 8 | CO 1 |
| 2 | 2.1 Helium – Neon Laser 2.2 Ruby Laser 2.3 CO ₂ Laser 2.4 Semiconductor Laser | 8 | CO 2 |
| 3 | 3.1 Industrial Applications of LASER 3.2 Laser cutting, welding drilling 3.3 Hologram 3.4 Recording and reconstruction of hologram | 8 | CO 3 |
| 4 | 4.1 Lasers in Medicine 4.2 Lasers in Surgery 4.3 Lasers in ophthalmology 4.4 Lasers in cancer treatment | 8 | CO 4 |
| 5 | 5.1 Lasers in Communication 5.2 Optic fiber communication 5.3 Total internal reflection 5.4 Block diagram of fiber optic communication system 5.5 Advantages of fiber optic communication | 8 | CO 5 |

TEXT BOOKS:

1. N. Avadhanulu (2013). *An introduction to LASERS*, S. Chand & Company, ISBN no: 9788121920711
2. William T. Silfvast (2008). *Laser Fundamentals*, Cambridge University Press, New Delhi, ISBN no: 978-0521541053
3. K. Thyagarajan and A.K. Ghatak (1984). *Laser Theory and Application*, MacMillan India Ltd, ISBN no: 978-1-4419-6442-7

REFERENCE BOOKS:

1. Pradip Narayan Ghosh (2018). *Laser Physics and Spectroscopy Book*, CRC Press, ISBN no: 9781138588271
2. William T. Silfvas (1996). *Laser Fundamentals Book*, Cambridge U.P., New York, ISBN no: 978-0521541053
3. Colin Webb and Simon Hooker (2010). *Laser Physics Book*, Oxford University Press, ISBN no: 9780198506911

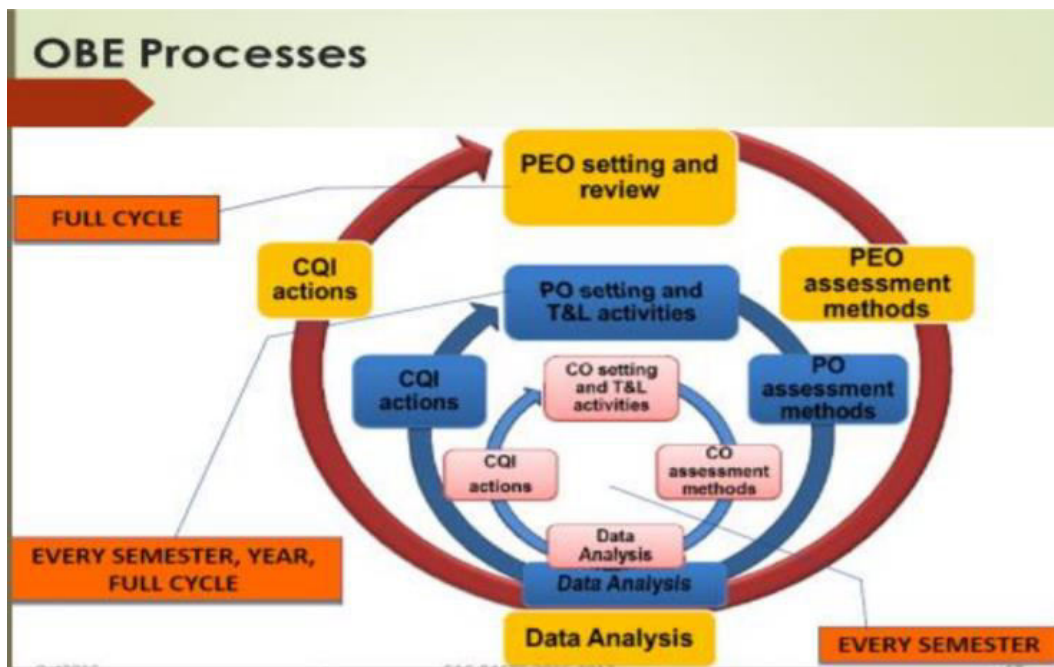
APPENDIX A

Outcome Based Education (OBE)

Outcome-based education means starting with a clear picture of what is important for students to be able to do, then organising the curriculum, instruction and assessment to make sure that this learning ultimately happens

OBE means clearly focusing and organizing an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences.

Students need to achieve by gaining Knowledge, Skill and Ability. For this to happen it is necessary to organize the curriculum, instruction, and assessment and make sure the learning ultimately happens.



APPENDIX B

Graduate Attributes

Graduate Attributes are the qualities, skills and understandings that the students should develop during their time with the Institution. These generic graduate attributes outline the overarching capabilities that will be developed by students. These qualities are intended to equip graduates to be global citizens, and effective members of society.

Intellectual rigour: a commitment to excellence in all scholarly and intellectual activities, including critical judgement.

Knowledge of the discipline: command of a discipline to enable a smooth transition and contribution to professional and community settings.

Communication and social skills: the ability to communicate and collaborate with individuals, and within teams, in professional and community settings.

Lifelong learning: the ability to be responsive to change, to be inquiring and reflective in practice, through information literacy and autonomous, self-managed learning.

Ethical practice: a commitment to sustainability and high ethical standards in social and professional practices.

Creativity: an ability to develop creative and effective responses to intellectual, professional and social challenges.

Cultural competence: an ability to engage with diverse cultural and Indigenous perspectives in both global and local settings.

APPENDIX C

Bloom's Taxonomy

REMEMBERING: recall of information

arrange; cite; collect; define; describe; duplicate; enumerate; find; identify; locate; memorize; record; recognize; match; relate; select; name; label; list; order; quote; recall; repeat; reproduce; select; show; state

UNDERSTANDING: demonstration of comprehension

associate; classify; compare; contrast; convert; describe; estimate; explain; extend; generalize; give examples; identify; interpret; justify; locate; outline; paraphrase; predict; recognize; report; restate; review; select; summarize; trace; translate

APPLYING: applying knowledge in a new context

apply; calculate; chart; choose; classify; complete; compute; construct; contribute; develop; discover; dramatize; employ; experiment; extend; illustrate; implement; instruct; interpret; modify; operate; participate; practice; predict; show; solve; teach; text; use

ANALYZING: supporting assertions through the use of evidence and arguments identifying causes and patterns

advertise; analyze; break down; categorize; classify; collect; compare; connect; contrast; correlate; criticize; diagram; differentiate; distinguish; divide; establish; explain; identify; illustrate; infer; investigate; order; outline; prioritize; question; select; separate; verify

EVALUATING: coming to a judgement on the value of information or the validity of arguments

appraise; argue; assess; choose; conclude; convince; criticize; critique; debate; decide, defend; determine; discriminate; evaluate; grade; integrate; interpret; judge; justify; predict; prioritize; rate; recommend; reframe; score; select; support; value

CREATING: combining or grouping knowledge to come to new conclusions

adapt; anticipate; arrange; assemble; collect; combine; compile; construct; decide; design; develop; facilitate; formulate; generate; generalize; imagine; incorporate; individualize; integrate; invent; modify; negotiate; organize; plan; propose; rearrange; reconstruct; reorganize; revise; select; structure; substitute; validate

[Verbs correlating to Bloom's Taxonomy drawn from <http://www.coun.uvic.ca/learn/program/hndouts/bloom.html>]

APPENDIX D

ELECTIVE I – BIO-PHYSICS

| | |
|------------------------------|-----------------------|
| Course Code : 1537413 | Credits : 05 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

This course is designed as a broad introduction into the field of biophysics for graduate students with the background in chemistry, physics, computer science, and biology. The goal of the course is to present the concepts of physical chemistry and map their application on a rapidly expanding interdisciplinary interface, combining biology, chemistry, and physics. The course aims to balance the need for rigorous mathematical treatment with the simplicity of presentation. Students who successfully passed this course will have understood the basic terms and concepts of Biophysics. They will be able to describe biophysical phenomena with simple physical models. They will master the complex experimental setups in modern experimental Biophysics. They should be able to describe biological phenomena with physical models of different complexity. They will learn to work with a tidy and complete recording of measurement data. They will be able to set-up, run and evaluate complex experiments as well as to report the results in a clear manner.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Learn about Interactive Potentials for strong and weak bonds, non-central forces, bond energies and spring constants |
| CO 2 | Explore the techniques and methods available such as X-ray diffraction and molecular structure, nuclear magnetic resonance, Scanning Tunnelling Microscopy, optical tweezers and Atomic Force Microscopy |
| CO 3 | Learn important topics like Biological Polymers, Biological Membranes, Nerve Signals and Vertebrate Heart |
| CO 4 | Master the concepts of Chemical Spectroscopy such as Absorption, Atomic and Molecular energy levels, Raman spectra, Electronic energy spectra of polyatomic molecules, UV absorption by proteins and nucleic acids. Understand Laser and its applications |
| CO 5 | Comprehend the chemical and analytical applications of Radiation and Traces in the Health Industry. |

Unit 1: Energies, Forces and Bonds

Interactive Potentials for strong and Weak Bonds, Non central forces, Bond Energies and Spring constants.

Unit 2: Techniques and Methods

X-ray diffraction and Molecular structure, Nuclear Magnetic Resonance, Scanning Tunnelling Microscopy, Atomic Force Microscopy, Optical Tweezers.

Unit 3: Physics of Membranes, Nerves and Heart

(a) Biological Polymers & Biological Membranes – Nucleic Acids – DNA and RNA – Proteins, Proteins folding Biological Membranes – Membrane Chemistry and Structure, Membrane Physics, Excitable Membranes, diffusion and Mobility of ions, Resting Potential.

Nerve Signals Passive Response, Nerve impulses, Nervous System Memory

(b) Vertebrate heart Role of the vertebrate circulatory system, blood pressure, the vertebrate heart, the heart sequence, Electrocardiography, Heart as a pump.

Unit 4: Chemical Spectroscopy

Absorption, spectroscopy and Molecular structure, Atomic and Molecular energy levels, vibration of polyatomic molecules, Raman spectra, characteristics bond frequency, Electronic energy level, Electronic energy spectra of polyatomic molecules, UV absorption by proteins and nucleic acids. Photoacoustic spectroscopic technique and its application to Biomolecules. Laser and its applications.

Unit 5: Radiation, Health and Traces

Absorption of radiation by body tissues, Damage because of neutrons, Radio dose units, Relative Biological Effectiveness (RBE), Radiation detection and measurements. Radioactive Traces, Requirements of a Tracer, Application of Traces. **Chemical applications:** Tracer method and its limitations, Rate of chemical exchange reaction **Analytical applications:** Neutron activation analysis, Analysis with ion beams, PIXE technique.

TEXT BOOKS:

1. Rodney Cottouill (2002). *Biophysics an Introduction*. John Wiley & Sons Ltd, 2002, ISBN no: 978-0-471-48538-4
2. Gerhart Friedlander, Joseph W. Kennedy, Edward S. Macias & J.M. Miller Jones (1981), *Nuclear and Radiochemistry* (3rd edn), Wiley & Sons, ISBN no: Q-471-86255-X
3. P. Narayanan (2016), *Essentials of Biophysics* (2nd edn), New Age International (P) Ltd., ISBN no: 9788122420807

REFERENCE BOOKS:

1. L. Stanford (1975). *Foundations of Biophysics* (1st edn), Academic Press, ISBN no: 9780126633504
2. **Glaser**, Roland (2012). *Biophysics-An Introduction* (1st edn), Springer Publications, ISBN 978-3-642-25212-9
3. **Hoppe W.**, **Lohmann W.**, Markl H., **Ziegler H.** (1983). *Biophysics* (1st edn), Springer Publications, ISBN 978-3-642-68877-5

ELECTIVE I – APPLIED PHYSICS

| | |
|------------------------------|-----------------------|
| Course Code : 1537413 | Credits : 05 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

The students will be able to apply principles to model and solve representative problems analytically and computationally, at an introductory level from the primary physical theories (classical mechanics, quantum mechanics, special relativity, thermodynamics, electromagnetism and optics), and at an advanced level in classical mechanics, electrostatics and optics/electrodynamics. They will gain knowledge to design and conduct experiments, build scientific equipment, write scientific programs to simulate physical systems, and analyze data. They will develop skills to communicate professionally to a technical audience both orally and in writing. They will also be able to understand scientific ideas by reading books and journal articles. They will understand scientific ethical practices and demonstrate them in the conduct of scientific research. They should also be able to conduct experimental, theoretical or computational research under the direction of a mentor to contribute to the generation of new knowledge or technologies and prepare to do this professionally.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|--|
| CO 1 | Recognize and present real-life examples of the concept and interrelate some of them |
| CO 2 | Describe the link between Physics and the technology |
| CO 3 | Identify technological applications of the topics covered in syllabus |
| CO 4 | Understand the benefits of the course and potential to find his/her area of specialization |

Unit 1: Semiconductors

Elemental and compound semiconductors Energy bands – Direct and indirect semiconductors – Electrons and holes – Effective mass – Intrinsic materials – Extrinsic materials – Fermi level – Electron and hole concentration at equilibrium – Temperature dependence of carrier concentrations – Compensation and space charge neutrality -Conductivity and mobility – Hall effect in semiconductors

Unit 2: Lasers & Its Applications

Basic principle – Induced absorption – Spontaneous and induced emissions – Ruby and He-Ne lasers – Semiconductor laser – Characteristics of laser light and its applications based on these characteristics – (e.g., in industry, science, medicine, communications, surveying, holography, fusion reactors, isotope separation, etc.)

Unit 3: Fibre Optics

Basic principle – Fibre construction – and dimensions – Light propagation in fibres – Numerical aperture of fibres – Step index and graded index fibres – Signal distortion in optical fibres – Transmission losses – Light wave communication in optical fibres – Advantages of optical fibres over conventional system of communication.

Unit 4: Particles and Waves

Mechanism of x – ray production (continuous and characteristic x – rays, Duane-Hunt limit) – Compton effect – Pair production – Phase and group velocities – Uncertainty principle – Quantum Mechanics: Introduction to quantum mechanics – Wave function – Conditions necessary for physically acceptable wave function – Probability density and probability – Schrödinger equation (time dependent and steady state or time independent forms) – Eigen values and Eigen functions – Expectation values – Particle in a box

Unit 5: Statistical Mechanics

Statistical distributions – Maxwell-Boltzmann statistics – Molecular energies in an ideal gas – Quantum statistics – Specific heats of solids – Free electron in a metal – Electron – energy distribution

TEXT BOOKS:

1. Ben G. Streetman (2000). *Solid State Electronic Devices* (5th edn), Prentice-Hall of India Private Limited, New Delhi, ISBN no: 10: 0130255386
2. Arthur Beiser (2003). *Concepts of Modern Physics* (6th edn), Mc. Graw Hills Inc. International Edition, ISBN no: 0-07-115096-X
3. M.R. Wehr, J.A. Richards Jr. and T.W. Adair III (1984). *Physics of the Atom* (4th edn), Addison Wesley/Narosa, ISBN no: 9780201088786

REFERENCE BOOKS:

1. M.R. Srinivasan (1996) *Physics for Engineers* (2nd edn), New Age International (P) Limited Publishers, ISBN no: 9788122426038
2. Dale Ewen, Neill Schurter, and P. Erik Gundersen (1997). *Applied Physics* (11th edn), Pearson Publications, ISBN no: 9780137715695
3. Richard Feynmann (1964). *The Feynmann Lectures on Physics* (2nd edn), Addison-Wesley, ISBN no: 978-8185015828

ELECTIVE II – PHYSICS OF MATERIALS

| | |
|----------------------------|-----------------------|
| Course Code : 37625 | Credits : 05 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Students will demonstrate an understanding of core graduate-level theoretical knowledge in materials science. Provides an overview of Materials Science and Engineering as a basis for understanding how structure/property/processing relationships are developed and used for different types of materials. Illustrates the role of materials in modern society by case studies of advances in new materials and processes. Students will demonstrate written and oral communication skills in communicating materials science and physics-related topics. Students will demonstrate an understanding of the impact of physics and science on society.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|--|
| CO 1 | Gain knowledge on phase diagrams and various material processing methods |
| CO 2 | Explain the necessary understanding on various advanced materials |
| CO 3 | An idea about various characterizations like XRD, Electron Microscopy, Atomic Force Microscopy |
| CO 4 | Describe why each of the fundamental properties of materials covered in the course (stress, strain, elastic constant, creep, fatigue, wear, hardness, Poisson's ratio, toughness, ductility, flexural strength, impact strength, elongation) are important |
| CO 5 | To research current applications of materials understand limitations of those materials, evaluate future trends in those applications |

TEXT BOOKS:

1. Balasubramaniam R. (2014). *Callister's Materials Science and Engineering* (2nd edn), Wiley India Pvt. Ltd, ISBN no: 8126541601
2. Kasap S.O. (2007). *Principles of Electronic Materials and Devices* (3rd edn), McGraw-Hill Education, ISBN no: 9780072393422
3. Wahab M.A. (2009). *Solid State Physics: Structure and Properties of Materials* (3rd edn), Narosa Publishing House, ISBN NO: 978-8184874938.

REFERENCE BOOKS:

1. Donald Askeland (2010). *Materials Science and Engineering* (1st edn), Brooks/Cole ISBN no: 978813151255
2. Raghavan V (2015). *Materials Science and Engineering* (5th edn), PHI Learning, ISBN no: 13: 978-81203509225
3. Smith W.F., Hashemi J. & Prakash R. (2014). *Materials Science and Engineering* (5th edn), Tata Mcgraw Hill Education Pvt. Ltd., ISBN no: 978-0073529240

**ELECTIVE II –
INTRODUCTION TO ASTRONOMY AND ASTROPHYSICS**

| | |
|----------------------------|-----------------------|
| Course Code : 37625 | Credits : 05 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

Students will know the positions in the night sky of key objects and have a basic knowledge of celestial motions and phenomena. They will be able to describe the basic structure and content of the Solar System. They will know how the fundamental properties of the Sun and stars are measured. They will be aware of the challenges surrounding the detection of extra-solar planets and of the physical requirements for extra-terrestrial life. They will know the characteristics of our Galaxy and be able to compare and contrast its properties to other galaxies. They will know, and be able to apply, the fundamental principles of optical telescopes and of other types of telescope. They will be familiar with the Big Bang theory of the creation and expansion of the Universe. Students will be able to apply the basic principles of physics and astronomy to the solution of a range of problems. They will know how to produce a well-structured solution, with clearly explained reasoning and appropriate presentation.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|-------------|---|
| CO 1 | Understand Kepler's Laws, Sky coordinates, phases of the Moon, the Moon's orbit and eclipses and Planetary motions. |
| CO 2 | Learn about the formation of Solar System and the various types of planets and atmospheres in the cosmos |
| CO 3 | Understand how galaxies are formed, the various of galaxies, the Big Bang. Learn about the history and fate of the universe |
| CO 4 | Explore the vast array of astronomical techniques and tools available at our disposal. Understand the techniques in use to detect dark matter |
| CO 5 | Learn about the structure and evolution of Stars, White Dwarfs and Chandrasekar Limit, Virial Theorem, stages of nuclear burning, Schonberg-Chandrasekar limit and supernovas |

Unit 1: Sky Coordinates and Motions:

Earth Rotation – Sky coordinates – seasons – phases of the Moon – the Moon's orbit and eclipses – timekeeping (sidereal vs synodic period); Planetary motions – Kepler's Laws – Gravity; Light & Energy – Telescopes – Optics – Detectors

Unit 2: Planets

Formation of Solar System – planet types – planet atmospheres – extrasolar planets; Stars: Measuring stellar characteristics (temperature, distance, luminosity, mass, size) – HR diagram – stellar structure (equilibrium, nuclear reactions, energy transport) – stellar evolution;

Unit 3: Galaxies

Our Milky Way – Galactic structure – Galactic rotation – Galaxy types – Galaxy formation; Cosmology: Expansion of the Universe – redshifts – supernovae – the Big Bang – history of the Universe – fate of the Universe

Unit 4: Astronomical Techniques

Telescopes and Detectors – optical, infrared, radio, x-rays, gamma-rays, neutrinos and cosmic rays; Gravitational radiation; Detection of dark matter and Dark Energy Astronomy from Space; Imaging – focal plane imagers, PSF and deconvolution, interferometry Photometry, Spectroscopy, Polarimetry, Astrometry; Solar telescopes; Surveys, Astronomical databases, Virtual Observatory

Unit 5: Structure and Evolution of Stars

Mechanical, Thermal and Nuclear time scales – Hydrostatic equilibrium (Newtonian and Relativistic) – Polytropic Equation of State – Lane Emden Equation – Degenerate matter Equation of State – White Dwarfs and Chandrasekhar limit – Virial Theorem – Radiative Equilibrium – Schwarzschild convection criterion – nuclear energy generation – stages of nuclear burning — Schonberg-Chandrasekhar limit – Hayashi tracks – Horizontal branch – giant and asymptotic giant branches – planetary nebula formation – supernovae.

TEXT BOOKS:

1. Carroll, Bradley W, Ostlie, Dale A (2003). *An Introduction to Modern Astrophysics* (1st edn), Addison-Wesley, ISBN no: 978-0805304022
2. Frank Shu (1981). *The Physical Universe* (2nd edn), University Science Books, ISBN no: 0935702059
3. Martin Harwit (1998) *Astrophysical Concepts* (2nd edn), Springer, ISBN no: 978-0-387-33228-4

REFERENCE BOOKS:

1. T. Padmanabhan (2006). *Invitation to Astrophysics* (2nd edn), World Scientific Publishing Co, ISBN no: 9789812566386
2. Malcolm Longair (2012). *High Energy Astrophysics* (2nd edn), Cambridge University Press, ISBN no:9781139170505

3. Sparke and Gallagher (2007). *Galaxies in the Universe: An Introduction* (2nd edn), Cambridge University Press, ISBN no: 978-0-521-85593-8

OPEN ELECTIVE I – OPTICS AND PHOTONICS

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 05 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

LEARNING OBJECTIVES:

This course provides students with a working knowledge of optics and photonics, including wave optics, Physical optics and introductory laser Physics. It also provides a basis for further study in photonics. This course explains the optics of periodic media and demonstrate working of lasers and also describe fiber optics and apprise the photonic devices.

Course Outcomes: At the end of the Course, the Student will be able to:

| | |
|------------|--|
| CO1 | Understand the basic concepts of Fourier optics |
| CO2 | Discuss the periodic media and coatings |
| CO3 | Demonstrate working of laser beams |
| CO4 | Analyze the fiber and integrated optics |
| CO5 | Demonstrate the concepts photonic device and also summarize the basic understanding of Fourier optics and functioning of devices |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PS O | PO | | | | | | | | | | | PSO | | | | |
|---------------|----|---|---|---|----|---|---|---|---|----|----|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 |
| CO4 | 3 | 2 | 3 | 3 | 23 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 |

STRONGLY CORRELATED – 3, MODERATELY CORRELATED – 2, WEAKLY CORRELATED – 1

| S. No | CONTENTS OF MODULE | Hrs | COs |
|-------|---|-----|-----|
| 1 | Fourier Optics 1.1 Diffraction integral 1.2 Fourier transformation in beam propagation 1.3 Fresnel and Fraunhofer approximations 1.4 Fourier filtering Image processing 1.5 Abbe principle of image formation 1.6 principle of phase contrast microscope 1.7 Holography 1.8 principles of recording and reconstruction | 20 | CO1 |
| 2 | Optics of Periodic Media 2.1 Multilayer dielectric interference coatings and their applications 2.2 Photonic crystals 2.3 Bragg reflectors | 10 | CO2 |
| 3 | Lasers 3.1 Optical amplification and lasers 3.2 Characteristics of laser radiation 3.3 Liquid and solid state Laser 3.4 Optics of Gaussian beams 3.4 Laser applications in medicine and surgery | 20 | CO3 |
| 4 | Fibre and Integrated Optics 4.1 Guided modes 4.2 Attenuation and dispersion in optical fibers 4.3 Application in sensors and communication | 20 | CO4 |
| 5 | Photonic Devices 5.1 Photonic devices based on acousto-optics 5.3 Electro-optics and magneto-optics-Intensity, phase and frequency modulation 5.5 Frequency shifters 5.6 Optical diode and isolator 5.7 Directional coupler 5.8 Spatial light modulator | 20 | CO5 |

TEXT BOOKS:

1. Buck J.A. (2004). *Fundamentals of Optical Fibres* (2nd edn), John Wiley & Son, ISBN no: 978-0-471-22191-3
2. Joannopoulos, Johnson, Winn, Meade (2007). *Photonic Crystals* (2nd edn), Princeton Univ. Press. ISBN No: 978-0-691-12456-8
3. Hawker & Latimer (1995). *Lasers, Theory and Practice* (1st edn), Prentice Hall. ISBN no: 978-0135214930

REFERENCE BOOKS:

1. Joseph Verdey (1995). *Laser Electronics* (3rd edn), Prentice Hall, ISBN no: 0-13-706666-X
2. Yariv A, Holt (1991). *Optical Electronics* (4th edn), Rinehart & Winston, ISBN no: 9781600490132
3. Graham Smith F, Terry A King, Dan Wilkins (2007). *Optics and Photonics* (2nd edn), Wiley, ISBN no: 978-0-470-01784-5



Dwaraka Doss Goverdhan Doss Vaishnav College
Arumbakkam, Chennai - 600106

Department of
Accounting & Finance

ACADEMIC YEAR 2021-22

B.Com (Accounting & Finance)

SCHEME AND SYLLABUS

CHOICE BASED CREDIT SYSTEM

OUTCOME BASED EDUCATION (OBE)

TABLE OF CONTENTS

| Sl. No | Heads | Page No. |
|-----------|---|-----------|
| 1. | Vision & Mission of the Institution | 1 |
| 2. | Vision & Mission of the Department | 2 |
| 3. | Program Educational Objectives (PEO) & Mapping with Mission | 3 |
| 4. | Program Outcomes (PO) with Graduate Attributes | 4 |
| 5. | Mapping of POs with PEOs | 5 |
| 6. | Program Specific Outcomes (PSO) | 6 |
| 7. | <i>SCHEME</i> | |
| | A. Scheme of First Semester | 9 |
| | B. Scheme of Second Semester | 10 |
| | C. Scheme of Third Semester | 11 |
| | D. Scheme of Fourth Semester | 12 |
| | E. Scheme of Fifth Semester | 13 |
| | F. Scheme of Sixth Semester | 14 |
| 8. | <i>SYLLABUS</i> | |
| | <i>A. Syllabus of First Semester</i> | |
| | Financial Accounting – I | 15 |
| | Economics for Finance | 21 |
| | Business Mathematics - I | 26 |
| | NME – I: Introduction to Supply Chain Management | 29 |
| | <i>B. Syllabus of Second Semester</i> | |
| | Financial Accounting – II | 32 |
| | Management Concepts & Organizational Behaviour | 37 |
| | Business Mathematics - II | 41 |
| | NME – I: E-Commerce | 43 |
| | <i>C. Syllabus of Third Semester</i> | |
| | Corporate Accounting - I | 46 |
| | Business Law | 50 |
| | Banking Theory & Practice | 54 |
| | Financial Management - I | 58 |
| | Business Statistics and Operations Research - I | 63 |
| | <i>D. Syllabus of Fourth Semester</i> | |
| | Corporate Accounting - II | 66 |
| | Financial Management - II | 71 |
| | Corporate Law | 76 |
| | Business Communication | 80 |
| | Business Statistics and Operations Research - II | 84 |

| | | |
|-----------|---|------------|
| | <i>E. Syllabus of Fifth Semester</i> | |
| | Basics of Cost Accounting | 86 |
| | Income Tax Law & Practice – I | 90 |
| | Practical Auditing | 93 |
| | Customs & Goods & Service Tax | 97 |
| | Elective I: International Business | 101 |
| | <i>F. Syllabus of Sixth Semester</i> | |
| | Management Accounting | 105 |
| | Costing Methods & Techniques | 109 |
| | Income Tax Law & Practice – II | 113 |
| | Elective II – 1. Investment Management | 116 |
| | Elective II – 2. Corporate Finance | 121 |
| | Elective II – 3. Corporate Governance & Ethics | 125 |
| | Elective III – 1. Entrepreneurship Development & Startups | 129 |
| | Elective III – 2. Marketing Management | 133 |
| | Elective III – 3. Human Resource Management | 137 |
| 9. | APPENDIX A | |
| | APPENDIX B | |
| | APPENDIX C | |

DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE

VISION

**TO IMPART KNOWLEDGE BY ESCALATING TO ACTIVE LEARNING
FROM ROTE LEARNING THAT**

- Ignites Wisdom
- Challenges Status Quo
- Strengthens Social Equality
- Elevates Human Values and Universal Oneness
- Recognizes Indian Tradition and Culture

MISSION

- Curriculum that makes student competent to contribute economically and intellectually.
- Offer an environment of learning that encourages innovation and excellence.
- Promote research and development
- Best of facilities with the Best of technology
- Provide an environment for all round growth of the student
- Quality in every activity undertaken by the student and the faculty
- Instilling pride in serving the society and in being the citizen of this country.

DEPARTMENT OF ACCOUNTING & FINANCE

VISION

Our vision is to provide students with an excellent career-oriented and comprehensive academic programme in commerce by integrating education with ethical, humanistic and social learning for enabling them to contribute in a better way to our country's progress.

MISSION

| | |
|-----------|---|
| M1 | To provide strong conceptual knowledge and application of skills in the domain of Accounting and Finance. |
| M2 | To sharpen the students' analytical and decision-making skills so as to enable them to comprehend the dynamic socio-economic and technological environment and its associated impact on businesses. |
| M3 | To prepare the students with necessary functional and behavioural skills so as to enable them to become ethically and socially responsible finance professionals thereby contributing to nation building. |

PROGRAM EDUCATION OUTCOMES (PEOs)

The Commerce program with specialization in accounting & finance aims to achieve the following objectives:

| | |
|-------------|---|
| PEO1 | Make a positive contribution to the accountancy in public sector, government, commerce and industry. |
| PEO2 | Pursue research in the field of accounting, finance, taxation and banking. |
| PEO3 | Provide students with the knowledge and skills required for them to pursue higher studies in finance, accounting or in multi-disciplinary areas. |
| PEO4 | Adapt to challenges in their professional careers by demonstrating team spirit, employing their skill-sets and values with continuous learning |
| PEO5 | Demonstrate high standards of ethical and moral conduct and be recognized as individuals with commitment towards human dignity, humility, empathy and societal responsibilities |

PEO TO MISSION STATEMENT MAPPING

| MISSION STATEMENTS | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 |
|---------------------------|-------------|-------------|-------------|-------------|-------------|
| M1 | 3 | 3 | 3 | 2 | 1 |
| M2 | 3 | 3 | 3 | 2 | 2 |
| M3 | 2 | 2 | 1 | 3 | 3 |

CORRELATION: 3- STRONG 2- MEDIUM 1- LOW

PROGRAM OUTCOMES (PO) IN RELATION TO GRADUATE ATTRIBUTES

| | |
|------------|---|
| PO1 | To participate in various types of employment, development activities and public discourses particularly in response to the needs of the community one serves |
| PO2 | To understand the need and have the competencies to support local, regional and national development |
| PO3 | To develop critical and analytical thinking |
| PO4 | To develop conceptual understanding, problem solving and application of skills |
| PO5 | To provoke entrepreneurship among the students along with strong ethics and communication skills |
| PO6 | To develop a questioning mind in diverse environments for better outcomes |
| PO7 | To engage in lifelong learning and enduring proficient progress |

MAPPING of POS to PEOs

| PEO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 |
|---------------|------------|------------|------------|------------|------------|------------|------------|
| PEO1 | 2 | 2 | 3 | 3 | 2 | 2 | 1 |
| PEO2 | 3 | 3 | 3 | 3 | 1 | 3 | 2 |
| PEO3 | 1 | 1 | 3 | 3 | 1 | 1 | 1 |
| PEO4 | 3 | 3 | 2 | 2 | 2 | 2 | 1 |
| PEO5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

CORRELATION: 3- STRONG

2- MEDIUM

1- LOW

PROGRAM SPECIFIC OUTCOMES

| | |
|-------------|--|
| PSO1 | To develop the intellect, executive personality and management skills of the students through appropriate integration of commerce, business and general education. |
| PSO2 | To develop an understanding about the economic and financial background of our country |
| PSO3 | To provide necessary knowledge, skills and competence to identify and comprehend various problems & empower them to develop viable alternatives to effectively make business decisions through analytical and reflective thinking. |
| PSO4 | Be abreast with the latest policies and practices in the areas of business & banking laws, accounting standards, taxation laws and gain knowledge on the operational aspects of a business. |
| PSO5 | Learn about the business entities, ease of doing business in India, financial products and services and ability to start entrepreneurial activities. |

COURSE OF STUDY:

The main subject of study for bachelor degree courses shall consist of the following:

| Sl. No. | Parts | Heading |
|----------------|--------------|--|
| 1. | Part I | Tamil / Other Languages |
| 2. | Part II | English |
| 3. | Part III | Core Subjects/Allied Subjects/Electives with three courses |
| 4. | Part IV | Basis Tamil* / NME Skilled based subjects (Electives) – Soft Skills Environmental Studies Value Education |
| 5. | Part V | Extension Activities** |

***PART – IV: Basic Tamil**

- (a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6th Standard).
- (b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part- I shall take Advanced Tamil comprising of two courses.
- (c) Others who do not come under a + b can choose non-major elective comprising of two courses.

****PART – V: EXTENSION ACTIVITIES**

- (a) A candidate shall be awarded a maximum of 1 Credits for Compulsory Extension Service.
- (b) All the Students shall have to enroll for NSS /NCC/ NSO (Sports & Games) Rotract/Youth Red cross or any other service organizations in the college and shall have to put in Compulsory minimum attendance of 40 hours which shall be duly certified by the Principal of the college before 31st March in a year. If a student LACKS 40 HOURS ATTENDANCE in the First year, he/she shall have to compensate the same during the subsequent years.
- (c) Students who complete minimum attendance of 40 hours in One year will get HALF A CREDIT and those who complete the attendance of 80 or more hours in Two years will get ONE CREDIT.

(d) Literacy and Population Education Field Work shall be compulsory components in the above extension service activities

SCHEME ON EXAMINATIONS

The following is the split up of marks for Internals & Externals.

(i) CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|--------------------------|---------------------------|-------------------------|-------------------------|-------------------|
| Marks (out of 40) | Descriptive 15 | Objective 10 | 10 | 5 |
| Remember | | | | |
| Understand | | | | |
| Apply | | | | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks - Descriptive + Objective Type Questions

**Generic Skills - Quizzes, Current Affairs, Field Visits, Projects, Seminars etc.

(ii) ESE- Semester End Examination (100 Marks; weightage 60%)

| Bloom's Category | Weightage |
|-------------------------|------------------|
| Remember | |
| Understand | |
| Apply | |
| Analyze | |
| Evaluate | |
| Create | |

Question Paper Pattern:

The question paper will be in A, B, C pattern.

| Section | No. of Questions (attempt all) | Marks for each question | Total Marks |
|----------------|--|--------------------------------|--------------------|
| A | 10 | 2 marks | 20 marks |
| B | 5 (Choice of (a) or (b)) | 7 marks | 35 marks |
| C | 5 (Q. 16 is compulsory and balance choice of (a) or (b)) | 15 marks | 45 marks |
| TOTAL | | | 100 marks |

COURSE OF STUDY FOR THE SIX SEMESTERS UNDER CHOICE BASED CREDIT SYSTEM (CBCS) SHALL BE AS FOLLOWS:

SEMESTER I

| Sl. No. | Part | Course | Hours Distribution | | | | Overall Credits | Marks | | |
|--------------|------|---|--------------------|---|---|---|-----------------|-------|-----|-------|
| | | | L | P | T | S | | CIE | ESE | Total |
| 1 | I | Language – I | 4 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | II | English – I | 4 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | III | Core Paper I: Financial Accounting – I | 4 | 2 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | III | Core Paper II: Economics for Finance | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | III | Allied Paper I: Business Mathematics – I | 6 | 0 | 0 | 0 | 5 | 40 | 60 | 100 |
| 6 | IV | Basic Tamil/NME Paper I: Introduction to Supply Chain Management | 2 | 0 | 0 | 0 | 2 | 50 | 50 | 100 |
| 7 | IV | Skill based subjects – Soft Skills | 2 | 0 | 0 | 0 | 2 | 50 | 50 | 100 |
| TOTAL | | | | | | | 23 | | | |

SEMESTER II

| Sl. No. | Part | Course | Hours | | | | Overall Credits | Marks | | |
|--------------|------|--|--------------|---|---|---|-----------------|-------|-----|-------|
| | | | Distribution | | | | | CIE | ESE | Total |
| | | | L | P | T | S | | | | |
| 1 | I | Language – II | 4 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | II | English – II | 4 | 0 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | III | Core Paper III: Financial Accounting - II | 4 | 2 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | III | Core Paper IV: Management Concepts & Organizational Behaviour | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | III | Allied Paper II: Business Mathematics - II | 6 | 0 | 0 | 0 | 5 | 40 | 60 | 100 |
| 6 | IV | Basic Tamil/NME Paper II: E- Commerce | 2 | 0 | 0 | 0 | 2 | 50 | 50 | 100 |
| 7 | IV | Skill based subjects – Soft Skills | 2 | 0 | 0 | 0 | 2 | 50 | 50 | 100 |
| TOTAL | | | | | | | 23 | | | |

SEMESTER III

| Sl. No. | Part | Course | Hours Distribution | | | | Overall Credits | Marks | | |
|--------------|------|---|--------------------|-----|---|---|-----------------|-------|-----|-------|
| | | | L | P | T | S | | CIE | ESE | Total |
| | | | 1 | III | Core Paper V: Corporate Accounting - I | 6 | | 0 | 0 | 0 |
| 2 | III | Core Paper VI: Business Law | 5 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | III | Core Paper VII: Banking Theory & Practice | 5 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | III | Core Paper VIII: Financial Management - I | 5 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | III | Allied Paper III: Business Statistics and Operations Research - I | 6 | 0 | 0 | 0 | 5 | 40 | 60 | 100 |
| 6 | IV | Environmental Studies <i>(Examination to be held in Semester IV)</i> | 1 | 0 | 0 | 0 | | | | |
| 7 | IV | Skill based subjects – Soft Skills | 2 | 0 | 0 | 0 | 2 | 50 | 50 | 100 |
| TOTAL | | | | | | | 23 | | | |

SEMESTER IV

| Sl. No. | Part | Course | Hours | | | | Overall Credits | Marks | | |
|--------------|------|--|--------------|---|---|---|-----------------|-------|-----|-------|
| | | | Distribution | | | | | CIE | ESE | Total |
| | | | L | P | T | S | | | | |
| 1 | III | Core Paper IX: Corporate Accounting - II | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 2 | III | Core Paper X: Financial Management - II | 5 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | III | Core Paper XI: Corporate Law | 5 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | III | Core Paper XII: Business Communication | 5 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | III | Allied Paper IV: Business Statistics and Operations Research -II | 6 | 0 | 0 | 0 | 5 | 40 | 60 | 100 |
| 6 | IV | Environmental Studies | 1 | 0 | 0 | 0 | 2 | 50 | 50 | 100 |
| 7 | IV | Skill based subjects – Soft Skills | 2 | 0 | 0 | 0 | 2 | 50 | 50 | 100 |
| TOTAL | | | | | | | 25 | | | |

SEMESTER V

| Sl. No. | Part | Course | Hours Distribution | | | | Overall Credits | Marks | | |
|--------------|------|--|--------------------|---|---|---|-----------------|-------|-----|-------|
| | | | L | P | T | S | | CIE | ESE | Total |
| 1 | III | Core Paper XIII: Basics of Cost Accounting | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 2 | III | Core Paper XIV: Income Tax Law & Practice - I | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | III | Core Paper XV: Practical Auditing | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | III | Core XVI: Customs & Goods & Service Tax | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 5 | III | Elective I: * International Business | 6 | 0 | 0 | 0 | 5 | 40 | 60 | 100 |
| 6 | IV | Value Education | 0 | 1 | 0 | 0 | 2 | 50 | 50 | 100 |
| TOTAL | | | | | | | 23 | | | |

***STUDENTS HAVE THE OPTION OF CHOOSING THE OPEN ELECTIVE BEING OFFERED BY THE DEPARTMENT. OR THE OPEN ELECTIVES OFFERED BY OTHER SIMILAR DISCIPLINE DEPARTMENTS.**

SEMESTER VI

| Sl. No. | Part | Course | Hours Distribution | | | | Overall Credits | Marks | | |
|--------------|------|--|--------------------|---|---|---|-----------------|-------|-----|-------|
| | | | L | P | T | S | | CIE | ESE | Total |
| 1 | III | Core Paper XVII: Management Accounting | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 2 | III | Core Paper XVIII: Costing Methods & Techniques | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 3 | III | Core Paper XIX: Income Tax Law and Practice - II | 6 | 0 | 0 | 0 | 4 | 40 | 60 | 100 |
| 4 | III | Elective Paper II: Choose any one 1. Investment Management 2. Corporate Finance 3. Corporate Governance & Ethics | 6 | 0 | 0 | 0 | 5 | 40 | 60 | 100 |
| 5 | III | Elective Paper III: Choose any one 1. Entrepreneurship Development & Startups 2. Marketing Management 3. Human Resource Management | 6 | 0 | 0 | 0 | 5 | 40 | 60 | 100 |
| 6 | IV | Extension Activities | 0 | 1 | 0 | 0 | 2 | 50 | 50 | 100 |
| TOTAL | | | | | | | 23 | | | |

FIRST SEMESTER
SYLLABUS
OF
B. COM (ACCOUNTING & FINANCE)

SEMESTER I

Course Title: CORE I – FINANCIAL ACCOUNTING - I

| | |
|---------------------|----------------|
| Course Code : 45101 | Credits : 4 |
| L:T:P:S : 4:2:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be introduced to the concepts of accounting and its standards, its application in various account preparations such as final accounts, depreciation, average due date and account current and gain an insight on the practical application of accounting concepts through accounting software.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|-----|---|
| CO1 | Recall the principles, concepts and conventions of accounting. (K1) |
| CO2 | Identify the reasons for the preparation of bank reconciliation statement and its application. Develop the knowledge about various accounting errors disclosed and not disclosed by the trial balance and the process of rectification (K1, K2, K3) |
| CO3 | Prepare final accounts of a sole trader's concern and a non-profit organization. (K3) |
| CO4 | Build knowledge regarding meaning, causes and various methods of depreciation and its accounting procedure. (K3) |
| CO5 | Understand the meaning, purpose and computation of average due date and the preparation of account current. (K2, K3) |
| CO6 | Articulate the concept of fire insurance and apply them in the computation of claims under different circumstances. (K2, K3) |
| CO7 | Create ledger, voucher entry, generate Profit and Loss and Balance Sheet computerized accounting software in addition to calculating GST, TDS and Security of data (K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 1 | 1 | 3 | 1 | 1 | 3 | 2 | 1 | 3 | 3 | 2 |
| CO2 | 3 | 1 | 1 | 3 | 1 | 1 | 3 | 2 | 1 | 3 | 3 | 2 |
| CO3 | 3 | 1 | 2 | 3 | 1 | 1 | 3 | 2 | 1 | 3 | 3 | 2 |
| CO4 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 | 1 | 3 | 3 | 2 |
| CO5 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 | 1 | 3 | 3 | 2 |
| CO6 | 3 | 1 | 2 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | 3 | 2 |
| CO7 | 3 | 1 | 2 | 3 | 2 | 3 | 3 | 3 | 1 | 2 | 3 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|---|-------|------------|
| I | Overview of Accounting, Rectification of Errors & Bank Reconciliation Statement: Meaning and scope of Accounting, Basic Accounting Concepts and Conventions, Objectives of Accounting, Concept of Accounting Standards - Classification of Errors: Error of omission, Error of commission, Error of principle, Compensating errors - Rectification of Errors, Preparation of Suspense Account - Bank Reconciliation Statement, Need, Preparation of Simple Bank Reconciliation Statement, Adjusted cash book method – Preparation of Bank Reconciliation Statement by comparing of Cash Book & Pass Book | 15 | CO1 CO2 |
| II | Preparation of Final Accounts & Depreciation: Preparation of Final Accounts - Sole Trading Concerns & Non-Profit Organizations. (Comprehensive problems only) Depreciation (as per AS-6) - Meaning, Causes and Types - Straight Line Method, Written Down Value Method - Change of method with retrospective effect | 25 | CO3 CO4 |
| III | Fire Insurance Claims, Average Due Date & Account Current: Need for fire insurance, Types of Fire Insurance Policies, Computation of claims to be lodged for Loss of Stock, Gross Profit Ratio, Abnormal Items, Average Clause, Computation of Claims for Loss of Profit, Important Terms, Accounting entries for fire claims Average Due Date Calculation, Holidays intervening in the period - Account Current, Preparation under Forward Method, Product method, Periodical balance method | 20 | CO5 CO6 |
| IV | Preparation of Computerized Financial Statement: Creating a company, Creating Accounting Ledger and group, Creating Stock Item and group - Voucher Entry – Ledger Accounts, Trial Balance, Profit and Loss account, Balance Sheet. | 15 | CO7 |
| V | Application of Computerized Accounting: Basic concept of TDS, Configuring TDS in Tally, Processing transaction and TDS report - Technological advantages of Tally, Security of data, Backup and restore – GST, Basic concept, Using tally for GST compliance. (Tally ERP 9) | 15 | CO7 |

SELF STUDY:

Final Accounts of Sole trader concerns and Non-profit organizations.

TEXT BOOKS:

1. Gupta R.L. & Gupta V.K. (2019). *Advanced Accounting*. New Delhi, India: Sultan Chand & Sons,
2. Reddy T.S. & Murthy A. (2011) *Financial Accounting*. Chennai, India: Margham Publishers
3. Ahamed, R.P. *Tally. ERP 9*. Chennai, India: Margham Publications.

REFERENCE BOOKS:

1. *Tally. ERP 9 Auditors' Edition Statutory Audit Reference Book*. (2011). Tally Solutions Pvt Ltd.
2. Shukla, M.C. & Grewal, T.S. (2019). *Financial Accounting*. New Delhi, India: S. Chand Publishing
3. Jain, S.P. & Narang, K.L. (2020). *Financial Accounting*. New Delhi, India: Kalyani Publishers
4. Tulsian, P.C. (2016). *Financial Accounting*. New Delhi, India: S. Chand & Sons.

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. Tally. *ERP 9 Auditors' Edition Statutory Audit Reference Book*, Tally Solutions Pvt. Ltd. Available at:
<http://mirror.tallysolutions.com/Downloads/Presentations/Chartered%20Accountants/Manuals/StatAuditReferenceBook.pdf>
2. <https://icmai.in/upload/Students/Syllabus2016/Foundation/Paper-2-09042021.pdf>
3. <https://lyryx.com/wp-content/uploads/2017/06/DauderisAnnand-IntroFinAcct-2017C.pdf>
4. https://icmai.in/upload/Students/Syllabus-2012/Study_Material_New/Inter-Paper5-Revised.pdf

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| Marks (out of 40) | Descriptive 15 | Objective 10 | 10 | 5 |
| Remember | | 6 | | |
| Understand | 5 | | | |
| Apply | 10 | 4 | 10 | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Modules IV & V relate to practical applications of Tally. Assessment will be done internally and will be part of Generic Skills.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 10 |
| Understand | 20 |
| Apply | 60 |
| Analyze | 10 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|-------------------|----------|-------------------|----------|------------------|----------|-----------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 1 | 1 | | 2 | 1 | - | 5 |
| II | 1 | 1 | - | 2 | - | 2 | 6 |
| III | 1 | 1 | - | 2 | - | 2 | 6 |
| IV | 2 | - | 2 | - | - | - | 4 |
| V | 2 | - | 2 | - | - | - | 4 |
| Total Questions | 7 | 3 | 4 | 6 | 1 | 4 | 25 |

Note: No 15 marks questions from Modules IV & V will be asked in Section C.

Course Title: CORE II: ECONOMICS FOR FINANCE

| | |
|----------------------------|-----------------------|
| Course Code : 45102 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to obtain practical knowledge and analytical framework of economics, elucidate the concept of national income, its related concepts and its determination, examine the fiscal role of government, the rationale behind government's intervention and application of fiscal policy, emanate the role of money in the financial system and describe the impact of exchange rate in the domestic economy.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Articulate the concept of National Income and Identify the challenges in National Income computation. (K2) |
| CO2 | Examine the functional framework and various instruments of fiscal policy and application of fiscal policy tools. Understand the role of government in an economic System (K2) |
| CO3 | Define money and describe the different determinants of money demand and supply (K1, K2, K3) |
| CO4 | Define monetary policy and its objectives. Elucidate different components of monetary policy framework and explain the operating procedures and instruments of monetary policy (K1, K2) |
| CO5 | Understand the concept of exchange rate, analyze the difference between nominal and real exchange rate and describe the impact of exchange rate fluctuation on domestic economy (K2, K4) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 3 | 1 | 2 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 3 |
| CO2 | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 3 | 2 |
| CO3 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 3 | 3 | 2 | 1 | - |
| CO4 | 1 | 3 | 2 | 1 | 1 | 2 | 1 | - | 3 | 2 | 2 | 1 |
| CO5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 3 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|--|-------|-----|
| I | <p>National Income – Definition, Usefulness and significance, Different concepts of National Income: GDP-Real Vs. Nominal GDP, Gross National product (GNP), Net Domestic Product (NDP), Net National product (NNP), Per capita Income, Personal Income (PI), Disposable Personal Income (DI) - Circular flow of Income (2,3,4 sector model) - Methods of National Income calculation: Product/Value added method, Expenditure method, Income method – Limitations and Challenges of National Income calculation.</p> | 20 | CO1 |
| II | <p>Public Finance – Role of Government in an economic system – Functional framework – Allocation, Redistribution and stabilization function - Fiscal policy: Objectives, Automatic stabilizer Vs. Discretionary Fiscal Policy, Instruments of Fiscal Policy, Types of fiscal policy, Fiscal policy for long-run economic growth, Limitations of fiscal policy – Crowding effect.</p> | 15 | CO2 |
| III | <p>Money Market - Concept of money, Characteristics of money, Functions of money, Demand for money, Theories of demand for money – Quantity theory of money (Classical approach), Neo-classical approach, Keynesian theory of demand for money - Behavior toward Risk.</p> <p>Money market – Money supply, Definition, Sources of Money Supply, Measurement of money supply, Determinants of money supply – Money multiplier concept – Determinants of Interest Rate: Concept - Money Multiplier approach to supply of money.</p> | 20 | CO3 |
| IV | <p>Monetary Policy – Definition, Framework, Objectives, Operating procedures and instrumentation (implementation) – Direct instruments: Cash Reserve Ratio (CRR), Statutory Liquidity Ratio (SLR), Direct Credit - Indirect instruments: Repos, Open market operation, Standing facilities - Monetary Policy Committee – Inflation, Deflation And Reflation: Definition, Types, Causes and effects of inflation on different sectors of the economy, Measures to control inflation.</p> | 20 | CO4 |
| V | <p>Exchange Rate and its Economic Effects - Foreign Exchange: Meaning - Exchange Rate, Exchange Rate Regimes, Advantages – Nominal Vs. Real Exchange rates, Determination of Nominal Exchange rate – Changes in Exchange rate – Devaluation – Revaluation – Depreciation – Appreciation – Impact of exchange rate fluctuation on domestic economy.</p> | 15 | CO5 |

TEXT BOOKS:

1. Muniraju. M., & Podder, S.K. (2014). *Macroeconomics for Business Decisions* Mumbai, India: Himalaya Publishing House.
2. Mithani, D.M. (2019). *Macro Economics*. Mumbai, India: Himalaya Publishing House.

REFERENCE BOOKS:

1. Ahuja. H.L. (2019). *Macro Economics*. New Delhi, India: S. Chand & Sons.
2. Girija, M., Cauvery, R., Sudha Nayak, U.K., & Meenakshi, R. (2018). *Macro Economics*. New Delhi, India: S.Chand & Sons.
3. Sankaran, S. (2019). *Macro Economics*. Chennai, India: Margham Publications
4. Jinghan M. L. (2016.) *Macro Economic Theory*. New Delhi, India: Vikas Publishing House

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. www.learn-economics.co.uk
2. www.bookboon.com
3. <http://www2.econ.iastate.edu/tesfatsi/sources.htm>
4. <https://learn.mru.org>
5. www.tutor2u.net

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------|-----------|------------------|------------|
| | Descriptive | Objective | | |
| Marks (out of 40) | 15 | 10 | 10 | 5 |
| Remember | 5 | 5 | | |
| Understand | 5 | 5 | 10 | |
| Apply | - | | | |
| Analyze | 5 | | | |
| Evaluate | | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.**

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 45 |
| Understand | 40 |
| Apply | |
| Analyse | 15 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|---------------------------|---------------------------|--------------------------|------------------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: ALLIED I - BUSINESS MATHEMATICS - I

| | |
|----------------------------|-----------------------|
| Course Code : 35106 | Credits : 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to attain solid foundation for preparing to Competitive exams, acquire skills in calculating specific business mathematics applications such as checking accounts, payroll, taxes, invoices, cash discounts, trade discounts, inventories, simple and compound interest, annuities, depreciations, and financial statements.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Restate the definition of sets. Differentiate the elements and sets. Demonstrate relation and functions of sets. |
| CO2 | Define the term ratio. Demonstrate the importance of proportions. Solve the problems on ratios, proportion and variance. |
| CO3 | Distinguish between permutation and combination. Solve the problems on binomial theorem. Summarize the concepts of exponential and logarithmic series. |
| CO4 | Define the term interest. Explain the difference between Simple interest and Compound interest. Calculate the future and present values of Annuities. Point out the important term of banker's discount. |
| CO5 | Distinguish between H.C.F & L.C.M of numbers. Demonstrate the importance of Average and Percentage. Solve real-life problems based on time & work. |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO2 | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 1 | 3 | 3 | 3 |
| CO3 | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 1 | 1 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 1 | 2 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|--|-------|-----|
| I | Set theory: Definition, Elements and types of sets, Operations on sets, Relations and functions of sets. | 12 | CO1 |
| II | Algebra: Ratio, proportion and variance | 12 | CO2 |
| III | Permutation and combination: permutation and combination, binomial theorem, exponential and logarithmic series. | 12 | CO3 |
| IV | Interest and annuity: Simple interest, Compound interest and Annuities-Discout on bills-Payroll-Wages-commission. | 12 | CO4 |
| V | Quantitative Aptitude: Operations on Numbers-H.C.F. & L.C.M. of Numbers- Average-Percentage - Time & Work - Time & Distance-Odd Man Out & Series. | 12 | CO5 |

TEXT BOOKS:

- Vittal, P.R. (2017). *Business Mathematics*. Chennai. Margham Publications

| Module | CHAPTERS |
|--------|----------------------|
| I | Chapter 1 |
| II | Chapters 2,3 |
| III | Chapters 8,9,10 |
| IV | Chapters 17,18,19,21 |

- Dr. R. S. Aggarwal (2017), *Quantitative aptitude*, S. Chand & Company limited. Revised Edition

| Module | CHAPTERS |
|--------|-----------------------------|
| V | Section 1 1,2,6,10,15,17,35 |

REFERENCE BOOKS:

- Dr. Rajagopalan, S.P. & Dr. Sattanathan, R. (2014). *Business Mathematics*. Chennai, India: Vijay Nicole Imprints Private Limited.
- Sancheti, D. C. & Kapoor, V. K. (2014). *Business Mathematics*. New Delhi, India: Sultan Chand & Sons.

Note: Latest Edition of the reading to be used.

ASSESSMENT PATTERN

Theory Examination

CIA I & II: 50 Marks Each, Total to be converted into 25 marks

CIA I – Multiple Choice Questions

CIA II – Description type questions

Time: 1 hour and 30 minutes

Course Title: NME PAPER I: INTRODUCTION TO SUPPLY CHAIN MANAGEMENT

| | |
|----------------------------|-----------------------|
| Course Code : 45103 | Credits : 2 |
| L:T:P:S : 2:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course, the student will be able to develop a sound understanding of the important role of supply chain management in today's business environment, the current trends, tools & equipment and kindle an interest to choose SCM as a career option.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Outline the key concepts relating supply chain management and logistics management (K1, K2) |
| CO2 | Identify the main drivers of supply chain performance and explain their role in supply chain (K2) |
| CO3 | Recommend the best mode of transportation under various situation and determine the various factors affecting transportation (K2, K5) |
| CO4 | Explain the role of warehouse and the various types of warehouses (K2) |
| CO5 | Determine the importance of material handling and list out the various tools and equipment used for material handling (K1, K2) |
| CO6 | Summarize the role of information technology in SCM (K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | - | 1 | 1 | 2 | 3 | - | 2 | 2 | - | 2 | 2 | 2 |
| CO2 | - | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 3 | 3 |
| CO3 | - | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 3 | 2 | 2 |
| CO4 | - | 2 | 3 | 3 | 3 | 2 | 2 | 1 | - | 2 | 3 | 2 |
| CO5 | - | 2 | 2 | 2 | 2 | 2 | 2 | 1 | - | 1 | 2 | 2 |
| CO6 | - | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|---|--------------|------------|
| I | Supply Chain Management – Introduction, Definition, Objectives, Importance, Functions – SCM as a profession - SCM Vs Logistics | 6 | CO1 |
| II | Key concepts in SCM - Enablers of supply chain performance - Linking supply chain and business performance – Supply Chain Performance Measures. | 6 | CO1 CO2 |
| III | Transportation selection – Modes of transportation – Modes of Distribution – Factors affecting network effectiveness – Indian Transport Infrastructure | 6 | CO3 |
| IV | Value information and Order Management - Distribution Requirement Planning - Just-In-Time system - Warehousing and materials Handling Management - Automated Warehousing System | 6 | CO4 CO5 |
| V | Information Technology in SCM – Web-based supply chain – E-business and SCM – Benchmarking | 6 | CO6 |

TEXT BOOKS:

1. Shah, J. (2016). *Supply Chain Management – Text and cases*. New Delhi, India: Pearson India Education Services.
2. Chopra, S. & Meindl, P. (2019). *Supply Chain Management-Strategy Planning and Operation*. Noida, India: PHI Learning

REFERENCE BOOKS:

1. Natarajan, L. (2018). *Logistics and Supply Chain Management*. Chennai, India: Margham Publications

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. <https://www.inboundlogistics.com/cms/index.php>
2. <https://supplychaindigital.com/>
3. <https://www.supplychainbrain.com/>
4. <https://www.scmr.com/>
5. <https://www.logisticsmgmt.com/>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category Marks (out of 40) | CIA* | | Generic Skills** | Attendance |
|---------------------------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Remember | 10 | 6 | 10 | 5 |
| Understand | 5 | 4 | 10 | |
| Apply | | | | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 50% |
| Understand | 50% |
| Apply | |
| Analyse | |
| Evaluate | |
| Create | |

SECOND SEMESTER
SYLLABUS
OF
B. COM (ACCOUNTING & FINANCE)

SEMESTER II

Course Title: CORE III - FINANCIAL ACCOUNTING - II

| | |
|----------------------------|-----------------------|
| Course Code : 45204 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course, the student will understand different accounting concepts relating to branch accounts, departmental accounts, investment accounts and hire purchase system and also acquire knowledge on advanced concepts such as royalty and lease accounting.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Articulate the need for preparing branch accounts and prepare books of accounts at both cost and invoice price. (K2, K3) |
| CO2 | Explain the concept of hire purchase system and instalment system, default and repossession, and its accounting treatment in the books of both parties. (K2, K3) |
| CO3 | Cite the concept of departmentalization and articulate its accounting process by allocating and apportioning various expenses on a suitable basis. (K2, K3) |
| CO4 | Understand the concept of Investment Account and the accounting procedure for recording the investment transactions. (K2) |
| CO5 | Understand the concept of partnership in business and prepare accounting books for dissolution of partnership, and insolvency by the Application of Garner Vs Murray's rule and Piecemeal Distribution (K2, K3) |
| CO6 | Explain the concept of lease accounting and royalty and prepare the books of accounts for lessee and lessor (K2, K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 3 | 3 | 2 |
| CO2 | 2 | 1 | 1 | 3 | 1 | 2 | 3 | 1 | - | 3 | 3 | 1 |
| CO3 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 3 | 3 | 2 |
| CO4 | 3 | 1 | 2 | 3 | 1 | 3 | 3 | 2 | 1 | 3 | 3 | 2 |
| CO5 | 1 | 1 | 2 | 3 | 1 | 3 | 2 | 2 | 1 | 3 | 2 | 2 |
| CO6 | 3 | 1 | 2 | 3 | 1 | 3 | 3 | 3 | 1 | 2 | 3 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|--|-------|------------|
| I | Branch Accounts – Debtors System, Stock and Debtors System, Wholesale Branch, Independent Branch (Excluding Foreign Branches) | 12 | CO1 |
| II | Hire Purchase Accounts - Calculation of interest, Default and Repossession, Complete and Partial Repossession, Hire Purchase Trading a/c and Stock and Debtors System – Installment System Accounting | 18 | CO2 |
| III | Departmental Accounts & Investment Accounts Departmental Accounts- Allocation of Departmental Expenses, Preparation of books of accounts including Inter-Department Account Transfers at Cost Price and Invoice Price Investments Accounts (AS-13) – Meaning, Classification of Investments, Accounting treatment of fixed income bearing securities and variable income bearing securities, Preparation of investment accounts (simple problems) | 12 | CO3 CO4 |
| IV | Partnership Accounts : Introduction to Partnership (Theory only) - Dissolution & Insolvency - Dissolution of Partnership, Simple and Comprehensive problems on dissolution - Insolvency of one partner, Insolvency of more than one partner but not all (Garner Vs Murray), Insolvency of all partners including Deficiency a/c, Piecemeal distribution | 24 | CO5 |
| V | Leasing Accounting and Royalty: Leasing Accounting (Ind AS 116) - Introduction, Advantages and Disadvantages, Types of Leasing (Theory only) Royalty - Introduction, Types of Royalty, Important terms used in royalty accounts, Minimum Rent, Excess Surplus, Recoupment of shortworkings, Accounting Treatment in the books of lessee and lessor (excluding sub-lease) | 24 | CO6 CO7 |

SELF STUDY:

1. Partnership – Fundamentals of Partnership, Admission, Retirement and Death of a partner.

TEXT BOOKS:

1. Gupta R.L. & Gupta V.K. (2019). *Advanced Accounting*. New Delhi, India: Sultan Chand & Sons,
2. Reddy T.S. & Murthy A. (2011) *Financial Accounting*. Chennai, India: Margham Publishers

REFERENCE BOOKS:

1. Shukla, M.C. & Grewal, T.S. (2019). *Financial Accounting*. New Delhi, India: S. Chand Publishing
2. Jain, S.P. & Narang, K.L. (2020). *Financial Accounting*. New Delhi, India: Kalyani Publishers
3. Tulsian, P.C. (2016). *Financial Accounting*. New Delhi, India: S. Chand & Sons.

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. https://icmai.in/upload/Students/Syllabus-2012/Study_Material_New/Inter-Paper5-Revised.pdf
2. <https://icmai.in/upload/Students/Syllabus2016/Inter/Paper-5-April-2021.pdf>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Remember | | 6 | 10 | 5 |
| Understand | 5 | | | |
| Apply | 10 | 4 | 10 | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 10 |
| Understand | 20 |
| Apply | 60 |
| Analyse | 10 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|---------------------------|----------|---------------------------|----------|--------------------------|----------|------------------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 2 | - | 1 | 1 | - | 1 | 5 |
| II | 2 | - | 1 | 1 | - | 1 | 5 |
| III | 2 | - | - | 2 | - | 1 | 5 |
| IV | 2 | - | - | 2 | - | 1 | 5 |
| V | 2 | - | 1 | 1 | - | 1 | 5 |
| Total Questions | 10 | 0 | 3 | 7 | 0 | 5 | 25 |

Course Title: CORE IV- MANAGEMENT CONCEPTS & ORGANIZATIONAL BEHAVIOUR

| | |
|----------------------------|-----------------------|
| Course Code : 45205 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to understand the conceptual framework of management and organizational behaviour.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Define the skills that a manager is expected to possess (K2) |
| CO2 | Restate the essentials of planning in management and sketching the organizational structure adopted in any organization (K2) |
| CO3 | Analyze the role of recruitment, selection and training and articulate the managerial aspects of controlling and coordinating (K2, K3, K4) |
| CO4 | Analyze the organizational and individual behaviour (K3, K4) |
| CO5 | Understand & evaluate the importance of leadership skills and motivational needs (K2, K4, K5) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 2 | 3 | 3 | 3 | 1 | 2 | 3 | 2 | 3 | 3 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 3 | 1 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 1 |
| CO4 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 |
| CO5 | 3 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 3 | 1 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|--|-------|-----|
| I | Introduction - Management: Meaning – Definition - Nature and Scope of Management – Management both Science and Art – Levels of Management – Role and Skills expected of a Manager- Business enterprise- different forms of business- Sole proprietorship- One Person Company, Joint Hindu Family Firm, Partnership firm, Joint Stock Company, Cooperative society; Limited Liability Partnership- Choice of form of Organization - Basic consideration in setting up of enterprise | 25 | CO1 |
| II | The Process of Management: Management by Objectives (MBO) Planning; Decision-making; Strategy Formulation. Organizing: Basic Considerations; Organization Structure, Departmentation – Functional, Project, Matrix and Network; Delegation and Decentralization of Authority | 20 | CO2 |
| III | Staffing: Recruitment: Meaning & Sources, Selection, Stages – Interview: Types – Training: Process and Methods of Training – Direction: Meaning, Importance, Principles Controlling: Meaning, Definitions, Nature, Characteristics, Benefits of Control, Importance, Problems – Management By Exception (MBE) - SWOT Analysis – Management Information Systems (MIS) - Coordination: Meaning, Definition, Nature, Importance, Problems - Principles of Coordination – Techniques of Coordination | 20 | CO3 |
| IV | Introduction to Organizational Behaviour: Introduction to Organization - Organizational behavior - OB Concepts - OB Model - Introduction to Individual Behavior - Motivation at work - Dynamics of group behaviour - Individual & organizational factors to stress - Prevention & Management of stress. | 10 | CO4 |
| V | Leadership: Concept and Styles; Trait and Situational Theory of Leadership - Motivation: Concept and Importance - Maslow Need Hierarchy Theory - Herzberg Two Factors Theory - McGregor and Ouchi theory - Control: Concept and Process - Communication: Process and Barriers - Transactional Analysis (TA) - Johari Window - Change Management: Resistance to change and strategies to manage change - Conflict levels, causes and resolution - Functional and Dysfunctional aspects of conflict - Emerging issues in management | 15 | CO5 |

TEXT BOOK:

1. Gupta, C.B. (2017). *Management Theory & Practice*, New Delhi, India: Sultan Chand & Sons.
2. Gupta, C.B. (2014). *A Textbook on Organizational behaviour*. New Delhi, India: S. Chand Publications.
3. Natarajan, K & Ganesan, K.P. (2020). *Principles of Management*. Mumbai, India: Himalaya Publishing House.

REFERENCE BOOKS:

1. Gupta, C.B. (2014). *A Textbook on Organizational behaviour*. New Delhi, India: S. Chand Publications.
2. Viswanthan, R. (2018). *Principles of Management – Concepts & Cases*. Mumbai, India: Himalaya Publishing House.
3. McShane, S. L. & Glinow, M. A. V. (2019). *Organizational Behavior*. New York, United States of America: McGraw-Hill Education,

Note: Latest Edition of the reading to be used.

ASSESSMENT PATTERN**CIE- Continuous Internal Evaluation (40 Marks)**

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | | 4 | 4 | |
| Understand | | 3 | 4 | |
| Apply | 8 | 3 | 2 | |
| Analyze | 7 | | | |
| Evaluate | | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.**

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 30 |
| Understand | 30 |
| Apply | 40 |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|---------------------------|---------------------------|--------------------------|------------------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: ALLIED II – BUSINESS MATHEMATICS - II

| | |
|----------------------------|-----------------------|
| Course Code : 36215 | Credits : 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this Course, the student will be able to develop the Analytical reasoning skills and attain proficiency in problem solving and quantitative aptitude. To understand the plane analytical geometry concepts, to demonstrate the applications of co-ordinate system, to prepare business mathematics model for any given real life situation through survey.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Restate the definition of plane analytical geometry. Demonstrate the Cartesian co-ordinate system. Demonstrate gradient of straight line. |
| CO2 | Distinguish between arithmetic mean and geometric mean. Solve the problem on arithmetic mean and harmonic mean. |
| CO3 | Define the term interpolation. Explain the concept of binomial method. Judge and classify the concepts of Newton and Lagrange interpolation method). |
| CO4 | Define the term matrix. Point out the important term of matrix inversion, solution to linear equation. |
| CO5 | Understand the difference between rational and irrational numbers and perform operations with Surds and Indices. Calculate the profit and loss of a real-life problem. Find the ratio between two or more ingredients at their respective prices |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | |
| CO1 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|---|-------|-----|
| I | Set theory: Plane analytical geometry –Cartesian co-ordinate system, length of a line segment, section formula (ratio)-gradient of a straight line, equation of a straight line. | 12 | CO1 |
| II | Algebra: Arithmetic, geometric and harmonic progressions. | 12 | CO2 |
| III | Interpolation: Binomial, Newton and Lagrange's method. | 12 | CO3 |
| IV | Matrices: Matrices- Meaning and operations, matrix inversion, solution to linear equation-payroll wages and commission. | 12 | CO4 |
| V | Quantitate Aptitude: Surds & Indices- Profit & Loss-Pipes & Cistern-Alligation or Mixture-Calendar-Clocks. | 12 | CO5 |

TEXT BOOK:

1. Dr. Vittal, P.R. (2012). *Business Mathematics*. Chennai, India: Margham Publications.
2. Dr. Aggarwal, R. S. (2017). *Quantitative Aptitude*. New Delhi, India: S. Chand & Co.

REFERENCE BOOKS:

1. Dr. Rajagopalan, S. P. & Dr. Sattanathan, R. (2009). *Business Mathematics*. Chennai, India: Vijay Nichole Imprints Private Limited.
2. Sanchetti, D.C. & Kapoor, V.K. (2014). *Business Mathematics*. New Delhi, India: Sultan Chand & Sons.

Note: Latest Edition of the reading to be used.

ASSESSMENT PATTERN

Theory Examination

CIA I & II: 50 Marks Each, Total to be converted into 25 marks

CIA I – Multiple Choice Questions

CIA II – Description type questions

Time: 1 hour and 30 minutes

Course Title: NME II - E-COMMERCE

| | |
|----------------------------|-----------------------|
| Course Code : 45206 | Credits : 2 |
| L:T:P:S : 2:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to improve his knowledge on the concept of e-commerce, its applications and development and the challenges faced while entering into/managing an e-business.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Develop an in-depth knowledge about the concept of E-Commerce and spell out the benefits and limitations of the same. (K1) |
| CO2 | Distinguish traditional Commerce and E- Commerce and determine the resources required for successful implementation of E-Commerce (K1, K2) |
| CO3 | Make use of various E-Commerce applications like E-Marketing, E-Shopping, E-Advertising, etc. (K1, K2, K3) |
| CO4 | Assume the role played by Electronic Data Inter-change in the modern world (K1) |
| CO5 | Maximize the usage of electronic payment systems like payment using credit cards, debit cards, electronic purses etc. (K1,K2) |
| CO6 | Identify and make use of E-Marketing techniques (K1, K2, K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 1 | 1 | 1 | 3 | 1 | 1 | 2 | - | 3 | 2 | 2 |
| CO2 | 2 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | - | 2 | 2 | 3 |
| CO3 | 2 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 |
| CO4 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 |
| CO5 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 |
| CO6 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | 3 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | Introduction to E-Commerce: Definition, Classification of E-Commerce: B2B, B2C, C2B, C2C, Benefits, Limitations, Traditional Commerce Vs E-Commerce, Resources required for Successful implementation of E-Commerce, Threats to E-Commerce Transactions, Disputes. | 6 | CO1 CO2 |
| II | E-Commerce Applications: Entertainment – E-Marketing – E-Advertising and its techniques: Banners, Sponsorships, Portals, Online Coupons - Online Trading – E-Shopping – Mobile Commerce: Advantages, Problems and Future of M-Commerce. | 6 | CO3 |
| III | Electronic Data Interchange (EDI): Applications – Security and Privacy Issues – Software Implementations – Value Added Networks – Internal Information System – Work-flow Automation and Coordination – Customization – Supply Chain Management | 6 | CO4 |
| IV | Electronic Payments Systems: Electronic Payment System: Special features required in payment system for e-commerce, Types of e- payment System: E-cash & currency servers, e- cheques, credit cards, smart cards, electronic purses & debit cards - Advantages - Issues of EPS. | 6 | CO5 |
| V | E-Marketing Techniques: Search Engines, Directories, Registrations, Solicited targeted E-mails, Interactive sites, Banners, Advertising, Spam Mails, E-mail, Chain letters. Applications of 5P's (Product, Price, Place, Promotion, People) | 6 | CO6 |

TEXT BOOKS:

1. Dr. Abirami Devi. K & Dr. Alagammai, M. (2019). *E-Commerce*. Chennai, Tamil Nadu, India: Margham Publications.
2. Dr. Raydu, C.S (2018). *E-Commerce & E-Business*. Mumbai, India: Himalaya Publishing House.

REFERENCE BOOKS:

1. Dr. Arora, S. (2020). *E-Commerce*, Chennai , Tamil Nadu, India: Taxmann Publications.
2. Dr. Pandey U.S & Saurabh, S. (2014). *E-Commerce and Mobile Commerce Technologies*. New Delhi. India: Sultan Chand & Sons Private Limited.
3. Bansal, R. Bansal, S. & Bansal, S. (2016). *E-Commerce*. New Delhi, India: Kalyani Publications.
4. Murthy, C.S.V. (2019). *E-Commerce (Concepts, Models, Strategies)*. Mumbai, India: Himalaya Publishing House

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. <https://irp-cdn.multiscreensite.com/1c74f035/files/uploaded/introduction-to-e-commerce.pdf>.
2. <https://saif4u.webs.com/E-ommerce-Notes.pdf>
3. https://backup.pondiuni.edu.in/storage/dde/dde_ug_pg_books/E-%20Commerce.pdf.

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|--------------------------|---------------------------|-------------------------|-------------------------|-------------------|
| Marks (out of 40) | Descriptive 15 | Objective 10 | 10 | 5 |
| Remember | | 6 | | |
| Understand | 15 | 4 | 10 | |
| Apply | | | | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.**

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 10 |
| Understand | 90 |
| Apply | |
| Analyse | |
| Evaluate | |
| Create | |

THIRD SEMESTER
SYLLABUS
OF
B.COM (ACCOUNTING & FINANCE)

SEMESTER III

Course Title: CORE V - CORPORATE ACCOUNTING – I

| | |
|---------------------|----------------|
| Course Code : 45307 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be familiarized with the Accounting Standards and International Financial Reporting Standards (IFRS), understand the accounting procedures relating to the issue, underwriting, redemption and valuation of shares and prepare and decipher a company's final accounts.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Get an insight on the Accounting Standards and International Financial Reporting Standards (IFRS). Determine the Profit earned prior to incorporation (K2) |
| CO2 | Understand the accounting procedures relating to issue and underwriting of shares and debentures (K2, K3, K4) |
| CO3 | Determine the accounting procedures for redemption of preference shares and debentures (K2, K3) |
| CO4 | Develop knowledge about corporate accounting practices in conformity with the provisions of the Companies Act, 2013 and the latest amendments. Apply Revised Schedule VI formats in preparation of company final accounts (K1, K2, K3) |
| CO5 | Understand the need for valuation of goodwill and shares and their valuation procedures (K2, K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | - | 2 | 3 | 3 | - | - | 1 | 2 | 1 | 3 | 2 | 1 |
| CO2 | - | 2 | 2 | 3 | - | 2 | 2 | 2 | 1 | 3 | 2 | 1 |
| CO3 | - | 2 | 3 | 3 | - | 2 | 2 | 2 | 1 | 3 | 3 | 1 |
| CO4 | - | 3 | 3 | 2 | 1 | 3 | 2 | 2 | 1 | 2 | 3 | 2 |
| CO5 | - | 3 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 3 | 1 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | <p>Accounting Standards & International Financial Reporting Standards Mandatory Accounting Standards issued by the ICAI – Meaning of IFRS (International Financial Reporting Standards)</p> <p>Profit Prior to Incorporation Formation of a company - Certificate of incorporation - Profits Prior to Incorporation - Basis of apportionment of expenses - Preparation of statement showing profit prior and subsequent to incorporation</p> | 13 | CO1 |
| II | <p>Issue of Shares and Debentures Shares: Meaning, Types of shares, Types of issue, Minimum subscription, Capital, Share capital and debentures - Issue of shares and debentures, Forfeiture, Reissue</p> <p>Underwriting of shares and debentures Underwriting: Meaning, Underwriting commission, Types, Determination of Liability in respect of underwriting contracts</p> | 18 | CO2 |
| III | <p>Redemption of Preference shares and Debentures Redemption of Preference shares: Meaning - Provisions of Companies Act - Revenue and capital profits - Redemption of Debentures: Meaning - Types of Redemption - (Problems on Sinking Fund Method Only)</p> | 17 | CO3 |
| IV | <p>Final Accounts of Companies (As per the Companies Act 2013) Preparation of company final accounts (R) - Company Balance Sheet - Transfer to reserves - Computation of Managerial Remuneration</p> | 25 | CO4 |
| V | <p>Valuation of Goodwill Meaning, Need for valuing goodwill, Factors affecting Goodwill, Methods of Valuation of Goodwill</p> <p>Valuation of Shares Need for valuation of shares, Factors affecting the value of shares, Methods of Valuation of Shares</p> | 17 | CO5 |

TEXT BOOKS:

1. Shukla, M.C., Grewal, T.S. & Gupta, S.C. (2019). *Corporate Accounting*. Chennai, India: S. Chand Publishing
2. Gupta, R.L. & Radhaswamy, M. (2018). *Corporate Accounting*. New Delhi, India: Sultan Chand & Sons
3. Maheshwari, S.N., Maheshwari, S.K. & Maheshwari, S.K. (2018). *Corporate Accounting*. New Delhi, India: Vikas Publishing House
4. Hanif, M. & Mukherjee, A. (2017). *Corporate Accounting*. New Delhi, India: McGraw Hill (India) Pvt. Ltd.
5. Reddy, T.S & Murthy, A. (2017). *Corporate Accounting (Volume One)*. Chennai, Tamil Nadu: Margham Publications

REFERENCE BOOKS

1. Goyal, B.K. (2021). *Corporate Accounting*. New Delhi, India: Taxmann Publications
2. Jain, S.P & Narang, N.L. (2017). *Advanced Accountancy (Volume - II) (Corporate Accounting)*. Chennai, Tamil Nadu: Kalyani Publications.
3. Shukla, M.C., Gupta, S.C. & Grewal, T.S. (2016). *Advanced Accounts*. New Delhi, India: S.Chand & Sons

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. <https://resource.cdn.icai.org/62039bos50398cp1.pdf>
2. <https://resource.cdn.icai.org/62041bos50398cp3u1.pdf>
3. <https://resource.cdn.icai.org/62042bos50398cp3u2.pdf>
4. <https://resource.cdn.icai.org/62222bos50444-cp1.pdf>
5. <https://resource.cdn.icai.org/62046bos50398cp5.pdf>
6. <https://resource.cdn.icai.org/62048bos50398cp7.pdf>
7. <https://resource.cdn.icai.org/62049bos50398cp8.pdf>
8. <https://resource.cdn.icai.org/62044bos50398cp4u1.pdf>
9. <https://resource.cdn.icai.org/62239bos50444-mod2appx.pdf>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | | | | |
| Understand | 5 | 5 | 5 | |
| Apply | 10 | 5 | 5 | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | |
| Understand | 50 |
| Apply | 50 |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|-------------------|----------|-------------------|----------|------------------|----------|-----------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 1 | 1 | 1 | 1 | 1 | - | 5 |
| II | 1 | 1 | 1 | 1 | - | 1 | 5 |
| III | 2 | - | - | 2 | - | 1 | 5 |
| IV | 2 | - | - | 2 | - | 1 | 5 |
| V | 1 | 1 | 1 | 1 | - | 1 | 5 |
| Total Questions | 7 | 3 | 3 | 7 | - | 5 | 25 |

Course Title: CORE VI - BUSINESS LAW

| | |
|----------------------------|-----------------------|
| Course Code : 45308 | Credits : 4 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to gain knowledge on the legal framework in which a business is expected to function

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Understand the basic requirements of the Indian contract Act, 1872 (K2, K3) |
| CO2 | Illustrate how parties can discharge their contract by agreement. (K2) |
| CO3 | Understand the general principles and the nature of obligations underlying Contracts of Indemnity & Guarantee and bailment & pledge. (K2) |
| CO4 | Point out transactions involving Sale of Goods Act, 1930 (K2, K3) |
| CO5 | Categorize and understand the various nuances of Intellectual Property Rights and Competition Law in India (K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 1 |
| CO2 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | - | 1 | 1 | 2 | 1 |
| CO3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | 1 | 1 | 1 |
| CO4 | 1 | 1 | 3 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 1 |
| CO5 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 3 | - | 1 | 3 | - |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|--|-------|-----|
| I | <p>Indian Contract Act, 1872 - Essentials of a Contract and Concepts</p> <p>Contract & Agreement: Definition, Meaning, Characteristics – Classification of contracts - Essentials of valid contract - Offer and essentials of valid offers - Acceptance and essentials of Acceptance - Communication of Offer and Acceptance - Revocation of Offer and Acceptance – Consideration - Essentials of Consideration – Stranger to contract – No Consideration no Contract - Contractual Capacity Effects of Minors - Persons of Unsound mind - Persons disqualified from contracting by any other law</p> | 20 | CO1 |
| II | <p>Indian Contract Act, 1872- Essentials, Performance, Discharge and Breach of Contract</p> <p>Free Consent - Coercion - Undue Influence - Fraud - Misrepresentation – Mistake - Legality of Object - Performance of Contract - Discharge of Contract, By Agreement, By Operation of law, By Breach, By Performance, By Impossibility, By Lapse of time - Breach of Contract - Remedies for Breach of Contract - Quasi Contracts.</p> | 15 | CO2 |
| III | <p>Indemnity, and Guarantee, Bailment and Pledge</p> <p>Indemnity - Right of indemnity holder when sued and Right of indemnifier - Time of Commencement of indemnifier’s liability - Guarantee - Essential features - Kinds of Guarantee - Bailment - Requisites of bailment - Classification – Duties and Rights of Bailor and Bailee - Pledge - Rights and Duties of Pledger and Pledgee - Pledge by Non - Owners - Law of Agency - Lien - Rights relating to Lien - Hypothecation - Charge - Mortgage</p> | 10 | CO3 |
| IV | <p>Sale of Goods Act, 1930</p> <p>Sale and Agreement to Sell – Meaning - Distinction - Essentials of a contract of sale - Hire Purchase – Pledge – Mortgage – Hypothecation – Lease – Goods: Classification of Goods, Passing of Property in Goods - Conditions and Warranties, Distinction, Express and implied conditions & warranties - Doctrine of Caveat emptor - Transfer of ownership in goods including sale by non-owners - Rights of an unpaid Seller, Buyer’s right, Seller’s right – Remedies for breach of contract of sale – Auction sale</p> | 15 | CO4 |

| | | | |
|----------|---|----|-----|
| V | Competition Law, 2002 and Intellectual Property Act Concept of Competition - Need & Importance of Competition Law - Features - Anti Competitive Agreements – Abuse of dominant position – Combinations – CCI (Competition Commission of India) Intellectual Property – Meaning, Types, Overview of Law governing IPR for Copyrights, Trademarks, Patents and Geographical Indications | 15 | CO5 |
|----------|---|----|-----|

TEXT BOOKS:

1. Kapoor, N.D. (2020). *Elements of Merchantile Law*. New Delhi. India: Sultan Chand and Sons
2. Sreenivasan, M.R. (2020). *Business Law*. Chennai, India: Margham Publications.
3. Kuchcal, M.C. (2018). *Mercantile Law*, New Delhi. India: Vikas Publishing House Pvt. Ltd.

REFERENCE BOOKS

1. Arora, S. (2021). *Business Law*, New Delhi. India: Taxman's Publications.
2. Dhingra, J. (2019). *Business Law*, New Delhi. India: Kalyani Publishers.
3. Bose, D.C. (2019). *Business Law*, New Delhi. India: PHI Learning Pvt. Ltd.
4. Charantimath, N.A. (2017). *Business Law*. Mumbai, India: Himalaya Publishing House.

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. <https://www.icai.org>
2. <https://www.icsi.in>
3. www.cramerz.comwww.digitalbusinesslawgroup.com
4. <http://swcu.libguides.com/buslaw>
5. <http://libguides.slu.edu/businesslaw>
6. www.cramerz.com
7. www.digitalbusinesslawgroup.com
8. <http://swcu.libguides.com/buslaw>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------|-----------|------------------|------------|
| | Descriptive | Objective | | |
| Marks (out of 40) | 15 | 10 | 10 | 5 |
| Remember | 5 | 10 | | |
| Understand | 10 | | 5 | |
| Apply | | | 5 | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 30 |
| Understand | 70 |
| Apply | |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|-------------------|-------------------|------------------|-----------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: CORE VII: BANKING THEORY AND PRACTICE

| | |
|----------------------------|-----------------------|
| Course Code : 45309 | Credits : 4 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to get an overview of Indian Banking system, gain knowledge on the technological concepts prevalent in the banking industry, be acquainted with the services under retail and wholesale banking, and be familiarized with negotiable instruments,

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Explain the conceptual framework of banking and the role of RBI (K2) |
| CO2 | Recall and understand the various functions of commercial banks and its loan system (K3) |
| CO3 | Develop the knowledge on various aspects of retail banking and customer grievances and redressal (K2) |
| CO4 | Understand the various services provided by banks under wholesale banking (K2) |
| CO5 | Know the laws governing the banks under the Negotiable Instruments Act (K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 3 | 1 | 2 | 1 | 1 | 1 | 3 | 3 | 1 | 3 | 1 |
| CO2 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 1 | 3 | 1 |
| CO3 | 3 | 2 | 2 | 2 | 1 | 2 | 1 | 3 | 3 | 1 | 3 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 3 | 3 | 1 | 3 | 2 |
| CO5 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 3 | 1 | 1 | 3 | 1 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|--|-------|------------|
| I | Banking in the Indian Context - Banking Regulation Act, 1949: Definition of Banking, Licensing, Opening of branches, Functions of Banks, Inspection - Other Forms of Business Permitted for a Banking Company - Businesses Prohibited for a Banking Company - Maintenance of Liquid Assets - Submission of Monthly Returns - Restrictions on Advances - Role of RBI and their functions - Reserve Banks Powers on Inspection - Reserve Banks Powers to Issue Direction - Reserve Banks Power to Control Advances - Tools of Monetary Control – Regulatory Restrictions on Lending - Current affairs – Money market- Financial Inclusion. | 12 | CO1 |
| II | Commercial Banks and Financial awareness - Functions of commercial banks - Primary, Secondary and Modern Functions - Loan System - Classification of Loans and Advances -Secured and Unsecured - Guaranteed Advances – Types of Borrowings – Precautions to be taken by a banker - General Principles of Sound - Advances - Advances against Goods - Advances against Documents of Title to Goods - Important Documents of Title to Goods - Credit Information Bureau (India) Limited (CIBIL) - Fair Practices Code for Debt Collection – Banking Codes and Standard Board of India (BCSBI) - Role and Functions of BCSBI - Fair Practices Code for Debt Collection - Codes of BCSBI - Precautions taken by banker. | 20 | CO2 |
| III | Retail Banking: Retail asset - Secured loans and Unsecured loans - Retail Liabilities: Branch Banking - Savings Bank Accounts, Recurring Deposit or Cumulative Deposit Accounts, Current Accounts - Types of customers (Individuals, Firms, Trusts and Companies) - CASA - Legal Aspects of Entries in the Pass book - Effect of Wrong Entries in favor of the Banker - Effect of False Entry in the Pass Book - Closing of a Bank Account - Importance of customer relations – Customer grievances and redressal - Ombudsman - Know Your Customer (KYC) norms | 18 | CO3 CO4 |
| IV | Wholesale Banking - Financial solutions to corporate - Capital Market - Custody Group - Structured Finance and Portfolio Management - Project Finance - Strategic Solutions – Syndication and advisory - Credit Monitoring - Credit Risk Management - Cash management services - Group Style of Credit - Cash Credit System - Commitment Charge - Overdrafts - Loan System - Classification of Loans and Advances - Secured and Unsecured - Guaranteed Advances - Types of Borrowing. | 15 | CO5 |

| | | | |
|---|--|----|-----|
| V | Negotiable Instruments Act, 1881 - Definition of Negotiable Instrument - Characteristics of negotiable instrument - Promissory Note - Definition, Features of Promissory Note - Definition of Bills of Exchange, Features, Types - Bill of Exchange and Promissory Note - Holder and Holder in Due Course - Payment in Due Course - Holder for Value - MICR Cheque - Definitions - Distinguishing Features of Cheque - Crossing, Types of crossing - Endorsement, Types of endorsement – Material Alteration - Paying Banker - Rights and Duties – Statutory Protection - Dishonour of Cheques - Role of collecting banker | 10 | CO6 |
|---|--|----|-----|

TEXT BOOKS:

1. Santhanam, B. (2012) *Banking Theory Law & Practice*. Chennai, Tamil Nadu: Margham Publications.
2. Sundaram, K.P.M & Varshney, P.N. (2014) *Banking Law Theory and Practice*. New Delhi, India: Sultan Chand & Co.
3. Muraleedharan, D. (2014). *Modern Banking Theory and Practice*, New Delhi, India: PHI Learning Pvt Ltd.

REFERENCE BOOKS:

1. Maheswari, S.N. (2014). *Banking Law Theory and Practice*. New Delhi. Kalyani Publications
2. Gordon, E. & Natarajan, K. (2016). *Banking Theory Law and Practice*. Mumbai, India: Himalaya Publishing House.
3. Tandon, D & Tandon, N (2015). *Management of Banks*. New Delhi, India: Taxmann Publications.
4. Shekhar, K. C. & Shekhar, L. (2013). *Banking Law Theory and Practice*. New Delhi, India: Vikas Publishing

Note: Latest Edition to be used.

WEB RESOURCES

1. <http://www.lawcommissionofindia.nic.in/>
2. <http://www.rbi.org/>
3. <http://www.bankingombudsman.org/>
4. <http://www.allbankingsolutions.com/Banking-Tutor/Pledge-vs-Hypothecation-vs-Mortgage.htm>
5. <https://indianmoney.com/articles/relationship-between-the-banker-and-customer>
6. <https://financialservices.gov.in/sites/default/files/Negotiable%20Instruments%20Act1881.pdf>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | 5 | 5 | 5 | |
| Understand | 10 | 5 | 5 | |
| Apply | | | | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 10 |
| Understand | 70 |
| Apply | |
| Analyse | 20 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|-------------------|-------------------|------------------|-----------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: CORE VIII: FINANCIAL MANAGEMENT - I

| | | |
|----------------------------|------------------|-------------|
| Course Code : 45310 | Credits | 4 |
| L:T:P:S : 5:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives:

On taking this course the student will be familiarized with the importance of the finance function and the key business decisions, the various sources of raising funds and its associated costs, gain knowledge on the concept of time value and its applications and the concept of leverage.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Demonstrate an understanding of the overall role and importance of the finance function and gain basic knowledge of financial management. (K1, K2) |
| CO2 | Gain an insight on the goals of the finance manager and identify funding sources, instruments and markets. (K1, K2) |
| CO3 | Demonstrate knowledge about the value of money over time, its uses and application. (K1, K2, K3, K4) |
| CO4 | Identify the firm's business and financial risk and the study the impact of leverage on the expected return, expected EPS and the risk borne by the shareholders through its application. (K1, K2, K3) |
| CO5 | Appraise the risk profile of firms, understand the influences of economic and political factors on the cost of various sources of funds, and estimate the specific costs of capital being debt, preference and equity capital and the overall cost of capital, using financial data. (K2, K3, K4) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 3 | 2 |
| CO2 | 1 | - | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 2 | 2 | 2 |
| CO3 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 1 | 1 |
| CO4 | 1 | 1 | 3 | 3 | 1 | 2 | 1 | 1 | 1 | 3 | 2 | 2 |
| CO5 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 1 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|---|-------|-----|
| I | Introduction to Financial Management: Financial Management – Meaning & Significance - Key Decision Areas in Financial Management - Objectives and goals of Financial Management - Factors affecting Financial Decisions - Key activities of Finance Manager - Agency Problem - Basics of Risk and Return | 15 | CO1 |
| II | Sources of Finance: Short term - Money markets instruments – T-bills, Commercial paper, Certificate of deposit, Factoring, Trade credit, Letter of credit, Repurchase agreements Medium term - Leasing, Hire purchasing, External commercial borrowings. Long term - Gilt-edged securities, Equity shares, Hybrid financing instruments, Preference shares, Terms loans, Debentures, Bonds, Venture capital, Retained earnings, Public Deposits, ADR, GDR | 5 | CO2 |
| III | Time Value of Money: Concept of Time value of Money - Process of Compounding and Discounting – Simple problems on Future Value of a Single amount, Future Value of an Annuity, Present Value of a Single Amount, Present Value of an Annuity (using time value tables only) – Applications – Effective Interest Rate | 15 | CO3 |
| IV | Leverages - Concept of Business and Financial Risk, Operating Leverage, Financial Leverage, Combined Leverage - EBIT-EPS Analysis - Indifference Point of EBIT | 20 | CO4 |
| V | Cost of capital – Concept, Measurement & Significance – Cost of Equity – Cost of Preference Capital – Cost of Debt – Cost of Retained Earnings - Weighted Average (or) Composite Cost of Capital (WACC) | 20 | CO5 |

TEXT BOOKS:

1. Khan, M.Y. & Jain, P.K. (2018). *Financial Management*. New Delhi. McGraw Hill (India) Pvt. Ltd.
2. Pandey I.M. (2021). *Financial Management*, Noida, New Delhi, India: Pearson India Education Services
3. Kishore, R. M. (2020). *Financial Management*. New Delhi, India: Taxman Publications

REFERENCE BOOKS

1. Murthy, A. (2020). *Financial Management*. Chennai, India: Margham Publications
2. Tulsian, P.C. & Tulsian, B. (2017). *Financial Management – A Self-study Text Book*. New Delhi, India: S. Chand Publishing
4. Chandra, P. (2020). *Fundamentals of Financial Management*. Noida, New Delhi, India: McGraw Hill (India) Pvt. Ltd.
3. Rustagi, R.P. (2018). *Financial Management*. New Delhi, India: Taxman Publications
4. Singhal, A. (2019). *Fundamentals of Financial Management*. New Delhi, India: S. Chand Publishing.

Note: Latest Edition of the reading to be used.

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | 4 | | | |
| Understand | 3 | 5 | 5 | |
| Apply | 5 | 5 | 5 | |
| Analyze | 2 | | | |
| Evaluate | 1 | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.**

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 20 |
| Understand | 15 |
| Apply | 50 |
| Analyse | 10 |
| Evaluate | 5 |
| Create | - |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|-------------------|----------|-------------------|----------|------------------|----------|-----------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 2 | - | 2 | - | 1 | - | 5 |
| II | 2 | - | 2 | - | 1 | - | 5 |
| III | 1 | 1 | - | 2 | - | 1 | 5 |
| IV | 1 | 1 | - | 2 | - | 1 | 5 |
| V | 1 | 1 | - | 2 | - | 1 | 5 |
| Total Questions | 7 | 3 | 4 | 6 | 2 | 3 | 25 |

**Course Title: ALLIED III - BUSINESS STATISTICS & OPERATIONS
RESEARCH - I**

| | | |
|--------------------------|------------------|-------------|
| Course Code : | Credits | 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks | : 40 |
| Exam Hours : 03 | ESE Marks | : 60 |

Learning Objectives:

On taking this course the student will be able to demonstrate knowledge of the statistical distributions. Demonstrate knowledge on applications of statistics in business operations. Compute and interpret correlation and regression analysis. Demonstrate the knowledge of applying linear programming to solve real life applications

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Explain about classification and tabulation of statistical data. Plot the diagrammatic and graphical representation of data |
| CO2 | Explain about central tendency and calculate various measures. Explain how mean, median and mode are related in symmetric and skew symmetric distributions. Explain about dispersion and calculate various measures. Estimate the coefficient of variation using standard deviation. Investigate the uniformity or consistency of a data using coefficient of variation. Interpret the concept of skewness and methods to calculate its coefficient |
| CO3 | Define correlation and its types. Calculate and interpret correlation between two variables. Apply regression equations to estimate the values of unknown variable using the given data. Rank the given data and examine the rank correlation |
| CO4 | Define the nature and features of operations research. Explain the term various terms in LPP. Formulate and model a linear programming problem. Solve an LPP using graphical and simplex method. Identify a feasible solution and optimal solution using simplex method |
| CO5 | Explain basic components of network analysis and critical path. Define CPM and PERT. Construct the network using CPM and PERT techniques to plan, schedule and control project activities |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO5 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|---|-------|-----|
| I | Introduction – Classification and Tabulation of statistical data – Diagrammatic and graphical representation of data | 12 | CO1 |
| II | Measures of central tendency: Arithmetic mean, median, mode Measures of dispersion : Range , Quartile deviation, Mean deviation, Standard deviation , Measures of skewness – simple problems | 12 | CO2 |
| III | Correlation: Karl Pearson’s coefficient of correlation, Spearman’s rank correlation, Regression Lines and Coefficients. | 12 | CO3 |
| IV | Introduction to OR – Linear Programming Formulation - Graphical and Simplex method to solve LPP with all constraints less than or equal to type only (simple problems) | 12 | CO4 |
| V | Network Analysis – PERT and CPM (no crashing) | 12 | CO5 |

TEXT BOOKS:

1. Dr. Vittal, P.R. (2012). *Business Statistics and Operations Research*. Chennai, India: Margham Publications
5. Dr. Rajagopalan, S.P. & Dr. Sattanathan, R. (*Business Statistics and Operations Research* New Delhi, India: McGraw Hill (India) Pvt. Ltd.
2. Gupta, C.B. (2004). *An Introduction to Statistical Methods*. New Delhi, India: S. Chand Publishers

REFERENCE BOOKS:

1. Dr. Gupta, S.P. & Gupta, V. (2004). *An Introduction to Statistical Methods*. New Delhi, India: S. Chand Publishing
2. Gupta, P.K. & Hira, D.S. (2012). *Introduction to Operations Research*, New Delhi, India: S. Chand Publishing

Note: Latest Edition of the reading to be used.

ASSESSMENT PATTERN**Theory Examination**

CIA I & II: 50 Marks Each, Total to be converted into 25 marks

CIA I – Multiple Choice Questions

CIA II – Description type questions

Time: 1 hour and 30 minutes

FOURTH SEMESTER

SYLLABUS

OF

B.COM (ACCOUNTING & FINANCE)

SEMESTER IV

Course Title: CORE IX: CORPORATE ACCOUNTING - II

| | |
|---------------------|----------------|
| Course Code : 45411 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to gain an understanding on the accounting procedures of certain specific types of companies like banking, holding and insurance companies and the liquidation and amalgamation of companies.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|-----|--|
| CO1 | Gain knowledge on meaning, process and accounting of internal reconstruction. Distinguish Amalgamation, Absorption and External Reconstruction, estimate the value of purchase consideration and determine the accounting procedures to be followed (K2, K3) |
| CO2 | Distinguish holding and subsidiary company and gain knowledge on the accounting procedures to be followed in the preparation of the consolidated Balance Sheet of a holding company (K2, K3) |
| CO3 | Gain knowledge on the accounting procedures of banking companies and its application (K2, K3) |
| CO4 | Apply the provision of the law in the preparation of the final accounts of insurance companies, life insurance as well as general insurance including fire insurance and marine insurance (K2, K3) |
| CO5 | Determine the liquidator's remuneration payable in the event of liquidation (K2, K3) |
| CO6 | Show how the assets are realized and liabilities are settled in the event of liquidation (K2, K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | - | 2 | 3 | 3 | - | 1 | - | 1 | 2 | 2 | 3 | 1 |
| CO2 | - | 2 | 3 | 3 | - | 1 | - | 1 | 2 | 2 | 3 | 1 |
| CO3 | - | 3 | 3 | 3 | - | 1 | - | 1 | 2 | 2 | 3 | 1 |
| CO4 | - | 2 | 3 | 3 | - | 1 | - | 1 | 2 | 2 | 3 | 1 |
| CO5 | - | 3 | 3 | 3 | - | 1 | - | 1 | 2 | 2 | 3 | 1 |
| CO6 | - | 2 | 3 | 3 | - | 1 | - | 1 | 2 | 2 | 3 | - |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | <p>Amalgamation, Absorption, External and Internal Reconstruction</p> <p>Meaning - Purchase Consideration - Methods of calculating purchase consideration: Lump sum method, Net assets method, Net payment method, Intrinsic value method - Types of amalgamation</p> <p>Alteration of Share Capital</p> <p>Alteration of Share Capital and Internal Reconstruction - Reduction of Capital – Procedure</p> | 25 | CO1 |
| II | <p>Accounts of Holding Companies</p> <p>Consolidated Final Statement of Holding Companies and Subsidiary Companies (Inter-company holdings excluded) - Minority Interest - Cost of Control / Goodwill - Calculation of Capital Profit/ Revenue profit - Consolidated Balance Sheet (Revised Format) – Treatment of dividend – (Inter-company Owings included)</p> | 13 | CO2 |
| III | <p>Accounts of Banking Company</p> <p>Final statements of banking companies (As per the new provisions) - Non Performing assets - Rebate on Bills Discounted - Profit and Loss a/c - Balance Sheet as per the Banking Regulation Act, 1949</p> | 15 | CO3 |
| IV | <p>Accounts of Insurance Companies</p> <p>Final Statement of Insurance companies (As per the new provisions) - Life insurance - Revenue a/c, Profit and Loss a/c, Balance Sheet as per IRDA regulation 2002 - Life assurance fund – Valuation Balance Sheet - General Insurance - Fire Insurance and Marine Insurance</p> | 25 | CO4 |
| V | <p>Liquidation of Companies</p> <p>Liquidation - Modes of Winding Up - Statement of Affairs & Liquidator’s Final statement of Account - Deficiency or Surplus a/c</p> | 12 | CO5 CO6 |

TEXT BOOKS:

1. Shukla, M.C., Grewal, T.S. & Gupta, S.C. (2019). *Corporate Accounting*. Chennai, India: S. Chand Publishing
2. Gupta, R.L. & Radhaswamy, M. (2018). *Corporate Accounting*. New Delhi, India: Sultan Chand & Sons
3. Maheshwari, S.N., Maheshwari, S.K. & Maheshwari, S.K. (2018). *Corporate Accounting*. New Delhi, India: Vikas Publishing House
4. Hanif, M. & Mukherjee, A. (2017). *Corporate Accounting*. New Delhi, India: McGraw-Hill (India) Pvt. Ltd.
5. Reddy, T.S & Murthy, A. (2017). *Corporate Accounting (Volume One)*. Chennai, Tamil Nadu: Margham Publications

REFERENCE BOOKS

1. Goyal, B.K. (2021). *Corporate Accounting*. New Delhi, India: Taxmann Publications
2. Jain, S.P & Narang, N.L. (2017). *Advanced Accountancy (Volume - II) (Corporate Accounting)*. Chennai, Tamil Nadu: Kalyani Publications.
3. Shukla, M.C., Gupta, S.C. & Grewal, T.S. (2016). *Advanced Accounts*. New Delhi, India: S. Chand Publishing

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. <https://resource.cdn.icai.org/62227bos50444-cp5.pdf>
2. <https://resource.cdn.icai.org/62228bos50444-cp6.pdf>
3. <https://resource.cdn.icai.org/62238bos50444-cp10.pdf>
4. <https://resource.cdn.icai.org/62232bos50444-cp8u2.pdf>
5. <https://resource.cdn.icai.org/62236bos50444-cp8u6.pdf>
6. <https://resource.cdn.icai.org/62229bos50444-cp7.pdf>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | | | | |
| Understand | 5 | 5 | 5 | |
| Apply | 10 | 5 | 5 | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | |
| Understand | |
| Apply | 50 |
| Analyse | 50 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|-------------------|----------|-------------------|----------|------------------|----------|-----------------|
| | A 12 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 2 | - | 1 | 1 | - | 1 | 5 |
| II | 2 | - | - | 2 | - | 1 | 5 |
| III | 2 | - | - | 2 | - | 1 | 5 |
| IV | 2 | - | - | 2 | - | 1 | 5 |
| V | 2 | - | 1 | 1 | - | 1 | 5 |
| Total Questions | 10 | 0 | 2 | 8 | - | 5 | 25 |

Course Title: CORE X - FINANCIAL MANAGEMENT - II

| | |
|----------------------------|-----------------------|
| Course Code : 45412 | Credits : 4 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be understand the impact of capital structure decisions and dividend policy on firm value and gain an in-depth understanding of management tools and techniques used in investment decisions of corporate organizations.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Understand the factors that influence capital structure decisions of a business organization and their impact on the market value of the firm. (K2, K3, K4) |
| CO2 | Understand the importance of capital budgeting and application of the various techniques for the evaluation of long term projects, their pros and cons and the basis of selection criteria of projects. (K2, K3, K4) |
| CO3 | Understand the concept of working capital and its importance in a business, the factors that determine its quantum, the meaning and determination of operating cycle, and the computation of working capital. (K2, K3) |
| CO4 | Explain the key strategies and techniques used for managing cash, the determination of the best collection period for accounts receivables and techniques for effective management of inventory. (K2, K3, K4) |
| CO5 | Understand the concept of dividend and justify the dividend strategies that support wealth maximization. (K2, K3, K4) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO2 | 2 | 1 | 3 | 3 | 2 | 1 | 1 | 1 | 3 | 2 | 3 | 1 |
| CO3 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| CO4 | 1 | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 3 | 2 | 1 |
| CO5 | 1 | - | 1 | 1 | - | 1 | 1 | 2 | 1 | 2 | 3 | 1 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | Capital Structure: Capital structures planning, Factors affecting Capital Structure, Determining Debt and equity proportion – Theories of Capital Structure: Net Income Approach, Net operating income Approach, Traditional Approach, Modigliani - Miller Approach | 10 | CO1 |
| II | Basics of Capital Budgeting - Cash flow estimation, Investment criteria – Discounted and non-discounted techniques - Net Present Value, Internal Rate of Return, Profitability Index, Payback, Discounted Payback, Accounting Rate of Return (Simple problems) | 15 | CO2 |
| III | Working Capital Management Policy: Working Capital – Concept, Definition, Need, Planning of working capital – Permanent & Temporary - Determinants of working capital, Financing of working capital – Computation of Working Capital | 15 | CO3 |
| IV | Management of Cash, Receivables & Inventory Operating cycle analysis - Managing the components of working capital - inventory, receivables and cash – Cash Management – Introduction, Meaning & Importance - Cash Budget – Receivables Management – Introduction, Evaluation of credit policy – Inventory Management – Importance, Inventory Management Techniques – EOQ, ABC System, JIT | 20 | CO4 |
| V | Dividend Policy: Dividend – Concept, Types - Factors affecting dividend payment – Forms of dividend – Dividend Models - Walter’s Model, Gordon’s Model, Modigliani & Miller’s Model | 15 | CO5 |

TEXT BOOKS:

1. Khan, M.Y. & Jain, P.K. (2018). *Financial Management*. New Delhi. McGraw Hill (India) Pvt. Ltd.
2. Pandey I.M. (2021). *Financial Management*, Noida, New Delhi, India: Pearson India Education Services
3. Kishore, R. M. (2020). *Financial Management*. New Delhi, India: Taxman Publications

REFERENCE BOOKS

1. Murthy, A. (2020). *Financial Management*. Chennai, India: Margham Publications
2. Tulsian, P.C. & Tulsian, B. (2017). *Financial Management – A Self-study Text Book*. New Delhi, India: S. Chand Publishing
3. Chandra, P. (2020). *Fundamentals of Financial Management*. Noida, New Delhi, India: McGraw Hill (India) Pvt. Ltd.
4. Rustagi, R.P. (2018). *Financial Management*. New Delhi, India: Taxman Publications
5. Singhal, A. (2019). *Fundamentals of Financial Management*. New Delhi, India: S. Chand Publishing.

Note: Latest Edition to be used.

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| Marks (out of 40) | Descriptive 15 | Objective 10 | 10 | 5 |
| Remember | | | 5 | |
| Understand | | | 5 | |
| Apply | 10 | 5 | | |
| Analyze | 5 | 3 | | |
| Evaluate | | 2 | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 10 |
| Understand | 10 |
| Apply | 50 |
| Analyse | 30 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|-------------------|----------|-------------------|----------|------------------|----------|-----------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 2 | - | - | 2 | - | 1 | 5 |
| II | 2 | - | - | 2 | - | 1 | 5 |
| III | 2 | - | 1 | 1 | - | 1 | 5 |
| IV | 1 | 1 | 1 | 1 | - | 1 | 5 |
| V | 2 | - | 1 | 1 | - | 1 | 5 |
| Total Questions | 9 | 1 | 3 | 7 | - | 5 | 25 |

Course Title: CORE XI - CORPORATE LAW

| | |
|----------------------------|-----------------------|
| Course Code : 45413 | Credits : 4 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to gain knowledge on the procedures of company formation, meetings and quorum, process of profit distribution and maintenance of company accounts and understand the legal framework of LP and IBC.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Understand the procedures relating the formation of a company and raising share capital. (K2) |
| CO2 | Explain the process of profit distribution and maintenance of accounts. (K3) |
| CO3 | Demonstrate the importance of meetings and the quorum required for a meeting and the resolutions that have to be taken depending upon the business decisions. (K3) |
| CO4 | Get an insight over Limited Liability Partnership Act, 2008 (K2) |
| CO5 | Understand the framework of Insolvency and Bankruptcy Code Act. (K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 2 | 3 | 3 |
| CO2 | 1 | 1 | 3 | 3 | 2 | 1 | 1 | 3 | 2 | 2 | 3 | 2 |
| CO3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 3 | 1 |
| CO4 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| CO5 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | <p>Introduction and Basics, Company Formation, Share Capital, Shareholders and Members (as per the Companies Act, 2013) Introduction - Characteristics of a company - Lifting of corporate veil - Types of companies including one person company, small company and producer company - Association not for profit, illegal association - Formation of company – Promoters, their legal position - Pre-incorporation contract and provisional contracts - Online registration of a company - Memorandum of Association - Doctrine of Ultra Vires - Articles Of Association- Contents & Alteration, Distinguish between MoA and AoA - Share capital and shareholders – Prospectus - Statement in Lieu of Prospectus – Meaning, Types of capital - Concept of issue and allotment - Rights and Bonus issue - Dematerialisation of shares - Criteria to become a member, Rights of members - Declaration of Beneficial Interest - Difference between members and shareholders</p> | 20 | CO1 |
| II | <p>Profit Distribution Profits and Divisible Profits – Declaration and Payment of Dividend – Unpaid Dividend – IEPF in case of Unpaid Dividend – Punishment for failure to pay Dividend - Right to Dividend - Books of Accounts – Consolidation of Accounts - Financial Statements – Reopening of Financial Statements – Voluntary revision of Financial Statements</p> | 20 | CO2 |
| III | <p>Company’s Meetings and Management Composition of the board – Introduction to committees - Powers and liabilities of Directors – Number of directors, Types of Directors, Qualification of directors, DIN Types of company meetings – Quorum - Minutes of meetings – Agenda - Proxies - Voting & Poll - Resolution - Ordinary and Special</p> | 10 | CO3 |
| IV | <p>The Limited Liability Partnership Act, 2008 Salient Features, Difference between LLP & Partnership, LLP & Company – Formation & Administration of LLP – Compliances under LLP</p> | 10 | CO4 |

| | | | |
|---|---|----|-----|
| V | Insolvency and Bankruptcy Code (IBC) Insolvency and Bankruptcy - A Comparison - Legal Framework for Insolvency and Bankruptcy In India - Objectives of the Code - Structure of the Code - Applicability of the Code - Features of the Code - Institutional Framework under the Code - Voluntary Liquidation under Chapter V - Benefits of IBC | 15 | CO5 |
|---|---|----|-----|

TEXT BOOK:

1. Kapoor, N.D. (2020). *Elements of Company Law*. New Delhi, India: Sultan Chand & Sons.
2. Sreenivasan, M.R. (2020), *Company Law as per Companies Act, 2013*. Chennai, India: Margham Publications

REFERENCE BOOKS:

1. Kapoor, G.K. & Dhamija, S. (2021). *Company Law*. New Delhi, India: Taxmann Publications.
2. Bagrial, A.K. (2019). *Company Law*. New Delhi, India: Vikas Publishing House Pvt. Ltd.
3. Maheswari, S.N. & Maheswari, S.K (2016). *Company Law*. Mumbai, India: Himalaya Publishing House
4. Garg, K.C, Dhingra, J. & Gupta, V. (2020). *Company Law and Secretarial Practice*. New Delhi, India: Kalyani Publications

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. ICSI Study Material for IBC - <https://www.icsi.edu/media/webmodules/CompanyLaw.pdf>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | 5 | 10 | | |
| Understand | 10 | | 5 | |
| Apply | | | 5 | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills – Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 30 |
| Understand | 70 |
| Apply | |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|-------------------|-------------------|------------------|-----------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: CORE XII - BUSINESS COMMUNICATION

| | |
|----------------------------|-----------------------|
| Course Code : 45414 | Credits : 4 |
| L:T:P:S : 5:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to improve his verbal and written communication and presentation skills and train and prepare for placements.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Apply communication tools, strategies and principles to make communication more effective (K3) |
| CO2 | Develop an understanding about appropriate verbal skills of communication and presentation skills (K2) |
| CO3 | Prepare various forms of business letters, reports, business proposals and forms of internal communication tools (K3) |
| CO4 | Explain and illustrate the various interpersonal communication including etiquette and netiquette (K1, K2) |
| CO5 | Groom and prepare themselves for placements through various stages (K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 1 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 1 |
| CO3 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 |
| CO4 | 3 | 1 | 1 | 2 | 3 | 1 | 2 | 3 | 2 | 1 | 2 | 1 |
| CO5 | 3 | 1 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 2 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|---|--------------|------------|
| I | Introduction to communication: Importance of Business Communication- Types and Effectiveness - Seven Cs of Communication. Using technology to improve business communication - Cross-cultural communication and their challenges in a global field – Technical writing – Executive Summary/Abstract Writing | 12 | CO1 CO2 |
| II | Verbal Communication Effective Public Speaking - Body Language - When, What, How, To Whom to Speak - Presentation skills - Delivering the business presentation using visual aids, Handouts - Glossophobia and Low confidence - Mastering listening skills - Conversational Skills - Criss-Cross communication: upward, downward, lateral, formal, informal, grapevine. | 20 | CO3 |
| III | Business Correspondence (Written) Guidelines to business communication - Formal & informal Writing - Tools of Business writing - Business Letter, Claims & Response to Claims (Accept, Reject, Partially Accept) – Report writing - Business Proposals - Circular, Notice, Memorandum. | 18 | CO4 |
| IV | Interpersonal Communication Netiquette (email & online), Telephone Etiquette, Social Etiquette, Dress Etiquette (Corporate Dressing) - Effective Team Communication - Team building, Team spirit - Time management - Agenda, Minutes of meetings - Podcasts - Feedback - Importance of Feedback, Kinds: No Feedback, Positive, Negative, Specific feedback, Constructive Criticism. | 17 | CO5 |
| V | Placement Grooming Cover Letter, Resume Writing, Pre-Placement Talk, Tests: Aptitude, Technical. Group Discussions, Personal Interview. | 8 | CO6 |

TEXT BOOKS:

1. Nawal, M. (2020). *Business Communication*. New Delhi, India: Cengage
2. Rath, P., Shalini, K. & Ray, D. (2018). *Corporate Communication*. New Delhi, India: Cengage
3. Gupta, C.B. (2019). *Essential Business Communication*. New Delhi, India: Cengage
4. Rajendra Pal & Korlahalli J.S. (2015). *Essentials of Business Communication*. New Delhi, India: Sultan Chand & Sons.
5. Taylor, S. (2005). *Communication for Business*. New Delhi, India: Pearson India Education Services.

REFERENCE BOOKS

1. Jain, N. & Mukherji, S. (2020). *Effective Business Communication*. New Delhi, India: McGraw Hill India Pvt. Ltd.
2. Mohan, K. Mohan, R.C. & Nirban, V.S. (2020). *Business Correspondence & Report Writing*. New Delhi, India: McGraw Hill India Pvt. Ltd.
3. Rai, U. & Rai, S.M. (2019). *Business Communication*. Mumbai, India: Himalaya Publishing Pvt. Ltd.
4. Bovee, C.L., Thill, J.V. & Raina, R.L. (2018). *Business Communication Today*. New Delhi, Pearson India Education Services

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. www.businesscommunication.org

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | 5 | 5 | 5 | |
| Understand | 10 | 3 | 5 | |
| Apply | | 3 | | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.**

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 15 |
| Understand | 75 |
| Apply | |
| Analyse | 15 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|---------------------------|---------------------------|--------------------------|------------------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: ALLIED IV- BUSINESS STATISTICS & OPERATIONS RESEARCH - II

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 5 |
| L:T:P:S : 6:0:0:3 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to demonstrate knowledge on applications of statistics in business operation and experience the use of statistical tools to make scientific decisions in uncertain business environment

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Explain the term time series Classify the various components of time series Analyze the seasonal and cyclical pattern in series of time. |
| CO2 | Interpret indices to identify trends in a data set. Construct simple and weighted price, quantity and value indices. Use the consumer price index to determine the purchasing power |
| CO3 | Explain basic probability axioms and rules. Calculate probabilities by using addition and multiplication law, with the terms independent and mutually exclusive events. Apply Bayes' Theorem to solve real world events |
| CO4 | Explain the Transportation problem and formulate it as LPP and solve the problem Determine that an assignment problem is a special case of LPP and evaluate using Hungarian Method |
| CO5 | Define various terms and rules used in the Theory of Games. Identify strategic situations and represent them as games. Compute general solution of m x n rectangular games. Demonstrate graphical solution for m x 2 and 2 x n games |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO4 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| CO5 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | Time Series Analysis – Trend – Seasonal Variation – Cyclical variations | 12 | CO1 |
| II | Index Numbers – Aggregative and Relative Index – Chain and Fixed Index – Wholesale Index – Cost of Living Index | 12 | CO2 |
| III | Probability – Addition and Multiplication Theorem – Conditional probability – Baye’s Theorem (without proof) – Simple problems | 12 | CO3 |
| IV | Assignment and Transportation Problems | 12 | CO4 |
| V | Game Theory - Games with saddle – Dominance – Graphical Method | 12 | CO5 |

TEXT BOOKS:

1. Dr. Vittal, P.R. (2012). *Business Statistics and Operations Research*. Chennai, India: Margham Publications
2. Dr. Rajagopalan, S.P. & Dr. Sattanathan, R. *Business Statistics and Operations Research*. New Delhi, India: McGraw Hill (India) Pvt. Ltd
3. Gupta, C.B. (2004). *An Introduction to Statistical Methods*. New Delhi, India: S. Chand Publishers

REFERENCE BOOKS:

1. Dr. Gupta, S.P. & Gupta, V. (2004). *An Introduction to Statistical Methods*. New Delhi, India: S. Chand Publishing
2. Gupta, P.K. & Hira, D.S. (2012). *Introduction to Operations Research*, New Delhi, India: S. Chand Publishing

Note: Latest Edition of the reading to be used.

ASSESSMENT PATTERN

Theory Examination

CIA I & II: 50 Marks Each, Total to be converted into 25 marks

CIA I – Multiple Choice Questions

CIA II – Description type questions

FIFTH SEMESTER
SYLLABUS
OF
B.COM (ACCOUNTING & FINANCE)

SEMESTER V

Course Title: CORE XIII - BASICS OF COST ACCOUNTING

| | |
|--------------------|----------------|
| Course Code :45515 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to possess in-depth knowledge about the basic cost concepts and its objectives, apply cost control and reduction techniques in practical, determine stock levels for efficient materials management, compute labour costs, analyze the implication of overheads and their effective apportionment, prepare the cost ledger and reconcile the cost and financial statements.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|-----|--|
| CO1 | Demonstrate the basic concept of cost and how costs are presented in financial statements. (K2) |
| CO2 | Compute the cost of a product by preparing a cost sheet and quotation for a production industry. (K3) |
| CO3 | Discover the need for fixing stock levels for production and its computation. Prepare stores ledger to value of closing stock and the cost of goods sold or sent for production (K1,K3) |
| CO4 | Understand the different wage payment systems and their computation, the concept of labour cost and labour turnover and their computation. (K2) |
| CO5 | Develop knowledge regarding overheads and the concept of allocation and apportionment of overheads to various departments on a suitable basis. (K2, K3) |
| CO6 | Create cost ledger and identify the reasons for disagreement of profit and prepare the reconciliation statement (K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO2 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 3 | 1 | 3 | 2 | 2 |
| CO3 | 2 | 2 | 2 | 3 | 1 | 3 | 1 | 2 | 2 | 1 | 2 | 1 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 |
| CO5 | 2 | 2 | 3 | 3 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 1 |
| CO6 | - | 1 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 3 | 2 | 1 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|--|-------|------------|
| I | CAS-1: Meaning, nature and scope of Cost Accounting, Cost analysis, Concepts and Classifications, Differences between Cost and Management accounting, Cost and Financial accounting, Cost control and Cost reduction: Meaning, Importance and Distinction - Techniques of cost control – Cost Sheet: Purpose, Preparation of cost sheet, tender and quotation | 20 | CO1 CO2 |
| II | CAS-6: Material purchase control: Level, aspects, need and essentials of material control - Stock level determination - Maximum, Minimum, Reorder, Danger and Average - Stores control - Stores Department, EOQ, Stores records, ABC analysis, VED analysis - Material costing: Issue of materials: FIFO, LIFO, HIFO, Simple Average Method, Weighted Average Method, Market price, Base stock method and Standard Price method | 20 | CO3 |
| III | CAS-7: Labour: Essentials of a good wage system, Methods of Wage Payment: Time Rate, Piece Rate, Taylor, Halsey and Rowan - Different types of Bonus plan: Gantt's task and bonus plan, Merricks multiple piece rate system - Causes of Labour Turnover, Methods of calculating labour turnover: Separation method, Replacement and Flux method - Methods of reducing labour turnover | 20 | CO4 |

| | | | |
|-----------|---|----|-----|
| IV | CAS-3: Overheads: Meaning and Definition, Importance of overhead costs, Classification of overhead costs, Codification of overheads – Departmentalisation of overheads – Methods of apportionment of overheads: Primary and Secondary apportionment – Under-absorption and over-absorption of overheads - Machine hour rate: Meaning, Importance and Computation | 15 | CO5 |
| V | Preparation of cost ledger – Integral & Non-Integral Accounts - Reconciliation of Cost and Financial Accounts | 15 | CO6 |

TEXT BOOK:

1. Khan, M.Y. & Jain, P.K. (2017). *Cost Accounting*. New Delhi, India: McGraw Hill (India) Pvt. Ltd.
2. Maheswari, S.N. & Mittal, S.N (2021). *Cost Accounting Principles and Practice*. New Delhi, India: Shree Mahavir Book Depot
3. Lal, J. & Srivastava, S. (2020). *Cost Accounting*. New Delhi, India: McGraw Hill (India) Pvt. Ltd

REFERENCE BOOKS:

1. Reddy, T.S. & Hariprasad Reddy, Y.T. (2020). *Cost Accounting*, Chennai, India: Margham Publications
2. Jain, S.P & Narang, K. L. (2019). *Cost Accounting*. New Delhi, India: Kalyani Publications
3. Singh, M. & Chauhan, M. (2020). *Cost Accounting*. Mumbai, India: Himalaya Publishing House.
4. Dr. Gupta, S., Dr. Reeta & Dr. Rao, R.P. (2020). *Cost Accounting*. New Delhi: India: Sultan Chand & Sons

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. www.cost-accounting-info.com
2. www.introtocost.info
3. <https://fasab.gov/resources/managerial-cost-accounting-resources>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Remember | | | | |
| Understand | 5 | 5 | | |
| Apply | 5 | 5 | | |
| Analyze | 5 | | 10 | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 15 |
| Understand | 25 |
| Apply | 45 |
| Analyse | 15 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|-------------------|----------|-------------------|----------|------------------|----------|-----------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 2 | - | 1 | 1 | - | 1 | 5 |
| II | 1 | 1 | 1 | 1 | - | 1 | 5 |
| III | 1 | 1 | 1 | 1 | - | 1 | 5 |
| IV | 2 | - | - | 2 | - | 1 | 5 |
| V | 2 | - | - | 2 | - | 1 | 5 |
| Total Questions | 8 | 2 | 3 | 7 | - | 5 | 25 |

Course Title: CORE XIV- INCOME TAX LAW AND PRACTICE - I

| | |
|---------------------------|-----------------------|
| Course Code :45516 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be introduced to the basic concepts of income tax and its provisions and its application under various heads of income

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Examine the basic concepts of schedules rate of tax liability, the basic concepts of income tax, total income and different heads (K2, K4) |
| CO2 | Apply and practice the computation of salary income (K2, K5) |
| CO3 | Produce annual value of house property and computation under different circumstances. (K2, K5) |
| CO4 | Define the allowable and non allowable expenses and provisions relating to income from business profession are dealt with. (K2, K4) |
| CO5 | Define income tax authorities and their role (K1, K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 3 | 3 | 1 |
| CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 1 |
| CO3 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 1 | 3 |
| CO5 | 3 | 3 | 1 | 1 | 3 | 1 | 2 | 1 | 1 | 1 | 3 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | Definitions – Income; Person; Assessment year; Previous year; Assesses; Residential Status – of individual, HUF, Firm & Company, scope of Total Income and Incidence of Tax; Exempted Incomes – Concept of GTI and Taxable Income | 12 | CO1 |
| II | Income from Salaries - Definition - Basis of charge - Types of allowances – allowances exempt from tax, special allowances, allowances partially exempted - Perquisites when taxable & not taxable and their valuation for tax purposes - Provident Fund - Recognized Provident fund, Statutory Provident fund, PPF - Gratuity - Pension - Commuted, Uncommuted - Leave Salary - Deduction from Salary Income | 33 | CO2 |
| III | Income from House property - Basis of charge - Self-occupied Property - Annual value – Deemed to be let-out – Let-out – Treatment for Unrealized Rent and Vacancy Loss – Annual Value - Gross Annual value, Net Annual value - Deductions u/s 24 from House property Income | 20 | CO3 |
| IV | Income from business/Profession - Expenses specifically allowed and inadmissible expenses - Provision relating to Depreciation - Block of assets - Deemed Profits & Undisclosed Income - Compulsory maintenance of books of accounts - Professionals – Chartered Accountants, Doctors, Engineers, Advocates - Computation of Income | 20 | CO4 |
| V | Income Tax Authorities - Power of Assessing officers, Powers of Central Board of Direct taxes - Role and Powers of Income Tax Commissioner | 5 | CO5 |

TEXT BOOKS:

1. Dr. Singhania, V.K., *Students' Guide to Income Tax*. New Delhi. Taxman Publications
2. Dr. Mehrotra, H.C. & Dr. Goyal, S.P. *Income Tax Law & Accounts*. Agra. Sahitya Bhavan Publications.
3. Gaur, V.P. & Narang, D.B. *Income Tax Law & Practice*. New Delhi. Kalyani Publishers.
4. Reddy, T.S. & Reddy, Y.H. *Income Tax Theory, Law & Practice*, Chennai. Margham Publications.

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | | 4 | 3 | |
| Understand | | 3 | 3 | |
| Apply | 8 | 3 | 2 | |
| Analyze | 7 | | 2 | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 10 |
| Understand | 10 |
| Apply | 40 |
| Analyse | 40 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|-------------------|----------|-------------------|----------|------------------|----------|-----------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 2 | - | - | 2 | - | 1 | 5 |
| II | - | 2 | - | 2 | - | 1 | 5 |
| III | - | 2 | - | 2 | - | 1 | 5 |
| IV | - | 2 | - | 2 | - | 1 | 5 |
| V | 2 | - | 2 | - | 1 | - | 5 |
| Total Questions | 4 | 6 | 2 | 8 | 1 | 4 | 25 |

Course Title: CORE XV - PRACTICAL AUDITING

| | |
|----------------------------|-----------------------|
| Course Code : 45517 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to learn the concept of auditing, its classification, the role of auditor and his appointment procedure and remuneration and, also gain knowledge on recent developments such as operational, management and information system audit.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Understand the basic auditing principles, concepts, planning an audit and due diligence (K1, K2) |
| CO2 | Illustrate the steps required to perform internal control and internal check, vouching, verification and valuation of assets and liabilities. (K1, K2) |
| CO3 | Understand the concept of depreciation & provisions and special audit for different entities (K2) |
| CO4 | Pronounce the qualification for a company auditor and procedure for his appointment and removal. (K1, K2) |
| CO5 | Apply auditing in a computerized environment and its utility in practical business. (K3) |
| CO6 | Understand the concept of management audit and operational audit. (K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | - | 2 | 2 | 2 |
| CO2 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | - | 3 | 3 | 3 |
| CO3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | - | 2 | 1 | 1 |
| CO4 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | - | 3 | 1 | 1 |
| CO5 | 3 | 2 | 1 | 3 | 2 | 3 | 3 | 2 | - | 3 | 2 | 2 |
| CO6 | 3 | 2 | 1 | 3 | 3 | 3 | 3 | 2 | - | 3 | 2 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | Meaning and definition of auditing, Distinction between auditing and accounting, Objectives, Advantages and limitations of audit, Scope of audit, Classifications of audits – Audit planning, Meaning – Audit programme, Meaning, Objectives and Contents – Audit note book, contents, Usefulness of audit note book – Audit working papers, Meaning, Ownership and custody – Test checking and Routine checking, meaning- Internal control, meaning , definition, objectives, Technique for evaluation of internal control system – Internal check, meaning, objectives, difference between internal control, Internal check and internal audit | 18 | CO1 |
| II | Vouching, meaning and Definitions, Objectives, Trading transactions, Audit of ledger, Scrutinizing of ledgers, Vouching of cash receipts and payments, Vouching of outstanding assets and liabilities – Verification, Meaning, Objectives and process – Valuation of assets and liabilities, Distinction between verification and valuation | 22 | CO2 |
| III | Depreciation and reserves, Meaning, Auditor’s duty with regard to depreciation, Reserves and provisions, Distinguish between reserves and provision, Depreciation of wasting Assets – Special Audit: Educational Institution, Cinema Theatres, Hospitals, & Hotels | 20 | CO3 |
| IV | Appointment of auditors, Appointment of first auditor, Appointment by central government, Filling of casual vacancy, Appointment by special resolution, Re-appointment and compulsory re-appointment – Ceiling on the number of Auditorship - Removal of auditor – Remuneration – Auditor’s lien – Qualification and disqualification – Duties of the company auditor – Rights and powers of auditors – Different classes of auditors – Audit Report – Preparation and Presentation | 20 | CO4 |
| V | Information Systems Audit (ISA), Meaning, Division of auditing in ISA environment, Impact of computerization on audit approach, Online Computer System Audit – Procedure of audit under ISA system - Management audit, Introduction, scope, Objectives, Management Audit Report - Operational audit, Introduction, Scope, Objectives, Types, Review of system and procedure | 10 | CO5 CO6 |

TEXT BOOKS:

1. Pagare, D. (2016). *Principles and Practice of Auditing*. New Delhi, India: Sultan Chand Publications.
2. Saxena, R.G., (2020). *Principles and Practice of Auditing*. Mumbai, India: Himalaya Publishing House.

REFERENCE BOOKS:

1. Gupta, K. Arora, A. (2015). *Fundamentals of Auditing*. New Delhi, India: McGraw Hill (India) Pvt. Ltd
2. Jena, B.M. & Satapathy, S.K. (2019). *Principles and Practice of Auditing*. Mumbai, India: Himalaya Publishing House.
3. Institute of Chartered Accountants of India, *Auditing and Assurance Standards*. New Delhi, India: ICAI.

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. <https://www.tutorialspoint.com/auditing/>
2. <https://www.accountingnotes.net/auditing>
3. https://archive.mu.ac.in/myweb_test/study%20TYBCom%20Accountancy%20Auditing-II.pdf
4. <https://www.sscasc.in/wp-content/uploads/downloads/BCOM/Principles-Practices-of-Auditing.pdf>
5. <https://www.icsi.edu/media/webmodules/publications/FULL%20FAA%20PDF.pdf>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Remember | | 10 | | |
| Understand | 10 | | 10 | |
| Apply | | | | |
| Analyze | 5 | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills – Internship, Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 10 |
| Understand | 90 |
| Apply | |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|-------------------|-------------------|------------------|-----------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: CORE XVI: CUSTOMS AND GOODS & SERVICE TAX

| | |
|----------------------------|-----------------------|
| Course Code : 45518 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course, the student will be able to acquire knowledge on the concept of goods and service tax, its implementation and applications in the current business environment and its registration and payment procedures through the electronic ledger.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Understand the concept of Indirect Tax and Custom Laws and exemption of duties (K2) |
| CO2 | Build knowledge on concepts of GST and the implementation of GST in India (K2) |
| CO3 | Classify the Goods and services exempted from tax and understand the procedures of registration and collection of tax (K2) |
| CO4 | Develop knowledge about Input Tax credit, tax credit in special circumstances and Reverse Charge Mechanism (K2) |
| CO5 | Understand the taxability procedure on goods and services and advanced ruling and e-invoice (K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 1 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|---|--------------|------------|
| I | Introduction to indirect tax and customs Introduction, Features of indirect tax , Role of indirect taxation , Merits and demerits of indirect tax – Customs law, Basic concepts, Territorial Waters, Types of custom duties, Levy and collection of custom duties, Exemptions from duty | 15 | CO1 |
| II | Goods and Services Taxes (theory only) Genesis of GST in India, Concepts of GST, Need for GST, Benefits of GST, Framework of GST as introduced in India , Constitutional provisions, GST network. | 15 | CO2 |
| III | Place, Time, Value of supply (theory only) Concepts of supply, Classification, Goods and services, Place of supply: within state, interstate, import and export – Time of supply – Valuation, Registration GSTN, Composite and mixed, Goods exempt from tax, List of services exempt from tax | 20 | CO3 |
| IV | Input tax credit and reverse charge mechanism Eligible and ineligible input tax credit, Doctrine of Unjust Enrichment, Apportionment of credit and blocked credit, Tax credit in respect of capital goods & special circumstances, Reversal, Reverse Charge Mechanism, Caselets | 15 | CO4 |
| V | Taxation under GST (Theory only) Taxability of E-commerce, anti-profiteering, E- way bills, Payment of tax, Interest, Penalty, Interest on delayed payment of tax, Zero-rated supply, Offences and penalties, approach - Advance Ruling, Introduction, procedure, applicability of time period - E-Invoice, Introduction and overview | 25 | CO5 |

TEXT BOOK:

1. Reddy, T.S. & Murthy, A. (2019). *Business Taxation (Goods & Service Tax-GST)*. Chennai, India: Margham Publishers.
2. Datey V S. & Sachdeva, K. (2018), *Principles of GST and Customs Law*. Chennai, India: Taxmann Publications
3. Saha, R.G., Dr. Shah, D. & Dr. Usha Devi, N. (2020). *GST (Indirect Taxes)*. Mumbai, India: Himalaya Publishing House.

REFERENCE BOOK:

1. Dr. Mehrotra, H.C. & Prof. Agarwal, V.P.(2018). *Goods & Service Tax (GST)*. Agra, India: Sahitya Bhavan Publication
2. Bansal, K. M. (2021). *GST & Customs Law*. Chennai, India: Taxmann Publication.
3. Dr. Varadharaj, S. (2019) *Indirect Taxation (GST and Customs)*. Chennai: India. Sri Rudhra Learning.

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. <https://icmai.in/upload/Students/Syllabus2016/Inter/Paper-11-Jan2021.pdf>
2. <https://www.icsi.edu/media/webmodules/Reading%20Material%20Indirect%20Tax.pdf>
3. https://www.researchgate.net/publication/333448381_indirect_tax_GST_book/link/5cee5bb2a6fdcc18c8e9b70f/download

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | | 10 | | |
| Understand | 10 | | 10 | |
| Apply | | | | |
| Analyze | 5 | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 10 |
| Understand | 90 |
| Apply | |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|---------------------------|---------------------------|--------------------------|------------------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: ELECTIVE I (OPEN): INTERNATIONAL BUSINESS

| | |
|----------------------------|-----------------------|
| Course Code : 45519 | Credits : 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to gain knowledge about the international business environment, principles and theories of international trade, and assess various international business avenues, financial markets and global financial transactions.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Understand the international business environment and justify the need for globalization (K2, K5) |
| CO2 | Identify the modes of entry into international business and explore the international business opportunities (K2, K3) |
| CO3 | Describe the international trade theories, concepts and functional framework of international business organizations (K2) |
| CO4 | Develop in depth knowledge regarding export-import policies and carry out the documentation process (K2, K3) |
| CO5 | Organize the information for international finance and identify the modes of payment in international trade (K4, K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 1 | 2 | 3 | 1 | 1 | 3 | 3 | 1 | - | 2 |
| CO2 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 3 | 2 | 3 |
| CO3 | 1 | 1 | 1 | 1 | - | 1 | 1 | 1 | - | 2 | 1 | - |
| CO4 | 2 | 1 | 3 | 2 | 3 | 1 | 2 | 3 | 1 | 3 | 1 | 3 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 3 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|--|-------|-----|
| I | International Business Environment: International Business: Meaning, Nature, Concept – Micro and Macro Environment, STEEPLE/PESTLE analysis – Globalization: Meaning and implications, Drivers of Globalization, The Globalization Debate: Arguments for and against - Multinational Corporations - EPRG Model | 10 | CO1 |
| II | International Business Avenues: Differences between Domestic and International Business - Different Modes of entry into International Markets, Factors, Types: Indirect and Direct Exports, Production Abroad, Assembly/Contract Manufacturing, Licensing, Franchising, Joint Ventures, Mergers & Acquisitions, Wholly owned subsidiary. | 15 | CO2 |
| III | Introduction to International Business Theories: Theory of Mercantilism: Absolute Advantage, Comparative Advantage, Hecksher-Ohlin Theory, The New Product Life Cycle Theory, The New Trade Theory, Porter’s Diamond Model - Tariff & Non-tariff barriers International Business Organizations: GATT, WTO, TRIPS, TRIMS, GATS | 15 | CO3 |
| IV | Overview of Export & Import: India’s Export-Import (EXIM) Policy - Promotional Measures - Export-oriented-Units (EOUs) - Deemed Exports - Export-Import Documentation | 20 | CO4 |
| V | International Financial market: International Financial Markets: Equity, Debt, Foreign Exchange, Commodities, Derivatives, FDIs, FIIs - Role of Banks in Global Financial Transactions - Modes of Payment in International Trade: NOSTRO, VOSTRO, SWIFT & CHIPS | 15 | CO5 |

TEXT BOOK:

1. Cherunilam, F. (2019). *International Business Text and cases*. Mumbai, India: Himalaya Publishing House
2. Verma, S. (2021). *International Business*. New Delhi, India: Pearson India Education Services

REFERENCE BOOKS:

1. Subba Rao, P. (2019). *International Business (Text and cases)*. Mumbai, India: Himalaya Publishing House.
2. Jeevanandham, C. (2020). *Foreign Exchange and Risk Management*. New Delhi, India: S. Chand & Sons.
3. Krugman, P. R., Obstfeld, M. & Melitz, M. J. (2018). *International trade: theory and policy*. New Delhi, India: Pearson India Education Services.

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. www.fte.org
2. www.lpude.in
3. www.open.umn.edu

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| Marks (out of 40) | Descriptive 15 | Objective 10 | 10 | 5 |
| Remember | 5 | 5 | | |
| Understand | 5 | 5 | | |
| Apply | - | | | |
| Analyze | 5 | | 10 | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 15 |
| Understand | 85 |
| Apply | |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|---------------------------|---------------------------|--------------------------|------------------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

SIXTH SEMESTER
SYLLABUS
OF
B.COM (ACCOUNTING & FINANCE)

Course Title: CORE XVII: MANAGEMENT ACCOUNTING

| | |
|----------------------------|-----------------------|
| Course Code : 45620 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be introduced to the various tools and techniques of management accounting and their importance in decision-making

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Recall the importance of Management accounting and imbibe critical thinking skills to analyze financial statements. (K1) |
| CO2 | Evaluate the financial position of the business by using ratio analysis. (K5) |
| CO3 | Apply the financial statement like cash flow statement and funds flow statement in decision making process. (K3) |
| CO4 | Analyze Cost-volume-Profit techniques to determine Optimal managerial decisions like make or buy decisions, shut down or continue. (K4) |
| CO5 | Provide knowledge about budget, budgetary control and Standard costing to prepare various forms of budget for the business and to achieve a desired cost objective. (K3, K5) |
| CO6 | Enhance the knowledge to prepare various reports that are required by the companies to make the right decision. (K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 1 | 3 | 3 | 1 | 2 | 2 | 2 | 1 | 3 | 2 | 1 |
| CO2 | 1 | 1 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| CO3 | 2 | 1 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 3 | 2 | 1 |
| CO4 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| CO5 | 3 | 1 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 1 |
| CO6 | 2 | 1 | 3 | 2 | 1 | 2 | 1 | 2 | - | 3 | 2 | 1 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|---|-------|------------|
| I | Management Accounting & Ratio Analysis Management Accounting – Meaning, scope, importance and limitations. Management Accounting vs. Cost Accounting – Management Accounting vs. Financial Accounting - Analysis and Interpretation of Financial Statements – Nature, objectives, tools – Methods – Comparative Statements, Common Size statement & Trend Analysis, Ratio Analysis: Classification of ratios, Interpretation, benefits and limitations (Calculation of Ratios Only) | 17 | CO1 CO2 |
| II | Cash Flow Statement & Funds Flow Statement Cash Flow Statement as per AS 3 - Cash flow from Operating, Investing & Financing Activities. Funds Flow Statement - Changes in Working Capital, Funds from Operations, Statement of Sources and Applications of Fund. | 23 | CO3 |
| III | Marginal Costing as a Technique – Marginal Costing – BEP Analysis – Profit Planning - Contribution – Key Factor – Margin of Safety - Marginal Costing – Decision-making – Sales-Mix – Exploring New Markets – Make or Buy Decisions – Shut down or Continue. | 15 | CO4 |
| IV | Budgetary control & Standard Costing – Budgetary Control - Meaning, objectives, merits and demerits – Types of Budgets – Purchase, Production, Sales, Cash and Flexible Budgets, Zero based Budget. Standard Costing – Meaning, Concept, Utility, Limitations - Variance Analysis: Material Variances, Labour Variances, Overhead Variances. | 20 | CO5 |
| V | Management Reporting: Meaning - Objectives - Essential of a good Reporting System - Significance, Types: Segmental Reporting, Integrated Reporting - Accounting Standards for Reporting. | 15 | CO6 |

TEXT BOOK:

1. Reddy, T.S., & Reddy, Y.H., (2020) *Management Accounting*. Chennai, India: Margham Publications
2. Gupta S.K., Sharma R.K., Gupta N. (2019). *Management Accounting - Principles and Practice*. Chennai, India: Kalyani Publishers

REFERENCE BOOKS:

1. Khan, M. Y. & Jain, P. K. (2017). *Management accounting: Text, problems and cases*. New Delhi, India: McGraw Hill (India) Pvt. Ltd.
2. Jain, S.P. & Narang, K.L. (2011). *Cost & Management Accounting*. Chennai, India: Kalyani Publishers
3. Arora, M.N. (2021). *A Text Book of Cost & Management Accounting*. New Delhi, India: S. Chand Publishing

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. <https://icmai.in/upload/Students/Syllabus2016/Inter/Paper-10-April-2021.pdf>
2. <https://www.pdfdrive.com/management-accounting-books.html>

ASSESSMENT PATTERN**CIE- Continuous Internal Evaluation (40 Marks)**

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| Marks (out of 40) | Descriptive 15 | Objective 10 | 10 | 5 |
| Remember | | 10 | | |
| Understand | 5 | | | |
| Apply | 5 | | 5 | |
| Analyze | 5 | | 5 | |
| Evaluate | | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.**

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 10 |
| Understand | 10 |
| Apply | 40 |
| Analyse | 40 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|---------------------------|----------|---------------------------|----------|--------------------------|----------|------------------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 1 | 1 | 1 | 1 | - | 1 | 5 |
| II | 2 | - | - | 2 | - | 1 | 5 |
| III | 1 | 1 | - | 2 | - | 1 | 5 |
| IV | 1 | 1 | - | 2 | - | 1 | 5 |
| V | 2 | - | 2 | - | 1 | - | 5 |
| Total Questions | 7 | 3 | 3 | 7 | 1 | 4 | 25 |

Course Title: CORE XVIII: COSTING METHODS AND TECHNIQUES

| | |
|----------------------------|-----------------------|
| Course Code : 45621 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to understand the costing procedures in various industries like job, process, contract and service and gain knowledge on the emerging trends in cost management and its applications.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Understand the job costing procedures and determine the economic batch quantity (K2) |
| CO2 | Identify the operating costing procedures in various service industries and Apply the operating cost techniques (K2, K3) |
| CO3 | Analyze the various industries using a process costing and prepare process accounts (K2, K3) |
| CO4 | Understand the contract costing system and ascertain notional profits for various contracts (K3) |
| CO5 | Build knowledge regarding new costing techniques and apply those techniques for effective cost management (K2, K3) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 1 | 2 | 2 | 3 | - | 2 | 1 | 2 | 2 | 3 | 2 | 2 |
| CO2 | 2 | 3 | 3 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | 3 | 2 |
| CO3 | 1 | 2 | 2 | 3 | 1 | 3 | 2 | 2 | 1 | 2 | 1 | 2 |
| CO4 | 2 | 2 | 3 | 3 | 1 | 2 | 1 | 3 | 2 | 2 | 1 | 1 |
| CO5 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 3 | 2 | 3 | 2 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|---|--------------|------------|
| I | Job & Batch Costing Job Costing: Meaning, Definition of job, Features, Objectives, Merits & demerits – Job Costing Procedures - Batch Costing: Meaning, Determination of Economic Batch Quantity (EBQ) | 15 | CO1 |
| II | Operating Costing: Meaning, Application of operating costing method, Operating cost units – Operating costing in Transport, Power Supply, Cinema Theatre, Hospital and Lodging house. | 15 | CO2 |
| III | Process Costing: Meaning of Process costing, Characteristic features, Types of industries using process costing, Advantages of process costing, Disadvantages of process costing – Difference between process costing & job costing - Important aspects of process costing – Process Losses - Normal, Abnormal loss & gain - Process a/c's involving two or three a/c's - Scrap value (Excluding inter-process profit and equivalent production) | 20 | CO3 |
| IV | Contract costing: Characteristic features of contracts and contract costing, System of contract costing - Recording of costs of a contract – Recording of value and profit on contracts – Profit/loss on contracts - Meaning of Notional profit, Computing notional profit based on different phases of completion - Meaning of escalation clause - Need and Importance | 25 | CO4 |
| V | Emerging trends in cost accounting (Theory only): Target costing: Features, Advantages, Methodology, Methods of establishment of target costs - Activity Based Costing – Problems with traditional costing, concept and usefulness of activity based, cost allocation and stages under ABC - Life cycle: Meaning of life cycle, Characteristics of life cycle, Importance and benefits, Product life cycle costing concept | 15 | CO5 |

TEXT BOOK:

1. Khan, M.Y. & Jain, P.K. (2017). *Cost Accounting*. New Delhi, India: McGraw Hill (India) Pvt. Ltd.
2. Maheswari, S.N. & Mittal, S.N (2021). *Cost Accounting Principles and Practice*. New Delhi, India: Shree Mahavir Book Depot
3. Lal, J. & Srivastava, S. (2020). *Cost Accounting*. New Delhi, India: McGraw Hill (India) Pvt. Ltd.

REFERENCE BOOKS:

1. Reddy, T.S. & Hariprasad Reddy, Y.T. (2020). *Cost Accounting*, Chennai, India: Margham Publications
2. Jain, S.P & Narang, K. L. (2019). *Cost Accounting*. New Delhi, India: Kalyani Publications
3. Singh, M. & Chauhan, M. (2020). *Cost Accounting*. Mumbai, India: Himalaya Publishing House.
4. Dr. Gupta, S., Dr. Reeta & Dr. Rao, R.P. (2020). *Cost Accounting*. New Delhi: India: Sultan Chand & Sons

Note: Latest Edition of the reading to be used.

WEB RESOURCES

1. www.cost-accounting-info.com
2. www.introtocost.info
3. <https://fasab.gov/resources/managerial-cost-accounting-resources>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | | | | |
| Understand | 5 | 5 | | |
| Apply | 5 | 5 | 10 | |
| Analyze | 5 | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 10 |
| Understand | 15 |
| Apply | 70 |
| Analyse | 5 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|---------------------------|----------|---------------------------|----------|--------------------------|----------|------------------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | 2 | - | 1 | 1 | - | 1 | 5 |
| II | 2 | - | - | 2 | - | 1 | 5 |
| III | 1 | 1 | 1 | 1 | - | 1 | 5 |
| IV | 1 | 1 | - | 2 | - | 1 | 5 |
| V | 2 | - | 2 | - | 1 | - | 5 |
| Total Questions | 8 | 2 | 4 | 6 | 1 | 4 | 25 |

Course Title: CORE XIX: INCOME TAX LAW AND PRACTICE - II

| | |
|----------------------------|-----------------------|
| Course Code : 45622 | Credits : 4 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course the student will be able to gain competence in computing total income and tax liability and to train them to file IT returns online.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Identify short term and long term capital gains and their related deductions (K2, K5) |
| CO2 | Explain the concept of income from other sources like gift, dividend etc. and their computation (K2, K4) |
| CO3 | List the procedures for set off and carry forward of losses (K2, K3) |
| CO4 | Apply and practice the permissible deductions from gross total income as per 80 C to 80 U and computation of tax liability (K1, K2, K5) |
| CO5 | Define TDS and deductions of filing IT return (K1, K2) |
| CO6 | State the assessment procedures. (K1, K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 1 | 1 | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 3 | 2 | 2 |
| CO2 | 2 | 1 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 2 |
| CO3 | 1 | 2 | 2 | 3 | 2 | 1 | 1 | 3 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 2 | 2 |
| CO6 | 3 | 1 | 1 | 1 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 1 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|---|--------------|------------|
| I | Capital Gains - Meaning of terms Capital Assets & Transfer - Transaction not regarded as transfer – Short-term and Long term Capital Gains - Cost of acquisition - Fair market value - Cost of Improvement - Indexing - Exempted Capital Gains - 54, 54B, 54D, 54EC,54F - Computation Capital Gain | 25 | CO1 |
| II | Income from other sources - General income - Specific income - Computation of income from other sources - Grossing up – Deductions u/s 57 in computation of income from other sources | 20 | CO2 |
| III | Set off - Carry forward of losses – inter source adjustment and inter head adjustment - Clubbing of Income | 20 | CO3 |
| IV | Deductions from Gross total income u/s 80C to 80U (chapter VI A) - Assessment of individuals - Tax rates and E-Filing with practical assessment of individuals | 20 | CO4 |
| V | Assessment procedure - Self assessment - Best Judgment Assessment - Income Escaping Assessment - Advance Payment of taxes - TDS - Deductions of filing IT returns - PAN - Meaning and its uses | 5 | CO5 CO6 |

TEXT BOOK:

1. Singhanian, M. & Singhanian, V.K. (2020). *Students' Guide to Income Tax*. New Delhi, India: Taxman Publications
2. Gaur, V.P. & Narang, D.B. (2020). *Income Tax Law & Practice*. New Delhi, India: Kalyani Publishers.
3. Reddy, T.S. & Reddy, Y.H. (2020). *Income Tax Theory, Law & Practice*, Chennai, India: Margham Publications.

REFERENCE BOOK:

1. Mehrotra, H.C. & Goyal, S.P. (2020). *Income Tax Law & Accounts*. Agra, India: Sahitya Bhavan Publications.

Note: Latest Edition of the reading to be used

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | | 4 | 3 | |
| Understand | | 3 | 3 | |
| Apply | 8 | 3 | 2 | |
| Analyze | 7 | | 2 | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 10 |
| Understand | 10 |
| Apply | 40 |
| Analyse | 40 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | | | | Total Questions |
|------------------------|-------------------|----------|-------------------|----------|------------------|----------|-----------------|
| | A 10 Questions | | B 10 Questions | | C 5 Questions | | |
| | T | P | T | P | T | P | |
| I | - | 2 | - | 2 | - | 1 | 5 |
| II | - | 2 | - | 2 | - | 1 | 5 |
| III | 2 | - | - | 2 | - | 1 | 5 |
| IV | - | 2 | - | 2 | - | 1 | 5 |
| V | 2 | - | 2 | - | 1 | - | 5 |
| Total Questions | 4 | 8 | 2 | 8 | 1 | 4 | 25 |

Course Title: ELECTIVE II: (A) INVESTMENT MANAGEMENT

| | |
|--------------------------------|-----------------------|
| Course Code : 45623 (A) | Credits : 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course, the student will be able to gain knowledge about the key investment concepts, various investment alternatives, capital markets and SEBI and kindle their interest to trade in stock market securities

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Understand the differences between Investment and Speculation and list out the essentials of a good investment programme (K1, K2) |
| CO2 | Analyze the relationship between risk & return and determine the methods for minimizing risk (K2) |
| CO3 | Identify the various investment alternatives available and understand the advantages and disadvantages of these investment alternatives (K2) |
| CO4 | Improve their knowledge relating capital markets and the role of regulatory authorities in capital market (K2) |
| CO5 | Analyze the factors determining the suitability of an investment. (K1, K2) |
| CO6 | Understand the concept of mutual fund and insurance, various mutual fund and insurance schemes and its advantages and disadvantages (K1, K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|-----------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | - | 2 | 3 | 3 | 2 | 2 | 2 | 1 | 3 | 3 | 2 | 3 |
| CO2 | - | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 1 | 1 |
| CO3 | - | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 1 |
| CO4 | - | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 1 |
| CO5 | - | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 1 |
| CO6 | - | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 1 | 3 | 1 | 2 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|--|-------|------------|
| I | Introduction to Investments: Investments: Introduction, Objectives – Savings, Investments and Speculation, Gambling & investment - Features of a Good Investment Programme – Investment Process - Attributes for evaluating Investment – Risk and Return – Concept, Trade-off between Return and Risk – Relationship between Risk & Return – Risk & Return of Various Securities - Systematic & Unsystematic Risks | 20 | CO1 CO2 |
| II | Investment Environment: Types of Investments - Commodities, Real Estate and Financial Assets – Equity, Fixed Income Securities, Deposits, Mutual funds, Equity oriented mutual funds, Bonds, Insurance Investments, Derivatives, Bank deposits, Post office deposits, PPF, Tax Saving Instruments | 10 | CO3 |
| III | The Stock Markets in India: Nature and Functions of the Stock Market, OTCEI & BSE, NSE, MCX & Role of Depositories, Security Market Indices – Differences - Trading system – Dematerialization - Role of Primary Market – New Issues Market – IPO – FPO – Rights issue - Bonus Issue - Procedures for Buying and Selling Shares – Tax consideration in Investment Management – Listing of securities – Merits, Qualification, Procedure - Secondary Market - Meaning, Nature and Functions – Role of SEBI and stock exchanges in investor protection; Investor grievances and their Redressal System - Insider Trading – Recent trends in Stock Markets | 20 | CO4 |

| | | | |
|-----------|--|----|-----|
| IV | Investment Analysis: Fundamental Security Analysis – Economic analysis, Industry Analysis, Company Analysis - Technical Security Analysis – Dow Theory - Random Walk Theory – Markowitz Theory - Efficient Market Theory – Capital Asset Pricing Theory – Portfolio management – Process –Planning - Evaluation Analysis. | 20 | CO5 |
| V | Investments in Mutual Funds: Meaning, Need and advantages of investing in Mutual Funds - Concept of Net Asset Value (NAV), Types of Mutual funds: Open ended, closed ended, equity, debt, hybrid, Growth Funds, Income Funds, Balanced Funds, money market funds, Load vs. non load funds, Large-cap, Mid-cap, Small-cap funds, Index Funds, Exchange Traded Funds, Gilt Funds - Factors affecting choice of mutual funds - CRISIL Mutual Fund Ranking and its Usage Investments in Insurance Meaning – Nature, Need, Principles ,Types, Benefits of insurance – Role of insurance in economic development – Insurance sector in India - Indian insurance market - Insurance Regulatory and Development Authority of India (IRDAI) | 20 | CO6 |

TEXT BOOKS:

1. Natarajan, L. (2019). *Investment Management*. Chennai, India: Margham Publishers
2. Chandra P. (2017). *Investment Analysis and Portfolio Management*. New Delhi, India: McGraw-Hill (India) Pvt. Ltd.
3. Bhalla, V.K. (2008). *Investment Management*. New Delhi, Delhi : S Chand & Company

REFERENCE BOOKS:

1. Agarwal, O.P. (2019). *Security Analysis & Investment Management*. Mumbai, India: Himalaya Publishing House Pvt. Ltd.
2. Rustagi, R.P. (2013). *Investment Analysis & Portfolio Management*. New Delhi, India: Sultan Chand & Sons
3. Pandya, F.H. (2013). *Security Analysis & Portfolio Management*. Mumbai, India: Jaico Publishing House
4. Dr. Tripathi, V. (2020). *Fundamentals of Investments*. New Delhi, India: Taxmann Publications
5. Ranganatham, M & Madhumati, R. (2012). *Security Analysis & Portfolio Management*. Chennai, India: Pearson India Education Services
6. Bhalla, V.K. (2008). *Investment Management*. New Delhi, India: S Chand & Co.

Note: Latest Edition of the Reading to be used.

WEB RESOURCES

1. <https://www.pdfdrive.com/security-analysis-and-portfolio-management-e124443201.html>
2. <https://www.pdfdrive.com/investment-analysis-portfolio-management-e58032995.html>
3. <https://www.pdfdrive.com/security-analysis-and-portfolio-management-e33409517.html>
4. <https://www.pdfdrive.com/investment-analysis-and-portfolio-management-e158760799.html>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|--------------------------|---------------------------|-------------------------|-------------------------|-------------------|
| Marks (out of 40) | Descriptive 15 | Objective 10 | 10 | 5 |
| Remember | 5 | 5 | | |
| Understand | 5 | 5 | 5 | |
| Apply | 5 | | 5 | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.**

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 30 |
| Understand | 50 |
| Apply | 20 |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|-------------------|-------------------|------------------|-----------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: ELECTIVE II: (B) CORPORATE FINANCE

| | |
|--------------------------------|-----------------------|
| Course Code : 45623 (B) | Credits : 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course, the student will be able to gain insight into the key aspects of corporate finance, corporate governance, ethics and corporate social responsibility, restructuring methods and ways of raising finance in the international markets

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Understand the various sources of corporate finance and its importance in the corporate world. Describe the underlying principles of corporate finance (K1, K2) |
| CO2 | Determine the main constituents and the benefits of corporate governance and determine the ethical issues in finance (K2) |
| CO3 | Summarize and elaborate the importance of Corporate Social Responsibility in business and determine the provisions relating CSR under Companies Act. (K2, K4) |
| CO4 | Explain the need and importance of corporate financial planning and determine the factors affecting financial plans (K2) |
| CO5 | Outline the various methods of corporate restructuring and financial restructuring and point out their benefits and drawbacks (K1, K2) |
| CO6 | Explain the functioning of International Financial Market and gain knowledge about the various financial instruments traded in International Financial Market (K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | - | 2 | 3 | 3 | 2 | 2 | 1 | 1 | - | 2 | 1 | 3 |
| CO2 | - | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 3 |
| CO3 | - | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 3 |
| CO4 | - | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 3 |
| CO5 | - | 3 | 3 | 2 | 2 | 2 | 1 | 3 | 1 | 3 | 3 | 3 |
| CO6 | - | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 3 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|---|--------------|-------------------|
| I | Corporate Finance – Nature, Importance, Objectives of Corporate Finance - Functions of Finance Manager - Shareholder Wealth Maximization - Agency Problems - Corporate Governance: Meaning, Origin, Objectives and Benefits of Corporate governance, Fundamental Pillars of Corporate Governance - Business Ethics, Ethical issues in Finance - Corporate Social Responsibility: Concept, Significance, CSR provisions under the Companies Act 2013 - Social Audit - Ethical Investing | 20 | CO1 CO2 CO3 |
| II | Corporate Financial Planning - Meaning, Definition, Objectives, Characteristics, Scope, Factors affecting financial planning, Essentials of a sound financial plan, Importance, Need, Problems in Corporate Financial Planning - Overtrading and Undertrading: Meaning, Causes, Symptoms, Consequences and remedies - Over and Under Capitalization: Meaning, Causes, Consequences & Remedies, Comparison of over and under capitalization. | 20 | CO4 |
| III | Corporate Restructuring – Meaning, Reasons for corporate restructuring, Types of corporate restructuring: Stock swaps, Merger & its types, Shell company, Acquisitions including Cross-border Acquisitions, Joint venture, Strategic Alliance, Disinvestment, Spin-off, Demerger, Slump sale, Franchising, Takeovers, Divestiture - Anti-takeover strategies: Greenmail, Golden Parachute, White Knight, Poison Pills, Macaroni Defense, Shark repellents, People Poison Pill – Corporate failures | 20 | CO5 |
| IV | Financial Restructuring - Meaning, Reasons, Components - Stock Split: Meaning, Objectives, Advantages and Disadvantages - Debt Consolidation and Corporate Debt Restructuring (CDR): Meaning, Differences and Similarities - Cancellation of Paid-up Capital - Leveraged Buyouts: Meaning, Characteristics, Types, Advantages and Disadvantages | 10 | CO5 |
| V | International Finance - Basic concepts of International Money Market – International Currency Markets - International Credit Markets – Foreign Bonds & Eurobonds – Features - FCCBs, FRNs issued by Indian Companies, International Equities: FIIs, FDIs, ADR, GDR | 20 | CO6 |

REFERENCE BOOKS:

1. Angelo Corelli. (2018). *Analytical Corporate Finance*. Berlin, Germany: Springer International Publishing
2. Richard, A. B., Stewart, C. M., Franklin, A. & Pitabas, M. (2018). *Principles of Corporate Finance*. New Delhi, India: McGraw-Hill Education.
3. Pilbeam, Keith. (2013). *International Finance*. London, UK: Palgrave Macmillan
4. Shapiro, A.C & Hanouna, P. (2019). *Multinational Financial Management*. New Delhi, India: Wiley India Private Limited
5. Apte, P.G. (2006). *International Financial Management*, New Delhi, India: McGraw Hill (India) Pvt. Ltd.
6. Berk, J. & DeMarzo, P. (2019). *Corporate Finance*. London, UK: Pearson Education
7. Ross, S. A. (2018). *Fundamentals of Corporate Finance*. New York, USA: McGraw-Hill Education
8. Apte, P.G. (2020). *International Financial Management*. New Delhi, India: McGraw Hill (India) Pvt. Ltd

Note: Latest Edition of the Reading to be used.

WEB RESOURCES

1. <https://www.pdfdrive.com/corporate-finance-corporate-finance-theory-and-practice-e158788603.html>
2. <https://www.pdfdrive.com/corporate-finance-principles-practice-e16763353.html>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | 5 | 5 | | |
| Understand | 5 | 5 | 5 | |
| Apply | 5 | | 5 | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills** - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 30 |
| Understand | 50 |
| Apply | 20 |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|---------------------------|---------------------------|--------------------------|------------------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: ELECTIVE II: (C) CORPORATE GOVERNANCE AND ETHICS

| | |
|--------------------------------|-----------------------|
| Course Code : 45623 (C) | Credits : 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course, the student will be exposed to the main theoretical perspectives and framework of corporate governance, corporate social responsibility and the ethical, environmental and social dilemma, develop the good corporate governance skills to become a successful executive and a good leader in one's future business life, identify and manage corporate governance issues and implement and control corporate governance procedures within their organizations

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Understand the concept of business ethics and its relevance in management and business (K2) |
| CO2 | Understand the concept of corporate Governance, the disclosure practices and its connection with globalization (K2) |
| CO3 | Develop knowledge about corporate governance reforms (K2) |
| CO4 | Introduce and understand the concept of corporate social responsibility and managing ethical dilemma (K1 & K2) |
| CO5 | Explain the contemporary practices in corporate governance (K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 2 | 1 | 1 | 3 | 2 | 3 | 3 | 2 | 1 | 2 | 3 |
| CO2 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| CO3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| CO4 | 3 | 3 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 1 |
| CO5 | 2 | 2 | 1 | 1 | 2 | 1 | 3 | 1 | 2 | 1 | 1 | 1 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|---|--------------|------------|
| I | Governance And Business Ethics - Introduction – Definition - Nature of Business Ethics – Characteristics - Causes of Unethical Behaviour - Work Ethics - Code of Conduct - Ethics in Indian business - Major Ethical Issues in Business - Ethics of Market-and Price - Ethics of Environmental, Consumer and Employee Issues - Human Values & Management Education - Relevance of values for management and in management of business. | 15 | CO1 |
| II | Corporate Governance - Concept - Structure and Principles - Corporate Governance in India - Initiatives and present position - Issues and Problems in Corporate Governance - Disclosure Practices - Globalization and Corporate Governance | 12 | CO2 |
| III | Corporate Governance Reforms - Organizational Structure - Board of Directors - Composition and their Role - Powers and Responsibilities - Board Meetings - Board Committees and their functions - Independent Director. | 15 | CO3 |
| IV | Corporate Social Responsibility (CSR) - Business Perspective on Social change and human values in the area of globalization – Concept - Need and importance of CSR - CSR Principles and Strategies for organization - Best practices in CSR. Managing Ethical dilemma - Holistic Approach for Managers in decision making. | 16 | CO4 |
| V | Contemporary Practices and Emerging Perspective on Corporate Governance - Stakeholders management- Corporate management structure for corporate governance - Decision making by boards - Board Objectives and strategies- Responsibilities of board and their informational requirements - Building Responsive Boards - Issues and challenges. | 17 | CO5 |

TEXT BOOK:

1. Fernando, A.C. (2013). *Business Ethics – An Indian Perspective*. New Delhi, India: Pearson India Education Services
2. Saraf, C.U. (2018). *Corporate Social Responsibility (CSR), Corporate Governance, Sustainable Development and Corporate Ethics/Business Ethics*. Mumbai, India: Himalaya Publishing House
3. Sharma, J.P. (2016). *Corporate Governance, Business Ethics, and CSR*. New Delhi, India: Ane Books Pvt. Ltd.

4. Murthy, C. S.V. (2019). *Business Ethics & Corporate Governance*. Mumbai, India: Himalaya Publishing House

REFERENCE BOOKS:

1. Kumar, S. & Rajan, S. (2019). *Business Ethics & Values*. Mumbai, India: Himalaya Publishing House
2. Mallin, C. (2019). *Corporate Governance (Indian Edition)*, New Delhi, India: Oxford University Press.
3. Tricker, B. (2018). *Corporate Governance-Principles, Policies, and Practice*, New Delhi, India: Oxford University Press
4. Jyotsna, G.B. & Joshi, R.C. (2019). *Business Ethics & Corporate Governance*. New Delhi, India: McGraw Hill India Pvt. Ltd.

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | 5 | 5 | 5 | |
| Understand | 10 | 5 | 5 | |
| Apply | | | | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 10 |
| Understand | 70 |
| Apply | |
| Analyse | 20 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|-------------------|-------------------|------------------|-----------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: ELECTIVE III: (A) ENTREPRENEURIAL DEVELOPMENT AND START UP

| | |
|--------------------------------|-----------------------|
| Course Code : 45624 (A) | Credits : 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course, the student will be able to understand the concept of entrepreneurship, identify significant changes and trends which create business opportunities, analyze the environment for potential business opportunities and provide conceptual exposure on converting idea to an entrepreneurial firm

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Understand the basic concepts of entrepreneurship (K2) |
| CO2 | Develop a B-Plan by the evaluation of business ideas and conduct of feasibility study (K6) |
| CO3 | Understand the various institutions providing support to entrepreneurial ventures (K2) |
| CO4 | Analyze the favorable environment required to run the venture successfully and the role of the government (K3) |
| CO5 | Criticize the challenges faced by women and rural entrepreneurs (K5) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 3 |
| CO2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 1 | - | 1 | 2 | 3 |
| CO3 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | - | 2 | 3 |
| CO4 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 1 | 3 | 2 | 1 | 3 |
| CO5 | 1 | 2 | 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | - | 3 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|--------|---|-------|-----|
| I | Concept of Entrepreneurship: Entrepreneur - Meaning - Functions of an entrepreneur - Traits of an Entrepreneur - Classification of Entrepreneurs – Myths on entrepreneurs – Concept of Intrapreneur – Entrepreneur Vs Intrapreneur - Concept of entrepreneurship – Factors promoting Entrepreneurship – Factors affecting entrepreneurial growth - Reasons for promoting Entrepreneurship - Barriers to entrepreneurship - Reasons of failure | 15 | CO1 |
| II | Start Up - An Overview: Business Model - Generation of Ideas - Sources of New Ideas - Methods of Generating Ideas, Opportunity Recognition – Feasibility Study: Market, Technical/Operational, Financial, Legal & Social - Opportunity Assessment – Developing an effective Business Plan - Execution of Business Plan | 20 | CO2 |
| III | Resource Mobilization & Institutional Support: Angel investors – Crowd-funding - Venture Capital Funds – Stock Market - Institutional support to entrepreneurs – Need - DIC, SIDO, NSIC, MSMEDI, SSIC, SIDCO, SIPCOT, IIC, KVIC - Entrepreneurial Development Programs (EDP) – Objective, Need and Relevance of EDPs – Problems of EDPs | 15 | CO3 |
| IV | Managing Environments: Economic, Technological and Social Environment – Business Cycles – Industry Cycles - Role of Government in promoting entrepreneurship – Policies and Schemes for promotion of MSME in India – Incentives, subsidies & tax concessions – Supporting institutions - Failure, Causes and Preventive Measures – Turnaround Strategies. | 20 | CO4 |
| V | Development of Women Entrepreneurship & Rural Entrepreneurship: Women Entrepreneurs – Concept – Growth – Challenges in the path of women entrepreneurship – Development of women entrepreneurship – Opportunities to Women Entrepreneurs – Initiatives, policies & schemes for women entrepreneurs - Grassroot entrepreneurship through Self-Help Groups (SHGs) - Rural entrepreneurship – Need, Importance, Types – Rural Industrialization: Advantages & types – Opportunities for rural entrepreneurs – Risks and problems faced by rural entrepreneurs | 20 | CO5 |

TEXT BOOK:

1. Charantimath, P.M. (2019). *Entrepreneurship Development and Small Business Enterprises*. New Delhi: India. Pearson India Education Services
2. Desai, V. (2019). *Dynamics of Entrepreneurial Development and Management*, Mumbai: India. Himalaya Publishing House.
3. Gordon, E & Natarajan, K. (2020). *Entrepreneurship Development*. Mumbai, India: Himalaya Publishing House Pvt. Ltd.

REFERENCE BOOKS:

1. Fisher, S. & Duane, J. (2016). *The Startup Equation: A Visual Guidebook To Building Your Startup*. New Delhi, India: McGraw Hill (India) Pvt. Ltd.
2. Barringer, B.R. & Ireland, D.R. (2020). *Entrepreneurship: Successfully Launching Ventures*. New Delhi, India: Pearson Education
3. Holt, D.H. (2016). *Entrepreneurship*. New Delhi, India. Pearson Education

Note: Latest Edition of the reading to be used

WEB RESOURCES

1. <https://openstax.org/details/books/entrepreneurship>
2. <https://www.entrepreneur.com/>
3. <https://openpress.usask.ca/entrepreneurshipandinnovationtoolkit/chapter/chapter-1-introduction-to-entrepreneurship/>
4. <https://vtechworks.lib.vt.edu/bitstream/handle/10919/70961/Chapter%206%20Entrepreneurship%20-%20Starting%20a%20Business.pdf?sequence=11&isAllowed=y>
5. <https://www.investopedia.com/terms/e/entrepreneur.asp>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------|-----------|------------------|------------|
| | Descriptive | Objective | | |
| Marks (out of 40) | 15 | 10 | 10 | 5 |
| Remember | | 10 | | |
| Understand | 5 | | | |
| Apply | 10 | | | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | 10 | |

*CIA – 25 marks

**Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|------------------|-------------|
| Remember | 10 |
| Understand | 40 |
| Apply | 25 |
| Analyse | 25 |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|-------------------|-------------------|------------------|-----------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: ELECTIVE III: (B) MARKETING MANAGEMENT

| | |
|--------------------------------|-----------------------|
| Course Code : 45624 (B) | Credits : 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

On taking this course, the student will be able to understand the concepts of marketing and consumer behaviour and gain knowledge on the currently prevalent marketing environment.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|--|
| CO1 | Understand the concepts and approaches in marketing and analyze the role of marketing in economic development (K1, K4) |
| CO2 | Identify the various factors influence consumer behaviour and locate Market Information system (K2) |
| CO3 | Determine the elements of marketing mix and develop a new product plan (K4, K6) |
| CO4 | Apply different methods of pricing and create a channel of distribution (K3, K6) |
| CO5 | Recognize the E-marketing tools and evaluate the impact of social media marketing (K2, K5) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | - | 1 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 3 | 2 | 3 | - | 3 |
| CO3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 3 |
| CO4 | 2 | 2 | 3 | 2 | 1 | 3 | 1 | 3 | 2 | 1 | 2 | 2 |
| CO5 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 3 | 2 | 1 | 2 | 3 |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | Introduction to Marketing : Marketing: Definition, Nature, Scope and Features of Marketing, Importance of Marketing - Concepts and Approaches to Marketing - Product vs. Service Marketing – Market: Classification of market - Role of Marketing in Economic Development - Innovations in Marketing - Meta marketing. | 15 | CO1 |
| II | Consumer Behaviour: Definition of Consumer behavior, An overview of consumer behavior, Significance - Buying motives - Determinants of consumer behavior – Decision-making process - Market Segmentation, Bases of segmentation - Marketing Research, Process – MIS, Need for Marketing Information System. | 20 | CO2 |
| III | Product & Marketing Mix strategies: Product, Features of a product – Classification of goods – Service product - Elements of marketing mix (7P's) - Product Line – Product positioning - Product differentiation - New product Development – Product Life cycle stages and strategies - Branding - Packaging and labeling. | 20 | CO3 |
| IV | Value design -Pricing, Place & Promotional strategies: Pricing: Objectives, Factors influencing pricing decisions, Kinds of pricing, Methods of pricing - New product pricing strategy - Channels of Distribution, Importance, Levels, Channel Members – Promotion – Communication Mix – Basics of Advertising, Sales Promotion and Personal Selling. | 20 | CO4 |
| V | Development & Issues in Marketing: E-commerce: Significance of E-Commerce – e-Marketing, Tools of e- marketing, e-Tailing, Types of E-Tailers, Advantages of e-tailing - Shopping malls – Social Media Marketing, Importance of Social Media, Advantages and Disadvantages - Services Marketing - Green Marketing - Rural marketing – Direct Marketing – Consumer Protection – Consumerism in India. | 15 | CO5 |

TEXT BOOK:

1. Kotler, P (2016). *Marketing Management*. New Delhi, India: Pearson Education
2. Pillai, R.S.N. & Bagavathi. (2018). *Modern Marketing Principles*. New Delhi, India: S.Chand & Co.

REFERENCE BOOKS:

1. Sontakki, C.N. (2018). *Marketing Management*. New Delhi, India: Kalyani Publishers
2. Dr. Jayasankar, J. (2013). *Marketing*. Chennai, India: Margham Publications
3. Karunakaran. K. (2017). *Marketing Management Text and cases in Indian context.*, India: Himalaya Publishing House.
4. Sherlekar, S.A & Krishnamoorthy, R. (2018). *Marketing Management Concepts and Cases*. Mumbai, India: Himalaya Publishing House.

Note: Latest edition of the reading to be used Mumbai

WEB RESOURCES

1. www.learnmarketing.net
2. www.marketingprofs.com
3. www.marketmotive.com
4. www.markting91.com

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | 5 | 5 | | |
| Understand | 10 | 5 | | |
| Apply | | | 10 | |
| Analyze | | | | |
| Evaluate | | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.**

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 30 |
| Understand | 70 |
| Apply | |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|---------------------------|---------------------------|--------------------------|------------------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

Course Title: ELECTIVE III: (C) HUMAN RESOURCE MANAGEMENT

| | |
|--------------------------------|-----------------------|
| Course Code : 45624 (C) | Credits : 5 |
| L:T:P:S : 6:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

Learning Objectives:

This course will facilitate the student to gain knowledge on the concept of human resources and methods to make optimum use of human capital and also explore the knowledge of recent trends such as E HRM, Human Resource Audit and their contemporary issues.

Course Outcomes: At the end of the course, the student will be able to:

| | |
|------------|---|
| CO1 | Understand the basic concept of human resource management and its evolution and challenges (K1, K2) |
| CO2 | Articulate human resource planning using quantitative and qualitative dimensions (K1, K2) |
| CO3 | List the methods of training and explain its role towards human resource development (K1, K2) |
| CO4 | Explain performance appraisal methods and their link with compensation. (K1, K2) |
| CO5 | Understand the concept of employee health, safety and digital HRM (K1, K2) |
| CO6 | Explain the measures of welfare of the employees. (K1, K2) |

Mapping of Course Outcomes to Program Outcomes:

| CO/PO/PSO | PO | | | | | | | PSO | | | | |
|------------|----|---|---|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 |
| CO1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | - | 1 | 3 |
| CO2 | 3 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | 3 | - | 3 |
| CO3 | 3 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 3 |
| CO4 | 3 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 2 |
| CO5 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 |
| CO6 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | - |

| MODULE | CONTENTS OF MODULE | Hours | COs |
|---------------|--|--------------|------------|
| I | Human Resource Management - Concept and functions, Role, Status and competencies of HR manager, HR policies, Evolution of HRM, Emerging challenges of Human Resource Management - Workforce diversity, Empowerment, Downsizing, VRS, Work Life Balance | 15 | CO1 |
| II | Human Resource Planning - Quantitative and qualitative dimensions, Job analysis – Job description & job specification – Recruitment, concept & sources – Selection, concept & process - Test & interview – Placement - Induction & socialization, Retention | 15 | CO2 |
| III | Training and Development - Concept and importance, Role specific and competency-based training, Training and development methods: Apprenticeship, Understudy, Job Rotation, Vestibule Training, Case Study, Role Playing, Sensitivity Training, In-basket, Management Games, Conferences and Seminars, Coaching and Mentoring, Management Development Programs, Training Process Outsourcing | 20 | CO3 |
| IV | Performance appraisal - Nature, objectives and process, Performance management, Methods of Performance Appraisal, Potential appraisal, Employee counseling, Job changes - Transfers and promotions - Human Resource Audit – Compensation, Concept and policies, Base and supplementary compensation, Individual, group and organization incentive plans, Fringe benefits, Performance linked compensation, Employee Stock Option, Pay Band Compensation System, Job evaluation. | 20 | CO4 |
| V | Employee Health and Safety; - Employee welfare - Social Security (excluding legal provisions) - Employer-employee relations: An overview, Grievance handling and redressal - Industrial disputes, Causes and Settlement machinery - Digital HRM – Digital Workforce - Human Resource Information System and Digital HRM, Impact of HRM practices on organizational performance - HR Audit, Contemporary issues in Human Resource Management | 20 | CO5 CO6 |

TEXT BOOK:

1. Khanka, S.S. (2019). *Human Resource Management – Text and Cases*. New Delhi, India: S. Chand Publishing.
2. Durai, P. (2020). *Human Resource Management* New Delhi, India: Pearson India Education Services.
3. Dr. Jayashankar, J. (2013). *Human Resource Management*, Chennai:India, Margham Publications.

REFERENCE BOOKS

1. Rao, V.S.P. (2020). *Human Resource Management*. Chennai, India: Taxmann Publications
2. Aswathappa, K. (2017). *Human Resource Management Text and Case*. New Delhi, India: McGraw Hill (India) Pvt. Ltd
3. Gupta, S.K. & Joshi, R. (2020). *Fundamentals of Human Resource Management*. Chennai, India: Kalyani Publishers.

Note: Latest Edition of the reading to be used

WEB RESOURCES

1. https://www.researchgate.net/publication/305954894_Human_Resource_Management_Theory_and_Practice/link/57a740ce08aee07544c130bd/download
2. http://www.opentextbooks.org.hk/system/files/export/32/32088/pdf/Human_Resource_Management_32088.pdf
3. <https://brauss.in/hrm-basic-notes.pdf>

ASSESSMENT PATTERN

CIE- Continuous Internal Evaluation (40 Marks)

| Bloom's Category | CIA* | | Generic Skills** | Attendance |
|-------------------|-------------------|-----------------|------------------|------------|
| | Descriptive 15 | Objective 10 | | |
| Marks (out of 40) | | | 10 | 5 |
| Remember | | 10 | | |
| Understand | 10 | | 10 | |
| Apply | | | | |
| Analyze | 5 | | | |
| Evaluate | | | | |
| Create | | | | |

***CIA – 25 marks**

****Generic Skills - Quiz, Current Affairs, Field Visits, Projects, Seminars etc.**

ESE- End Semester Examination (100 Marks; Weightage 60%)

| Bloom's Category | Weightage % |
|-------------------------|--------------------|
| Remember | 10 |
| Understand | 90 |
| Apply | |
| Analyse | |
| Evaluate | |
| Create | |

ALLOCATION OF QUESTIONS FOR END SEMESTER EXAMINATIONS

| MODULE | SECTIONS | | | Total Questions |
|------------------------|---------------------------|---------------------------|--------------------------|------------------------|
| | A 10 Questions | B 10 Questions | C 5 Questions | |
| I | 2 | 2 | 1 | 5 |
| II | 2 | 2 | 1 | 5 |
| III | 2 | 2 | 1 | 5 |
| IV | 2 | 2 | 1 | 5 |
| V | 2 | 2 | 1 | 5 |
| Total Questions | 10 | 10 | 5 | 25 |

APPENDIX A

OUTCOME BASED EDUCATION

Outcome-based education (OBE) is an educational theory that bases each part of an educational system around goals (outcomes). By the end of the educational experience each student should have achieved the goal. There is no specified style of teaching or assessment in OBE; instead classes, opportunities, and assessments should all help students achieve the specified outcomes.

There are three educational Outcomes as defined by the National Board of Accreditation:

Program Educational Objectives: The Educational objectives of an engineering degree program are the statements that describe the expected achievements of graduate in their career and also in particular what the graduates are expected to perform and achieve during the first few years after graduation. [nbaindia.org]

Program Outcomes: What the student would demonstrate upon graduation. Graduate attributes are separately listed in Appendix C

Course Outcome: The specific outcome/s of each course/subject that is a part of the program curriculum. Each subject/course is expected to have a set of Course Outcomes

APPENDIX B - MAPPING OF OUTCOMES

COURSE OUTCOME

PROGRAM OUTCOME

PROGRAM EDUCATIONAL
OBJECTIVES

DEPARTMENTAL MISSION

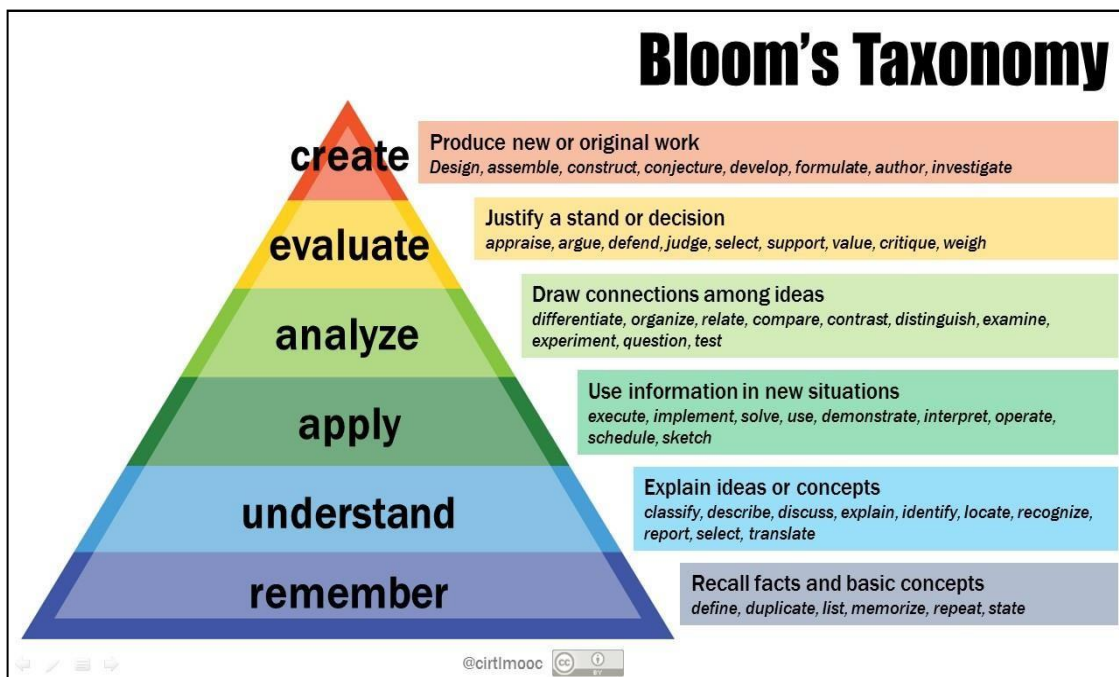
DEPARTMENTAL VISION



APPENDIX C

BLOOM'S TAXONOMY

Bloom's taxonomy is a classification system used to define and distinguish different levels of human cognition—i.e., thinking, learning, and understanding. Educators have typically used Bloom's taxonomy to inform or guide the development of assessments (tests and other evaluations of student learning), curriculum (units, lessons, projects, and other learning activities), and instructional methods such as questioning strategies. [eduglosarry.org]





**DWARAKA DOSS GOVERDHAN DOSS VAISHNAV
COLLEGE**

(Autonomous – Affiliated to the University of Madras)
GokulBagh, 833, PeriyarE.V.R. High Road, Arumbakkam,
Chennai – 600 106.

Phone: 044-23635101, 23635102 Fax: 044-23635103

e-mail: principal@dgvaishnavcollege.edu.in website:
www.dgvaishnavcollege.edu.in

**Undergraduate Programme in
Psychology**

**Curriculum and Syllabus for
B.Sc. Psychology**

(With effect from the Academic Year 2021-22)

DEPARTMENT OF PSYCHOLOGY

VISION

- To enable students to develop new perspectives about the discipline thereby contributing to the world of knowledge.
- To provide a platform for students by giving them an opportunity to have healthy discussions and deliberations in the field of Psychology.
- To inculcate a sense of responsibility, authenticity, creativity and ethical values among students.
- To contribute to the academic profile of the College and the community at large.

MISSION

To foster human values through psychological discourses, create responsible citizenry, address contemporary societal concerns thereby contributing to the psychological well-being of the community at large.

PROGRAM SPECIFIC OUTCOMES OF B.SC PSYCHOLOGY PROGRAM

- To acquire basic knowledge on various theories, principles and concepts of Psychology.
- To develop relevant skills expected of Psychology professionals in an employment context.
- To encourage the application of concepts and processes of psychology to nurture the development of qualities, capacities and skills relevant to the individual and the society.
- To discover one's strengths and weaknesses, figuring out one's self and identity, establishing social relationships and ways to organize everyday life and relationships in such a way that the level of subjective wellbeing increases.
- To acquire an attitude of scientific enquiry and critical thinking, ability to plan, design and conduct research, analyze data and interpret them.

COURSE STRUCTURE

FIRST SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext. Marks | Total |
|----------------|--|----------|---------|------------|------------|-------|
| Part-I | Language Paper – I | 4 | 3 | 50 | 50 | 100 |
| Part-II | English Paper –I | 4 | 3 | 50 | 50 | 100 |
| Part-III | Core I - General Psychology–I | 6 | 4 | 50 | 50 | 100 |
| | Core II - Biological Psychology | 6 | 4 | 50 | 50 | 100 |
| | Allied I - Introduction to Social Work | 6 | 5 | 50 | 50 | 100 |
| Part-IV | Basic Tamil/NME | 2 | 2 | 50 | 50 | 100 |
| | Soft skill – I | 2 | 3 | 50 | 50 | 100 |

SECOND SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext. Marks | Total |
|----------------|---------------------------------------|----------|---------|------------|------------|-------|
| Part-I | Language Paper – II | 4 | 3 | 50 | 50 | 100 |
| Part-II | English Paper –II | 4 | 3 | 50 | 50 | 100 |
| Part-III | Core III - General Psychology–II | 6 | 4 | 50 | 50 | 100 |
| | Core IV – Psychology of Childhood | 6 | 4 | 50 | 50 | 100 |
| | Allied II – Cross Cultural Psychology | 6 | 5 | 50 | 50 | 100 |
| Part-IV | Basic Tamil/NME | 2 | 2 | 50 | 50 | 100 |
| | Soft skill - II | 2 | 3 | 50 | 50 | 100 |

THIRD SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext. Marks | Total |
|----------------|--|----------|---|------------|------------|-------|
| Part-I | Language Paper – III | 6 | 3 | 50 | 50 | 100 |
| Part-II | English Paper –III | 6 | 3 | 50 | 50 | 100 |
| Part-III | Core V – Psychology of Adolescence and Early Adulthood | 5 | 4 | 50 | 50 | 100 |
| | Core VI- Social Psychology I | 6 | 4 | 50 | 50 | 100 |
| | Allied III - Statistics in Psychology | 5 | 5 | 50 | 50 | 100 |
| Part-IV | Environmental Studies | 1 | Examination will be held in Semester IV | | | |
| | Soft Skill III | 1 | 3 | 50 | 50 | 100 |

FOURTH SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Hrs | Ext. Marks | Total |
|----------------|---|----------|---------|----------|------------|-------|
| Part-I | Language Paper – IV | 6 | 3 | 50 | 50 | 100 |
| Part-II | English Paper –IV | 6 | 3 | 50 | 50 | 100 |
| Part-III | Core VII – Psychology of Middle age and Old age | 5 | 4 | 50 | 50 | 100 |
| | Core VIII - Social Psychology II | 6 | 4 | 50 | 50 | 100 |
| | Allied IV- Forensic Psychology | 5 | 5 | 50 | 50 | 100 |
| Part-IV | Environmental Studies | 1 | 2 | 50 | 50 | 100 |
| | Soft skill - IV | 1 | 3 | 50 | 50 | 100 |

FIFTH SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext. marks | Total |
|-----------------------|--|-----------------|----------------|-------------------|-------------------|--------------|
| Part-III | Core IX - Abnormal Psychology-I | 6 | 4 | 50 | 50 | 100 |
| | Core X - Experimental Psychology | 6 | 4 | 50 | 50 | 100 |
| | Core XI - Introduction to Research Methodology | 6 | 4 | 50 | 50 | 100 |
| | Core XII - Health Psychology | 6 | 4 | 50 | 50 | 100 |
| | Elective I –Counselling | 5 | 5 | 50 | 50 | 100 |
| Part-IV | Value Education | 1 | 2 | 50 | 50 | 100 |

SIXTH SEMESTER

| Course Content | Name of the Course | Ins. Hrs | Credits | Int. Marks | Ext. Marks | Total |
|-----------------------|-------------------------------------|-----------------|----------------|-------------------|-------------------|--------------|
| Part-III | Core XIII - Abnormal Psychology-II | 6 | 4 | 50 | 50 | 100 |
| | Core XIV - Psychological Assessment | 6 | 4 | 50 | 50 | 100 |
| | Core XV – Organizational Psychology | 6 | 4 | 50 | 50 | 100 |
| | Elective II – Case Study Project | 6 | 5 | 50 | 50 | 100 |
| | Elective III – Consumer Behaviour | 6 | 5 | 50 | 50 | 100 |
| Part-V | Extension Activities | | 1 | | | |

FIRST SEMESTER

CORE I - GENERAL PSYCHOLOGY I

COURSE OUTCOMES

- CO1 – To understand psychology and its basic concepts like methods and scope of psychology and analyze psychology in Indian perspective.
- CO2 – To summarize the fundamental processes underlying human behaviour such as sensation, perception, and attention.
- CO3 – To Relate the nature of consciousness and the underlying theoretical interpretations and describe the various stages of sleep & dreams.
- CO4 – To explain, restate, and interpret basic theories of Learning in psychology.
- CO5 – To summarize and compare the various functions and memory processes involved in memory and forgetting.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 1 | 1 |
| CO2 | 3 | 1 | 1 | 3 | 2 |
| CO3 | 2 | 2 | 1 | 3 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 2 |
| CO5 | 3 | 1 | 1 | 2 | 2 |

UNIT I: INTRODUCTION TO PSYCHOLOGY & INDIAN PSYCHOLOGY

Psychology – Definition, History, Schools, Contemporary perspectives, Methods, Scope and branches; Indian Psychology-Nature of Indian Psychology, Fundamental assumptions of Indian Psychology, Mind-body complex, Psychology: Eastern and Western Approach.

UNIT II: SENSATION, PERCEPTION AND ATTENTION

Sensation - Meaning, Psychophysics, Thresholds, Weber's Law, Adaptation; Basic sensation – Vision, Hearing, Touch and other Skin senses, Olfaction, Gustation, Proprioception: Kinesthetic sense, Vestibular sense; Perception – Meaning, Organizing principles of perception, Constancies, Pattern perception, Distance perception, Errors in Perception; Illusion – Types; Hallucinations – Types; Extra

Sensory Perception; Factors that influence perception – Depth perception; Attention - Meaning – Types – Determinants.

UNIT III: CONSCIOUSNESS

Consciousness – Definition, Natural states of consciousness, Circadian rhythms; Sleep – Stages, Sleep disorders, Dream; Altered states of Consciousness – Meaning, Hypnosis, Use of drugs, Meditation.

UNIT IV: LEARNING

Learning: Definition, Nature; Classical Conditioning – Basic Principles; Operant Conditioning – Basic Principles, Reinforcement and Types, Punishment and Types, Schedules of Reinforcement, Shaping, Learned Helplessness; Similarities and Differences between Classical Conditioning and Operant Conditioning; Social and Cognitive Learning: Latent Learning, Insight Learning, Observational Learning.

UNIT V: MEMORY AND FORGETTING

Memory – Definition; Memory process – Encoding, Storage, Retrieval; Information processing model – Sensory memory, Short Term memory, Long term; Forgetting – Meaning, Forgetting curve, Causes of forgetting, Improving memory, Memory dysfunction.

REFERENCES

1. Cicarelli, K. S., Meyer, E. G. & Misra, G. (2008). *General psychology*. New Delhi, India: Pearson India Education Services Pvt Ltd.
2. Baron, R. A. (2010). *Psychology*. New Delhi, India: Pearson India Education Services Pvt Ltd.
3. Safaya, R. (1975). *Indian Psychology*. New Delhi: MunshiramManoharlal Publishers.
4. Rao, K.R. & Paranjpe, A.C. (2016). *Psychology in the Indian tradition*: New Delhi: India: Springer Pvt. Ltd.

CORE II - BIOLOGICAL PSYCHOLOGY

COURSE OUTCOMES

- CO1 - Explain the research methods and perspectives of biopsychology and the reciprocal relationship between brain and behavior .
- CO2 – To label and explain the anatomy of the nervous system.
- CO3 – To illustrate the regulations of internal body states.
- CO4 – To describe the manifestation of biological deficits in behavior .
- CO5 – To illustrate the relationship between hormones and sexual behaviour.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 1 | 2 | 2 | 2 |
| CO2 | 3 | 1 | 1 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 1 | 1 | 2 | 2 |

UNIT I: BIOLOGICAL FOUNDATIONS OF BEHAVIOUR

Introduction – Meaning of Biological Psychology, Biological explanation of behaviour, Mind Brain relationship, Recording brain activity, Research methods.

UNIT II: BASICS OF NERVOUS SYSTEM AND NEUROTRANSMISSION

Development of nervous system, Central Nervous System, Peripheral Nervous System; Neurons – Structure, types; Brain – Structure, Divisions, Glial cells, Cerebrospinal fluid, Blood Brain barrier; Neurotransmitters – Meaning, Types, Events at synapse; Membrane Potential – Action potential and Resting potential.

UNIT III: REGULATION OF INTERNAL BODY STATES

Temperature – Homeostasis, Allostasis, Temperature regulations and Behaviour; Thirst – Maintaining water balance, Causes of thirst, Osmotic thirst and hypovolemic thirst; Hunger – Physiological mechanisms of hunger and satiety, Role of Hypothalamus.

UNIT IV: HORMONES AND SEX

Neuroendocrine system, Hormones and sexual development, Functions of hormones, Hypothalamus and sexual behaviour.

UNIT V: BRAIN DAMAGE

Causes of Brain damage, Neurodegenerative diseases, Stress and illness.

REFERENCES

1. Carlson, N.R. (2007). *Foundations of physiological psychology*. New Delhi, India: Pearson India Education Services Pvt Ltd.
2. Kalat, J.W. (2011). *Biopsychology*. Delhi, India: Cengage Learning India Private Limited.
3. Pinel, J. (2007). *Biopsychology*. New Delhi, India: Pearson India Education Services Pvt Ltd.

ALLIED I – INTRODUCTION TO SOCIAL WORK

COURSE OUTCOMES

- CO1 – To understand the values, belief and Principles of Social Work.
- CO2 – To explain the concepts related to Social Work.
- CO3 – To describe the history of Social Work.
- CO4 – To analyse the need for Social Work practice in various settings.
- CO5 – To illustrate the skills needed in the profession of Social Work.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 1 | 2 | 2 | 2 |
| CO2 | 3 | 1 | 1 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 2 | 2 | 2 | 2 |

UNIT – I: INTRODUCTION IN SOCIAL WORK

Definition, Values, Principles, Philosophy, Objectives of Social work, Misconception of Social work.

UNIT – II: CONCEPTS RELATED TO SOCIAL WORK

Social service, Social welfare, Social reform, Social movement, Social action, Social development and Empowerment, Social security.

UNIT – III: HISTORY OF SOCIAL WORK

History of Social work (USA, England), Friendly visitors-Elizabethan poor laws, work home and alms houses, charity organization, society, History of Social work (India), Social services, traditional social institutions, contribution of social reforms, Christian missionaries, Gandhi and NGO to social work.

UNIT – IV: AREAS OF SOCIAL WORK PRACTICE

Health, Mental health, Community service, Child care, Legal and correctional help, Vocational rehabilitation, Education, economic and social development, Industrial and environment.

UNIT – V: SKILLS OF SOCIAL WORK

Interviewing, Listening, Observation, Questioning, Supporting, Education, Counselling, Explaining and Informing.

References:-

1. Bhattacharya, S. (2000). *Introduction to Social work*, New Delhi: Deep & Deep publication pvt.ltd.
2. Paul, C. D. (2000). *Introduction to social work*. New Delhi: Atmaram& Sons.

SECOND SEMESTER

CORE III - GENERAL PSYCHOLOGY II

COURSE OUTCOMES

- CO1 – To state the different types of cognition and thinking processes and to understand the steps in problem solving and decision making.
- CO2 – To outline the various theories of motivation.
- CO3 – To describe the theories of emotions and stress
- CO4 – To explain the theories of intelligence and the ways to assess intelligence.
- CO5 – To explore the various theories of Personality and examine the uses of personality assessments.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 1 | 2 | 2 | 2 |
| CO2 | 3 | 1 | 2 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 2 | 2 | 2 |

UNIT I: COGNITION

Cognitive Psychology – Meaning; Types of cognition, Mental Imagery – Concept; Problem solving- Steps, Barriers to Effective problem solving, Strategies of problem solving - Algorithms, Heuristic; Decision making – Step; Reasoning – Inductive and Deductive reasoning; Language – Nature, Main Components of Language, Phonemes, Morphemes, Syntax, Semantics, Pragmatics.

UNIT II: MOTIVATION

Motivation – Definition, Types of needs; Theories of Motivation – Drive reduction theory, Social cognitive theory, Maslow’s hierarchy of needs; Conflict – Meaning, Types; Frustration – Meaning, Types.

UNIT III: EMOTION AND STRESS

Emotions – Meaning, Basic emotions, Components of emotions, Expression of emotions; Theories of emotions – James-Lange theory, Cannon-Bard theory, Schachter-Singer theory, Cognitive Appraisal theory, Facial – Feedback theory; Stress

– Definition, Four variations, Stressors, Effects, General Adaptation Syndrome, Individual differences, Coping mechanism.

UNIT IV: INTELLIGENCE AND CREATIVITY

Intelligence – Definition, Concept of Intelligence Quotient, Theories of Intelligence – Thurstone, Sternberg, Gardner; Assessment of Intelligence, Emotional Intelligence – Meaning, Characteristics; Creativity – Definition, Five step creative process, Improving creativity.

UNIT V: PERSONALITY

Personality – Definition, Theories of Personality – Psychoanalytic; Neo-Freudian – Jung, Adler, Karen Horney, Erikson; Humanism – Roger’s theory; Trait theories – Allport, The Big Five Factors; Personality tests.

REFERENCES

1. Cicarelli, K. S., Meyer, E. G. & Misra. (2008). *General psychology*. New Delhi, India: Dorling Kingsley (India) Private Limited.
2. Baron, R. A. (2010) *Psychology*. New Delhi, India: Pearson India Education Services Pvt Ltd.

CORE IV – PSYCHOLOGY OF CHILDHOOD

COURSE OUTCOMES

- CO1 – To explicate the developmental stage of conception through birth.
- CO2 – To elucidate the developmental tasks of early childhood.
- CO3 – To describe the various emotions and socialization patterns of early childhood.
- CO4 – To distinguish the hazards and happiness of late childhood
- CO5 – To critically analyze the cognitive and personality development in childhood.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 3 | 2 | 3 | 2 | 3 |

UNIT I – HUMAN DEVELOPMENT

Human development, Period of life span, Conception through Birth, Heredity and environment; Birth – Stages, Methods and settings of Child birth; Characteristics of Infancy and Babyhood.

UNIT II – EARLY CHILDHOOD

Characteristics of early childhood, Developmental tasks, Physical development, Physiological habits, Speech during early childhood.

UNIT III – EMOTIONS AND SOCIALISATION IN EARLY CHILDHOOD

Emotions – Common emotions of early childhood, Variations in emotional pattern; Socialization – Patterns of early socialization, Early forms of behaviour in social situations, Companionship in early childhood, Social and Unsocial behaviour patterns.

UNIT IV – LATE CHILDHOOD

Characteristics of late childhood, Developmental tasks, Physical development, Interests in later childhood, Sex-role typing in late childhood, Hazards of late childhood, Happiness in late childhood.

UNIT V – COGNITION AND PERSONALITY IN CHILDHOOD

Cognitive Development – Piaget’s Sensory motor stage, Piaget’s Pre-operational stage, Piaget’s stage of Concrete operations, Information Processing Approach of memory development, Psychometric and Vygotskian Approaches of Intelligence; Personality – Development of Self-concept, Freud’s Phallic stage and Latency stage, Erikson’s Initiative Vs guilt and Industry Vs inferiority.

REFERENCES

1. Hurlock, E. (1980). Developmental psychology. New Delhi, India: Tata McGraw Hill Publishing Co.
2. Santrock, J. W. (1999). Life span development, New York, NY: McGraw Hill.
3. Berndt, T.J. (1997). Child development, Madison, WI: Brown & Benchmark Publishers.
4. Papalia, D.E., & Olds, S.W. (1994). Human development, New York, NY: Tata McGraw Hill.

ALLIED II – CROSS CULTURAL PSYCHOLOGY

COURSE OUTCOMES

- CO1 - To describe and discuss the various theoretical orientations/paradigms that describe cultural differences
- CO2 - To analyse and discuss the ways in which different cultures influence human responses
- CO3 - To discuss and evaluate the differing methods used to ensure culture free evaluations of human beings
- CO4 - To identify and evaluate the different methods and issues involved with studying humans across culture.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 3 | 2 | 2 |
| CO3 | 3 | 2 | 2 | 2 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |

UNIT I: INTRODUCTION TO CULTURE AND PSYCHOLOGY

Definition of Culture, Origins of Culture, Contents of Culture, Pancultural Principles Etics&Emics.

UNIT II: SOCIALIZATION & ENCULTURATION

Definition, Bronfenbrenner model, Culture & Parenting - Parenting Goals & Beliefs, Baumrind parenting theory, Culture & Peer – Margaret Mead socialization theory, Social and cultural factors that influence math's achievement.

UNIT III: CULTURE AND DEVELOPMENTAL PROCESS –TEMPERAMENT

Three major categories of temperaments Thomas & Chess, 1977, Goodness of fit - Cross-Cultural research on Temperament; Attachment- Bowlby's (1969) evolutionary theory of

attachment, Ainsworth's *Classification* System of Attachment; Moral reasoning- Kohlberg's Theory of Morality, Criticism: Kohlberg's Theory of Morality.

UNIT IV: CULTURE, LANGUAGE AND COMMUNICATION

Structure of language, Language differences across cultures, Culture, language, and cognition – Sapir- Whorf hypothesis support and Criticisms, Bilingualism and culture, Components of communication – Non Verbal Communication, Role of culture in the communication process, Intracultural vs. intercultural communication-- Barna's obstacles in communication, Improving intercultural communication.

UNIT V: CULTURE AND GENDER

Definition of terms, Gender differences- Hofstede's Masculinity vs. Femininity, Cognitive differences, Gender stereotypes, Gender role ideology, Future research

REFERENCES

1. Matsumoto, D., & Juang, L. (2013). *Culture and Psychology* (5th Ed.). Belmont, CA: Wadsworth Cengage Learning.
2. Garstein, M.A., Gonzalez, C., Carranza, J.A., Ahadi, S.A., Ye, R., Rothbart, M.K., & Yang, S.W. (2006). Studying cross-cultural differences in the development of infant temperament: 3. People's Republic of China, the United States of America, and Spain. *Child Psychiatry Hum Dev*, 37, 145-161.

THIRD SEMESTER

CORE V – PSYCHOLOGY OF ADOLESCENCE AND EARLY ADULTHOOD

COURSE OUTCOMES

- CO1 - To describe and discuss the various physical changes and emotionality during adolescence.
- CO2 - To analyse and understand the changes in morality, sex interest and family relationships in adolescence.
- CO3 - To discuss and evaluate the personal and social hazards of early adulthood.
- CO4 - To identify and critically analyse the vocational and marital adjustments made by early adults.
- CO5 – To understand the cognitive and personality development.

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 1 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 2 | 2 | 3 | 2 | 3 |

UNIT I: ADOLESCENCE

Characteristics of adolescence, Developmental tasks, Physical changes, Emotionality during adolescence, Social changes during adolescence, Adolescent interests.

UNIT II: ADOLESCENT BEHAVIOR

Changes in morality during adolescence, Sex interest and sex behaviour during adolescence, Approved sex roles, Family relationships during adolescence.

UNIT III: EARLY ADULthood

Characteristics of early adulthood, Developmental tasks, Changes in interests, Social mobility, Sex role adjustment, Personal and social hazards.

UNIT IV: VOCATIONAL AND FAMILY ADJUSTMENTS IN EARLY ADULthood

Vocational adjustments, Marital adjustments, Adjustment to parenthood, Adjustment to singlehood, Hazards of vocational and marital adjustments.

UNIT V: COGNITION AND PERSONALITY

Cognitive Development - Piaget's Formal operational stage, Elkind's Immature characteristics of Adolescent thought, Shift to postformal thought, Schaie's Life-span model of Cognitive development, Personality - Freud's genital stage, Erikson's Identity Vs Confusion, Marcia's Identity status Crisis and Commitment, Gender differences in identity formation during adolescence, Four views of personality development during Early adulthood – Normative stage models, Timing of events model, Trait models, Typological Models.

REFERENCES

1. Hurlock, E. (1980). Developmental psychology. New Delhi, India: Tata McGraw Hill Publishing Co.
2. Santrock, J. W. (1999). Life span development, New York, NY: McGraw Hill.
3. Berndt, T.J. (1997). Child development, Madison, WI: Brown & Benchmark Publishers.
4. Papalia, D.E., & Olds, S.W. (1994). Human development, New York, NY: Tata McGraw Hill.
5. Berk, C. L. (1996). Child development, New Delhi, India: Prentice- Hall of India (Pvt) Ltd.

CORE PAPER – VI SOCIAL PSYCHOLOGY I

COURSE OUTCOMES

- CO1 - To Outline the nature, history, principles and scope of social psychology and methods used in social psychology research
- CO2 – To understand social cognition and its potential sources of error
- CO3 – To describe the strategies used to form and maintain positive impression.
- CO4 – To elucidate the ways to resist persuasion
- CO5 – To analyze the causes of marital happiness and relationship failure.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 3 | 3 |
| CO4 | 3 | 1 | 2 | 2 | 2 |
| CO5 | 2 | 2 | 3 | 3 | 3 |

UNIT I: INTRODUCTION TO SOCIAL PSYCHOLOGY

Definition of Social Psychology, History, Research method in Social Psychology, Social Psychology in new millennium.

UNIT II: SOCIAL COGNITION

Definition of social cognition; Schemas – Meaning, Impact of schemas on social cognition, Priming, Schema persistence; Heuristics – Meaning, Representativeness, Availability, Anchoring and adjustment; Potential sources of error in social cognition.

UNIT III: SOCIAL PERCEPTION

Definition of social perception; Non-verbal communication – Basic channels; Deception – Meaning. Non-verbal cues to identify deception; Attribution – Definition, Theories of attribution – Correspondent inference, Kelley’s theory of causal attribution; Basic sources of error in attribution, Impression formation, Impression management.

UNIT IV: ATTITUDES

Attitudes – Meaning, Types, Formation of attitudes – Classical conditioning, Instrumental conditioning, Observational learning; Strength of attitudes, Change in attitude – Persuasion, cognitive processes underlying persuasion, Resisting persuasion attempts, Cognitive dissonance, Dissonance and attitude change.

UNIT V: INTERPERSONAL ATTRACTION AND CLOSE RELATIONSHIPS

Meaning of interpersonal attraction, Internal determinants of attraction, External determinants of attraction; Romantic relationships and falling in love – Romance, Selecting a potential mate, Love, Jealousy, Marital happiness, Causes of relationship failure.

REFERENCES

1. Myers, D.G. & Twenge, J.M. (2017): *Social psychology*. New York, NY: McGraw – Hill Education.
2. Branscombe, N.R., Baron, R.A. & Kapur, P. (2017). *Social psychology*. Chennai, India: Pearson India Education Services Pvt. Limited.
3. Myers, D.G. (2002). *Social psychology*. New York, NY: McGraw Hill Book Company.
4. Baron, A., & Byrne, D. (2002). *Social psychology*. New Delhi, India: Prentice-Hall of India.
5. Baron, A., Branscombe, N., Byrne, D., & Bhardwaj, G. (2009). *Social psychology*. New Delhi, India: Dorling Kindersley (India) Private Limited .

ALLIED III - STATISTICS IN PSYCHOLOGY

COURSE OUTCOMES

- CO1 –To interpret and classify a great deal of information.
- CO2 – To describe the information in the form of visual representation
- CO3 --To infer different elements of a sample or population.
- CO4 -- To summarize what already exists in a given population
- CO5 -- To compute, predict and prepare the results of a study

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 3 | 2 | 3 |

UNIT I: INTRODUCTION TO STATISTICS

Meaning and importance of statistics, use of statistics in psychology; Basic terminologies: population, sample, sampling, variables, continuous and discontinuous variables, distinction between artificial and naturally dichotomous variables, primary and secondary data; descriptive and inferential statistics; scales of measurement; construction of frequency distribution table.

UNIT II: MEASURES OF CENTRAL TENDENCY

Meaning and Measures of central tendency: mean, median, mode, uses, advantages and disadvantages; computation for grouped and ungrouped data.

UNIT - III: MEASURES OF VARIABILITY

Meaning and importance of Measures of variability, Methods of finding variability- range, quartile deviation, average deviation, standard deviation; computation from grouped and ungrouped data and uses.

UNIT IV: CORRELATION

Linear correlation- meaning and types of correlation - positive, negative, zero correlation, strength of correlation, correlation coefficient, computation of correlation- pearson product moment correlation and Spearman's rank order correlation. Overview of other methods of correlation- partial correlation, multiple correlation, biserial correlation, point biserial correlation, tetrachoric correlation, Phi Coefficient.

UNIT V: NORMAL DISTRIBUTION AND SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS

Normal curve, characteristics of a normal curve, skewness and kurtosis; Need and importance, standard error, testing hypothesis, level of significance, two tailed and one tailed tests of significance, type i and type ii error, determining the significance of difference between the two mean of independent samples.

REFERENCES

1. Howell, D. (2012). *Statistical method for psychology*. Delhi, India: Cengage Learning.
2. Agresti, A., & Finlay, B. (2013). *Statistical methods for the social sciences*. Hoboken, NJ: Pearson Education
3. Aron, A., Aron, E. N., & Coups, E. J. (2006). *Statistics for psychology*. New Delhi, India: Pearson India Education Services Pvt Ltd.
4. Heiman, G. (2013). *Basic statistics for the behavioral sciences*. Belmont, CA: Cengage Learning.
5. Bear, G., King, B.M., & Minium, E. W. (2008). *Statistical reasoning in psychology and education*. Bengaluru, India: Wiley India Private Limited.
6. Gupta, S.P. (1999). *Statistical methods..* New Delhi, India: Sultan Chand & Sons
7. Garrett, H. E. (2006): *Statistics in psychology and education*. New Delhi, India: Paragon International Publishers.

FOURTH SEMESTER
CORE VII – PSYCHOLOGY OF MIDDLE AGE AND OLD AGE

COURSE OUTCOMES

- CO1 - To describe and discuss the various developmental tasks of middle age.
- CO2 - To analyse and understand the vocational and family adjustments made by middle aged people.
- CO3 - To discuss and evaluate the personal and social hazards of old age.
- CO4 - To identify the changes to be made in the living arrangements of elderly
- CO5 – To understand memory decline in old age.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 3 | 2 | 3 |
| CO4 | 2 | 2 | 2 | 3 | 2 |
| CO5 | 2 | 1 | 2 | 3 | 2 |

UNIT I: MIDDLE AGE

Characteristics of middle age, Developmental tasks, Adjustment to Physical changes, Adjustment to mental changes, Adjustment to changed interests, Social adjustments, Personal and social hazards of middle age.

UNIT II: VOCATIONAL AND FAMILY ADJUSTMENT IN MIDDLE AGE

Vocational adjustments, Adjustment to changed family pattern, Adjustment to single hood, Adjustment to loss of spouse, Adjustment to approaching retirement, Adjustment to approaching old age, Vocational and marital hazards of middle age.

UNIT III: OLD AGE

Characteristics of old age, Developmental tasks, Adjustment to physical changes in old age, changes in motor abilities, Changes in mental abilities, Changes in interests, Hazards of personal and social adjustments.

UNIT IV: VOCATIONAL AND FAMILY ADJUSTMENT IN OLD AGE

Vocational adjustments, Adjustment to retirement, Adjustment to changes in family life, Adjustment to loss of a spouse, Adjustment to singlehood, Living arrangements for the elderly, Vocational and family life hazards.

UNIT V: COGNITION AND PERSONALITY

Cognitive Development – Measuring cognitive abilities in middle age, The distinctiveness of adult cognition, Creativity in middle age, Intelligence and Processing abilities in old age, Measuring older adult's intelligence, Competence in everyday tasks and problem solving in old age; Memory changes in old age, Improving memory in older adults; Personality – Erikson's Generativity Vs stagnation and Integrity Vs Despair, The self at midlife, Models of coping in old age.

REFERENCES

1. Hurlock, E. (1980). Developmental psychology. New Delhi, India: Tata McGraw Hill Publishing Co.
2. Santrock, J. W. (1999). Life span development, New York, NY: McGraw Hill.
3. Berndt, T.J. (1997). Child development, Madison, WI: Brown & Benchmark Publishers.
4. Papalia, D.E., & Olds, S.W. (1994). Human development, New York, NY: Tata McGraw Hill.
5. Berk, C. L. (1996). Child development, New Delhi, India: Prentice- Hall of India (Pvt) Ltd.

CORE-VIII: SOCIAL PSYCHOLOGY II

COURSE OUTCOMES

- CO1 - To outline the nature and causes of social influence.
- CO2 – To understand the internal and external influences on helping behaviour.
- CO3 – To describe the strategies that can be used to prevent or control human aggression.
- CO4 – To elucidate group dynamics.
- CO5 – To analyze the role of social psychology in various settings like legal system , Health and work.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 3 | 2 | 2 |
| CO3 | 3 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 1 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 3 | 2 | 3 |

UNIT I: SOCIAL INFLUENCE

Conformity – Meaning, Asch’s research on conformity, Sheriff’s research on autokinetic phenomenon, Factors affecting conformity, Resisting pressures to conform; Compliance - Meaning, Six basic principles of compliance, Symbolic social influence; Obedience – Meaning, Milgram’s experiment on obedience.

UNIT II: PROSOCIAL BEHAVIOUR

Meaning, Motives for pro-social behaviour, Competitive altruism, Five crucial steps to determine helping Vs not helping, External and internal influences on helping behaviour, Empathy, Personality and Helping.

UNIT III: AGGRESSION

Perspectives on aggression – Evolutionary perspective, Drive theories; Modern theories of aggression – Social learning perspective and General Aggression Model; Causes of human aggression – social, cultural, personal and situational; Prevention and control of aggression.

UNIT IV: GROUPS AND INDIVIDUALS

Groups – Meaning, Types, Key components, Stages of group formation, Benefits of joining a group, Social facilitation, Social loafing, hooliganism, deindividuation; Conflict: Nature, Causes and Effects; Techniques to resolve conflicts, Perceived fairness in groups – Basic rules for judging fairness, Reactions to perceived unfairness; Decision making by groups, Downside to group decision making.

UNIT V: APPLICATION OF SOCIAL PSYCHOLOGY

Social Psychology and legal system, Social Psychology and Health, Social Psychology and the world of work.

REFERENCES

1. Myers, D.G., & Twenge, J.M. (2017). *Social psychology*. New York, NY: McGraw – Hill Education.
2. Branscombe, N.R., Baron, R.A. & Kapur, P. (2017). *Social psychology*. Chennai, India: Pearson India Education Services Private Limited.
3. Myers, D. G. (2002). *Social Psychology*. New York, NY: McGraw Hill Book Company.
4. Baron, A., & Byrne, D. (2002). *Social Psychology*. New Delhi, India: Prentice-Hall of India.
5. Baron, A., Branscombe, N., Byrne, D., & Bhardwaj, G. (2009). *Social Psychology*. New Delhi, India: Dorling Kindersley (India) Private Ltd.

ALLIED IV – FORENSIC PSYCHOLOGY

COURSE OUTCOMES

- CO1 –To demonstrate understanding of the major concepts, theoretical perspectives, and empirical findings historical and current trends in forensic psychology.
- CO2 –To summarize the techniques of criminal investigation.
- CO3 –To critically analyse the development of habitual criminal behaviour.
- CO4 –To understand the treatment and management of sexual offenders.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 2 |

UNIT I – INTRODUCTION AND OVERVIEW

Forensic Psychology; Police Psychology; Legal Psychology; Correctional Psychology.

UNIT II – POLICE PSYCHOLOGY

The History and Application of Police Psychology; Critical Incident Stress Management / Psychological Services; Interview and Interrogation.

UNIT III – TECHNIQUES OF CRIMINAL INVESTIGATION

Criminal Profiling and Forensic Psychology; The Need to Develop Criminal Profiles; Definitions and Approaches to Criminal Profiling; Procedures used in Criminal Profiling; Psychological Autopsies; Hypnosis in Criminal Investigations; The Polygraph Technique; Research Evaluation; The Role of the Forensic Psychologist.

UNIT IV – CRIMINAL PSYCHOLOGY – JUVENILE DELINQUENCY

Development of Habitual Criminal Behaviour; Juvenile Offender; School Violence; Criminal Psychopath.

UNIT V – CRIMINAL PSYCHOLOGY – SEXUAL OFFENDERS

Definition of sexual offenders; Assessment of Sexual Offenders; Treatment and Management of Sexual Offenders; Special Groups of Sexual Offenders; Sexual Offender Legislation and legal aspects.

References

1. Bartol, C. R., & Bartol, A. H. (2004). *Introduction to Forensic Psychology*. (6th ed.). Sage Publications
2. Thomas, D. J. (2011). *Police Psychology – A New Specialty and New Challenges for Men and Women in Blue*. Praeger: California
3. Fulero, S. M. & Wrightsman, L. S. (2009). *Forensic Psychology*. (3rd ed.). Wadsworth Cengage Learning: USA
4. Huss, M. T. (2014). *Forensic Psychology – Research, Clinical Practice and Applications*. (2nd ed.). Wiley: USA

FIFTH SEMESTER
CORE IX – ABNORMAL PSYCHOLOGY I

COURSE OUTCOMES

- CO1 - To distinguish between normal & abnormal behavior and outline the historic view of abnormal psychology.
- CO2 – To understand the classification and diagnosis of abnormal behaviour.
- CO3 –To outline the common intellectual disability syndromes.
- CO4 – To elucidate various somatoform and Dissociative disorders
- CO5 – To analyze the causes and treatment of addiction.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 1 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 3 | 2 | 3 |

UNIT I: INTRODUCTION TO ABNORMAL PSYCHOLOGY

Mental health, psychological abnormality, deviance, dis function, historical views of abnormal behaviour, differences between psychosis and neurosis, clinical assessment and methods - mental status examination, clinical interviews, questionnaires, projective tests in clinical practice.

UNIT II: PARADIGMS IN PSYCHOPATHOLOGY.

Psychoanalytic paradigm, Physiological paradigm, Cognitive paradigm, Humanistic paradigm, classification and diagnosis: DSM 5 and ICD 10 classification, issues in classification of abnormal behaviour.

UNIT III: INTELLECTUAL DISABILITY

Definition, classification, prevalence, interpersonal deficits and behavior problems, common intellectual disability syndromes - hypothyroidism, Fragile X syndrome, Down's, William's, PKU.

UNIT IV: SOMATOFORM AND DISSOCIATIVE DISORDERS

Somatoform disorders- Hypochondriasis, Pain disorder, Conversion disorder and Body dysmorphic disorder

Dissociative disorders- Depersonalization disorder, Dissociation amnesia and fugue, Dissociative identity disorder, Biological, Psychosocial and socio cultural causal factors of somatoform and dissociative disorders, Treatment and outcomes.

UNIT V: ADDICTION DISORDERS

Alcohol abuse and dependence, Drug abuse and drug dependence, Treatment and outcome.

REFERENCES

1. Butcher, J.N., Hooley, J. M., Mineka, S., Dwivedi, C.B. (2017). *Abnormal psychology*. New Delhi, India: Pearson India Education Services Private Limited.
2. Barlow, D. (2017). *Abnormal psychology and casebook in abnormal psychology*. Belmont, CA: Wadsworth.
3. Comer, R. (2018). *Fundamentals of abnormal psychology*. New York, NY: Worth Publishers.
4. Davison, G.C., Neale, J.M & Kring, A. M. (2004). *Abnormal psychology*. Marblehead, MA: John Wiley & Sons Inc.
5. Alloy, L. B., Riskind, J. H., & Manos, M.J. (2005). *Abnormal psychology*. New Delhi, India: Tata McGraw Hill pubg Co
6. Cutting, J. (1997). *Principles of psychopathology*. New York, NY: Oxford University Press

CORE X –EXPERIMENTAL PSYCHOLOGY (Practical)

COURSE OUTCOMES

- CO1- Demonstrate the effect of distraction, division and span of attention
- CO2- Explain the factors involved in errors of perception
- CO3- Demonstrate the concepts of transfer of learning, trial and error learning, insight learning and learning through the knowledge of results
- CO4 - Relate to one’s own level of aspiration and achievement motivation
- CO5 - Illustrate the use of the motor-skills in manual and tweezers dexterity
- CO 6- Demonstrate assessment of IQ levels.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 3 | 2 | 3 |
| CO6 | 3 | 3 | 2 | 2 | 3 |

LIST OF EXPERIMENTS

I.ATTENTION

1. Distraction of Attention
2. Division of Attention

II. PERCEPTION

3. Span of Attention
4. Muller Lyre Illusion
5. Progressive Weights

III.LEARNING

6. Habit Interference
7. Knowledge of Results

8. Insight and Trial & Error Learning

9. Maze Learning

10. Mirror Drawing

IV. INTELLIGENCE

11. Bhatia's Battery

12. MISC (Malines intelligence scale for Indian children)

V. MOTIVATION

13. Level of Aspiration

VI. PSYCHO – MOTOR

14. Finger dexterity test

VII. THINKING

15. Concept Achievement (formation- CAT)

16. Problem Solving(PSAT-D)

Marks = 100 Internal = 25 (Record-15, Assignment-5, Test-5)

External = 75 (Viva-20, Record-5, Conduction-15, Plan and

Procedure-10, Results and Tabulation-10, Discussion-10, Conclusions 5)

References: -

1. Wood Worth and Scholerberg. (2018). Experimental psychology. New Delhi: Oxford & IBH publishing Co.
2. Anastasi, A and Urbina, S. (2002). Psychological testing. New Delhi: Pearson Education.
3. Cohen, R, J and Swerdlik, M, E. (2010). Psychological testing and Assessment: An Introduction to Tests and Measurement. Boston: McGraw-Hill Higher Education.
4. Harris, P. (2002). Designing and Reporting Experiments in Psychology. Buckingham: Open University Press.
5. Myers, Anne. Hansen, Christine. (2011) Experimental Psychology. Wadsworth Publishing. 7. Francis, G. and Neath, I. (2015). Introduction to Psychology, Cengage Learning.

CORE-XI: INTRODUCTION TO RESEARCH METHODOLOGY

COURSE OUTCOME

- CO1 – To explain the needs, objectives , importance , problem and process of research based on review of literature
- CO2 – To identifying research problems and formulating hypothesis
- CO3 – To distinguish between the different types of sampling
- CO4 – To examine the methods used in data collection
- CO5 – To demonstrate an understanding of writing a research report

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 3 | 2 | 3 |

UNIT I: INTRODUCTION RESEARCH METHODOLOGY

Definition, Need and Importance of psychological Research, Objectives of Research, Types of Research, The Research Process, Principles of a Good Research, Problems encountered by researches in India.

UNIT II: RESEARCH PROBLEM, HYPOTHESIS AND REVIEW OF LITERATURE

Research Problem-Meaning and characteristics of a problem, ways in which a problem is manifested, Types of Problems, Hypothesis- Meaning and characteristics of a good hypothesis, Types, Sources and Functions of Hypotheses, Reviewing the Literature- Purpose of Review, Sources of Review.

UNIT III: SAMPLING

Meaning and Need for sampling, Fundamentals of sampling, Factors influencing decision to sample, Types of Sampling - Probability and Non probability, Probability Sampling - Simple random, stratified random and area cluster sampling; Non probability sampling - Quota, Accidental, Judgmental or purposive, systematic and snowball sampling

UNIT IV: METHODS OF DATA COLLECTION

Primary data- Questionnaire and schedule, Interview, Observation as a tool of Data Collection, Difference between Participant observation and non-participant observation, Rating Scale, Secondary data - Sources.

UNIT V: WRITING A RESEARCH REPORT

Meaning, General purpose of writing a research report-of a research report, Styles of writing a research report, Types of research reports, Precautions in writing research report and Written presentation of mini survey research report.

REFERENCES

1. McBurney, D.H. (2007). *Research methods*; New Delhi, India: Thomson Wadsworth
2. Singh, A.K. (2012). *Tests, measurements and research methods in behavioral sciences*. Patna, India: B.B. Printers.
3. Zechmeister, J. S., Zechmeister, E. B., & Shaughnessy, J. J. (2001). *Essentials of research methods in psychology*. New Delhi, India: Tata McGraw-Hill Education Private Limited.
4. Haslam, A.S., & McGarty, C. (2003). *Research methods and statistics in psychology*. New Delhi, India: Sage Publications.
5. Ramadass, P., & Aruni, W. A. (2009): *Research and writing across the disciplines*; Chennai, India: MJP Publishers.

CORE XII – HEALTH PSYCHOLOGY

COURSE OUTCOME

- CO1 - To Outline the definition and scope of Health Psychology
- CO2 - To explain the various models of health behavior
- CO3 - To identify types of pain, symptoms and suitable intervention
- CO4 - To summarize theories of stress, sources of stress and coping
- CO5 - To explain health promoting strategies

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 2 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 3 | 2 |
| CO5 | 2 | 2 | 3 | 2 | 3 |

UNIT I: INTRODUCTION TO HEALTH PSYCHOLOGY- HEALTH BEHAVIOUR

Health psychology- Definition and Need, The biopsychosocial model, Patient Practitioner relationship, Training for a career in health psychology, Introduction to health behaviour- Factors influencing the practice of health behaviour.

UNITII: MODELS OF HEALTH BEHAVIOUR

Changing health habits using theoretical models - Health belief model, Theory of planned behaviour, Cognitive behavioural approaches to change health behaviour, Trans theoretical model of behaviour change, Avenues for health habit modification.

UNIT III: CHRONIC ILLNESS AND PAIN

Illness Factors, Onset, Progression, Types of Symptoms, Quality of Life, Personal issues in chronic illness, coping with chronic illness, Co management of chronic illness, Psychosocial Interventions, Pain: definition, types of pain, Pain control techniques, Pain management

UNIT IV: STRESS AND COPING

Stress - definition, dimensions of stress- sources of chronic stress, Theoretical contributions - Lazarus's Appraisal Model, Flight or fight response, General adaptation Syndrome, Tending and Befriending Model, Coping with stress- Sources of stress.

UNIT V: PROMOTING HEALTH BEHAVIOUR

Smoking - Effects of smoking, reasons for smoking, Alcoholism - effects, reasons, Interventions for reducing smoking , changing problem drinking, Management of Overweight & obesity- effects of dieting & physical activity.

REFERENCES

1. Boyer, B., & Paharia, I. (2008). *Comprehensive handbook of clinical health psychology*. Edison, NJ: John Wiley & Sons.
2. Sarafino, E. (1994). *Health psychology*. Edison, NJ: John Wiley & Sons.
3. Taylor, S. (1995). *Health psychology* (6th ed.). Toronto, Canada: McGraw-Hill Ryerson.
4. Marks, D., Murray, M., Evans, B., Willig, C., Woodall, C., & Sykes, C.M. (2008). *Health psychology: Theory, research and practice* (2nd ed.). New Delhi, India: Sage Publications.
5. Branmon, L., & Frist, J. (2010). *Introduction to health psychology*; New Delhi, India: Cengage Learning India Pvt Ltd.

ELECTIVE I –COUNSELLING PSYCHOLOGY

COURSE OUTCOME

- CO1 – To identify the need and importance of counselling in the current context.
- CO2 – To explain the various approaches in counselling and the types, uses & diagnosis in counselling process.
- CO3 – To summarize the interpretation of psychological tests in counselling.
- CO4 – To articulate the qualities of an effective counsellor.
- CO5 – To identify the various specialties in counselling.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 2 |
| CO5 | 2 | 2 | 2 | 2 | 3 |

UNIT I: NATURE AND SCOPE OF COUNSELLING

Counselling– Meaning, Nature, Need and Functions of Counselling, Emergence of Counselling in India, Goals and Scope of Counselling, Types of Counselling Services.

UNIT II: APPROACHES TO COUNSELLING AND THE COUNSELLING PROCESS

Directive and non-directive approaches, Humanistic approach, Behavioristic approach, Existential Approach, Eclectic Approach, Counselling Process - Preparation for counselling, Steps in the counselling process.

UNIT III: PSYCHOLOGICAL TESTING AND DIAGNOSIS

Use of psychological tests in counselling, Types of psychological tests, Nature of a good psychological test, Test interpretation in counselling, Limitations of psychological tests, Diagnosis and its limitations.

UNIT IV: COUNSELLOR QUALITIES, SKILLS AND ETHICAL RESPONSIBILITIES

Qualities of an effective counsellor, Counsellor skills- Building Trust, Listening, Attending, Observing, Building Rapport, Demonstrating Empathy, Ethics in counselling.

UNIT V: AN OVERVIEW OF SPECIALITIES IN COUNSELLING

Family group consultation, Counselling Families Concerning Children, Counselling with Parents, Counselling the Delinquent, Marriage Counselling, Premarital Counselling, Counselling the differently abled, Career Counselling, Adolescent Counselling, Counselling people affected by pandemic and epidemic, Role of Counsellor in fostering Good Mental Health.

REFERENCES

1. Rao, N. (2013). *Counselling and Guidance*. Chennai, India: Tata McGraw Hill.
2. Gladding, S.T. (2017). *Counselling: A comprehensive profession*. Chennai, India: Pearson.
3. Gibson, R. L., & Mitchell, M. H. (2007). *Introduction to counselling and guidance*. Upper Saddle River, NJ: Prentice Hall.
4. Nayak, A. K. (2007): *Guidance and counseling*. New Delhi, India: APH Publishing.
5. Barki, B. G., & Mukhopadhyay, B. (2008): *Guidance and counselling manual*. New Delhi, India: Sterling.
6. Kochhar, S. K. (1984). *Guidance and counselling in colleges and universities*. New Delhi, India: Sterling.

SIXTH SEMESTER

CORE XIII – ABNORMAL PSYCHOLOGY II

COURSE OUTCOME

- CO1 – To explain the causes of unipolar and bipolar disorder and treatment
- CO2 – To summarize types, causes and treatment of Personality disorder
- CO3 – To understand the contemporary interventions used to treat Attention Deficit Hyperactive Disorder.
- CO4 – To detail the symptoms, causes and treatment of anxiety disorders.
- CO5 – To be able to identify schizophrenic behaviour.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 1 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 3 | 2 |
| CO5 | 2 | 3 | 3 | 2 | 3 |

UNIT 1: ANXIETY DISORDERS

Anxiety, phobia, Generalized anxiety disorder- clinical picture, causes and treatment, specific phobia, social phobia, panic disorder, agoraphobia, obsessive compulsive disorder- clinical picture, causes and treatment, post traumatic stress disorder - symptoms, causes and treatment.

UNIT -2 MOOD DISORDERS

Mania, Depression, Major Depressive disorder, Dysthymia, Cyclothymia, Bipolar I and Bipolar II disorders, causes and treatment.

UNIT 3: SCHIZOPHRENIA

Schizophrenia, clinical picture, positive and negative symptoms - hallucinations, delusions, disorganised behaviour, disorganised speech, catatonia; subtypes of schizophrenia, other

psychotic disorders- Schizoaffectedisorder, Schezophreniform disorder, Delusional disorder, Brief psychotic disorder, Shared psychotic disorder.

UNIT 4: PERSONALITY DISORDERS

Personality, personality disorder, Cluster A, Cluster B and Cluster C disorders, causes and treatment.

UNIT :5CHILDHOOD DISORDERS

Attention Deficit Hyperactive Disorder - clinical picture, Causes, management, treatment, contemporary interventions, Learning Disorders -Dyslexia, Dysgraphia, Dyscalculia - clinical picture, management, contemporary interventions.

REFERENCES

1. Butcher, J.N., Hooley, J.M., Mineka, S., & Dwivedi, C.B. (2017). *Abnormal psychology*. New Delhi, India: Pearson Publication.
2. Barlow, D. (2017). *Abnormal psychology and casebook in abnormal psychology*. Belmont, CA: Wadsworth.
3. Comer, R. (2018). *Fundamentals of abnormal psychology*. New York, NY: Worth Publishers.
4. Davison, G.C., Neale, J.M., & Kring, A. M. (2004). *Abnormal psychology*. Malden, MA: John Wiley & Sons Inc.
5. Alloy, L.B., Riskind, J.H., & Manos, M.J. (2005). *Abnormal psychology*. New Delhi, India: Tata McGraw Hill publishing Co.
6. Cutting, J. (1997) *Principles of Psychopathology*. New York, NY: Oxford University Press.

CORE XIV –PSYCHOLOGICAL ASSESSMENT

COURSE OUTCOMES

- CO1 - Assess Personality, Motivation, Emotion interpret the results
- CO2 - Measure and interpret achievement test, stress and coping levels
- CO3 - Select appropriate test to measure attitude, behavior & creativity and discuss the result.

Mapping of CO v/s PSO:

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 2 | 3 | 2 | 2 |

CONCEPTS AND LIST OF PAPER PENCIL TESTS (Any 10)

1. Personality

Eysenck Personality Inventory (EPQ-R)

Self-concept Questionnaire (SCQ-S)

IPIP

NEO -PI

2. Work Determinants

Job motivation Scale

Organizational Climate Inventory

Job Satisfaction Scale

3. Emotion

Emotional Maturity Scale

Self-esteem Scale

Social Maturity Scale

Strait & Trait Anxiety Scale(STAT)

4. Attitudes and behavior

Superstitious attitude scale

Rajamanikams religious attitude scale

5. Achievement

Career Maturity Scale

6. Stress and coping

Mental health well- being

Stress management scale.

Marks = 100 Internal = 25 (Record-15, Assignment-5, Test-5)

External = 75 (Viva-20, Record-5, Conduction-15, Plan and

Procedure-10, Results and Tabulation-10, Discussion-10, Conclusions 5)

REFERENCES

1. Rajamanickam, (2005). Experimental Psychology with advanced experiments. (Vol.1). New Delhi: Concept Publishing Company.
2. Rajamanickam, (2005). Experimental Psychology with advanced experiments. (Vol.2). New Delhi: Concept Publishing Company.
3. Sharma, R.N. & Sharma, R. (2003). Experimental Psychology. New Delhi: Atlantic Publishers & Distributors.
4. Anastasi, A. & Urbina, S. (2017). Psychological Testing, Noida: Pearson.
5. Mook, D. (2004). Classic experiments in Psychology. Westport: Greenwood Press.
6. Gregory, R. J. (2004). Psychological Testing – History, Principles, and Applications, Delhi: Pearson Education.

CORE XV - ORGANISATIONAL PSYCHOLOGY

COURSE OUTCOMES

- CO1 – To review various I/O Psychological theories/paradigms.
- CO2 –To discuss how Psychological theories/paradigms may be applied to understanding human behaviors at work.
- CO3 - To perform job analysis using various concepts of I/O Psychology.
- CO4 – To design and evaluating training programs.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 3 | 3 | 3 |

UNIT I: Introduction to Organisational Psychology – Definition, Scope of Organizational psychology, History of I/O Psychology – Pre – During- post WWI and WWII, Hawthorne Studies, Changes in workplace since 1980, Today Organisational Psychology

UNIT II: Job Analysis Definition, Methods and Techniques- Job Description, Job Specification, Job Evaluation, Performance Criteria, Uses of Job Analysis. Methods – Observation, Participation, Existing data, Interviews, Surveys and Job Diaries. Techniques- Job Element Methods, Critical Incidents Technique (CIT), Position Analysis Questionnaire (PAQ).

UNIT III: Employee Recruitment, Assessment, & Selection– Recruitment- Internet recruitment, Employee Referrals, Job Fairs, Newspaper ads,**Screening**– written materials, References & letters of recommendation, **Types of Assessments** – Cognitive Ability, Mechanical Ability, Motor & Sensor Ability, Physical Ability, Job Skills and Knowledge, Personality and Integrity tests, **Selection, Placement, EEO** – Importance and process.

UNIT IV: Employee Attitudes, Motivation & Performance Designing and Evaluating Training -Motivation theories, Relationship between motivation and performance, Employee Engagement, Job satisfaction, Commitment, Absenteeism, Turnover, OCB, Positive Affect,

Areas of employee training, Fundamental issues in employee training, A model for successful training programs.

UNIT V: Leadership - Definition and Theories - Trait Theories, Behavioral Theories, Contingency Theories (Fielder), LMX Theory, Transformational Leaders, Organisational Climate, Application of the theories.

REFERENCE

1. Schultz, D. and Schultz, S.E. (2004). Psychology and Work Today. Delhi: Pearson Inc.
2. Mc Cormick, E.J. and Ilgen, D.R. (1984). Industrial psychology. New Delhi: Prentice Hall of India.
3. Robbins, S.P. (2005). Organizational Behavior. 11th Edition. New Delhi: Prentice Hall of India Pvt. Ltd.

ELECTIVE II – CASE STUDY PROJECT

Students must submit 3 Case study Reports (compulsory) from three different areas mentioned below:

Health and Organizational Psychology, Physical, Mental Health, Deviant Behaviour, Adjustment Problems, Special Children, Neurological Disorders, Educational Institutions, Retail Outlets, Service Industries, NGO.

Marks = 100 Internal = 25 External = 75 (Viva = 25 Report = 50)

ELECTIVE III – CONSUMER BEHAVIOUR

COURSE OUTCOMES

- CO1 - To demonstrate how knowledge of consumer behavior can be applied to marketing.
- CO2 – To identify and explain factors which influence consumer behavior, Relate internal dynamics such as personality and motivation.
- CO3 - To relate internal dynamics such as perception, learning and attitude to the choices consumers make.
- CO4- To cite how consumer decisions are affected by their behavior.
- CO5- To explain consumer behavior for the purpose of helping a firm or organization to achieve its objectives.

Mapping of CO v/s PSO

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|------|------|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 3 | 3 | 3 |
| CO5 | 3 | 2 | 2 | 2 | 3 |

UNIT I: INTRODUCTION TO CONSUMER BEHAVIOR.

Consumer Behavior – Definition, Consumer and Customers, Buyers and Users, Organizations as Buyers, Development of Marketing Concept, Consumer Behavior and its Applications in Marketing.

UNIT II: CONSUMER MOTIVATION, PERSONALITY.

Introduction, Needs and Goals, motivational Conflict, Defense Mechanisms, Motivational Theories, Maslow’s hierarchy of needs,

Consumer Personality: Introduction, Self-concept, personality Theories, emotions.

UNIT III: CONSUMER PERCEPTION, CONSUMER ATTITUDES

Consumer Perception - Introduction, Sensation (Exposure to Stimuli), Perceptual Selection, Perceptual Organization, Factors that Distort Individual Perception, Price Perceptions, Perceived Product and Service Quality, Consumer Risk Perceptions.

Consumer Attitudes - Introduction, Functions of Attitude, Attitude Models, Factors that Inhibit Relationship between Beliefs, Feelings and Behavior, Learning Attitudes, Changing Attitudes, Attitude Change Strategies.

UNIT IV: CONSUMER DECISION-MAKING PROCESS

Problem Recognition, Information Search and Evaluation of Alternatives: Introduction, Problem Recognition, Information Search, Evaluation of Alternatives.

UNIT V: ORGANIZATIONAL BUYING BEHAVIOR

Introduction, Organizational Buyer Characteristics, Purchase and Demand Patterns, Factors Influencing Organizational Buyer Behavior, organizational Buyer Decision Process, Organizational Buying Roles.

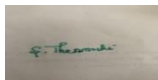
REFERENCE

1. Kotler, Philip (2001). Marketing Management. Millenium edition. New Delhi: Prentice Hall of India.
2. Schiffman, L.G. and Kanuk, L.L (1999). Consumer Behavior. 12th edition. New Delhi: Prentice Hall of India Pvt Ltd.

Place : DGVC, Arumbakkam , Chennai.

Date : 08-07-2021

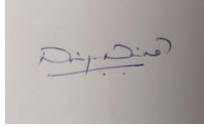
Signatures:



Prof. Dr. S. Thenmozhi
University Nominee



Dr. Ragitha Radhakrishnan
Subject Expert



Dr.DivyaDovina
Subject Expert

Dr. Sangeetha Makesh
Industry Expert

Ms.Sreelakshmi
Alumnus

Dr.M.S.Priyadarshini
Chairperson

Ms.R.Aswini
Senior Faculty

UNIVERSITY OF MADRAS

Faculty of Commerce

BACHELOR OF COMMERCE DEGREE COURSE IN FINANCE AND TAXATION CHOICE BASED CREDIT SYSTEM (CBCS) WITH GRADING SEMESTER SYSTEM WITH CREDITS

Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Shift - II

B.Com. (Finance & Taxation)
(Effective from the Academic year 2019-20)

REGULATIONS

1. ELIGIBILITY FOR ADMISSION

Candidates for admission to the first year of the B.Com. (Finance & Taxation) programme shall be required to have passed the higher secondary examinations under Commerce stream with commerce and accountancy (Academic or Vocational Stream) conducted by the Government of Tamil Nadu or an examination accepted as equivalent thereof by the Syndicate of the University of Madras.

B.Com (Finance & Taxation) **FIRST SEMESTER**

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|--|--------------------------------|---------|-------------------|----------------------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – I | Language Courses | 4 + 2* | 3 | 3 | 40 | 60 |
| 2 | Part – II | English | 4 | 3 | 3 | 40 | 60 |
| 3 | Part – III | Core I - Business Accounting | 5 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core II Business Economics | 5 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Allied I Information Technology (Practical) | Lecture – 2 Hrs Lab – 4 Hrs | 4 | 3 | Record –40 Practical 60 | |
| 6 | Part – IV | Non Major Elective / *Basic Tamil / Advanced Tamil | 2 | 2 | 3 | 40 | 60 |
| 7 | Part – IV | Skill Based Subject Soft Skills – I | 2 | 3 | 3 | 50 | 50 |
| | Total | | 30 | 23 | | | |

SECOND SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|--|------------------|--|---------------------|---|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – I | Language Courses | 4 + 2* | 3 | 3 | 40 | 60 |
| 2 | Part – II | English | 4 | 3 | 3 | 40 | 60 |
| 3 | Part – III | Core III Financial Accounting | 5 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core IV Principles of Management | 5 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Allied II Ethics & Corporate Governance | 6 | 5 | 3 | 40 | 60 |
| 6 | Part – IV | Non Major Elective / *Basic Tamil / Advanced Tamil | 2 | 2 | 3 | 40 | 60 |
| 7 | Part – IV | Skill Based Subject Soft Skills – II | 2 | 3 | 3 | 50 | 50 |
| | Total | | 30 | 24 | | | |
| Non Major Electives (Semester I) – Any one | | | | Non Major Electives (Semester II) – Any one | | | |
| 1. Analytical & Logical Reasoning 2. Basics of Retail Marketing 3. An Overview of ISO 4. Basics of Health Care Management | | | | 1. Emotional Intelligence 2. Basics of Business Insurance 3. Fundamentals of Disaster Management 4. Concept of Self Help Group | | | |

THIRD SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|---|---------------------|---------|--------------------------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – III | Core V Corporate Accounting | 6 | 4 | 3 | 40 | 60 |
| 2 | Part – III | Core VI Audit & Assurance | 5 | 4 | 3 | 40 | 60 |
| 3 | Part – III | Core VII Corporate & Business Laws | 5 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core VIII Cost Accounting | 5 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Allied III Business Mathematics | 6 | 5 | 3 | 40 | 60 |
| 6 | Part – IV | Skill Based Subject Soft Skills – III | 2 | 3 | 3 | 50 | 50 |
| 7 | Part – IV | Enviromental Studies | 1 | | Examination will held in Semester IV | | |
| | Total | | 30 | 24 | | | |

FOURTH SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|---|---------------------|---------|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – III | Core IX Financial Reporting | 5 | 4 | 3 | 40 | 60 |
| 2 | Part – III | Core X International Marketing | 5 | 4 | 3 | 40 | 60 |
| 3 | Part – III | Core XI Management Accounting - I | 5 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core XII International Taxation & Technology | 6 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Allied IV Operations Research | 6 | 5 | 3 | 40 | 60 |
| 6 | Part – III | Internship (2 Weeks) | - | 1 | | | |
| 7 | Part – IV | Skill Based Subject Soft Skills – IV | 2 | 3 | 3 | 50 | 50 |
| 8 | Part – IV | Environmental Studies | 1 | 2 | 3 | 40 | 60 |
| | Total | | 30 | 27 | | | |

FIFTH SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|--|---------------------|---------|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – III | Core XIII Corporate Finance | 5 | 4 | 3 | 40 | 60 |
| 2 | Part – III | Core XIV Information Management | 5 | 4 | 3 | 40 | 60 |
| 3 | Part – III | Core XV Income Tax – Law & Practice | 6 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core XVI Financial Management | 6 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Open Elective I 1. Financial Services 2. International Financial Reporting Standards (IFRS) | 6 | 5 | 3 | 40 | 60 |
| 8 | Part – IV | Value Education | 2 | 2 | 3 | 40 | 60 |
| | Total | | 30 | 23 | | | |

SIXTH SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|---|---------------------|---------|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – III | Core XVII Insurance & Risk Management | 6 | 4 | 3 | 40 | 60 |
| 2 | Part – III | Core XVIII Banking Law & Operations | 6 | 4 | 3 | 40 | 60 |
| 3 | Part – III | Core XIX Goods & Services Tax [GST] & Customs Law | 6 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Elective II 1. Project Management 2. Indian Accounting Standards | 6 | 5 | 3 | 40 | 60 |
| 5 | Part – III | Elective III – Project Work & VIVA VOCE | 6 | 5 | 3 | 20 | 80 |
| 8 | Part – V | Extension Activity | | 1 | | | |
| | Total | | 30 | 23 | | | |

| | | |
|----------------------|-------------------------------------|---------------|
| Semester | I | |
| Subject | CORE I – BUSINESS ACCOUNTING | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit-I

Accounting - Meaning and scope of accounting - Financial Statements, meaning – purposes of financial statements for the users – main elements of financial reports – **conceptual framework* – definitions of asset, liability, equity, income & expenses. **Qualitative characteristics of financial statements** - Concepts of relevance, faithful presentation, materiality, substance over form, going concern, business entity, accruals, consistency, comparability, verifiability, understandability and timeliness.

Unit-II

Main data sources for accounting – different business documents such as sales order, purchase order, goods received note, quotation, goods despatched note, invoice, credit & debit notes, receipt, remittance advice, cash vouchers – understand the double entry accounting & duality concept – types of transactions such as sales, purchases, payments & receipts. **Accounting Process** - Recording into journals – ledger accounts – balancing of ledger accounts – **accounting for discounts*, sales tax – recording cash transactions – errors & rectification – bank reconciliation statements.

Unit-III

Preparations of Final Accounts – Statements of profit or loss and other comprehensive income - balance sheet – events after reporting period. [**Adjustments** – Closing Stock (accounting & valuation of inventories), Outstanding and Prepaid items (accruals & prepayments, receivables & payables), Depreciation, Provision for Bad Debts, Discount on Debtors (provisions & contingencies), Interest on Capital and Drawings, Loss of Stock by Fire].

Unit-IV

Tangible & Non-Tangible Assets – depreciation & amortization accounting – Meaning, Causes, Types – Straight-Line Method (SLM) – Written down Value method (WDV) – Sinking Fund Method.

Unit-V

Financial Statement Analysis - ** uses of Interpretation of financial statements*- Common size financial statements - Common base year financial statements - Financial Ratios - Liquidity, Leverage, Activity & Resource , Profitability, Market ratios.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 6 | 6 | 12 | 10 | 2 | 20 |
| Section – B | 2 | 5 | 7 | 5 | 7 | 35 |
| Section – C | 1 | 4 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books:

1. P.C. Tulsian – Financial Accounting – TATA Mc Graw Hill Publishers
2. Jain & Narang, Advanced Accounting, Kalyani Publishers
3. Paul D. Kimmel, Jerry J. Weygandt, Donald E. Kieso, Financial Accounting: Tools for Business Decision Making, Wiley
4. Frank Wood, Business Accounting, Pearson Edition
5. Jill Collis, Andrew Holt, Business Accounting, TATA Mc Graw Hill
6. Manikandan S, Rakesh Shankar R, Financial Accounting, Scitech Publications

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|-------------------------------------|---------------|
| Semester | I | |
| Subject | CORE II – BUSINESS ECONOMICS | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit- I:

Introduction to Economics – Wealth, Welfare, Scarcity and Growth Views on Economics – ***Positive and Normative Economics – Scope and Importance of Managerial Economics-** Economic approach, Circular flow of activity, Nature of the firm, Forms of organizations, Objectives of firms.

Concepts: Production possibility frontiers – Opportunity Cost – Accounting Profit and Economic Profit – Incremental and Marginal Concepts.

Unit-II:

Demand Function – Meaning of Demand – Determinants and Distinctions of demand – Law of Demand – Slope & Elasticity of Demand –Shifts in the demand curve vs. movement along the demand curve - ***Demand Forecasting**.

Supply Function – Meaning of Supply – Determinants of Supply – Law of Supply – Slope & Elasticity of Supply – shifts in the supply curve Vs. movement along the supply curve - Concept of Equilibrium.

Unit-III:

Consumer Behaviour - Indifference Curve – Definition, Properties and equilibrium - Law of Diminishing Marginal utility – Equi-marginal utility – Consumer surplus and producer surplus

Production Function - Factors of Production: Law of Variable proportion – Laws of Returns to Scale –Costs of production -total cost, fixed cost, variable cost, average cost, marginal cost, short run and long run costs- Producer’s equilibrium – Economies of scale - Break Even Analysis.

Unit-IV:

Product pricing: price and output determination under perfect competition - profit maximization, monopoly- price discrimination, monopolistic competition, oligopoly- collusion and cartels- ***pricing objectives and methods**.

Unit-V:

Introduction to National Income Accounts – Models of National Income Determination – Economic Indicators; Technology and Employment – ***Issues and Challenges**.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference books:

1. P.L. Mehta, Managerial Economics- analysis, problems and cases – Sultan Chand Publishers, New Delhi.
2. C.M Chaundhary, business economics- RBSA Publishers, Jaipur
3. H.L. AHUJA, business economics, Sultan Chand Publishers, New Delhi
4. Maddala, G.S., and E. Miller. Microeconomics: Theory and Applications. McGraw- Hill International Ed.
5. Gupta G S, Managerial Economics- TATA Mc Graw Hill International

Note: Latest edition of the books to be referred.

| | |
|----------------------|--|
| Semester | I |
| Subject | ALLIED I – INFORMATION TECHNOLOGY |
| Maximum Marks | CIA- 40 Marks ESE-100 Marks |
| Exam Duration | 3 Hours (Practical Examination) |

Unit-I : WORD PROCESSING

Application of word processing - Menus & Tool Bars - Word processor – Creating – Entering - Saving & printing the document - Editing & Formatting Text - Mail Merge and Macros

Unit-II: SPREADSHEET

Application of work sheet/spread sheet - Menus & Tool bars - Creating a worksheet - Entering and editing of numbers - Cell reference - Worksheet to analyze data with graphs & Charts. Advanced tools: Functions – Formulae – Formatting numbers - Macros – Sorting - Filtering - Validation & Consolidation of Data - PivotTable Reports & PivotChart Reports - Importing/Exporting data - Multi-Dimensional Analysis of data - Dashboard Reporting using MS - Excel

Unit-III: POWERPOINT PRESENTATION

Application of Power Point Presentation – Menus & Tool bars – Creating presentations – Adding - Editing and deleting slides - Templates and manually – Slide show – Saving - Opening and closing a Presentation –Types of slides - Slide Views - Formatting – Insertion of Objects and Charts in slides - Custom Animation and Transition

Unit-IV: MS ACCESS

Introduction to MS - Access - Working with Table and Forms - Working with Queries and Reports.

Unit-V: ACCOUNTING PACKAGE

Introduction to Tally. ERP 9 - Voucher Entry in Tally. ERP 9 - Generating Reports In Tally. ERP 9 - Financial Analysis Tools In Tally.ERP 9 - E-filing Process in Tally ERP9.

Record - 40 Marks Practical - 60 Marks

Reference books:

1. Alexis Leon & Mathews Leon, Fundamentals of Information Technology, S Chand Publishing
2. V Rajaraman, Introduction to Information Technology, PHI Learning House
3. S K Bansal, Fundamentals of Information Technology, SCS Publications
4. Guide to Tally, Tally Publications, Bengaluru

Evaluation Process

1. Record shall be evaluated jointly by Internal & External Examiners
2. Practical Examination shall be conducted by External Examiner, duly co-ordinated by Internal Examiner.

| | | |
|----------------------|--|---------------|
| Semester | I | |
| Subject | NON MAJOR ELECTIVE I – ANALYTICAL AND LOGICAL REASONING | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Analogy – Classification - Number Series- series completion

Unit – II:

Statement and assumptions – Statement and conclusion

Unit – III:

Verbal reasoning – Coding and Decoding (with alpha numeric characters)- Reasoning - Blood Relationship

Unit – IV:

Direction Sense Test – Data Interpretation from bar chart, pie chart.

Unit – V:

Logical Venn Diagrams – Image Series – Alphabet Test

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. A.K. Gupta, Logical and Analytical Reasoning – Ramesh publishing house – 2016
2. R.S.Agarwal , A Modern Approach to verbal and non-verbal reasoning , S.Chand and Company Pvt. Ltd

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | I | |
| Subject | NON MAJOR ELECTIVE I – BASICS OF RETAIL MARKETING | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Retailing – Definition – Retail Marketing – Growth of organized retailing in India – Importance of retailing

Unit – II:

Functions of Retailing – characteristics of Retailing – Types of Retailing – store retailing – Non-store retailing

Unit – III:

Retail location factors – Branding in retailing – private labeling – Franchising concept.

Unit – IV:

Communication tools used in Retailing – Sales promotion, e-tailing- window display.

Unit – V:

Supply chain management – definition – importance – Role of information Technology in retailing.

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. A.K Modern Retail Management – J.N.Jain & P.P.Singh Regal Publications , New delhi
2. Retail Management – Suja Nair, Himalaya Publishing house.

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | I | |
| Subject | NON MAJOR ELECTIVE I – AN OVERVIEW OF ISO | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

An Introduction to ISO 9000, 9001,9002,9003. The Quality systems to be certified- Meaning of ISO- Benefits of ISO 9001- Certification- General Scheme of ISO 9001.

Unit – II:

QMS (Quality Management Systems). Meaning- Principles of ISO 9001-2000-Preparing a specimen QMS – future of ISO? – QMS Documentation- QMS Process & Measurement.

Unit – III:

ISO 9001-2000 Requirements- Explanation of main clauses – Time Line and cost Implication of Implementing.

Unit – IV:

ISO 9001-2000 and QIS- Comparison of ISO 901 and the capability Maturity Model for software. Certification bodies operating Multinationals.

Unit – V:

ISO and how to hire an ISO 9000 Consultant- What is Internal Quality Auditing.

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. Guide to ISO 9001-2000. A.K.Chakraborty P.K.Basu S.C.Chakravarthy, Asian Books Pvt. Ltd.

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | I | |
| Subject | NON MAJOR ELECTIVE I – BASICS OF HEALTH CARE MANAGEMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Personal Hygiene – Personal Diet pattern – Self health maintenance by yoga and other spiritual practice – Drills

Unit – II:

Family hygiene – group health care by vaccination – prophylaxis and prevention – Sanitation and diet patterns.

Unit – III:

Mass – Hygiene (Social Hygiene) – Environmental Hygiene - Communal health care centres – Hospitals – Statistical bodies - Government and Non government organizations (NGO) for propagation of nutritious diet patterns - maintained by voluntary health organizations and government schemes.

Unit – IV:

Health awareness programme organized by governmental and non governmental agencies. Communal amenity programme.

Unit – V:

First Aid – Disaster management techniques like epidemic eruption control, management and eradication.

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. Social and preventive Medicine, K. Park, Brimnot publishers

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | II | |
| Subject | CORE III - FINANCIAL ACCOUNTING | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit-I

Hire Purchase System – Introduction – Accounting procedure for high value goods – Default and Repossession – Hire purchase trading account – Installment purchase system – Accounting treatment.

Unit-II

Branch Accounting – Debtors system, Stock and debtors system, Independent branch (Foreign Branches excluded) – Branch final accounts system and whole sale basis system.

Departmental accounts – inter-departmental transfers.

Unit-III

Consignment Accounts – Meaning – Features of consignment business – distinction between sale and consignment – accounting treatment in the books of consignor and consignee – Valuation of Inventories – Normal Loss – computation of different types of commission – account sales

Joint Venture Accounts - Meaning – Features of joint venture transactions – distinction between joint venture and partnership – methods of maintaining joint venture accounts.

Unit-IV

Partnership Accounts – Admission, Retirement and Death of Partner(s) – Computation of Revised profit sharing ratios - Accounting for Goodwill – Treatment of Reserves – Revaluation of Assets and Liabilities – Preparation of Balance Sheet of Reconstituted firm.

Unit-V

Dissolution of Partnership – Insolvency of a partner – Garner Vs Murray – Insolvency of one or more partners – Insolvency of all partners - piecemeal Distribution – Proportionate Capital Method and Maximum Loss method.

* *Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 6 | 6 | 12 | 10 | 2 | 20 |
| Section – B | 2 | 5 | 7 | 5 | 7 | 35 |
| Section – C | 1 | 4 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books:

1. R.L.Gupta & V.K.Gupta – Financial Accounting – Sultan Chand Publishers, New Delhi
2. Jain & Narang - Financial Accounting – Kalyani Publishers
3. P.C. Tulsian – Financial Accounting – TATA Mc Graw Hill Publishers
4. Shukla & Grewal – Advanced Accountancy -Vol .I – S. Chand & Co.
5. Manikandan S, Rakesh Shankar R, Financial Accounting, Scitech Publications
6. T. S. Reddy & A. Murthy - Financial Accounting – Margham Publications

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | II | |
| Subject | CORE IV – PRINCIPLES OF MANAGEMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

UNIT I:

Management - definition, importance, functions; **Nature-as profession, science and art, universality of management*; **Levels of management - strategic, middle management & operational levels* - managerial tasks and skills Classical School- contributions of Taylor, Henry Fayol and Elton Mayo, Different schools of management thought – Approaches in Management - Behavioural, Scientific, Systems, and Contingency, Management thoughts in Indian Philosophy – An Overview.

UNIT II:

Planning - concept, importance, types, steps, premises, **Barriers to effective planning* and remedial measures. MBO - Strategic Planning-concept.

Forecasting-concept – techniques.

Decision making – Meaning, Advantages and Disadvantages, process, problems in Decision making.

UNIT III:

Organising - concept, importance, principles, different organization models - Line & Staff, Functional, Product, Matrix, Geographical, Virtual, Formal & Informal Organizations, Networks - Types of Network Organizations/Clusters Organizational Designs for Change and Innovation

**Departmentation – need, basis, principles* - Delegation of Authority - elements – steps – barriers- Centralisation and Decentralization of Authority - Span of Management –concept - types and factors.[Role of different functions within an organisation such as R & D, sales, marketing, production, purchase, administration, finance & accounting, support services, and human resources – relationship between accounting and other business functions]

UNIT IV:

Motivation: concept, importance, contributions of McGregor, Maslow, and Herzberg.

Leadership: concept, importance, types, leadership traits - different types of leadership styles – Approaches to leadership referring to theories of Adair, Fiedler, Bennis, Kotter & Heifetz, Ashridge, Blake & Mouton – managing teams.

Co-ordination: concept, significance, principles, and techniques

Control: concept and steps, Control Techniques.

UNIT V:

Latest trends in Management- Concept of Knowledge management, technology management, Employee energy management, Process & change management- project quality standards – six sigma, CMM, CMMI, PCMM, Impact of IT quality management systems, learning organizations.

* *Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. Gupta.C.B, Business Management, Sultan Chand Publishers, New Delhi
2. Koontz Harold and Heinz Weihrich , Essentials of Management , TATA Mc Graw Hill
3. Prasad L.M., Principles & Practice of management, Sultan Chand Publishers
4. Stoner.A.F and freeman.R.E., Management, Prentice Hall of India
5. Chhabra, T.N. Principles and Practice of Management. Dhanpat Rai & Co.,

Note: Latest edition of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | II | |
| Subject | ALLIED II – ETHICS & CORPORATE GOVERNANCE | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

Concept of ethics – sources – ethics and morals – justice – fairness – values – relevance of business ethics – arguments for and against – business values for 21st century – ethics in Indian business – **Ethics in Indian Epics (Mahabharatham, Arthasasthram) – an Overview.*

Unit II: (# - Unit for Compulsory Question)

Ethical management – strengthening of personal and organizational integrity – complexity and group dynamic – spiritual core of leadership – leaders and the value reference – **corporate scams and its effects* – law as an instrument of ethics.

Unit III:

Corporate social responsibility – meaning – promoting – stakeholders’ satisfaction – corporate responsiveness – managing socially responsible business – environment responsibility – ethics and ecology – **advertisement and information disclosure*- ethics at work place and professionalism.

Unit IV:

Corporate Governance – meaning, scope – transparency – disclosures share holders’ welfare vs. stakeholders approach – Board of Directors – Role, duties, responsibilities – Independent Directors – Executive and compensation – Disclosure requirements – **Director’s Responsibility Statement.*

Unit V: (# - Unit for Compulsory Question)

SEBI and corporate governance – Clause 49 A of SEBI listing agreement – Committees under Listing agreement – Governance committees – Audit committees – **Shareholders grievances committee – Investor protection – shareholders information* – Disclosure requirements – Role of Accountants and Auditors – accountability – professional Code & values.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference books:

1. Corporate Governance and business Ethics by All India Management Association – Excell Books
2. Riya Rupani, Business Ethics & Corporate Governance, Himalaya Publishing House
3. Subhash Chandra Das, Corporate Governance in India, PHI Publishing House
4. William H. Shaw, Business Ethics – Thomson Publications
5. N. Balasubramanyan, Corporate boards and Governance – Sterling publishers
6. Reference on corporate governance and directors duties and responsibilities – publication of Institute of Company secretaries of India
7. Neville Bain & David Band “winning ways through corporate governance” – Macmillan publishers

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | II | |
| Subject | NON MAJOR ELECTIVE II – EMOTIONAL INTELLIGENCE | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Introduction -Emotional Intelligence –Meaning, Benefits, **Importance of emotions* - Self-awareness and Competencies Psychological Needs. Emotional Quotient vs. Intelligence Quotient.

Unit – II:

Personality Analysis -Distinct Personality Type-Hand writing Analysis, Colour preference, listening, Profile, Self Esteem, **Will power*, Confidence.

Unit – III:

Negative Traits - Anger Management -Negative Syndrome and Attitude-**Negative thinking*- Guilt Quotient Stress and Emotion, Adapting to Loneliness

Unit – IV:

Positive Traits-Humor and Happiness- Empathetic ability-**Sensitivity profile*-Empowered personality, Self-Empowerment

Unit – V:

Self-analysis: Psychological growth and adjustment- **Personal Development plan*-Successful negotiator Personal SWOT Analysis, Celebrating Life

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. Dr.Aparna Chattopadhyaym What’s Your Emotional IQ, PustakMahal,May 2004.
2. Jill Dann,Hodder & Stoughton , Emotional Intelligence In A Week, ,10 Edition,2007.
3. Daniel Goleman, Emotional Intelligence: Why It Can Matter More Than IQ

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | II | |
| Subject | NON MAJOR ELECTIVE II – BASICS OF BUSINESS INSURANCE | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Introduction to Insurance – Type of Insurance – Principles of Insurance.

Unit – II:

Salient features of IRDA Act – Administration of IRDA Act – Regulatory measures of IRDA.

Unit – III:

Life insurance products – Term, Whole life, Endowment.

Unit – IV:

Introduction to general Insurance – fire, marine and motor insurance.

Unit – V:

Government and insurance companies – LIC India- private players in Insurance in India.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. Dr.N.Premavathy – Elements of Insurance, Sri Vishnu Publications, Chennai.
2. Dr.A.Murthy – Elements of Insurance, Margham Publications, Chennai
3. M.N.Mishra – Insurance, Principles and practice, S.Chand & Co. Ltd., New Delhi
4. Nalini Prava Tripathy, Prabir Paal – Insurance Theory & Practice, Prentice Hall of India
5. Anand Ganguly – Insurance Management, New Age International Publishers.

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | II | |
| Subject | NON MAJOR ELECTIVE II – FUNDAMENTALS OF DISASTER MANAGEMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Meaning, definition, basic aspects and types of disasters.

Unit – II:

Stages IN Disaster - Pre, during and post disaster.

Unit – III:

Disaster Mitigation – guiding principles of Mitigation. Formulation and implementation of Mitigation programmes.

Unit – IV:

Disaster training – Utilisation of resources, training and public awareness.

Unit – V:

Disaster Management policy and legislation; Disaster Management – Strategy in India.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. “Disaster Management” , I sundar, T. Sezhiyan 1st Edition, Sarup and Sons, New Delhi, 2007.
2. “Disaster Management” , A Disaster Manager’s Hand boob; Carter.W, ASTAN Development Bank, Manila.
3. Natural Disaster Management, Destruction, Safety and Pre cautions, S. Prasad, Mangalam publishers and Distributors, New Delhi – 2007.
4. Challenge and Response; K.D.Gangrade, S.Dhadde, Delhi, Rachna publications, 1973.

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | II | |
| Subject | NON MAJOR ELECTIVE II – CONCEPT OF SELF HELP GROUPS | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Meaning, Concept and Functions of Self Help Groups (SHGS).

Unit – II:

Women empowerment through SHGS.

Unit – III:

Micro finance through SHGS.

Unit – IV:

Social Development through SHGS.

Unit – V:

Role of Govt. and NGO's in fostering SHGS.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. “Clinical approach to promotion of entrepreneurship” ED.Setty, Anmol publications Pvt., Ltd, New Delhi 2004.
2. “India economic Empowerment of Women”, V.S. Ganesamurthy, New Century publications, New Delhi, 1st published – May 2007.
3. “Readings in Microfinance”, N. Lalitha Dominant publishers and Distributors, New Delhi, 1st Edition 2008.
4. “Rural Credit and Self Help Groups, Micro finance needs & concepts in India”, K.G.Karmakar, Sage publications, New Delhi, 1999.
5. “Rural empowerment through, SHGS, NGO's & PRI's S.B.Verma, Y.T. Pavar, Deep & Deep publications, New Delhi 2005.
6. “Women's Own; the Self help movement of Tamil Nadu”. C.K. Gariyali, S.K. Vettivel, Vetri publishers, New Delhi, 2003.

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|--------------------------------------|---------------|
| Semester | III | |
| Subject | CORE V - CORPORATE ACCOUNTING | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

Accounting for Issue of Shares & Debentures, Employee Stock Option Plan – **Meaning, importance*, Accounting for employee stock option plan.

Unit II:

Redemption of preference shares and Debentures – Underwriting of shares and Debentures.

Unit III:

Corporate Financial Reporting – Concepts - Final Accounts as per new guidelines – **divisible profits*, managerial remuneration, profits prior to incorporation.

IFRS in India - the application of IFRS in India through the use of Ind AS – the applicability of Ind AS – the mapping of Ind AS to IFRS – differences between IFRS & Ind AS – the list of IFRS (Ind AS) – Process of transition to IFRS.

Unit IV:

Valuation – Concepts – Valuation of Intangible Assets – Goodwill, Patents, trademarks, IPR's – **Characteristics* – Valuation methods.

Asset based standards such as PPE, Intangible assets, borrowing costs, impairment of assets, inventory & biological assets, provisions & contingencies, events after reporting period, accounting policies, estimates & errors.

Unit V:

Corporate Restructuring - Concepts and accounting treatment as per Accounting Standard: 14 (ICAI) Advanced problems for Mergers and Amalgamations, (excluding inter-company holdings)

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 6 | 6 | 12 | 10 | 2 | 20 |
| Section – B | 2 | 5 | 7 | 5 | 7 | 35 |
| Section – C | 1 | 4 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books

1. P.Jain and K.L.Narang, Corporate Accounting, Kalyani Publishers, New Delhi
2. R.L.Gupta and M.Radhaswamy, Advanced Accounting, Sultan Chand & Sons, New Delhi
3. S.N.Maheswarm Advanced Accounting, Sultan Chand & Sons, New Delhi
4. M.C.shukla & T.S.Grewal, Advanced Accounting, S.Chand & Co.Ltd. New Delhi
5. Hanif & Mukherjee, Advanced Accounting, TATA Mc Graw Hill Publications

Note: Latest edition of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | III | |
| Subject | CORE VI – AUDIT & ASSURANCE | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I: Audit framework & regulation

Concept of audit & assurance – professional ethics of an auditor – scope of internal & external audit – governance & audit.

Unit – II: Audit planning & risk assessment

Obtaining & planning for audit assignments – understanding the entity & its environment – assessing audit risk – fraud risk – interim audit and impact of work performed - audit planning & documentation – audit evidence, documentation, working papers.

Unit – III: Internal control & audit tests

Internal control system assessment – control environment, risk assessment procedures, monitoring of controls – evaluation of internal control system by auditor – test of control – communication on internal controls, Application of concept of materiality and audit risk, Concept of internal audit.

Unit – IV: Audit evidence

Techniques of collecting audit evidence such as inspection, observation, external confirmation, recalculation, analytical procedures, and enquiry – quality & quantity of audit evidence – audit sampling – computer assisted auditing techniques – review procedures including subsequent events, going concern, written representations.

Unit – V: Audit Report

Audit Report – Characteristics – types of opinion – preparation of reports and certificates, disclosures, **Latest Trends in Auditing* – Information System Audit.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. Karon . L. Hooks, Auditing & Assurance Services, Wiley
2. Alvin A. Arens & Others, Auditing & Assurance Services,
3. Yumpu, Principles of Auditing
4. Sharma T.R., Auditing Principles & Problems, Sahitya Bhawan, Agra
5. Kamal Gupta and Ashok Arora, Fundamentals of Auditing, Tata McGraw Hill Publishing Company

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | III | |
| Subject | CORE VII – CORPORATE & BUSINESS LAWS | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I :

Companies Act, 2013 - Introduction- Definition of Company – Characteristics – Types of Company – One Person Company (OPC) – Dormant Company – Small Company - Lifting of the Corporate Veil - Formation of Company - Incorporation Procedures – * Documents/E-forms to be filed with Registrar for registration of Companies– Certificate of Incorporation – Preliminary Contracts - Incorporation Documents - Memorandum of Association – Articles of Association – Contents – Alterations.

Unit – II :

Share Capital – Issue Procedures – Rights Issue – Private Placement – Bonus Shares - alteration of share capital – Transfer of shares - **Dematerialization of shares* - transmission of shares – Registration of Charge. **Members and shareholders** – Mode of acquiring membership – Rights and privileges of Members, Register of Members- Voting Rights. **Company Meetings** - Annual General Meeting – Extraordinary General Meeting – Class Meeting – Special and Ordinary business - convening and conduct of meetings. **Administration** - Key Managerial Personnel – Women Directors – Independent Directors – Roles and Responsibilities.

Unit – III :

Introduction to Mercantile Law - Law of Contract and basic definitions -Kinds of Contracts, Essentials of a Valid Contract - offer and Acceptance and Communication, Consideration, Capacity to Contract, Free Consent, Legality of Object and Consideration, Performance of Contract, Discharge of Contract, Breach of Contract – Remedies.

Special Contracts

Bailment- Definition and Essential elements, Rights and duties of bailor and bailee, Finder of lost goods.

Pledge- Essentials, Rights and duties of Pawnor and Pawnee, Indemnity- Definition, nature of liability of surety, rights of surety, Discharge of surety, Guarantee- Meaning and definition, types, revocation of guarantee

Unit – IV:

Contract of Agency – Creation – classification of Agents – Principal Agent relationships – **Delegation of authority* – Personal liability of agent – Termination of agency, Sub agents and substituted agents.

The Sale of Goods Act, 1930 –Introduction – definition - goods and their classification; sale and a agreement to sell - essential elements of contract of sale - **sale distinguished from hire purchase and instalment sale.*

Unit – V :

Conditions and Warranties - distinction between condition and warranty - implied conditions and warranties- **Doctrine** of Caveat Emptor and its exceptions - Transfer of Ownership - passing of property from the seller to the buyer - unpaid seller and his rights. **Information Technology Act** – Scope, Objectives, Electronic Contracting, electronic records and digital signatures, **cyber offences*, legality of e-marketing.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. N.D.KAPOOR, Elements of mercantile law, Sultan Chand & co
2. P.P.S Gogna, Company Laws, S. Chand & co
3. Dr.M.R.Sreenivasan, Business Law 2nd Ed Margham Publication, Chennai
4. P.C.Tulsian Business Laws, 2nd ed, Tata Mcgraw Hill, New Delhi
5. ICSI Material on Company Law

Note: Latest edition of the books to be referred.

| | | |
|----------------------|------------------------------------|---------------|
| Semester | III | |
| Subject | CORE VIII – COST ACCOUNTING | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

Introduction to Cost Accounting – Meaning - **Objectives and advantages of cost accounting, Relationship between cost accounting and financial accounting.*

Cost concepts and classifications - Cost centres and Cost units - cost behaviour with use of graphs Role of a cost accountant in an organization. **Elements of cost** – Preparation of cost sheets – Tenders and quotations – Reconciliation of Cost & Financial Accounts. (Reference to Cost Accounting Standard (CAS)– 1)

Unit II:

Materials - Procurement procedures— Store procedures and documentation in respect of receipts and issue of stock, - Material/inventory control- concept and techniques- Techniques of fixing of minimum, maximum and reorder levels, EOQ, ABC classification; Stock taking and perpetual inventory.

Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues – FIFO, Weighted Average, Standard, Treatment of Material Losses. (Reference to CAS – 6)

Unit III:

Labour cost – Attendance and payroll procedures, Overview of statutory requirements, Overtime, Idle time and – Labour turnover – Remuneration systems and incentive schemes (Reference to CAS – 7). labour efficiency, capacity & volume ratios. **Overhead** – Classification – allocation, apportionment and absorption of overhead. Under and over-absorption – Machine Hour rate.

Unit IV:

Costing Systems - Process costing – Treatment of Normal, Abnormal losses and Gains – Valuation of Work- in Progress, Statement of Equivalent Production.

Unit V:

Budgeting and budgetary control: Concept of budget and budgetary control - **objectives, merits, and limitations*, Functional budgets, Fixed and flexible budgets, Cash Budget - Zero base budget, – Variance Analysis – Material Variance only.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 6 | 6 | 12 | 10 | 2 | 20 |
| Section – B | 2 | 5 | 7 | 5 | 7 | 35 |
| Section – C | 1 | 4 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books:

1. S.P.Jain and K.L.Narang, Cost Accounting, Kalyani Publishers.
2. Dr.S.N.Maheswari, Principles of Cost Accounting, Sultan Chand Publications
3. V.K.Saxena and C.D.Vashist, Cost Accounting, Sultan Chand Publications
4. S.P. Iyengar, Cost Accounting, Sultan Chand
5. T.S.Reddy and Y.Hari Prasad Reddy, Cost Accounting, Margham Publications

Note: Latest edition of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | III | |
| Subject | ALLIED III – BUSINESS MATHEMATICS | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Theory of Sets - Set Theory – Definition - Elements and Types of Sets - Operations on Sets- Relations and Functions of Sets.

Unit – II:

Ratio, Proportion and Variations - Permutation and Combinations.

Unit – III:

Binominal Theorem, Exponential and Logarithmic Series - Arithmetic, Geometric and Harmonic Progressions.

Unit – IV:

Differential Calculus - Differentiation – Meaning – Rules - Maxima and Minima of Univariate Functions- Application of Maxima and Minima in Business.

Unit – V:

Simple Interest, Compound Interest and Annuity – Matrices – Meaning and Operations – Matrix inversion – Solutions to Linear Equations.

Note: No Theory Questions to be asked

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. P.R.Vittal , Business Mathematics, Margham Publications, Chennai
2. D.C. Sancheti and V.K. Kapoor Business Mathematics , Sultan Chand Publishers, New Delhi
3. B.M. Agarwal , Business Mathematics, Kalyani Publishers
4. R.S. Soni , Business Mathematics, Pitambar Publishing House
5. Singh J. K. Business Mathematics. Himalaya Publishing House.

Note: Latest edition of the books to be referred.

| | | |
|----------------------|--------------------------------------|---------------|
| Semester | IV | |
| Subject | CORE IX – FINANCIAL REPORTING | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

Corporate Financial Reporting - Concept – objectives – Financial reporting and Financial Statements – objectives of Financial statements . Users in Financial reporting. Qualitative characteristics of financial reporting information – Benefits of Financial reporting

Unit II:

International Standards related to Incomes Taxes, cash flows, Government Grants, effects of changes in foreign exchange rates, investments in associates & joint ventures, leases.

Unit III:

Accounting for Insurance Companies – Life Assurance Fund – Valuation Balance Sheet & Treatment of Surplus - Revenue Account for Life & General insurance Companies – Balance Sheet (Simple Problems Only).

Unit IV:

Integrated reporting - Accounting for Holding Companies - Consolidated financial statements (excluding group cash flow statement) for a simple group with one subsidiary and one associate – computation of fair value of net assets, goodwill and Non-Controlling Interest (NCI) on date of acquisition -computation of group reserves on date of consolidation – fair value adjustments on consolidation – effects of intra-group trading on consolidation — consolidation of Balance Sheet – treatment of mutual Owings, contingent liabilities – unrealized profit – revaluation of assets – bonus issue and payment of dividend (intercompany holdings excluded) as per AS 21.

Unit V:

Accounting for Banking Companies in India – Non Performing Assets – prudential norms – Rebate on Bills discounted – profit and Loss account and Balance Sheet – (Revised Format).

* *Self Study Portion*

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 10 | 2 | 12 | 10 | 2 | 20 |
| Section – B | 4 | 3 | 7 | 5 | 7 | 35 |
| Section – C | 3 | 2 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books

1. R.L.Gupta and M.Radhaswamy, Advanced Accounting, Sultan Chand & Sons, New Delhi
2. S.N.Maheswari Advanced Accounting, Sultan Chand & Sons, New Delhi
3. Jain & Narang, Advanced Accountancy, Kalyani Publishers
4. Bruce Mackenzie & Others, IFRS 2012: Interpretation and Application of International Financial Reporting Standards, Wiley
5. Loftus, Financial Reporting, Wiley

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | IV | |
| Subject | CORE X – INTERNATIONAL MARKETING | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Introduction to International Marketing – Meaning, Importance - Scope and challenges of international marketing - Recent trends and developments in international trade, protectionism, trade barriers, easing trade restrictions, role of the IMF and World Bank, WTO and TRIPS, TRIMS and liberalization of service industries. - International Marketing Environment- Political and legal systems – **Culture and Business Customs*.

Unit – II:

International Marketing Mix - International Research and Segmentation- Developing Global Products and Pricing - **International Promotion and Advertising* - International Distribution Systems.

Unit – III:

International Marketing Planning - Managing Systems for International Marketing - Reflection and Evaluation of the Endeavors - **Assessing international market opportunities* - marketing research – International marketing management - planning and organization - Market entry strategies - export, joint ventures and direct investments.

Unit – IV:

Global product management - **standardisation vs. differentiation* - Product planning and development - Marketing industrial products and services globally - Pricing for international markets.

Unit – V:

Global logistics management - International distribution systems - **Global advertising and promotional strategies* - Sales management - Developing marketing strategies and programs for international markets.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. R Srinivasan, International Marketing, PHI Publishing House
2. R L Varshney & B Bhattacharya, International Marketing Management, S Chand
3. Philip R.Cateora and John L.Graham, International Marketing, McGraw-Hill 10th Edn
4. Micheal R.Czinkota and Ilkka A.Ronkainen: Global Marketing, The Dryden Press
5. Terpstra & Sarathy: International Marketing, Thomson Press.
6. Daniels and Raderbaugh: International Business / Globalisation and Business, Prentice-Hall India,

Note: Latest edition of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | IV | |
| Subject | CORE XI – MANAGEMENT ACCOUNTING | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I: SCOPE AND IMPORTANCE

Management accounting - meaning, nature scope and functions, need, importance and limitations- **management accounting vs cost accounting. Management accounting vs financial accounting.* Analysis and interpretation of financial statements - nature, objectives, essentials and tools. Methods- comparative statements , common size statement and trend analysis.

Unit – II: CVP ANALYSIS

Marginal costing- Break even analysis- Marginal Costing Vs Absorption costing- CVP Analysis- Decision making Areas - sales mix, Product mix, key factor, Merging of plant, make or Buy Decisions, acceptance of foreign orders, discontinuance of a product line.

Unit – III: BUDGETARY CONTROL AND STANDARD COSTING

Budgetary systems in an organisation such as top-bottom, bottom-up, rolling, zero based, activity based, incremental budgets – preparation of flexed budgets – beyond budgeting model – employee participation in budgetary system – quantitative analysis using high-low method, applying learning curve model – advanced variance analysis with the help of material mix & yield variances, sales mix & quantity variances, planning & operational variances – performance analysis with variances.

Unit – IV: PERFORMANCE ANALYSIS

Understand & apply financial & non-financial performance indicators (KPIs) – using Norton’s Balanced Scorecard model and Fitzgerald & Moon’s Building Block model for performance measurement – using Value-for-money approach for not-for-profit organisations – economy, efficiency & effectiveness approach. Understand & apply the concept of relevant costs – determination of relevance with regard to a contextual decision – opportunity costs – cost-volume-profit (CVP) relationship – calculate & interpret break-even point and margin of safety – estimation of target profit in single & multi-product scenario – resource optimisation in light of limiting factors – single or multiple factors – make or buy decisions

Unit – V: DIVISIONAL PERFORMANCE

Mechanism for evaluating the performance of a business division and the divisional managers – tools such as Return on Investment (ROI), Residual Income (RI) – impact of transfer pricing on divisional performance – methods of setting transfer prices. Life cycle costing – costs involved at different stages of life cycle – benefits & application of life cycle costing; Throughput accounting – theory of constraints – calculation & interpretation of Throughput Accounting Ratio (TPAR) – application in a multi-product entity; and environmental accounting – management of environmental costs – accounting for environment costs.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 10 | 2 | 12 | 10 | 2 | 20 |
| Section – B | 5 | 2 | 7 | 5 | 7 | 35 |
| Section – C | 3 | 2 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books:

1. Dr A Murthy and Dr S Gurusamy, Management Accounting, Tata McGraw Hill / Vijay Nicole Publishers
2. S N Maheswari, Management Accounting – Sultan Chand Publications
3. N P Srinivasan, Management Accounting, New Age Publishers
4. RSN Pillai & Bagavati, Management accounting- S Chand & Co Ltd – New Delhi.
5. Horngren sunder Stratton, introduction to management accounting – Pearson education.

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | IV | |
| Subject | CORE XII – INTERNATIONAL TAXATION & TECHNOLOGY | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Federal Tax legislative process - IRS – Jurisdiction – Tax System – Types of Tax Payers. Overview of US GAAP – comparison.

Accounting methods- Recognition – valuation – long term contracts - Tax election types – Authoritative hierarchy – Commutations with clients.

Unit – II:

Individual Taxation - Concept – Filing Status and Exemptions - Gross income - Capital gains and losses - Inclusions and Exclusions - Adjustment and Itemized deductions - Passive activity losses -Loss limitations – Savings and retirement plan benefits

Tax computation and credits – Alternative minimum tax – Income recognition for Foreign Nationals

Simulations -Filing Forms and schedules -- due dates – extension – tax calculation

Unit – III:

Property Transactions - Types of assets – basis and holding periods – depreciation, depletion and amortization – Sale and exchange (Taxable and nontaxable) - gains and losses – Netting process – Related party transactions. Estate and Gift taxation - Transfers - Annual exclusion and deductions - determination – deduction – unified credit. Simulations -Filing Forms and schedules -- due dates – extension – tax calculation

Unit – IV:

Partnerships - determination of income /losses - Basis of partner interest and assets contribution to partnership - Election – Transaction between partner and partnership - Liabilities treatment –Distribution of assets – change in ownership - liquidation - termination

Simulations -Preparation of Forms and schedules -- due dates – extension – tax calculation

Unit – V:

C CORPORATION - Determination – computation - earnings and profits - AMT- losses treatment – Entity transactions- contribution and distribution – Consolidation

S CORPORATION - Eligibility and election – income determination – losses – other stated items – basis of shareholders interest - Entity transactions- contribution and distribution – Built in gains tax

Simulations - Preparation of Forms and schedules -- due dates – extension – tax calculation

* *Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. Jeffrey Helewiz, A Guide to Federal Taxation
2. Robert Hissey, Practical Guide to US Taxation, Wolters Kluwer
3. US Tax Masters Guide, Wolters Kluwer

Note: Latest edition of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | IV | |
| Subject | ALLIED IV – OPERATIONS RESEARCH | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Introduction to Operations Research (OR) - Meaning & scope - **characteristics* – models in OR – Linear Programming Problem – formulation – graphical method

Unit – II:

Transportation model –Balanced and unbalanced transportation problem- minimization and maximization - basic feasible solution – formulation, Solving Transportation using North West Corner Rule, Least Cost Method – Vogel’s Approximation method – MODI Method

Unit – III:

Assignment models- Balanced and Unbalanced problems (Minimization Only).

Unit – IV:

Decision making under risk – Decision trees – Decision making under uncertainty.

Queuing Theory - single and Multi-channel models – infinite number of customers and infinite calling source. Replacement Models-Individuals replacement Models (With and without time value of money) – Group Replacement Models.

Unit – V:

Network Analysis - **importance in business decisions* - PERT and CPM (no crashing) (Simple Problems only)

Game Theory – Meaning, Importance – Pay offs, Pure Strategy Vs. Mixed Strategy – Two Way game theory.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 6 | 6 | 12 | 10 | 2 | 20 |
| Section – B | 2 | 5 | 7 | 5 | 7 | 35 |
| Section – C | 1 | 4 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books:

1. Pannerselvam R, Operations Research, Prentice Hall of India – New Delhi
2. S.C.Gupta and V.K.Kapoor, Operations Research, S.Chand & Co.
3. Hamdy A Taha, Operation Reasearch – An introduction, Prentice Hall of India – New Delhi
4. P.K.Gupta & Man Mohan, Problems in Operations Reasearch – Sultan Chand & Sons – New Delhi
5. S P Gupta, Statistical Methods, Sultan Chand Publishers.

Note: Latest edition of the books to be referred.

| | |
|-----------------|---|
| Semester | IV |
| Subject | INTERNSHIP (2 WEEKS) |
| Examination | Presentation of Report – Evaluation & VIVA VOCE |

1. The candidate is required to undergo 2 weeks internship with a business enterprise, preferably in the domain of Finance, Accounting & Auditing, Management consulting, Wealth Management, Tax Laws Practice, to gain exposure on the practical aspects of the Finance & Taxation and its application in business.
2. The Report shall be submitted and evaluation of the report shall be in form of presentation and it shall be jointly evaluated by the internal and external examiners for the award of credit.

Guidelines:

- Internship shall be undertaken during the vacation in Semester – IV
- The student shall report his / her organisation choice to the head of the department for approval and only after due approval, the internship shall be commenced.
- The student intern is expected to comply with the college code of conduct in all interactions with the intern organisation.
- After the completion of internship, the certificate of completion issued by the organisation concerned shall be submitted to the Head of the Department (within a week after the completion of the Internship)
- Internship shall be restricted to the Finance & Taxation only.
- The report shall be in the form of presentation to the Board of Examiners for the award of credits.

| | | |
|----------------------|--------------------------------------|---------------|
| Semester | V | |
| Subject | CORE XIII – CORPORATE FINANCE | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit-I:

Indian Capital Market – Basic problem of Industrial Finance in India. Equity – Debenture financing – Guidelines from SEBI, **advantages and disadvantages and cost of various sources of Finance* - Finance from international sources, financing of exports – role of EXIM bank and commercial banks.– Finance for rehabilitation of sick units

Unit-II:

Estimating working capital requirements – Approach adopted by Commercial banks, Commercial paper- Public deposits and inter corporate investments.

Unit-III :

Appraisal of Risky Investments, certainty equivalent of cash flows and risk adjusted discount rate, risk analysis in the context of DCF methods using Probability information, nature of cash flows, Sensitivity analysis; Simulation and investment decision.

Unit-IV:

Simulation and financing decision - cash inadequacy and cash insolvency- determining the probability of cash insolvency- Financing decision in the Context of option pricing model and agency costs- Inter-dependence of investment- financing and Dividend decisions.

Unit-V:

Corporate Governance - SEBI Guidelines- **Corporate Disasters and Ethics-* Corporate Social Responsibility- Stakeholders and Ethics- Ethics, Managers and Professionalism.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. Dr S Gurusamy, Indian Financial Systems / Financial Services, Vijay Nicole
2. Richard A.Brealey, Stewart C.Myers Principles of Corporate Finance, Tata McGraw Hill
3. I.M.Pandey, Financial Management, Vikas Publishing House Pvt., Ltd.
4. M.Y Khan, Indian Financial System, Tata McGraw Hill,
5. Krishnamurthy and Viswanathan, Advanced Corporate Finance, PHI Learning,
6. Smart, Megginson, and Gitman, Corporate Finance, Pearson

Note: Latest edition of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | V | |
| Subject | CORE XIV – INFORMATION MANAGEMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

INTRODUCTION - Data, Information, Intelligence, Information Technology, Information System, evolution, types based on functions and hierarchy, Functional Information Systems, DSS, EIS, KMS, GIS, International Information System- **Introduction to data analytics & Artificial Intelligence.*

Unit II:

SYSTEMS ANALYSIS AND DESIGN - Systems development methodologies, Systems Analysis and Design Tools – System flow chart, Decision table, DFD, ER, Object oriented Analysis and Design, UML diagram.

Unit III:

DATABASE MANAGEMENT SYSTEMS - DBMS – HDBMS, NDBMS, RDBMS, OODBMS, Query Processing, SQL, Concurrency Management, Data warehousing and Data Mart

Unit IV:

SECURITY, CONTROL AND REPORTING - Security, Testing, Error detection, Controls, IS Vulnerability, Disaster Management, Computer Crimes, Securing the Web, Intranets and Wireless Networks, Software Audit, Ethics in IT, User Interface and reporting.

Unit – V:

NEW IT INITIATIVES - Role of information management in ERP, **e-business, egovernance*, Data Mining, Business Intelligence, Pervasive Computing, Cloud computing, CMM.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books :

- 1.K Veeraanjaneyalu & Ors. Emerging Technologies in Information Management, BS Publications,
- 2.Sahil Raj, Management Information System, Pearson Edition
- 3.Gordon Davis, MIS: Conceptual Foundations, Structure and Development, Tata McGraw Hill,
- 4.Haag, Cummings and Mc Cubbrey, Management Information Systems for the Information Age, McGraw Hill,
- 5.Turban, McLean, Information Technology for Management Transforming Organisations in the Digital Economy
- 6.Raymond McLeod and Jr. George P. Schell, Management Information Systems, Pearson Education
- 7.James O Brien, Management Information Systems Technology in the E-business enterprise, Tata McGraw Hill

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | V | |
| Subject | CORE XV –INCOME TAX - LAW & PRACTICE | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit- I:

Meaning of Income – Important definitions under the Income Tax Act – scope of total income – Residential Status and Incidence of tax of an individual - Incomes Exempt from tax.

Unit –II:

Income from Salaries – scope of salary income – Allowances, Perquisites and its valuation – Deduction from salary income.

Income from House Property – Computation of Annual value – Deductions from annual Value.

Unit- III:

Income from Business or Profession – Basic Principles of arriving at business income – Losses incidental to trade – specific deductions in computing income from business – General deductions – Deemed business profits chargeable to tax – compulsory maintenance of account – Audit of accounts of certain persons – specific provisions for computing incomes on estimated basis under sec 44AD, AE, AF (An Overview).

Unit- IV:

Capital Gains – Short term and Long Term gains – Transfer of Capital asset – Certain transactions that do not constitute transfer – Computation of capital gains – exempted capital gains.

Income from other sources – Deductions in computation of Income from Other Sources.

Unit-V:

Clubbing of income - Set off and carry forward of losses –**Permissible deductions from Gross Total Income** with reference to an individual - **Assessment of individual’s total income & Tax Liability** - Filing of Returns – Types – Due Dates.

Pattern for End Semester Examination

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 6 | 6 | 12 | 10 | 2 | 20 |
| Section – B | 2 | 5 | 7 | 5 | 7 | 35 |
| Section – C | 1 | 4 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books:

1. Dr.Vinod K.Singhania, Students Guide to Income Tax. Taxmann publications Pvt.Ltd, New Delhi
2. P.Gaur, D.B.Narang, Income Tax Law and Practice, Kalyani Publications.
3. T N Manoharan, Income Tax – Law & Practice, Snow White Publishers.
4. Study Material on Income Tax – The Institute of Chartered Accountants of India /The Institute of Cost Accountants of India.

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---------------------------------------|---------------|
| Semester | V | |
| Subject | CORE XVI –FINANCIAL MANAGEMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit – I:

Financial objective of a business organisation – shareholder value maximisation v/s profit maximisation, growth in earning per share, total shareholder return – possible conflict between stakeholder objectives and balancing them– linkage of financial objective with corporate strategy – financial & other objectives of a not-for-profit organisation. Macroeconomic environment of the business – role & impact of fiscal & monetary policies, interest rate & exchange rate policies – competition policies.

Unit – II:

Elements and composition of working capital – objective of working capital management through balancing of profitability v/s liquidity – cash operating cycle, factors influencing it and computation thereof – management of inventory through EOQ, inventory levels, availing bulk discounts, early payment discounts and Just-In-Time (JIT) techniques – management of receivables through credit policy, early settlement discounts, extending credit period, factoring & invoice discounting – managing accounts payables through bulk discounts, early payment discounts – managing cash using Baumol’s model and Millar-Orr model – working capital financing strategies

Unit – III:

Types of investment projects such as mutually exclusive projects & independent projects - Use of discounted cash flow (DCF) and non-DCF tools for investment appraisal – payback period & discounted payback – Return on Capital Employed (ROCE) – Net Present Value (NPV) and Internal rate of Return (IRR) – relative merits & demerits of these methods – project risk assessment through sensitivity analysis – lease v/s buy decision – replacement cycle decision – single period capital rationing – risk adjusted discount rates.

Unit – IV:

Models of Financial Management - Estimating cost of equity using dividend growth model (DGM), Capital Asset pricing Model (CAPM), concept of systematic & unsystematic risk – estimating cost of debt (irredeemable & redeemable), convertible debt – estimating Weighted Average Cost of Capital (WACC) using book value and market value weightages – capital structure theories including traditional view and Modigliani-Millar view (without & with tax) – pecking order theory.

Unit – V:

Financial Risk Management - Sources of & factors influencing Foreign currency risks – types of currency risks such as transaction risk, translation risk, & economic risks – causes of currency rate fluctuations including balance of payments, purchasing power parity (PPP), interest rate parity (IRP), Fischer equation – tools of managing currency risks such as internal tools (currency of invoice, netting, leading & lagging) and external tools (forwards, futures, options & swaps, money market hedging) – Causes of interest rate fluctuations - managing interest rate risks through internal tools (matching and smoothing, asset & liability management, forward rate agreements (FRA).

** Self Study Portion*

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 10 | 2 | 12 | 10 | 2 | 20 |
| Section – B | 5 | 2 | 7 | 5 | 7 | 35 |
| Section – C | 4 | 1 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books:

1. A Murthy, Financial Management, Margham Publications.
2. M.Y.Khan and P.K.Jain – Basic Financial Management , TATA Mc Graw Hill Publications
3. I.M.Pandey financial management, Vikas Publications
4. Paul D. Kimmel, Jerry J. Weygandt, Financial Accounting: Tools for Business Decision Making, Wiley
5. Thomas J. O'Brien, Applied International Finance: Managing Foreign Exchange Risk and International Capital Budgeting, Business Expert Press.

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | V | |
| Subject | OPEN ELECTIVE I – FINANCIAL SERVICES | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

Financial Services - An Overview – functions – financial services market – credit cards - concept – features, facilities and services - benefits and drawbacks – Credit card frauds – Credit Information Bureau (CIB) – **Debit Cards: Concept and mechanism – dangers and precautions in the use of debit cards.*

Unit II:

Credit rating – features and advantages – major issues – **credit rating agencies* – regulatory framework – major factors in credit rating – equity rating –

Commercial Bill Financing - meaning of commercial bills – features and advantages of commercial bill financing – precautions by a banker – steps in discounting and purchasing of bill.

Consumer finance - meaning – types – pricing of consumer finance – marketing of consumer finance – consumer credit scoring.

Unit III:

Factoring - definition – mechanism – characteristics – types – advantages and disadvantages – players in factoring services – functions of a factor – factoring costs – factoring Vs bills discounting – cost – benefit analysis of factoring – Forfeiting (An Overview)

Leasing - Concept – characteristics – types – financial lease Vs Operating lease – tests for financial lease - leasing process – services of a lessor –advantages – limitations – Sale and Lease back – concepts – tax implications.

Unit-IV:

Merchant banking - definition – functions – code of conduct – regulatory framework.

Mutual funds - definition – products and schemes - working mechanism of mutual funds –regulatory structure of mutual funds in India - Asset Management Company (AMC) – SEBI requirements on AMC – functions of AMC – Association of Mutual Funds of India (AMFI).

Unit – V:

Securitisation - definition – pass through certificates – features – need – mechanism – purposes – asset characteristics – application – benefits – economic functions – limitations – Securitization as a risk management tool. **Book – building** - concept – characteristics – process – allocation procedure .

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. GURUSAMY.S Financial services / Merchant Banking and Financial Services, Tata McGraw Hill
2. Khan M Y Financial Services, Tata McGraw Hill
3. Kothari, Vinod Lease financing & Hire Purchase including consumer credit, Wadhwa and company
4. B. Santhanam, Financial Services, Margham Publications, Chennai
5. E Gordon & K Natarajan, Financial Markets & Services, Himalaya Publishing House

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | V | |
| Subject | OPEN ELECTIVE I – INTERNATIONAL FINANCIAL REPORTING STANDARDS [IFRS] | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

International Financial Reporting Standards – Introduction – importance & relevance in global scenario –
IFRS 1 First-time Adoption of International Financial Reporting Standards

Unit II:

IFRS 2 Share-based Payment
IFRS 3 Business Combinations

Unit III:

IFRS 5 Non-current Assets Held for Sale and Discontinued Operations
IFRS 7 Financial Instruments: Disclosures

Unit-IV:

IFRS 8 Operating Segments
IFRS 9 Financial Instruments

Unit – V:

IFRS 10 Consolidated Financial Statements
IFRS 11 Joint Arrangements

* *Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. CA Kamal Garg, Practical Guide to IFRS , Bharat Publishing House,
2. Abbas Ali Mizra, Practical Implementation Guide & Workbook for IFRS, Wiley
3. Jagadish R Ralyani, IFRS and Indian Accounting Practices, Taxmann
4. Steven M Bragg, IFRS Guide book, Accounting Tools Series.

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | VI | |
| Subject | CORE XVII –INSURANCE AND RISK MANAGEMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

Risk – meaning – types - risk management process – risk identification – evaluation – risk management techniques – significance of risk management function within business organizations.

Unit II:

Insurance- Definition - Purpose & need of Insurance - Insurance as risk transfer & risk sharing mechanism - Benefits & Cost of insurance to society - Insurance as contract- Essential elements, Fundamental principles of insurance- Utmost good faith - Insurable Interest - Indemnity - Proximate cause – Subrogation - Mitigation of loss.

Unit III:

Life Insurance – Meaning, Characteristics, Principles - Types of Policies in Life and General Insurance. Premium – Meaning - Types of premium - Factors for determination of premium - Mortality table - Nomination and assignments, Claims Management - types of documents needed in various types of claims –Life Insurance Agents & Advisors – Regulations of IRDA for Agents.

UNIT IV:

General Insurance (Fire, Marine and Health) – Meaning, Characteristics, Principles - Types of Policies. - Types of premium - Factors for determination of premium - Claims Management - types of documents needed in various types of claims.

Composite Insurance Agents & Advisors – Regulations of IRDA for Agents.

UNIT V:

Insurance Underwriting - need for insurance underwriting, factors that affect the activities performed by the underwriter, steps involved in the process of insurance underwriting, Introduction to Actuarial Science - Role of Actuaries in risk management.

* *Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books :

1. M. N. Mishra, Insurance – Principles and Practices – S. Chand & Co.
2. Sengupta Mrinal Chandra, Insurance Finance, Progressive Publishers, New Delhi
3. A. Murthy, Principles and Practice of Insurance, Margham Publications
4. Dorfman, “Introduction to Risk Management and Insurance, Prentice Hall
5. Williams, Heins, “Risk Management and Insurance”, TATA Mc Graw Hill Publishers

Note: Latest edition of the books to be referred.

| | | |
|----------------------|--|---------------|
| Semester | VI | |
| Subject | CORE PAPER XVIII – BANKING LAW & OPERATIONS | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit-I:

Commercial bank – definition – classification of banking system– universal banking – functions – **role of commercial banks in economic development* – central banking – definition – need – principles – **central banking Vs commercial banking* – functions and role – RBI- functions and working – objectives – legal frame work.

Unit-II:

Opening bank accounts – type of bank accounts – KYC Norms - **FDR- Pay-in-slip book, Withdrawal forms* – special type of customers – bank lending – sources and factors of lending – Assessment and evaluation of customer profile and credit worthiness of the applicant for loan – Credit information Bureaus – CIBIL, Experian, Equifax, CRIF High Mark, Credit Records and Reference – disclosure to customers

Unit-III:

Negotiable instruments – meaning – definition – types – distinction between cheque, promissory note and bills of exchange - ** Cheque Truncation System [CTS] Cheques – meaning – advantages.* Endorsement – meaning – types - Crossing – definition – need – types – consequences – opening of crossing – marking of cheques - dishonouring of a cheque – payment in a crossed cheque – material alteration – statutory protection.

Unit-IV:

Paying Banker – meaning duties and liabilities of paying banker - **Collecting banker** – meaning – collecting banker’s role – collecting banker’s duty – collection of bills of exchange – Agent for collection – paying banker Vs collecting banker. **Customer grievances** – grievances redressal mechanism structure in banks – Banking Ombudsman.

Unit-V:

E-banking – meaning – services – Internet banking – Internet banking Vs. traditional banking – Limitations of internet banking – Mobile banking – Automatic Teller Machine (ATM) – Cash Deposit Machine (CDM) & Recycler Machine - Electronic Funds Transfers – National Electronic Fund Transfer [NEFT] - Real Time Gross Settlement [RTGS] – Intra – bank mobile payments system [IMPS]- Society for Worldwide Interbank Financial Telecommunication [SWIFT] – Indian Financial Network [INFINET]

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. Dr. S.Gurusamy, Banking, Theory Law & Practice Tata McGraw Hill, New Delhi
2. K.P.M.Sundharam, P.N.Varshney, Banking Theory Law & Practice – Sultan Chand & Sons
3. Khan, M.Y. Indian Financial System – Theory and Practice. Vikas Publishing House
4. B. Santhanam – Banking – Theory , Law & Practice, Margham Publications
5. K.C. Shekhar & Lekshmy Shekhar, Banking Theory and Practice, Kindle Store

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | VI | |
| Subject | CORE XIX –GOODS AND SERVICES TAX [GST] & CUSTOMS LAW | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

UNIT I:

Indirect Taxes - Introduction – Origin of GST – One Nation, One Tax, One Market ideology – Structure and types of GST, GST Council – Composition, functions, powers GST Network, GST Practitioners – Qualifications and Enrollment Procedures.

Registration under GST – procedures and formalities – E-forms – GSTIN – Amendment and Cancellation of Registration.

UNIT II:

Taxable Event – Supply of goods and Services – Classification of goods and services – Composite and Mixed Supplies – Place of Supply – Point of Taxation – Levy of GST – Regular and Composition Scheme – Documents and Registers to be maintained by Assessee.

UNIT III:

Valuation in GST – Transaction Value, Valuation Rules

Periodicity of GST Payment – Mode of Payment – Reverse Charge Mechanism- Due dates of Filing Return – Types of Returns and Forms. Simple problems in calculation of GST Payable and Set off Input Tax Credit.

UNIT IV:

Customs Act, 1962 – objectives – Basic concepts of customs law, Territorial waters, high seas - levy and collection – classification of goods – procedure for assessment & payment of customs duty – types of customs duty – valuation of goods – clearance of goods.

Unit – V:

Customs Procedures, Import and Export Procedures, Baggage, Exemptions – Simple problems in computation of assessable value and Customs Duty.

(FOB, CIF Values, Insurance Charges, Landing Charges etc.)

* *Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Theory | Practical Problems | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|--------|--------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 8 | 4 | 12 | 10 | 2 | 20 |
| Section – B | 4 | 3 | 7 | 5 | 7 | 35 |
| Section – C | 3 | 2 | 5 | 3 | 15 | 45 |
| Total Marks | | | | | | 100 |

Reference Books

1. Rajat Mohan, Goods & Services Tax, Bharat Law Publications House,
2. Nitya Tax Associates, Basics of GST, Taxmann
3. Study Material on GST – The Institute of Chartered Accountants of India /The Institute of Cost Accountants of India.
4. Guidance material on GST issued by CBIC, Government of India
5. V S Datey, GST & Customs Law, Taxmann Publishers.

Note: Latest Editions of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | VI | |
| Subject | ELECTIVE II – PROJECT MANAGEMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

Basics of Project Management: Introduction, Need for Project Management, Project Management Knowledge Areas and Processes, The Project Life Cycle, The Project Manager (PM), **Phases of Project Management Life Cycle*, Project Management Processes, Impact of Delays in Project Completions, Essentials of Project Management Philosophy, Project Management Principles.

Unit II:

Project Identification, Selection and Planning: Introduction, Project Identification Process, Project Initiation, Pre-Feasibility Study, Feasibility Studies, **Project Break-even point*, Project Planning, Need of Project Planning, Project Planning Process, Work Breakdown Structure (WBS).

Unit III:

Organizational Structure and Organizational Issues: Introduction, Concept of Organizational Structure, Roles and Responsibilities of Project Leader, **Relationship between Project Manager and Line Manager*, Leadership Styles for Project Managers, Conflict Resolution, Team Management and Diversity Management, Change management.

Unit IV:

Project Quality Management and Value Engineering and IS: Introduction, Quality, Quality Concepts, Value Engineering **Project Management Information System (PMIS)- importance*, Planning of PMIS, Design of PMIS.

Unit V:

Project Performance Measurement and Evaluation: Introduction, **Performance Measurement*, Productivity, Project Performance Evaluation, Benefits and Challenges of Performance Measurement and Evaluation, Controlling the Projects.

** Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. A Guide to the Project Management Body of Knowledge: PMBOK® Guide
2. Gregory Horine, Project Management Absolute Beginner’s Guide
3. Harold Kerzner, Project Management: A Systems Approach to Planning, Scheduling, and Controlling
4. Paul Roberts, Guide to Project Management: Getting it right and achieving lasting benefit
5. Stephen Barker and Rob Cole, Brilliant Project Management: What the best project managers know

Note: Latest edition of the books to be referred.

| | | |
|----------------------|---|---------------|
| Semester | VI | |
| Subject | ELECTIVE II – INDIAN ACCOUNTING STANDARDS [Ind AS] | |
| Maximum Marks | CIA- 40 Marks | ESE-100 Marks |
| Exam Duration | 3 Hours | |

Unit I:

Introduction to Ind AS –
 Ind AS 101 – First time adoption of Ind AS.
 Ind AS 103 – Business Combinations

Unit II:

Ind AS 104 – Insurance Contracts
 Ind AS 105 – Non Current Assets held for sale & discontinued operations.

Unit III:

Ind AS 107 – Financial Instruments : Disclosure
 Ind AS 108 – Operating Segments

Unit IV:

Ind AS 109 – Financial Instruments
 Ind AS 110 – Consolidated Financial Statements

Unit V:

Ind AS 114 – Regulatory Deferral Accounts
 Ind AS 115 – Revenue from contracts with customers.

* *Self Study Portion*

Pattern for End Semester Examination

| End Semester Questions Pattern | Total Questions | To Answer Questions | Marks Per Question | Total Marks |
|--------------------------------|-----------------|---------------------|--------------------|-------------|
| Section – A | 12 | 10 | 2 | 20 |
| Section – B | 7 | 5 | 7 | 35 |
| Section – C | 5 | 3 | 15 | 45 |
| Total Marks | | | | 100 |

Reference Books:

1. B D Chatterjee, Guide to Indian Accounting Standards, Taxmann
2. CA Praveen Sharma, Handbook on Ind AS, Pooja Law Publishing House
3. Dolpoy D Souza & Vishal Bansal, Indian Accounting Standards, Snow White
4. CA Kamal Garg, Practical Guide to Ind AS, Bhaarat Law Publishing House

Note: Latest edition of the books to be referred.

| | | |
|----------------------|--|--------------|
| Semester | V | |
| Subject | ELECTIVE III – PROJECT WORK & VIVA VOCE | |
| Maximum Marks | CIA- 20 Marks | ESE-80 Marks |
| Exam Duration | - | |

- (1) Project Work is an integral part of B.Com (Finance & Taxation) Degree Course. It is a sort of job testing programme designed to bridge the gap between theory & practice and create a natural interest in the practical aspects of the Finance & Taxation domain so as to stimulate trainee's desire to face its challenges and problems.
- (2) The project work shall broadly relate to
 - (a) Accounting & Auditing
 - (b) Tax Laws Practice
 - (c) Management Accounting & Decision Making
 - (d) Auditing & Assurance Services
 - (e) Wealth Management Services
 - (f) Financial Management
 - (g) Capital Markets & Financial services.

The above domains are not exhaustive. Students can choose any domain related to the Finance & Taxation management.
- (3) The students should submit a project report in the sixth semester during the last week of February. Project Work Evaluation & Viva Voce examinations shall be conducted during March. The report shall not exceed 50 typed pages, excluding tables, figures, bibliographies and appendices.
- (4) The paper on Institutional Training shall carry hundred marks divided as follows:

| | |
|----------------|------------|
| Project Report | - 60 Marks |
| Viva Voce | - 20 Marks |
| Internal Marks | - 20 Marks |
- (5) The Evaluation of project Reports and Viva voce shall be co-ordinated by the H.O.D. and Senior Faculty members of the department along with external examiners appointed. The external examiner in consultation with internal examiner should conduct Viva-Voce and evaluate the report.
- (6) The decision of the Head of the Department shall be final and binding on the student with respect to the project work.

LIST OF COURSES FOCUSING ON EMPLOYABILITY/ENTREPRENEURSHIP/ SKILL DEVELOPMENT

| S.NO | COURSE CODE | NAME OF THE COURSE | EMPLOYABILITY | ENTREPRENEURSHIP | SKILL DEVELOPMENT |
|------|-------------|----------------------------------|---------------|------------------|-------------------|
| 1 | 19-21/63101 | Financial Accounting | ✓ | | |
| 2 | 19-21/63102 | Business Economics | ✓ | | |
| 3 | 19-21/63103 | Business Communication | | | ✓ |
| 4 | 19-21/63205 | Advanced Financial Accounting | ✓ | | |
| 5 | 19-21/63206 | Marketing Managemnt | | ✓ | |
| 6 | 19-21/63207 | Business Regulatory Framework | ✓ | | |
| 7 | 19-20/63309 | Corporate Accounting | ✓ | | |
| 8 | 1963310 | Internet & Digital Marketing | | ✓ | |
| 9 | 19-21/63311 | Consumer Behaviour | | ✓ | |
| 10 | 2063520 | Entrepreneurial Development | | ✓ | |
| 11 | Advertising | Advertising | | ✓ | |
| 12 | 19-21/63313 | Modern Banking | | | ✓ |
| 13 | 19-20/63414 | Customer Relationship Management | ✓ | | |

| | | | | | |
|----|------------------------|--|---|---|--|
| 14 | 20-21/63310 | International Marketing | ✓ | | |
| 15 | 2063146 | Brand Management | | | |
| 16 | 20-21/63417 | Retail Marketing | | ✓ | |
| 17 | 19-21/63418 | Business Statistics & Operations Research | ✓ | | |
| 18 | 1963521 | Cost accounting | ✓ | | |
| 19 | 19-20/63522 | Financial Management | ✓ | | |
| 20 | 1963523/206 3628 | Sales&distribution management | | ✓ | |
| 21 | 2063523(A) | Financial Services | ✓ | | |
| 22 | 1963524(B)/ 2063524 | Practical Auditing | ✓ | | |
| 23 | | Open Elective Social media marketing | | ✓ | |
| 24 | 1963625/206 3625 | Accounting for decision making | ✓ | | |
| 25 | 1963626/206 3626 | Service Mmarketing | | ✓ | |
| 26 | 1963627/206 3627 | Marketing Research & Information system | | ✓ | |
| 27 | 19-20/63628 (A) | Logistics & Supply Chain Management | ✓ | | |
| 28 | 19-20/63628 (B) | Industrial Marketing | ✓ | | |

APPENDIX – 19(i) (R&S)

UNIVERSITY OF MADRAS

BACHELOR OF COMMERCE DEGREE COURSE IN MARKETING MANAGEMENT

Faculty of Commerce

Choice Based Credit System (W.E.F.2019-2020)

DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE (AUTONOMOUS)

Shift – II

REGULATIONS

(As per Common Regulations framed by University of Madras)

SCHEME OF EXAMINATIONS:

FIRST SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|---|---------------------|---------|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – I | Language Courses | 4 + 2* | 3 | 3 | 40 | 60 |
| 2 | Part – II | English | 4 | 3 | 3 | 40 | 60 |
| 3 | Part – III | Core I - Financial Accounting - I | 6 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core II Business Economics | 5 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Allied I Business Communication | 5 | 4 | 3 | 40 | 60 |
| 6 | Part – IV | Non-Major Elective / *Basic Tamil / Advanced Tamil | 2 | 2 | 3 | 40 | 60 |
| 7 | Part – IV | Skill Based Subject Soft Skills – I | 2 | 3 | 3 | 50 | 50 |
| | Total | | 30 | | | | |

SECOND SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|---|------------------|---|--|---------|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – I | Language Courses | 4 + 2* | 3 | 3 | 40 | 60 |
| 2 | Part – II | English | 4 | 3 | 3 | 40 | 60 |
| 3 | Part – III | Core III Financial Accounting – II | 6 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core IV Marketing Management | 5 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Allied II Business Regulatory Framework | 5 | 4 | 3 | 40 | 60 |
| 6 | Part – IV | Non-Major Elective / *Basic Tamil / Advanced Tamil | 2 | 2 | 3 | 40 | 60 |
| 7 | Part – IV | Skill Based Subject Soft Skills – II | 2 | 3 | 3 | 50 | 50 |
| | Total | | 30 | | | | |
| Non-Major Electives (Semester I) | | | Non-Major Electives (Semester II) | | | | |
| Social Entrepreneurship | | | E-Waste Management | | | | |

THIRD SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|--|---------------------|---------|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – III | Core V Corporate Accounting | 6 | 4 | 3 | 40 | 60 |
| 2 | Part – III | Core VI Internet & Digital Marketing | 6 | 4 | 3 | 40 | 60 |
| 3 | Part – III | Core VII Consumer Behaviour | 5 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core VIII Advertising | 5 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Allied III Modern Banking | 6 | 4 | 3 | 40 | 60 |
| 6 | Part – IV | Skill Based Subject Soft Skills – III | 2 | 3 | 3 | 50 | 50 |
| | Total | | 30 | | | | |

FOURTH SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|--|---------------------|---------|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – III | Core IX Customer Relationship Management | 5 | 4 | 3 | 40 | 60 |
| 2 | Part – III | Core X International Marketing | 5 | 4 | 3 | 40 | 60 |
| 3 | Part – III | Core XI Brand Management | 5 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core XII Retail Marketing | 6 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Allied IV Business Statistics & Operations Research | 6 | 4 | 3 | 40 | 60 |
| 6 | PART-III | Allied V Internship (1 Month) | | 4 | | | |
| 7 | Part – IV | Skill Based Subject Soft Skills – IV | 2 | 3 | 3 | 50 | 50 |
| 8 | Part – IV | Environmental Studies | 1 | 2 | 3 | 50 | 50 |
| | Total | | 30 | | | | |

FIFTH SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|---|---------------------|---------|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – III | Core XIII Entrepreneurial Development | 5 | 4 | 3 | 40 | 60 |
| 2 | Part – III | Core XIV Cost Accounting | 5 | 4 | 3 | 40 | 60 |
| 3 | Part – III | Core XV Financial Management | 6 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Core XVI Sales & Distribution Management | 5 | 4 | 3 | 40 | 60 |
| 5 | Part – III | Elective I 1. Financial Services 2. Practical Auditing | 5 | 5 | 3 | 40 | 60 |
| 6 | Part –III | Open Elective Social Media Marketing (For Other Departments) | 2 | 5 | 3 | 40 | 60 |
| 7 | Part – IV | Value Education | 2 | 2 | 3 | 50 | 50 |
| | Total | | 30 | | | | |

SIXTH SEMESTER

| Sl.No | Course Component | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------|---|---------------------|---------|-------------------|------------|-----|
| | | | | | | CIA | ESE |
| 1 | Part – III | Core XVII Accounting for Decision Making | 6 | 4 | 3 | 40 | 60 |
| 2 | Part – III | Core XVIII Services Marketing | 6 | 4 | 3 | 40 | 60 |
| 3 | Part – III | Core XIX Marketing Research and Information Systems | 6 | 4 | 3 | 40 | 60 |
| 4 | Part – III | Elective II 1. Logistics & Supply Chain Management 2. Industry Marketing | 6 | 5 | 3 | 40 | 60 |
| 5 | Part – III | Project Work & VIVA VOCE | 6 | 4 | 3 | 20 | 80 |
| 6 | Part – V | Extension Activity | | 1 | | | |
| | Total | | 30 | | | | |

BACHELOR OF COMMERCE DEGREE COURSE IN MARKETING MANAGEMENT

| | |
|-----------------------------------|--|
| Semester | I |
| Subject | CORE I - FINANCIAL ACCOUNTING – I |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) |
| Exam Duration | 3 Hours |

Unit-I

Accounting - Meaning and scope of accounting - **Basic Accounting Concepts and Conventions- Objectives of Accounting – Accounting Transactions* – Double Entry Book Keeping – Journal, Ledger, Trial Balance - Rectification of errors – Preparation of Suspense Account – Effect of Rectification on Profits, Bank Reconciliation Statement.

Unit-II

Preparations of Final Accounts of a Sole Trading Concern – Adjustments – Closing Stock, Outstanding and Prepaid items, Depreciation, Provision for Bad Debts, Discount on Debtors, Interest on Capital and Drawings, Loss of Stock by Fire.

Unit-III

Depreciation – Meaning, Causes, Types – Straight-Line Method (SLM) – Written down Value method (WDV) – Sinking Fund Method.

Insurance claims – Average Clause (Loss of stock only)

Unit-IV

Accounting from Incomplete Records– Meaning, Features, Defects, Differences between Single Entry and Double Entry System – Statement of Affairs Method – Conversion Method.

Unit-V

Preparations of Receipt and Payments Accounts – Distinction between Revenue and Capital items - Income and Expenditure Account and Balance Sheet of Non-Trading Organization

** Self Study Portion*

Reference Books:

1. R.L.Gupta & V.K.Gupta – Financial Accounting – Sultan Chand Publishers, New Delhi
2. Jain & Narang - Financial Accounting – Kalyani Publishers
3. P.C. Tulsian – Financial Accounting – TATA Mc Graw Hill Publishers
4. Shukla & Grewal – Advanced Accountancy -Vol .I – S. Chand & Co.
5. Manikandan S, Rakesh Shankar R, Financial Accounting, Scitech Publications
6. T. S. Reddy & A. Murthy - Financial Accounting – Margham Publications

| | | |
|-----------------------------------|-------------------------------------|--------------|
| Semester | I | |
| Subject | CORE II – BUSINESS ECONOMICS | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives

1. To facilitate the understanding of the relevance and need of the Economics in the Current Scenario.
2. To customize the importance of Business Economics and its relevance in market conditions.

Unit- I:

Introduction to Economics – Wealth, Welfare, Scarcity and Growth Views on Economics – ***Positive and Normative Economics – Scope and Importance of Managerial Economics-** Economic approach, Circular flow of activity, **Nature of the firm, Forms of organizations, Objectives of firms.**

Concepts: Production possibility frontiers – Opportunity Cost – Accounting Profit and Economic Profit – Incremental and Marginal Concepts.

Unit-II:

Demand Function – Meaning of Demand – Determinants and Distinctions of demand – Law of Demand – Slope & Elasticity of Demand – Shifts in the demand curve vs. movement along the demand curve - ***Demand Forecasting.**

Supply Function – Meaning of Supply – Determinants of Supply – Law of Supply – Slope & Elasticity of Supply – shifts in the supply curve Vs. movement along the supply curve - Concept of Equilibrium.

Unit-III:

Consumer Behaviour - Indifference Curve – Definition, Properties and equilibrium - Law of Diminishing Marginal utility – Equi-marginal utility – Consumer surplus and producer surplus

Production Function - Factors of Production: Law of Variable proportion – Laws of Returns to Scale – **Costs of production -total cost, fixed cost, variable cost, average cost, marginal cost, short run and long run costs- Producer's equilibrium – Economies of scale - Break Even Analysis.**

Unit-IV:

Product pricing: price and output determination under perfect competition - profit maximization, monopoly- price discrimination, monopolistic competition, oligopoly- collusion and cartels- ***pricing objectives and methods.**

Unit-V:

Introduction to National Income Accounts – Models of National Income Determination – Economic Indicators; Technology and Employment – ***Issues and Challenges.**

* *Self Study Portion*

Reference books:

1. P.L. Mehta, Managerial Economics- analysis, problems and cases – Sultan Chand Publishers, New Delhi.
2. C.M Chaundhary, business economics- RBSA Publishers, Jaipur
3. H.L. AHUJA, business economics, Sultan Chand Publishers, New Delhi
4. Maddala, G.S., and E. Miller. Microeconomics: Theory and Applications. McGraw- Hill International Ed.
5. Gupta G S, Managerial Economics- TATA Mc Graw Hill International

| | |
|-----------------------------------|--|
| Semester | I |
| Subject | ALLIED I – BUSINESS COMMUNICATION |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To facilitate the students to understand the concept of Communication.
2. To know the Basic Techniques of the Modern forms of Communication.

Unit-I:

Introduction to Communication- Meaning and Definition - Process - Functions - **Objectives - Importance - Essentials of effective communication - Communication barriers - Overcoming communication barriers, Interactive Communication and the role of communication in the job of marketing & sales personnel.*

Unit-II:

**Types of Communication -Written - Oral - Face-to-face - Silence - Merits and limitations – modern methods of communication- E-Mail, Video Conferencing – *Social Corporate Networking. Business etiquette, Effective communication and convincing customers- Persuasive Communication & Handling Negativity; Presentations to Hostile Audience –Negotiating Skills.*

Unit-III:

Business Letters - Need and functions of business letters - Planning & layout of business letter - Kinds of business letters - Drafting of business letters - Enquiries and replies - Sales letters.

Unit-IV:

Market positioning in communication – Pillars of Marketing Communication [Mar.Com] – the Product, the benefit, the effect and the motivation – **Objectives of the Mar.Com Cycle*, marketing surveys- analysis and report writing (an Overview)

Unit-V:

Application of Communication Skills - Group Decision-Making - Presentation - Speeches – Customer Care/Customers Relations - Public Relations

** Self Study Portion*

Reference books:

Rajendra Pal, Essentials of Business Communication, Sultan Chand Publishers, New Delhi

1. N. S . Raghunathan & B. Santhanam, Business Communication, Margham Publications, Chennai
2. R. C. Bhatia, Business Communication, Ane Books Pvt Ltd, New Delhi
3. Munter, Mary. Guide to Managerial Communication: Effective Business Writing and Speaking, Prentice Hall,
4. Kaul Asha., Effective Business Communication, Prentice Hall of India

| | |
|-----------------------------------|---|
| Semester | II |
| Subject | CORE III - FINANCIAL ACCOUNTING - II |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To enable the students to know the Principles of Accounting related to the marketing field
2. To gain working knowledge on the special transactions relating to the marketing field.

Unit-I

Hire Purchase System – Introduction – Accounting procedure for high value goods – Default and Repossession – Hire purchase trading account – Installment purchase system – Accounting treatment.

Unit-II

Branch Accounting – Debtors system, Stock and debtors system, Independent branch (Foreign Branches excluded) – Branch final accounts system and whole sale basis system.

Departmental accounts – inter-departmental transfers.

Unit-III

Consignment Accounts – Meaning – Features of consignment business – distinction between sale and consignment – accounting treatment in the books of consignor and consignee – Valuation of Inventories – Normal Loss – computation of different types of commission – account sales

Joint Venture Accounts - Meaning – Features of joint venture transactions – distinction between joint venture and partnership – methods of maintaining joint venture accounts.

Unit-IV

Partnership Accounts – Admission, Retirement and Death of Partner(s) – Computation of Revised profit-sharing ratios - Accounting for Goodwill – Treatment of Reserves – Revaluation of Assets and Liabilities – Preparation of Balance Sheet of Reconstituted firm.

Unit-V

Dissolution of Partnership – Insolvency of a partner – Garner Vs Murray – Insolvency of one or more partners – Insolvency of all partners - piecemeal Distribution – Proportionate Capital Method and Maximum Loss method.

* *Self Study Portion*

Reference Books:

1. R.L.Gupta & V.K.Gupta – Financial Accounting – Sultan Chand Publishers, New Delhi
2. Jain & Narang - Financial Accounting – Kalyani Publishers
3. P.C. Tulsian – Financial Accounting – TATA Mc Graw Hill Publishers
4. Shukla & Grewal – Advanced Accountancy -Vol. I – S. Chand & Co.
5. Manikandan S, Rakesh Shankar R, Financial Accounting, Scitech Publications
6. T. S. Reddy & A. Murthy - Financial Accounting – Margham Publications

| | | |
|-----------------------------------|---------------------------------------|--------------|
| Semester | II | |
| Subject | CORE IV – MARKETING MANAGEMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives

1. To expose the students to the World of Marketing
2. To make the students understand the Functions of Marketing.

Unit – I:

Marketing Management – an Overview of basic concepts of market and marketing management - **what is marketing? - Responsibilities of Marketing Management* - Marketing Strategy Planning - Managing a Marketing Program - The Environment of Marketing - Analyzing Market Opportunities - Environmental Scanning - Differences between Micro and Macro Environment - Marketing Mix-The Traditional 4P's – the modern 7P's.

Unit – II:

Market Targeting - Buyer Behavior: Consumers and Industrial Buyer - Market Segmentation, Targeting and Positioning - **New Product Planning* – Marketing Strategies with reference to Product Life Cycle and Competitive Strategies.

Unit – III:

Marketing Mix Decisions - Product decisions- Differentiation, Branding, New product decisions - Pricing decisions - Marketing Channel and distribution strategy, sales force management decisions - Marketing Communications: Advertising and sales promotion decisions- ** role of Indian Advertising Standards Council*

Unit – IV:

Distribution - Channels of distribution - meaning and importance; Types of distribution channels; **Wholesaling and retailing* - Factors affecting choice of distribution channel.

Marketing organization - Marketing Control - Marketing Research and the Marketing Information System.

Unit – V:

Marketing of Services - International Marketing - Non-Business Marketing – Rural Marketing - Marketing in the Contemporary Environment, **Recent issues and developments in marketing* - Social Marketing - online marketing, green marketing, sustainable marketing and relationship marketing.

** Self Study Portion*

Reference Books:

1. C B Gupta & Dr. Rajan Nair –Marketing Management, Sultan Chand Publishers, New Delhi
2. William J Stanton – Marketing, Prentice- Hall of India, Economy Edition
3. Philip Kotler – Principles of Marketing, Prentice- Hall of India, Eastern Economy Edition
4. Majaro, Simon. The Essence of Marketing. Prentice Hall, New Delhi.
5. J Jayasankar, Marketing, Margham Publications, Chennai

| | | |
|-----------------------------------|--|--------------|
| Semester | II | |
| Subject | ALLIED II – BUSINESS REGULATORY FRAMEWORK | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives

1. To expose the students to the legal framework related to the business
2. To make the students understand the relevance of legal aspects in business and marketing.
3. To enable the students to understand the Legal Remedies available Law to the Business and other People.

Unit-I:

Introduction to Mercantile Law - Law of Contract and basic definitions -Kinds of Contracts, Essentials of a Valid Contract -offer and Acceptance and Communication, Consideration, Capacity to Contract, Free Consent, Legality of Object and Consideration, Performance of Contract, Discharge of Contract, Breach of Contract – Remedies.

Unit-II:

Special Contracts

Bailment- Definition and Essential elements, Rights and duties of bailor and bailee, Finder of lost goods.

Pledge- Essentials, Rights and duties of Pawnor and Pawnee, Indemnity- Definition, nature of liability of surety, rights of surety, Discharge of surety, Guarantee- Meaning and definition, types, revocation of guarantee

Unit-III:

The Sale of Goods Act, 1930 –Introduction – definition - goods and their classification; sale and a agreement to sell - essential elements of contract of sale - **sale distinguished from hire purchase and instalment sale* - **Conditions and Warranties** - distinction between condition and warranty - implied conditions and warranties- **Doctrine** of Caveat Emptor and its exceptions - Transfer of Ownership - passing of property from the seller to the buyer - unpaid seller and his rights.

Unit IV:

Contract of Agency – Creation – classification of Agents – Principal Agent relationships – **Delegation of authority* – Personal liability of agent – Termination of agency, Sub agents and substituted agents.

Unit V:

Information Technology Act – Scope, Objectives, Electronic Contracting, electronic records and digital signatures, **cyber offences*, legality of e-marketing.

Overview of The Competition Act- 2002, Consumer Protection Act- 1986, Food Safety and Standards Act- 2006

** Self Study Portion*

Reference Books:

1. N.D.KAPOOR, Elements of mercantile law, Sultan Chand & co
2. N.D.KAPOOR, Business Laws, Sulthan Chand & co
3. DR.M.R.Sreenivasan, Business Law 2nd Ed Margham Publication, Chennai
4. P.C.Tulsian Business Laws, 2nd ed, Tata Mcgraw Hill, New Delhi
5. R.S.N.Pillai and Bhagavathi, 2004, Business Law, 3rd Ed., S.Chand & Co., New Delhi

| | |
|-----------------------------------|--------------------------------------|
| Semester | III |
| Subject | CORE V - CORPORATE ACCOUNTING |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To enable the students about the Preparation of the Company accounts.
2. To motivate the students to understand the various Provisions of the Company Law & Accounting Standards.

Unit I:

Accounting for Issue of Shares & Debentures, Employee Stock Option Plan – **Meaning, importance*, Accounting for employee stock option plan.

Unit II:

Redemption of preference shares and Debentures – Underwriting of shares and Debentures.

Unit III:

Corporate Financial Reporting – Concepts - Final Accounts as per new guidelines – **divisible profits*, managerial remuneration, profits prior to incorporation.

Unit IV:

Valuation – Concepts – Valuation of Intangible Assets – Goodwill, Patents, trademarks, IPR's – **Characteristics* – Valuation methods.

Internal reconstruction: Concepts and accounting treatment (excluding scheme of reconstruction)

Unit V:

Corporate Restructuring - Concepts and accounting treatment as per Accounting Standard: 14 (ICAI) Advanced problems for Mergers and Amalgamations, (excluding inter-company holdings)

**Self Study Portion*

Reference Books

1. P.Jain and K.L.Narang, Corporate Accounting, Kalyani Publishers, New Delhi
2. R.L.Gupta and M.Radhaswamy, Advanced Accounting, Sultan Chand & Sons, New Delhi
3. S.N.Maheswarm Advanced Accounting, Sultan Chand & Sons, New Delhi
4. M.C.shukla & T.S.Grewal, Advanced Accounting, S.Chand & Co.Ltd. New Delhi
5. Hanif & Mukherjee, Advanced Accounting, TATA Mc Graw Hill Publications

| | | |
|-----------------------------------|---|--------------|
| Semester | III | |
| Subject | CORE VI – INTERNET AND DIGITAL MARKETING | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives

1. To highlight the emerging technologies in the area of marketing and familiarize the students with the trends.
2. To enable the students to understand the importance of Internet of Things in marketing.

Unit – I:

Digital marketing – Meaning, importance of digital marketing, Distinction from traditional marketing, **new trends and current scenario of the world*- Digital marketing a boon or a Bane – tool of success for companies - advantages to small and medium enterprises - Categorization of digital marketing for the business.

Web site - levels of web site, Difference between blog, portal & website - Diagnosis of the present website and business- SWOT analysis of business, website and media or promotion plan - Setting up vision, mission and goals of digital marketing- Website planning & Creation

Unit – II:

Search Engine Optimization (SEO) - On page optimization techniques- Off page Optimization techniques, - Book marking and news Aggregators, Preparation of Reports - Keywords, titles, meta tags etc.,

Unit – III:

Social Media Optimization (SMO) - Introduction to social Media Marketing - Advanced Facebook Marketing - Word Press blog creation - Twitter marketing - LinkedIn Marketing - Google plus marketing -- **Instagram Marketing* – Multimedia – YouTube Marketing - Optimization process. – Influencer Marketing.

Unit – IV:

Search Engine Marketing (SEM) – Introduction - Tools used for Search engine Marketing - PPC , **Google AdWords Tool* - Display advertising techniques - Report generation

Unit – V:

Analysis & Reporting Tools - Google Analytics - Online Reputation Management - E-Mail Marketing - Affiliate Marketing - AdSense & Blogging - Social Media Analytics Meaning, Social Media Analytical Tools - Ad designing – **Opportunities in Internet & Digital Marketing*.

**Self Study Portion*

Reference Books:

1. Digital Marketing for Dummies, Ryan Deiss and Russ Hennesberry
2. Puneet Bhatia (2018) Fundamentals Of Digital Marketing, Pearson Publication
3. Google Adwords for Beginners: A Do-It-Yourself Guide to PPC Advertising, Cory Rabazinsky
4. Seema Gupta (2018) Digital Marketing, Tata Mc GrawHill
5. Blogging: A Practical Guide to Plan Your Blog: Start Your Profitable Home-Based Business with a Successful Blog, Jo and Dale Reardon

| | | |
|-----------------------------------|--------------------------------------|--------------|
| Semester | III | |
| Subject | CORE VII – CONSUMER BEHAVIOUR | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives:

1. To expose the students to the consumer behaviours and factors influencing the buyer.
2. To make the students understand the importance of consumer's Behaviour in buying decision.

Unit – I :

Consumer Behaviour and Marketing Action: An overview – Consumer involvement, decision making processes and **purchase behaviour and marketing implications* –Consumer Behaviour Models

Unit – II:

Environmental influences on consumer behaviour – **Cultural influences* – Social class, reference groups and family influences - Opinion leadership and the diffusion of innovations – Marketing implications of the above influences.

Unit – III:

The individual consumer and buying behaviour and marketing implications – Consumer perceptions, learning, attitudes, **motivation and personality* – psychographics, values and lifestyles.

Unit – IV:

Strategic marketing applications – Market segmentation strategies – Positioning strategies for existing and new products, Re-positioning, perceptual mapping – Marketing communications – Source, message and media effects. Store choice and shopping behaviour – In-Store stimuli, store image and loyalty – Consumerism – **Consumer rights and Marketers' responsibilities*.

Unit – V :

The Borderless Consumer Market and buying behaviour – Consumer buying habits and perceptions of emerging non-store choices – Research and applications of consumer responses to direct marketing approaches – **Issues of privacy and ethics-* Satisfaction & Value Post–purchase Processes, Satisfaction and retention, Quality and satisfaction

** Self Study Portion*

Reference Books:

1. Suja R Nair (2018). Consumer Behaviour and Marketing Research, Himalaya Publishing House
2. David Loudon and Albert J Della Bitta (Reprint), Consumer Behavior, 4th edition. , Tata Mcgraw Hill
3. Henry Assael: Consumer Behaviour & Marketing Action, Kent Publishing Co.
4. Berkman & Gilson: Consumer Behaviour –Concepts and Strategies, Kent Publishing Co.
5. Bennet and Kassarjian: Consumer Behaviour, Prentice Hall of India

| | |
|-----------------------------------|--------------------------------|
| Semester | III |
| Subject | CORE VIII – ADVERTISING |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) |
| Exam Duration | 3 Hours |

Unit-I:

Advertising – Meaning, evolution and its role in the marketing process - Legal, Ethical and Social aspects of advertising. Communication - processes of communication; integrated marketing communications, reasons for its growth and its role in branding.

Unit-II:

The promotional mix; segmentation, Targeting and positioning and their role in promotion, Promotional objectives, determination, types and approaches, DAGMAR approach, problems in setting objectives; Advertising budget, establishment and allocation, budgeting approaches.

Unit-III:

Advertisement copy – meaning, concepts, components and types; The importance of creativity in advertising, creative strategy and process, implementation and evaluation

Unit-IV:

Media Planning, Establishing Media objectives, Media strategies, Media mix, Reach Vs. Frequency, Creative aspects, budget considerations, Evaluation of Broadcast media, Print media, Support media, Internet and interactive media etc.; computers in Media planning.

Unit-V:

Measuring the effectiveness of the promotional program, Advertising Research, Market testing, Testing via internet, Pre testing, Post testing, Laboratory Tests, Field tests, PACT (Positioning Advertising Copy Testing).

**Self Study Portion*

Reference Books:

1. Chunawalla, S.A., Advertising, Sales and Promotion Management, Himalaya Publishing House,
2. Mohan, Manendra; Advertising Management, Tata McGraw Hill, New Delhi
3. S.K. Sarangi, Advertisement & Sales Promotion, Asian Books Private Limited.
4. Belch, George E. and Belch, Michael A.; Advertising and promotion, Tata McGraw Hill, New Delhi
5. Ogilvy David, Ogilvy on Advertising, London, Longman.
6. Jones, John Philip, What’s in a brand, Tata McGraw Hill, New Delhi

| | | |
|-----------------------------------|------------------------------------|--------------|
| Semester | III | |
| Subject | ALLIED III – MODERN BANKING | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives:

1. To Familiarise the students to the basics of banking
2. To expose them to the modern banking system and to acquire basic knowledge related to business.

Unit-I:

Commercial bank – definition – classification of banking system– universal banking – functions – **role of commercial banks in economic development* – central banking – definition – need – principles – **central banking Vs commercial banking* – functions and role – RBI- functions and working – objectives – legal frame work.

Unit-II:

Opening bank accounts – type of bank accounts – KYC Norms - **FDR- Pay-in-slip book, Withdrawal forms* – special type of customers – bank lending – sources and factors of lending – Assessment and evaluation of customer profile and credit worthiness of the applicant for loan – Credit information Bureaus – CIBIL, Experian, Equifax, CRIF High Mark, Credit Records and Reference – disclosure to customers

Unit-III:

Negotiable instruments – meaning – definition – types – distinction between cheque, promissory note and bills of exchange - ** Cheque Truncation System [CTS] Cheques – meaning – advantages.* Endorsement – meaning – types - Crossing – definition – need – types – consequences – opening of crossing – marking of cheques - dishonouring of a cheque – payment in a crossed cheque – material alteration – statutory protection.

Unit-IV:

Paying Banker – meaning duties and liabilities of paying banker - **Collecting banker** – meaning – collecting banker’s role – collecting banker’s duty – collection of bills of exchange – Agent for collection – paying banker Vs collecting banker. **Customer grievances** – grievances redressal mechanism structure in banks – Banking Ombudsman.

Unit-V:

E-banking – meaning – services – Internet banking – Internet banking Vs. traditional banking – Limitations of internet banking – Mobile banking – Automatic Teller Machine (ATM) – Cash Deposit Machine (CDM) & Recycler Machine - Electronic Funds Transfers – National Electronic Fund Transfer [NEFT] - Real Time Gross Settlement [RTGS] – Intra – bank mobile payments system [IMPS]- Society for Worldwide Interbank Financial Telecommunication [SWIFT] – Indian Financial Network [INFINET]

** Self Study Portion*

Reference Books:

1. Dr. S.Gurusamy, Banking, Theory Law & Practice, Tata McGraw Hill, New Delhi
2. K.P.M.Sundharam, P.N.Varshney, Banking Theory Law & Practice – Sultan Chand & Sons
3. Khan, M.Y. Indian Financial System – Theory and Practice. Vikas Publishing House
4. B. Santhanam – Banking – Theory , Law & Practice, Margham Publications
5. K.C. Shekhar & Lekshmy Shekhar, Banking Theory and Practice, Kindle Store

| | |
|-----------------------------------|---|
| Semester | IV |
| Subject | CORE IX – CUSTOMER RELATIONSHIP MANAGEMENT |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To make the students understand the area of customer relationship Management.
2. To expose the students to learn the significance of CRM to be successful marketing personnel.

Unit I:

Introduction to CRM - Meaning – Definition – CRM technology - components, customer life style Customer Loyalty – customer interaction- Customer Satisfaction Analysis – e – CRM – Meaning- **features of e CRM* – Transformation from CRM to e-CRM – transformation process and benefits.

Unit II:

Communication in CRM – Communication Process – Customer Relationship Marketing – meaning, structure, process – Success Chain in CRM – Target Formulation – Customer Segmentation.

Unit III:

Customer Loyalty - Meaning – building customer loyalty in CRM - marketing campaign, campaign planning and management, business analytic tools.

Unit IV:

Implementing CRM - Pre implementation, kick off meeting, requirements gathering, detailed proposal generation, development, training, roll out, ongoing support, system, follow up – Relationship marketing reward systems (An Overview).

Unit – V:

Technology for CRM – Components – Creating value for customers – Customization of technology – critical areas – customer care – call centre – Technological solutions – Integration of ERP.

* *Self Study Portion*

Reference Books:

1. John Egan, “Relationship Marketing, Exploring Relational Strategies In Marketing”, Prentice Hall.
2. John Anton, “Customer Relationship Management”, Prentice Hall.
3. Jagdish N Sheth and Atul Parvatiyar, “Handbook of Relationship Marketing”, Response Books,
4. Anderson, “Customer Relationship management”, Tata McGraw Hill,
5. David Strutton; Lou E. Pelton; James R. Lumpkin, “Marketing Channels: A Relationship Management Approach”, McGraw-Hill Higher Education.

| | |
|-----------------------------------|---|
| Semester | IV |
| Subject | CORE X – INTERNATIONAL MARKETING |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To acclimate the students about the concept of International Marketing.
2. To enable the students to learn the Modern Techniques of World Marketing.

Unit – I:

Introduction to International Marketing – Meaning, Importance - Scope and challenges of international marketing - Recent trends and developments in international trade, protectionism, trade barriers, easing trade restrictions, role of the IMF and World Bank, WTO and TRIPS, TRIMS and liberalization of service industries. - International Marketing Environment- Political and legal systems – **Culture and Business Customs*.

Unit – II:

International Marketing Mix - International Research and Segmentation- Developing Global Products and Pricing - **International Promotion and Advertising* - International Distribution Systems.

Unit – III:

International Marketing Planning - Managing Systems for International Marketing - Reflection and Evaluation of the Endeavors - **Assessing international market opportunities* - marketing research – International marketing management - planning and organization - Market entry strategies - export, joint ventures and direct investments.

Unit – IV:

Global product management - **standardisation vs. differentiation* - Product planning and development - Marketing industrial products and services globally - Pricing for international markets.

Unit – V:

Global logistics management - International distribution systems - **Global advertising and promotional strategies* - Sales management - Developing marketing strategies and programs for international markets.

** Self-Study Portion*

Reference Books:

1. Philip R.Cateora and John L.Graham, International Marketing, McGraw-Hill 10th Edn
2. Micheal R.Czinkota and Ilkka A.Ronkainen: Global Marketing, The Dryden Press
3. Terpstra & Sarathy: International Marketing, Thomson Press.
4. Daniels and Raderbaugh: International Business
5. Daniels, Raderbaugh & Sullivan: Globalisation and Business, Prentice-Hall India,

| | |
|-----------------------------------|-----------------------------------|
| Semester | IV |
| Subject | CORE XI – BRAND MANAGEMENT |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours (per week) |
| Exam Duration | 3 Hours |

Unit – I:

Introduction to Brands – What is a Brand – Brands Vs Products – Types of brands – Functions of branding – Brand attributes – Significance of branding to consumers & firms – Brand names

Unit – II:

Brand Awareness –Types of Brand Awareness, Brand Image – Types of Associations, Brand Identity, Brand Personality – Steps of brand building – Defining and establishing brand values – Brand knowledge, Brand portfolios and market segmentation

Unit – III:

Identifying and establishing brand positioning – Brand Leveraging and Brand Performance – Creating Core Brand Values – Building Branding Strategies – Brand Extensions, Brand Licensing, Franchising and Global Branding

Unit – IV:

Brand equity – Customer based brand equity – Sources of brand equity – Measuring sources of brand equity and consumer mindset – Establishing a brand equity management system, Co-branding – Brand Rejuvenation and Re launch

Unit – V:

The new competitive environment and branding – Designing & Sustaining Branding Strategies – Packaging design and branding for the consumer – Celebrity endorsements – Luxury brands

Reference Books:

1. Sunil B Rao, Md. Ghouse Basha T and D N Kumar (2018). Brand Management. Vision Book House.
2. Niraj Kumar & Mr. Paras Tripathi (2018) Brand Management, Himalaya Publishing House
3. K. Sasikumar & K.S. Chandrasekar (2015) Brand Management Practices - Issues and Trends, Himalaya Publishing House
4. S.A.Chunawalla (2018), Compendium of Brand Management. 5th Edition. Himalaya Publishing House

| | |
|-----------------------------------|------------------------------------|
| Semester | IV |
| Subject | CORE XII – RETAIL MARKETING |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To expose the students to learn the area of Retail Marketing and its management.
2. To enable the students to learn the nature of the Consumer behavior in Retail Marketing.

Unit – I:

Introduction to Retailing – Retailing in India - Significance of retail industry - Marketing retail equations - new role of retailer - **Indian retail scenario and its future prospects*. Retail life cycle – Retail value chain

Unit – II:

Retail Formats - Classification of retail stores - The role of franchising in retail - The factors influencing retail shopper - Store Locations, importance of store locations, types of locations, steps involving in selection of store, **Retail Store Design & Visual Merchandising*.

Understanding the Retail Consumers, Consumer decision making process, the use of market research as a tool for understanding markets and consumers

Unit – III:

Retail Pricing – Meaning, factors affecting price, **elements of retail price*, developing a pricing strategy, adjustment to retail price

Retail Merchandising, Meaning, Evolution, process of merchandise buying- Role of merchandiser- Retail sourcing- Merchandise planning

Unit – IV:

Servicing the Retail Customer

Retail Communication - The concept of customer service, the gaps in customer service, methods and tools available for encouraging loyalty, **role of retail sales person in customer service*.

Unit – V:

Retail Management and IT - **Role and importance of IT* - application of IT- recent developments in retail channel. E-tailing- online shopping- difference between store shopping and online shopping.

** Self Study Portion*

Reference Books:

1. Berman , Barry and Joel Evans, Retail Management
2. Cooper, J., Strategy planning in Logistics and Transportation
3. Cox, Roger and Paul Brittain, Retail Management
4. Levy & Weitz, Retailing Management
5. Philip Kotler , Marketing Management

| Semester | IV |
|----------------------------|---|
| Subject | ALLIED IV – BUSINESS STATISTICS AND OPERATIONS RESEARCH |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To facilitate the understanding of the relevance and need of the Statistics in the Current Scenario.
2. To Customize the importance of Business Statistics & Operations Res. for the Commerce Students.

Unit – I:

Introduction to statistics - Definition, Scope and limitation of statistics.

Collection of Data - Meaning, types of data – **Classification of data: Types of classification-*

Frequency Distribution- Tabulation of data: Components of table – Formation of frequency table-

Diagrammatic and graphical representation of data- Simple bar diagram, multiple bar diagram, subdivided bar diagram, Deviation bar diagram, Histogram, Pie diagram.

Measures of Central tendency - Mean, median and mode.

Unit – II:

Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation – Measures of Skewness. Correlation – Meaning - Types – Karl Pearson's co-efficient of Correlation – Rank Correlation – Concurrent Deviation - Regression analysis (Simple Problems) - **application in business decisions*

Unit – III:

Introduction to Operations Research (OR) - Meaning & scope - **characteristics* – models in OR – Linear Programming Problem – formulation – graphical method.

Unit – IV:

Transportation model –Balanced and unbalanced transportation problem- minimization and maximization - basic feasible solution – formulation, Solving Transportation using North West Corner Rule, Least Cost Method – Vogel's Approximation method – MODI Method - Assignment models- Balanced and Unbalanced problems (Minimization Only).

Unit – V:

Network Analysis - **importance in business decisions* - PERT and CPM (no crashing) (Simple Problems only)
Game Theory – Meaning, Importance – Pay offs, Pure Strategy Vs. Mixed Strategy – Two Way game theory.

** Self-Study Portion*

Reference Books:

1. P.R.Vittal, Business Mathematics & Statistics, Margham Publications
2. S.C.Gupta and V.K.Kapoor, Business Statistics, S.Chand & Co.
3. Hamdy A Taha, Operation Reasearch – An introduction Prentice Hall of India – New Delhi
4. P.K.Gupta & Man Mohan, Problems in Operations Reasearch – Sultan Chand & Sons – New Delhi
5. S P Gupta, Statistical Methods, Sultan Chand Publishers.

| | | |
|-----------------------------------|--|--------------|
| Semester | V | |
| Subject | CORE XIII – ENTREPRENEURIAL DEVELOPMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives:

1. To make the students to understand the concept of Entrepreneurship and their work in life.
2. To enable the students to know the effectiveness of the Manpower in Entrepreneurship.

Unit I:

Concept of entrepreneurship – definition – traits – types – **classification of entrepreneurs* – factors influencing entrepreneurship – Entrepreneurs in India.

Unit II:

Women entrepreneurs – definition – problems – **Development of women entrepreneurship* – Women Entrepreneurs and Self Help Group (SHG's) – Micro Finance - rural entrepreneurship – problems – relationship between rural and urban markets. Strategic Approaches: Niche strategy – Networking – Geographic Concentration.

Unit III:

Search for business idea – Project Proposal - sources of project identification – formalities of setting up a unit – project selection –project evaluation - project formulation – feasibility analysis – projects report – types.

Unit IV:

Institutional finance to entrepreneurs – **commercial banks*, Development banks and autonomous organizations – Industrial Development Bank of India (IDBI) – Industrial Finance Corporation of India (IFCI) – Industrial Investment Bank of India Ltd (IIBI) – Small Industries Development Bank of India (SIDBI) – Small Industries Development Organization (SIDO).

UNIT V:

Entrepreneurial development programme – Role and Relevance – role of government organizations - - State Industries Promotion Corporation of Tamil Nadu (SIPCOT), District Industries Centre (DIC), Securities Industry Development Corporation (SIDC), Micro & Small Medium Enterprises (MSME) – Technical Consultancy Organisations (TCO) and Non-Governmental Organisations (NGOs')

**Self Study Portion*

Reference Books:

1. C.B.GUPTA and S.P.SRINIVASAN, Entrepreneurial Development, Sultan Chand Publishers
2. S.S.KHANKA, Entrepreneurial Development, S. Chand & Co.
3. Ramachandran K, Entrepreneurial Development, TATA Mc Graw Hill Publishers
4. Jayashree Suresh, Entrepreneurial Development, Margham Publications, Chennai
5. Chalam KS, Women Entrepreneurs and Socio-Economic Development, Serials Publications

| | | |
|-----------------------------------|-----------------------------------|--------------|
| Semester | V | |
| Subject | CORE XIV – COST ACCOUNTING | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives

1. To make the students to know the Process of Accounting for Cost Elements.
2. To understand the advantages of Costing to the Stakeholders, Workers, Creditors and the Public.

Unit I:

Introduction to Cost Accounting – Meaning - **Objectives and advantages of cost accounting, Relationship between cost accounting and financial accounting.*

Cost concepts and classifications - Cost centers and Cost units - Role of a cost accountant in an organization.

Elements of cost – Preparation of cost sheets – Tenders and quotations – Reconciliation of Cost & Financial Accounts. (Reference to Cost Accounting Standard (CAS)– 1)

Unit II:

Materials - Procurement procedures— Store procedures and documentation in respect of receipts and issue of stock, - Material/inventory control- concept and techniques- Techniques of fixing of minimum, maximum and reorder levels, EOQ, ABC classification; Stock taking and perpetual inventory.

Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues – FIFO, Weighted Average, Standard, Treatment of Material Losses. (Reference to CAS – 6)

Unit III:

Labour cost – Attendance and payroll procedures, Overview of statutory requirements, Overtime, Idle time and – Labour turnover – Remuneration systems and incentive schemes. (Reference to CAS – 7)

Overhead – Classification – allocation, apportionment and absorption of overhead. Under and over-absorption – Machine Hour rate.

Unit IV:

Costing Systems - Process costing – Treatment of Normal, Abnormal losses and Gains – Valuation of Work- in Progress

Unit V:

Contract Costing- Progress payments, Retention money, Escalation clause, Contract accounts, Accounting for material, Accounting for plant used in a contract, Contract profit and Balance sheet entries.

Reference Books:

1. S.P.Jain and K.L.Narang, Cost Accounting, Kalyani Publishers.
2. Dr.S.N.Maheswari, Principles of Cost Accounting, Sultan Chand Publications
3. V.K.Saxena and C.D.Vashist, Cost Accounting, Sultan Chand Publications
4. S.P. Iyengar, Cost Accounting, Sultan Chand
5. T.S.Reddy and Y.Hari Prasad Reddy, Cost Accounting, Margham Publications

| | | |
|-----------------------------------|---------------------------------------|--------------|
| Semester | V | |
| Subject | CORE XV – FINANCIAL MANAGEMENT | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives

1. To expose the students to the area of Sales & Distribution in Marketing.
2. To enable the students to understand the significance of Sales & Distribution Management in Marketing.

Unit I:

Financial management – introduction – Scope and objective – **Finance and other related disciplines* – Financial Functions. Financial Goals - Profit Maximization Vs Wealth Maximization – Concept of time value of money – Risk and return - **Sources of financing – short term and long term.*

Unit II: (Theory & Problems)

Cost of Capital and Financing Decision - Sources of long-term financing Estimation of components of cost of capital. Methods for Calculating cost of equity capital, Cost of Retained Earnings, Cost of Debt and Cost of Preference Capital, Weighted Average cost of capital (WACC) and Marginal cost of capital. Capital structure Optimum capital structure – Determinants of Capital Structure - Operating and financial leverage.

Unit III: (Theory & Problems)

The Capital Budgeting Process - Cash flow Estimation - Payback Period Method - Accounting Rate Of Return - Net Present Value (NPV) - Net Terminal Value - Internal Rate of Return (IRR) - Profitability Index - Capital budgeting under Risk – Certainty Equivalent Approach and Risk- Adjusted Discount Rate – Decision Tree Analysis.

Unit IV: (Theory Only)

Dividend Decision – Meaning – Types – Determinants - Cash and stock dividends – Capitalisation of dividend – Bonus and Rights Issue.

Unit – V: (Theory & Problems)

Working Capital Decisions - **Concepts of working capital*, the risk-return trade off, **sources of short-term finance*, working capital estimation, cash management, receivables management, inventory management.

**Self Study Portion*

Reference Books :

1. M.Y.Khan and P.K.Jain – Basic Financial Management , TATA Mc Graw Hill Publications
2. I.M.Pandey financial management, Vikas Publications
3. S.M.Maheswari financial Management, Sultan Chand Publications
4. R.K. Sharma & Shashi. K. Gupta, Financial Management , Kalyani Publishers.
5. Prasanna Chandra, Financial Management, TATA Mc Graw Hill Publishing

| | |
|-----------------------------------|--|
| Semester | V |
| Subject | CORE XVI –SALES & DISTRIBUTION MANAGEMENT |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 5 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To expose the students to the area of Distribution management.
2. To enable the students to understand the significance of intermediaries & Sales Personnel in Marketing

Unit- I:

Sales Management and Personal Selling: Objectives and sales management, sales executive as a coordinator, sales management and control , sales organisation - it's purpose , setting up a sales organisation , types of sales organisation .
Objectives of personal selling, analysing market potential, sales potential and sales forecasting methods, determining sales related marketing policies - product policies, distribution policies & pricing policies.

Unit –II:

Sales Operations: Sales budget , sales territories , sales Quota's , control of sales , **sales meeting and sales contest*, organizing display , showroom and exhibitions.

Unit- III:

Salesmanship & Sales Force Management: Sales manager- Qualities and functions, **types of salesman, prospecting* , pre-approach & approach , selling sequence , psychology of customers . **Sales force Management** - Recruitment & selection, training, formulation & conduction of sales training programme, motivation, compensation, evaluation and supervision of sales personnel .

Unit- IV:

Physical Distribution - Participants in the physical distribution function, the environment of physical distribution – Channel Design strategies and structures, **selecting channel members*, setting distribution objectives and tasks – Target markets and channel design strategies.

Unit-V:

Managing the marketing channel - Product, Pricing and Promotion issues in channel Management and Physical Distribution – Motivating channel members – Evaluating channel member performance – Vertical marketing systems – Retail co-operatives, **Franchise systems and corporate marketing systems*, introduction to e-Commerce and e-retailing as a channel of distribution.

** Self Study Portion*

Reference Books:

1. P.Venugopal, Sales and Distribution Management: An Indian Perspective, SAGE
2. T.K. Panda & Sunil Sahadev, Sales and Distribution Management, Oxford
3. Krishna Havaladar, Sales & Distribution Management, TATA Mc Graw Hill
4. Bert Rosenbloom: Marketing Channels – A Management View, Dryden Press.
5. Still , Cundiff & Govani, Sales management & Case

| | | |
|-----------------------------------|--|--------------|
| Semester | V | |
| Subject | ELECTIVE I – FINANCIAL SERVICES | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 5 Credits / 5 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives

1. To make the students understand the area of Financial Services.
2. To expose the students to learn the significance of importance of Financial Service

Unit I:

Financial Services - An Overview – functions – financial services market – credit cards - concept – features, facilities and services - benefits and drawbacks – Credit card frauds — ****Debit Cards: Concept and mechanism – dangers and precautions in the use of debit cards.***

Unit II:

Credit rating – features and advantages – major issues – ****credit rating agencies*** – regulatory framework – major factors in credit rating – **Commercial Bill Financing** - meaning of commercial bills – features and advantages of commercial bill financing – precautions by a banker – steps in discounting and purchasing of bill.

Consumer finance - meaning – types – mode – factors – marketing of consumer finance.

Unit III:

Factoring - definition – mechanism – characteristics – types – advantages and disadvantages – players in factoring services – functions of a factor – factoring costs – factoring Vs bills discounting – cost – benefit analysis of factoring – Forfeiting (An Overview) **Leasing** - Concept – characteristics – types – financial lease Vs Operating lease – tests for financial lease - advantages – limitations – overview of sale and Lease back concepts – tax implications.

Unit-IV:

Merchant banking - definition – functions – code of conduct – regulatory framework. **Mutual funds** - definition – products and schemes - working mechanism of mutual funds –regulatory structure of mutual funds in India - Asset Management Company (AMC) – functions - SEBI requirements on AMC – Association of Mutual Funds of India (AMFI).

Unit – V:

Securitisation - definition – pass through certificates – features – need – mechanism – purposes – asset characteristics – application – benefits – economic functions – limitations – Securitization as a risk management tool. **Book – building** - concept – characteristics – process – allocation procedure.

** Self Study Portion*

Reference Books:

1. GURUSAMY.S Financial services, Tata McGraw Hill
2. GURUSAMY.S Merchant Banking and Financial Services, Tata McGraw Hill
3. Khan M Y Financial Services, Tata McGraw Hill
4. Kothari, Vinod Lease financing & Hire Purchase including consumer credit, Wadhwa and company
5. B. Santhanam, Financial Services, Margham Publications, Chennai

| | | |
|-----------------------------------|---------------------------------------|--------------|
| Semester | V | |
| Subject | ELECTIVE I –PRACTICAL AUDITING | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 5 Credits / 5 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives

1. To expose the students to the area of practical Auditing
2. To enable the students to understand the significance and importance of auditing.

Unit I:

Auditing Concepts - Nature and limitations of Auditing, Basic Principles governing an audit, Ethical principles and concept of Auditor's Independence, *Relationship of auditing with other disciplines.

Unit II:

Planning and conduct of Audit – Audit Planning – Audit Programme
 Audit Documentation - Audit Note Book – Audit Working Papers – Audit Files
 Audit evidence - Audit procedures for obtaining evidence, Sources of evidence, Reliability of audit evidence, Methods of obtaining audit evidence, Physical verification, Direct confirmation, Re-computation, Analytical review techniques, Representation by management. (SA 500 - 599)

Unit III:

Internal Control - Elements of internal control, Review and documentation, Evaluation of internal control system, *internal control questionnaire, Internal control check list, Tests of control, Application of concept of materiality and audit risk, Concept of internal audit.

Unit IV:

Audit sampling. - Types of sampling, Test checking, Techniques of test checks.
 Vouching - Audit of Payments, Audit of receipts, Audit of Purchases, Audit of Sales, Audit of suppliers' ledger and the debtors' ledger, Audit of impersonal ledger, Audit of assets and liabilities.

Unit V:

Company Auditor – Qualification, Disqualification, Appointment, Rights, Duties, Ceiling Limit and Liabilities of an auditor. Audit Report – Characteristics – types of opinion – preparation of reports and certificates, disclosures, *Latest Trends in Auditing – Information System Audit. (SA 700 – 709)

* *Self Study Portion*

Reference Books:

1. Dinkar Pagare, Principles and Practices of Auditing, Sultan Chand and Sons, New Delhi
2. S.Vengadamani, Practical Auditing, Margham Publications.
3. Sharma T.R., Auditing Principles & Problems, Sahitya Bhawan, Agra
4. Kamal Gupta and Ashok Arora, Fundamentals of Auditing, Tata McGraw Hill Publishing Company
5. B.L.Tandon, Auditing.

| | |
|-----------------------------------|---|
| Semester | V |
| Subject | OPEN ELECTIVE – SOCIAL MEDIA MARKETING (Other Departments) |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 5 Credits / 2 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1.

Unit I

Introduction to social media Marketing – Need - Advantages - Disadvantages of social Media Marketing.

Unit II:

Social media channels and their utility

Types of Social Media Marketing – Facebook - Twitter, YouTube, Instagram and LinkedIn

Unit III:

Social Networks- Media Sharing Networks- Discussion forums- Consumer Review Networks

Unit IV:

Role of Social Media marketing in ecommerce

Unit V:

Social Media Advertising - AdWords, Search Advertising, Display Advertising - Video Advertising - Mobile Advertising

| | |
|-----------------------------------|--|
| Semester | VI |
| Subject | CORE XVII –ACCOUNTING FOR DECISION MAKING |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To make the students to know the analysis of financial statements.
2. To understand the advantages of management to the Stakeholders, Workers, Creditors and the Public.

Unit – I:

Management accounting - meaning, nature scope and functions, need, importance and limitations- **management accounting vs cost accounting. Management accounting vs financial accounting.* Analysis and interpretation of financial statements - nature, objectives, essentials and tools. Methods- comparative statements, common size statement and trend analysis.

Unit – II:

Ratio analysis- interpretation, **benefits and limitations* - classification of ratios- liquidity, profitability, turnover ratios – construction of statement of proprietary funds and balance sheet.

Unit – III:

Funds flow Statement – Schedule of changes in Working Capital – Sources and applications of Funds
Cash flow analysis as per AS – 3 (Operating, Investing and Financing Activities).

Unit – IV:

Budgeting and budgetary control: Concept of budget and budgetary control - **objectives, merits, and limitations*, Functional budgets, Fixed and flexible budgets, Cash Budget - Zero base budget, – Variance Analysis – Material Variance only.

Unit – V:

Marginal costing- Break even analysis- Marginal Costing Vs Absorption costing- CVP Analysis- Decision making Areas - sales mix, Product mix, key factor, Merging of plant, make or Buy Decisions, acceptance of foreign orders, discontinuance of a product line.

**Self Study Portion*

Reference Books :

1. S N Maheswari, Management Accounting – Sultan Chand Publications
2. Dr A Murthy and Dr S Gurusamy, Cost Accounting, Tata McGraw Hill
3. RSN Pillai & Bagavati, Management accounting- S Chand & Co Ltd – New Delhi.
4. Horngren sunder Stratton, introduction to management accounting – Pearson education.
5. T.S.Reddy and Hari Prasad Reddy, Management Accounting, Margham Publication

| | |
|-----------------------------------|---------------------------------------|
| Semester | VI |
| Subject | CORE XVIII –SERVICES MARKETING |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives :

1. To make the students understand the area of Services Marketing.
2. To expose the students to learn the significance of Marketing Service

UNIT I:

Introduction – evolution and growth of service sector - characteristics of services - **Distinction between goods and services* - classification of services.

UNIT II:

Service Marketing Mix— Elements: Service Products, Pricing in Services, Service Promotion. Place in Services, and People in Services, Managing Service Quality, Relationship Marketing — Concept, -Application - Marketing Strategy.

UNIT III:

Cost of services, Pricing – objectives of pricing – cost based pricing – monetary and non monetary costs – value based pricing – pricing tactics – applications of pricing.
Promotion – designing the promotional mix – **personal selling – advertising – sales promotion* – publicity and public relations – Service location – factors affecting choice of service location – Distribution – methods of distributing services – challenges in distribution of services.

UNIT IV:

Place-Service distribution - components of service delivery system - potential management - problems associated with services delivery.

Physical Evidence- concept of Physical Evidence, importance, types of Physical Evidence in various services – designing physical evidences for services.

Unit – V:

Marketing of Services – Banking Services – Financial Services – Insurance Service Marketing - Application of Service Marketing to Hospitals & Health care industry - Tourism and telecommunication services – Educational Institutions.

**Self Study Portion*

Reference Books

1. Valarie. A. Zeithaml, Service Marketing, Tata Mc Graw Hill, 2000.
2. Christopher Lovelock, Service Marketing, Pearson Education Asia, 2000
3. Helen Woodruff, Services Marketing, Macmilan India Limited
4. Govind Apte, Services Marketing, Oxford University Press India
5. L . Natarajan, Services Marketing, Margham Publications, Chennai

| | | |
|-----------------------------------|--|--------------|
| Semester | VI | |
| Subject | CORE XIX –MARKETING RESEARCH & INFORMATION SYSTEM | |
| Maximum Marks | CIA- 40 Marks | ESE-60 Marks |
| Credits/ Instruction Hours | 4 Credits / 6 Hours(per week) | |
| Exam Duration | 3 Hours | |

Objectives :

1. To make the students understand the area of Marketing Research & Information System.
2. To expose the students to learn the significance of MRIS in the marketing field.

Unit – I:

The Marketing Research System - Definition of MR - Basic and Applied Research – the Research Process – Types of Research - Steps in MR Process - Research Design – **Data Sources* - Marketing Information System.

Unit – II:

Sampling – Simple and Complex Sampling Procedures - Stratigical, Systematic, Area, Random-Digit Dialing - **Sample Size - Sampling Errors.*

Unit – III:

Measurement - Factors in Measurement - Concepts of Validity and Reliability - Attitude Measurement - **Scaling Procedures* - Casual Designs – Four Design Procedures.

Unit – IV:

Data Instruments - Data Collecting Methods - Field Operations - Errors and Difficulties - Data Processing, Coding and Editing.

Unit – V:

Data Analysis - Univariate, Bivariate, Multivariate -Hypothesis Testing – **Descriptive and Inferential Statistics* - Anova, Ancova, Manova, Factor, Cluster, Discriminant Analysis - Report Writing - Presentation of Data - Diagrammatic – Pareto analysis – Ishikawa diagrams.

**Self Study Portion*

Reference Books:

1. Naresh K Malhotra: Marketing Research, An applied orientation, Pearson Education Asia.
2. Thomas C. Kinnear & James R. Taylor: Marketing Research
3. Aaker, Kumar & Day: Marketing REsearch, John Wiley & Sons
4. Boyd, Westfall & Stasch: Marketing Research – Text and cases, Richard D Irwin Inc., AITBS
5. Paul E. Green & Donald S Tull: Research for Marketing Decisions.

| | |
|-----------------------------------|--|
| Semester | VI |
| Subject | ELECTIVE II – LOGISTICS & SUPPLY CHAIN MANAGEMENT |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 5 Credits / 6 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To expose the students to learn the area of Logistics
2. To enable the students to understand the significance of the Logistics and Supply Chain Management.

Unit I:

Concepts of Logistics – Evolution – **Nature and Importance* – Components of Logistics Management – Competitive advantages of Logistics – **Functions of logistics management* – Principles – Logistics Network – Integrated Logistics system. Supply chain management – Nature and Concepts – Value chain – Functions – Supply chain effectiveness – Outsourcing – 3PLs and 4PLs – supply chain relationships – Customer services - Issues and challenges for developing countries in Logistics and Supply Chain Management.

Unit II:

Elements of Logistics and Supply chain management – Inventory carrying – Warehousing – Material handling – order processing – **Transportation – Demand Forecasting* – Impact of Forecasts on Logistics and Supply chain management – Performance measurements.

Unit III:

Transportation – Position of Transportation in Logistics and Supply chain management – **Road, Rail, Ocean, Air, Transport multi model transport* – Components of a logistic system – Ocean transport – ships – types – measurement of capacity of ships – shipping information.

Unit IV:

Containerization – CFS – ICDS – Selection of transportation mode – Transportation Network and Decision – Insurance Aspects of logistics. Logistical Information System (LIS) – Operations – Integrated IT solution for Logistics and Supply chain management – Emerging technologies in Logistics and Supply Chain management.

Unit V:

Export Procedures – Exporting General Merchandise – Documents for exporting - Containerized cargo for export through Inland container Depots – Infrastructure development – Comparative evaluation of transport system – Decision Criteria.

** Self Study Portion*

Reference Books:

1. Krishnaveni Muthjiah, 'Logistics Management and Seaborne Trade' Himalaya Publishing House.
2. D.K.Aarwal, 'Textbook of Logistics and Supply chain management' , Macmillan India Ltd.
3. Martin Christoper, 'Logistics and Supply chain management' Pearson Education, 2003
4. Ronald H.Ballou, 'Business Logistics and Supply Chain management' Pearson Education
5. Coyle, Managing Supply Chain Management – A Logistics Approach, CINGAGE Learning

| | |
|-----------------------------------|---|
| Semester | VI |
| Subject | ELECTIVE II – INDUSTRIAL MARKETING |
| Maximum Marks | CIA- 40 Marks ESE-60 Marks |
| Credits/ Instruction Hours | 5 Credits / 6 Hours(per week) |
| Exam Duration | 3 Hours |

Objectives

1. To impart knowledge on the area of Industrial Marketing.
2. To facilitate the students to learn about the Industrial structure in terms of Marketing Practices.

Unit I:

Industrial Marketing - Difference between Consumer and Industrial Marketing - **Nature of Industrial Marketing* - Understanding Industrial Markets and Environment.

Unit II:

Nature - Positioning - Buyer, Seller Relationship - Industrial Market Research – Marketing Intelligence.

Unit III:

Industrial Consumers - Buyer motives - Buyer temperament - The Special case of Purchasing by Public Institutions

- Buyer characteristics - ** Customer types* - Buyer population - Size - Distribution - Types of Purchasing organization - Business and Institutional buyers - Government buyer.

Unit IV:

Marketing Strategy - Formulating strategy - Product development - Determinants of Product mix - Industrial Marketing Channels - Industrial Pricing - Decisions - The Promotional component - **Advertising - Personal Selling and Sales Promotion.*

Unit V:

Strategic Goals - Identifying marketing opportunities - Goals based on market share and on sales forecast - Marketing budget - Process of control - Comparing Standards and Performance - **Corrective action* - Problems in Industrial Selling and Marketing.

** Self Study Portion*

Reference Books:

1. Krishna K Havaladar, Industrial Marketing, SAGE Publishers.
2. Richard M.Hill,Ralph S.Alexander,James S.Cross,I ndustrial Marketing ,A.I.T.B.S Publishers, New Delhi.
3. Michael D.Hutt and T.V. Spech, Industrial Marketing Management, The Dryden Press, New York
4. Boland, R.G.A.and Oxtoby. R.M, Industrial Marketing Languages and Concept

UNIVERSITY OF MADRAS
BACHELOR OF STATISTICS DEGREE COURSE IN STATISTICS
CHOICE BASED CREDIT SYSTEM (CBCS) WITH GRADING SEMESTER SYSTEM WITH CREDITS

Curriculum Framework and Syllabus for Outcome Based Education in

Dwaraka Doss Goverdhan Doss Vaishnav college (Autonomous)

B.Sc., (statistics)

(Effective from the Academic year 2021-22)

REGULATIONS

1. ELIGIBILITY FOR ADMISSION

Candidates for admission to B.Sc., Degree course in Statistics shall be required to have passed the Higher Secondary Examination (HSE), Conducted by the Government of Tamil Nadu or an examination accepted as equivalent there to by the Syndicate with Mathematics or Statistics or Business Mathematics as a subject of study.

2. ELIGIBILITY FOR AWARD OF DEGREE

A Candidate shall be eligible for the award of the B.Sc., (Statistics) Degree only if he/she has undergone the prescribed course of study in a college affiliated to the University for a period of not less than three academic years, passed the examinations of all the six semesters prescribed, earning 140 credits and also fulfilled such conditions as may have been prescribed thereof.

3.DURATION OF THE COURSE

1. The UG course is of three years duration with six semesters.
2. Each academic year shall be divided into two semesters. The first academic year shall comprise the first and second semesters, the second academic year the third and fourth semesters, and the third academic year as the fifth and sixth semesters.
3. The odd semester include the period from June to November and the even semester from December to April. There shall not be less than 90 working days for each semester.

4.COURSE OF STUDY, CREDITS AND SCHEME OF EXAMINATION

- (a) The main subject of study for B.Sc., (Statistics) shall consist of the following :

FOUNDATION COURSES

PART – I : Language (I to IV Semesters) Tamil or Other Language

PART – II : English (I to IV Semesters)

CORE COURSES

PART – III : (a) Core subjects (b) Allied Subjects, (c) Project/ Elective subjects related to the main subject of study

PART – IV : (a) **Non- Major Elective / Basic Tamil / Advanced Tamil (I & II Semesters)**

(b) Environmental Studies (IV Semester)

(c) Soft Skill (I,II,III and IV Semester)

(d) Value Education (V Semester)

PART – V : **Compulsory Extension Service**

(a) A candidate shall be awarded one credit for compulsory extension service.

(b) Total Number of Credits shall be 140 credits.

(c) Details of Course of Study (Part I to V)

PART – I : **Tamil or Other Language**

Tamil or any one of the following Modern (Indian or Foreign) or Classical languages at the option of candidates and according to the syllabus and text books prescribed from time to time.

PART – II : **English**

According to the syllabus and text books prescribed from time to time.

PART – III : **Core , Allied , Elective subjects , Project work**

As prescribed by the concerned Board of Studies from time to time.

Part – IV : **Non- Major Elective / Basic or Advanced Tamil**

(a) Students who have not studied Tamil up to XII STD and have taken any Language other than Tamil in Part I shall take Basic Tamil comprising of Two courses (Level will be at 6th Standard) . (I & II Semesters)

(b) Students who have studied Tamil up to XII STD and have taken any Language other than Tamil in Part I shall take Advanced Tamil comprising of Two Courses.

(c) Students who have studied Tamil up to XII STD and also have taken Tamil in Part I shall take Non-Major Elective comprising of Two Courses. (I & II Semesters)

Soft skill courses / Environmental studies / Value Education :

According to the syllabus prescribed from time to time.

Part – V : **Compulsory Extension Activity**

All the students shall enroll for NSS / NCC /NSO (Sports & Games) / Rotract / Youth red cross or any other service organization in the college and shall have to put in compulsory minimum attendance of 40 hours which shall be duly certified by the Principal of the college before 31st March in a year. If a student LACK of 40 HOURS ATTENDANCE in the first year, he /she shall

have to compensate the same during the subsequent years. Literacy and population, educational field work shall be compulsory components in the above extension service activities.

5. Course Curriculum:

Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous) , Chennai – 600 106.

[Affiliated to University of Madras]

B.Sc., Statistics Curriculum

(Batch 2021 - 2022 Onwards)

| Semester - I | Credits | Hours | Semester - II | Credits | Hours |
|--|-----------|-----------|---|-----------|-----------|
| 1.Language-I | 3 | 6 | 1.Language-II | 3 | 6 |
| 2. English - I | 3 | 4 | 2. English - II | 3 | 4 |
| 3.Descriptive Statistics | 4 | 5 | 3.Probability and Random Variables | 4 | 4 |
| 4. Practical – I | | 5 | 4. Computational Statistics With Excel(Including Lab Hours) | 3 | 5 |
| 5. Mathematics for Statistics | 5 | 6 | 5. Core Practical – I | 4 | 2 |
| 6.Non Major Elective -I | 2 | 2 | 6. Core Practical – II (Based on Excel) | 2 | - |
| 7.Soft Skills –I | 3 | 2 | 7. Real Analysis | 5 | 5 |
| | | | 8.Non Major Elective -II | 2 | 2 |
| | | | 9.Soft Skills –II | 3 | 2 |
| Total | 20 | 30 | | 29 | 30 |
| Semester - III | Credits | Hours | Semester - IV | Credits | Hours |
| 1.Language-III | 3 | 6 | 1.Language-IV | 3 | 6 |
| 2. English - III | 3 | 4 | 2. English - IV | 3 | 4 |
| 3.Distribution Theory | 4 | 5 | 3.Statistical Inference - I | 4 | 5 |
| 4. Practical – II | | 5 | 4. Core Practical – II | 4 | 6 |
| 5. C Programming Language (Theory) | 3 | 4 | 5. Numerical Methods | 4 | |
| 6. Allied Practical –I | 2 | 2 | 6. Numerical Methods with C Programming(Practical) | 2 | 6 |
| 7.Soft Skills –III | 3 | 2 | 7.Soft Skills –IV | 3 | |
| 8. Environmental Studies | - | 2 | 8. Environmental Studies Internship (2 Weeks) | 2 | 2 |
| | | | | - | 1 |
| Total | 18 | 30 | Total | 25 | 30 |
| Semester - V | Credits | Hours | Semester - VI | Credits | Hours |
| 1.Operations Research | 4 | 5 | 1.Design of Experiments | 4 | 5 |
| 2.Statistical Inference – II | 4 | 5 | 2. Actuarial Statistics | 4 | 5 |
| 3.Sampling Theory | 4 | 6 | 3. Time Series, Index Numbers and Official Statistics | 4 | 5 |
| 4.Statistical Quality Control | 4 | 6 | 4. Core Practical III | | |
| 5. Demography(or) Statistical Applications with R- Language. | 5 | 6 | 5. Stochastic Processes (or) Differential Equations , Fourier Series and Fourier Transformation | 4 | 5 |
| 6.Practical – III | | | 6. Mathematical Economics (or) International Trade | 4 | 5 |
| 7. Value Education | 2 | 2 | 7. Extension Activity | 1 | |
| Total | 23 | 30 | Total | 25 | 30 |

APPENDIX – 19(ii) (R&S)
UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN STATISTICS

CHOICE BASED CREDIT SYSTEM
(w.e.f.2021-2022)

DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE (AUTONOMOUS)

Shift - II
REGULATIONS
(As per Common Regulations framed by University of Madras)

SCHEME OF EXAMINATIONS

B.Sc. Statistics - I SEMESTER

| Course Components/Title of the paper | Credits | MARKS | | |
|--|--|-------|-----|-------|
| | | CIA | EXT | TOTAL |
| Part –I - Language Paper –I | 3 | 50 | 50 | 100 |
| Part –II - English Paper –I | 3 | 50 | 50 | 100 |
| Part-III Core Paper-I: Descriptive Statistics | 4 | 50 | 50 | 100 |
| Core paper – IV – Practical – I | Practical examination will be at the end of the semester II. | | | |
| Allied Paper- I – Mathematics for Statistics | 5 | 50 | 50 | 100 |
| Part-IV: * Basic Tamil/Adv. Tamil Non Major Elective –I | 2 | 50 | 50 | 100 |
| Soft Skills –I | 3 | 50 | 50 | 100 |
| Total | 20 | 300 | 300 | 600 |

B.Sc. Statistics - II SEMESTER

| Course Components/Title of the paper | Credits | MARKS | | |
|---|---------|-------|-----|-------|
| | | CIA | EXT | TOTAL |
| Part –I – Language Paper –II | 3 | 50 | 50 | 100 |
| Part –II - English Paper –II | 3 | 50 | 50 | 100 |
| Part-III Core Paper -II: Probability and Random Variables | 4 | 50 | 50 | 100 |
| Core Paper-III: Computational Statistics With Excel | 3 | 50 | 50 | 100 |
| Core Paper – IV: Core Practical –I | 4 | 50 | 50 | 100 |
| Core Paper – V : Core Practical – II (Based on Excel) | 2 | 50 | 50 | 100 |

| | | | | |
|--|----|-----|-----|-----|
| Allied paper- II – Real Analysis | 5 | 50 | 50 | 100 |
| Part-IV * Basic Tamil/Adv. Tamil/ Non Major Elective –II | 2 | 50 | 50 | 100 |
| Soft Skills – II | 3 | 50 | 50 | 100 |
| Total | 29 | 450 | 450 | 900 |

B.Sc. Statistics - III SEMESTER

| Course Components/Title of the paper | Credits | MARKS | | |
|---|---|-------|-----|-------|
| | | CIA | EXT | TOTAL |
| Part –I – Language Paper –III | 3 | 50 | 50 | 100 |
| Part –II – English Paper –III | 3 | 50 | 50 | 100 |
| Part-III Core paper-VI: Distribution Theory | 4 | 50 | 50 | 100 |
| Core IX – Practical II | Practical examination will be at the end of semester IV | | | |
| Allied paper- III- C Programming Language | 3 | 50 | 50 | 100 |
| Allied Practical – I Programming in C (Lab) | 2 | 50 | 50 | 100 |
| Soft Skills –III | 3 | 50 | 50 | 100 |
| Total | 18 | 250 | 350 | 600 |

B.Sc. Statistics - SEMESTER – IV

| Course Components/Title of the paper | Credits | MARKS | | |
|--|---------|-------|-----|-------|
| | | CIA | EXT | TOTAL |
| Part –I - Language Paper –IV | 3 | 50 | 50 | 100 |
| Part –II - English Paper –IV | 3 | 50 | 50 | 100 |
| Part-III Core Paper-VII: Statistical Inference – I | 4 | 50 | 50 | 100 |
| Core Paper VIII : Core Practical II | 4 | 50 | 50 | 100 |
| Allied paper- IV – Numerical Methods | 4 | 50 | 50 | 100 |
| Allied Practical – II Numerical Methods with C Programming | 2 | 50 | 50 | 100 |
| Environmental Studies | 2 | 50 | 50 | 100 |
| Soft Skills-IV | 3 | 50 | 50 | 100 |
| Total | 25 | 400 | 400 | 800 |

B.Sc. Statistics - V SEMESTER

| Course Components/Title of the paper | Credits | MARKS | | |
|---|---------|-------|-----|-------|
| | | CIA | EXT | TOTAL |
| Part-III Core Paper-X : Operations Research | 4 | 50 | 50 | 100 |

| | | | | |
|--|---|------------|------------|------------|
| Core Paper - XI: Statistical Inference – II | 4 | 50 | 50 | 100 |
| Core Paper - XII: Sampling Theory | 4 | 50 | 50 | 100 |
| Core Paper - XIII – Statistical Quality Control | 4 | 50 | 50 | 100 |
| Core Elective Paper -I: Demography (or) Statistical Applications with R- Language. | 5 | 50 | 50 | 100 |
| Core XVII - Practical – III | Practical examination will be at the end of the semester VI | | | |
| Value Education | 2 | 50 | 50 | 100 |
| Total | 23 | 300 | 300 | 600 |

B.Sc. Statistics - VI SEMESTER

| Course Components/Title of the paper | Credits | MARKS | | |
|---|-----------|------------|------------|------------|
| | | CIA | EXT | TOTAL |
| Part-III | | | | |
| Core Paper-XIV: Design of Experiments | 4 | 50 | 50 | 100 |
| Core Paper -XV: Actuarial Statistics | 4 | 50 | 50 | 100 |
| Core Paper XVI –Time Series, Index Numbers and Official Statistics | 4 | 50 | 50 | 100 |
| Core Paper XVII– Core Practical III | 4 | 50 | 50 | 100 |
| Core Elective Paper II : Stochastic Processes (or) Differential Equations , Fourier Series and Fourier Transformation | 4 | 50 | 50 | 100 |
| Core Elective Paper III: Mathematical Economics (or) International Trade | 4 | 50 | 50 | 100 |
| Part-V | | | | |
| Extension Activity | 1 | | | |
| Total | 25 | 300 | 300 | 600 |

A.C.S '19

UNIVERSITY OF MADRAS

B.Sc. DEGREE COURSE IN STATISTICS

CHOICE BASED CREDIT SYSTEM
(w.e.f.2021-2022)

DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE (AUTONOMOUS)

Shift - II

SYLLABUS

| | | |
|-------------|----------------------------------|--------------|
| Code& Title | :2164101& Descriptive Statistics | Semester : I |
| Course Type | : Core | Credits: 4 |

Learning Outcomes:

Upon finishing this course, students will be able to

1. Know the uses of statistics in society
2. Organize, manage and present data
3. Analyze the statistical data graphically using frequency distribution and cumulative frequency distribution.
4. Analyze statistical data using measures of central tendency, dispersion and location.

Course Content:

UNIT - 1:

Nature and scope of statistical methods and their limitations –concepts of research design- primary and secondary sources of data - nominal, ordinal, ratio and interval scale - complete enumeration, observational studies and sample surveys.

UNIT - 2:

Presentation by tables and diagrams- Construction of tables with one, two and three factors of classifications - Diagrammatic representations, frequency distributions for continuous and discrete data, graphical representation of a frequency distribution by histogram and frequency polygon, cumulative frequency distributions (inclusive and exclusive methods) and Ogives.

UNIT - 3:

Measures of location, dispersion, moments and measures of skewness and kurtosis for both grouped and ungrouped data.

UNIT - 4:

Correlation- Scatter diagram, Karlpearson's co-efficient and its properties, Spearman's rank correlation coefficient, principle of least squares and fitting of first, second degree and exponential curves,

UNIT -5:

Regression Equations- properties of regression equations, regression lines and concept of error in regression - partial and multiple correlation- concepts. Association of attributes and simple problems.

Suggested Readings

Books for Study:

- 1) Richard I. Levin , David S. Rubin (2008), Statistics for Management Pearson.
- 2) Goon, AM., Gupta M.K and . Dasgupta B (1991): Fundamentals of Statistics, Vol.1, World Press, Calcutta.
- 3) M.R. Spiegel (1961): Theory and problems of statistics, Schaum's outline series
- 4) Bhat B.R, Srivenkataramana T, and Madhava K.S,(1996) Statistics: A Beginner's text Vol. I, New Age International (P) Ltd.

Books for Reference:

- 1) G.U.Yule and M.G. Kendall (1956): An introduction to the theory of Statistics, Charles Griffin.
- 2) Snedecor .G.W. and Cochran W.G. (1967): Statistical methods, Iowa State University Press.
- 3) Anderson, T.W. and Sclove SL. (1978): An introduction to statistical analysis of data, Houghton Mifflin co.
- 4) Croxton FE, and Cowden D.J. (1973) Applied General Statistics, Printice Hall of India.

Course – Basic Details

Course Code& Title :2164204 & Probability and Random variables

Semester : II

Course Type : Core

Credits: 4

Learning Outcomes: Upon finishing this course, students will be able to

1. Identify random experiments in real life data and translate real-world problems into probability models.
2. Understand the use of basic probability rules, including additive and multiplicative laws, independent and mutually exclusive events.
3. Derive the probability density function of transformation of random variables
4. Calculate probabilities, and derive the marginal and conditional distributions of bivariate random variables.

Course Content:

UNIT - 1:

Random experiment, sample point, sample space, event, algebra of events, operations on events. Classical and relative frequency approach to probability - axiomatic approach to probability, Simple problems.

UNIT –2 :

Addition theorem of probability, conditional probability, independence of events multiplication theorem –Baye’s theorem and its applications.

UNIT –3:

Definition of discrete and continuous random variables - probability mass function, distribution functions and probability density functions and their properties. Expectation of random variables and its properties.

UNIT-4:

Moment generating function, characteristic function, cumulant generating function – their properties, moments, measures of locations, dispersion, Skewness and Kurtosis for discrete and continuous variants-simple problems

UNIT-5:

Bivariate distributions - discrete and continuous type, cumulative distribution function(c.d.f.), and probability mass function (p.m.f) and probability density function (p.d.f.)Marginal and Conditional expectation.

Suggested Readings:

Books for Study:

1. A.M.Mood, F.A. Graybill and D.C. Boes (1974): Introduction to the theory of Statistics, International student ed. McGraw Hill.
2. Hogg, R.V. and Craig, A.T. (2002): Introduction to Mathematical Statistics, 4thed. Academic Press.
3. A.M.Goon, M.K.Gupta and B. Dasgupta (1980): An outline of Statistical theory, Vol. I,6th revised, World Press.

Books for Reference:

1. P.G.Hoel (1971): Introduction to Mathematical Statistics, Asia publishing house.
2. Murry R. Spiegel (1982): Theory and problems of Probability and Statistics, Schaum's outline series, McGraw Hill.
3. Seymour Lipshutz (1982): Theory and problems of probability, Schaum's outline series, McGraw Hill.
4. K.L.Chung (1983): Elementary probability theory with stochastic processes, Springer International student edition.
5. William.Feller (1968): An introduction to probability theory and its applications, Vol. I, 3rded., John Wiley & Sons.

Course – Basic Details

Course Code & Title: 2164205 & Computational statistics with excel Semester: II

Course Type: Core

Credits: 3

Learning Outcomes:

Upon finishing point of this course, students will be able to

1. To understand the importance of excel application.
2. To Study the basic features and features for data analytics of excel.
3. To create formulae and use existing functions in excel.
4. To acquire knowledge on data entry and manipulate data in excel sheet.
5. Can perform data preprocessing and data analytics with the acquired statistical knowledge.

Course Content:

UNIT I: Introduction: Excel Environment- Introduction-Menus, Tool bars and icons, Spreadsheet application, Create, save and switch between spreadsheets, formatting Spreadsheet- Manipulating Text.

UNIT II: Entering and editing data in Spreadsheet-Import data from web-Filtering and sorting data in excel-Creating hyperlinks-Cell referencing –Numeric formats-Array formula in excel- Diagrams and graphs-Set print area-printing

UNIT III: Data Preprocessing-Data Cleaning-Data normalization, Integration and transformation--Pivot tables-Heat Maps

UNIT IV: Functions-Excel functions and Formula-Formulae in excel-logical functions-Test functions-Basic statistical functions-Basic mathematical functions-Basic Financial functions- Data Manager - Descriptive Statistics, Histogram, Correlation, Regression.

UNIT V: Dashboards for Excel-Data Visualization-Excel data presentation library- Dashboard design, tools and concepts-Elements of Excel dashboard and decision support system.

Books for study/ reference:

1. Bernd Held (2006), *Microsoft Excel Functions and Formulas*, Wordware Publishing, Inc.
2. Jordan Gold Meier and Purnachandra Duggirala (2015), *Dashboards for excel*, Apress.
3. *Microsoft excel 2019-Step by Step*, Curtis Frye, Microsoft press store.
4. Rudy LeCorps (2002), *Microsoft Excel fundamentals, A practical workbook for beginners and Advanced Users*, RGL Publishing.

Course – Basic Details

Course Code & Title : 2164310 & Distribution Theory

Semester: III

Course Type: Core

Credits: 4

Learning Outcomes:

Upon finishing point of this course, students will be able to

1. Understand the basic concept of Probability distribution and density function
2. Identify the characteristics of different discrete and continuous distributions.
3. Identify the type of statistical situation to which different distributions can be applied.
4. Comprehend the Sampling distributions.
5. Be acquainted with concept of Limiting distributions.

Course Content:

UNIT -1:

Discrete distributions: Binomial, Trinomial and Multinomial distributions and their properties - Poisson, Negative Binomial and Geometric distributions –interrelationships and their properties.

UNIT -2:

Continuous distributions: Normal, Uniform, Exponential, Gamma and Beta distributions and their properties.

UNIT -3:

Bivariate Normal Distribution and its properties-marginal and conditional distributions–simple problems.

UNIT -4:

Central Limit Theorem- Lindeberg- Levy, Demovier's (statement only) - convergence in probability, convergence in distribution, convergence in mean square- simple problems.

UNIT-5:

Order statistics-distribution of first, n^{th} and i^{th} order statistics, joint distribution of r^{th} and s^{th} order statistics-distribution of median and range- Simple problems.

Suggested Readings

Books for Study :

1. Parimal Mukhopadhyay,(1996), Mathematical Statistics, New Central Book Agency
2. Goon, AM., Gupta M.K and .Dasgupta B (1991): Fundamentals of Statistics, Vol.1, World Press, Calcutta

Books for Reference:

1. Hogg, R. V and Craig, A. T (2002), Introduction to Mathematical Statistics, Pearson Education Asia, India.
2. A.M.Mood, F.A. Graybill and D.C. Boes (1974): Introduction to the theory of Statistics, International student ed. McGraw Hill.

Course – Basic Details

Course Code & Title : 2164413 & Statistical Inference- I

Semester: IV

Course Type : Core

Credits: 5

Learning outcomes:

Upon finishing this course, students will be able to

1. To know the concepts of Sampling distributions, Point Estimation and Unbiasedness.
2. To analysis the concepts of Testing of Hypothesis and Test of Significance.

Course Content:

UNIT - 1:

Sampling distributions - concept - distributions of mean and variance from Normal population. Sampling distributions : Chi-square, Student's t and F distributions - Derivation of their density functions and their properties

UNIT - 2:

Point Estimation - Problem of Point estimation - Properties of estimators- Consistency and Efficiency of an estimator. Sufficiency of a statistic - Neyman- Fisher factorization theorem (discrete case) - Simple problems.

UNIT - 3:

Unbiasedness - Properties, MVUE, BLUE, Rao - Blackwell theorem-Sufficiency and completeness, Lehman- Scheffe theorem, Cramer- Rao inequality - simple problems.

UNIT - 4:

Testing of Hypothesis - Neyman - Pearson theory - Statistical Hypothesis - Simple and composite hypothesis, Null and Alternative Hypothesis - Two types of errors – critical region- power of a test - Most powerful test – Neyman-Pearson lemma –p-value and its interpretation, simple problems.

UNIT - 5:

Test of Significance - Interval Estimation - Confidence Interval for proportions, mean(s), variance, and variance ratio based on chi square, student's t, F and Normal distributions.

Suggested Readings

Books for Study:

1. Mood, AM. Graybill , F.A. and Boes, D.C. (1974) : Introduction to the theoryof Statistics, McGraw Hill.
2. Hogg R.V. and Craig, A.T. (2002): Introduction to mathematical statistics, 3rd edition, Academic Press, USA.
3. Goon, A.M. Gupta, M.K., and Das Gupta, B. (1980): An outline of statistical theory, Vol.I, 6th revised ed. World Press limited, Calcutta.

Books For Reference:

1. Hoel, P.G. (1971) : Introduction to mathematical Statistics, Asia publishing house.
2. Rohatgi, V.K. (1984) An introduction to probability theory and mathematical statistics, Wiley Eastern.
3. Degroot, M.H. (1975): Probability and Statistics, Addison - Wesley
4. Spiegel, M.R. (1982): Theory and problems of probability and statistics, Schaum's outline series, McGraw Hill
5. Snedecor, G.W. and Cochran, W.G. (1967): Statistical methods 6th edition, Oxford IBH

Course – Basic Details

Course Code & Title : 2164517 & Operations Research Semester: V
Course Type : Core Credits: 4

Learning outcomes:

Upon finishing point of this course, students will be able to

1. Solve the linear programming models using various methods.
2. Develop, report and also explain why heuristics are used to solve large-scale linear programming problems.
3. Analyze the results and propose recommendations in language understandable to the decision making processes in management engineering
4. Increase the knowledge, and broaden the perspective of the world in which you will contribute your talents and leadership in business operations.
5. Understand the managerial responsibility for Operations, even when production is outsourced

Course Content:

UNIT - 1:

Introduction to Operations Research - Nature, Scope, Functions, Linear programming problem - Formulation of LPP - Solving the LPP by graphical method.

UNIT - 2:

Solving the LPP by simplex method, Big-M method, Duality in LPP, Dual simplex method and problems.

UNIT - 3:

Transportation problem- obtaining initial feasible and optimal solutions. Optimality test, degeneracy, Unbalanced transportation problem, Assignment problem, and unbalanced assignment problem - Traveling salesman problem.

UNIT - 4:

Game Theory - Two person zero sum games, The maximin - minimax principle – Games without saddle points - Mixed strategies - Graphical solution of $2 \times n$ and $m \times 2$ games Dominance property. Sequencing - 'n' jobs through 2 machines - 'n' jobs through 3 machines - 'n' jobs through 'm' machines, Two jobs and 'm' machines.

UNIT - 5:

Network analysis by CPM / PERT basic concepts - constraints in Network – construction of the network - Time calculations - Concepts of slack and float in Network Analysis -finding optimum project duration and minimum project cost, finding expected project time and variance.

Suggested Readings

Books For Study:

1. Handy A. Taha (1996): Operations Research, 6 ed. Prentice Hall of India.
2. Sharma J.K. (2001): Operations Research. Theory and applications, Macmillan India Ltd.
3. Kanti Swaroop, Gupta.P.K. and Manmohan : Operations Research, Sultan Chand and Sons, New Delhi.

Books for Reference:

1. Goel & Mittal (1982): Operations Research, Pragati Prakashan, Meerut.
2. Gupta R.K. (1985): Operations Research, Krishna Prakashan, Mandir, Meerut.
Schaum's outline series : Operations Research.
3. Sharma J.K. (2002): Operations Research, Problems and Solutions, Macmillan India Ltd.

Course – Basic Details

Course Code & Title : 2164518 & Statistical Inference- II Semester: V
Course Type : Core Credits: 5

Learning outcomes:

Upon finishing this course, students will be able to

3. To know the concepts of Methods of estimation and Method of minimum chi-square
4. To analysis the concepts of Uniformly most powerful tests, Sequential Probability Ratio Test and Non-parametric tests

Course Content:

UNIT – 1

Methods of estimation: Method of Moments and Method of Maximum Likelihood Estimators with their properties -simple problems.

UNIT - 2:

Method of minimum chi-square, Method of modified minimum chi-square, method of least squares- simple problems.

UNIT - 3:

Uniformly most powerful tests, Likelihood ratio criterion - Definition and test for means and variance (one sample only).

UNIT - 4:

Sequential Probability Ratio Test: Definition – OC functions, ASN and simple problems.

UNIT - 5:

Non-parametric tests - Run, Sign, Wilcoxon Signed rank test, Kolmogorov's Smirnov one sample test, Mann Whitney tests (one sample and two sample), Median, Kruskal Wallis test - Applications and simple problems.

Suggested Readings

Books for Study

1. Hogg R.V. and Craig, A.T. (2002): Introduction to mathematical statistics, 3rd edition, Academic Press, USA.
2. Goon, A.M. Gupta, M.K., and Das Gupta, B. (1980): An outline of statistical theory, Vol.I, 6th revised ed. World Press limited, Calcutta.
3. Rohatgi, V.K. (1984) An introduction to probability theory and mathematical statistics, Wiley Eastern.

Books for Reference:

1. Mood, A.M. Graybill, F.A. and Boes, D.C. (1974): Introduction to the theory of Statistics, McGraw Hill.
2. Hod, P.G. (1971): Introduction to mathematical statistics, Asia publishing house.
3. Marek Fisz (1961): Probability theory and Mathematical statistics, John Wiley.
4. Spiegel, M.R. (1982): Theory and problems of probability and statistics, Schaum's outline series, McGraw Hill
5. Snedecor, G.W. and Cochran, W.G. (1967): Statistical methods 6th edition.

Course – Basic Details

Course Code & Title : 2164519 & Sampling Theory

Semester: V

Course Type : Core

Credits: 4

Learning outcomes:

Upon finishing this course, students will be able to

1. to study various steps involved in planning of sample survey.
2. to obtain sample estimates and to study their properties for simple random sampling.
3. to study sampling procedures for attributes and to determine sample size.
4. to identify sample estimates for the method of stratification.
5. to find sample estimates and to study their properties for systematic sampling.

Course Content:

UNIT - 1:

Design - Organization and execution of sample surveys - principle steps in sample survey- Pilot survey - principles of sample survey - sampling and non-sampling errors - advantages of sampling over census - limitations of sampling.

UNIT - 2:

Sampling from finite population - simple random sampling with and without replacement - unbiased estimate of the mean, variance of the estimate of the mean finite population correction estimation of standard error from a sample - determination of sample size.

UNIT - 3:

Stratified random sampling - properties of the estimates - unbiased estimates of the mean and variance of the estimates of the mean-optimum and proportional allocations – relative precision of a stratified sampling and simple random sampling - estimation of gain in precision in stratified sampling.

UNIT - 4:

Systematic sampling - estimate of mean and variance of the estimated mean – comparison of simple and stratified with systematic random sampling.

UNIT - 5:

Ratio estimators: Ratio estimates, variance of the ratio estimates - Bias of the ratio estimates. Regression estimators: Linear regression estimate regression estimates with preassigned b-regression estimates when b is computed from the sample.

Suggested Readings

Books for Study:

1. William, G. Cochran (1984): Sampling techniques, Wiley Eastern. Murthy, M.N. (1967): Sampling theory and methods,
2. Statistical Publishing Society, Calcutta.
3. Sampath S. (2005): Sampling theory and methods (2nd Edition). Alpha science International Ltd.

Books for Reference:

1. Des Raj and Khanis (1976): Sampling theory, Narosha Publications,
2. Daroga Singh and Chaudhary, F.S. (1986): Theory and Analysis of Sample Survey Designs. Wiley Eastern.
3. Sukhatme P.V. and Sukhatme B.V. (1984): Sample survey methods and its applications, Indian Society of Agricultural Statistics, New Delhi.

Course – Basic Details

Course Code & Title : 2164520 & Statistical Quality Control Semester: V
Course Type : Core Credits: 4

Learning Outcomes:

Upon finishing this course, students will be able to

1. Understand the general theory of Control charts.
2. Know the attribute and variable control charts.
3. Obtain the acceptance sampling.
4. Prepare a reliability demonstration plan.
5. Learn the approach of Quality ISO9000 standards.

Course Content:

UNIT -1:

Need for Statistical Quality Control techniques in Industry - Causes of Quality variation control charts - Use of the Shewhart - control chart - Specification and tolerance limits – 3sigma limits - warning limits - application of theory of runs in quality control.

UNIT - 2:

Control chart for variables - \bar{X} chart, R chart, σ chart - purpose of the charts - Basis of subgrouping - plotting \bar{X} and R results - determining the trial control limits - Interpretation of control charts \bar{X} and R.

UNIT - 3:

Control chart for attributes - purpose of the chart - p chart - np chart - construction of p and np chart - choice between chart for P and chart for np - construction of c-chart.

UNIT - 4:

Acceptance of sampling plans for attributes - Producer's risk and consumer's risk -- single, double sampling plans –associated performance measures.

UNIT - 5:

Variable sampling plans - Sigma known and sigma unknown determination of „n” and „k” for one sided specification - OC curve- concepts and simple problems.

Suggested Readings

Books for Study:

1. Gupta, R.C.(1974): Statistical Quality Control.
2. Montgomery, D.C. (1983): Introduction to Statistical Quality Control, John Waley & Sons.

Books For Reference:

1. Grant, E,L. and Laven Worth, R.S.: Statistical Quality Control, McGraw Hill.
2. Edward G. Schilling and Dean V. Neubauer (2009) Acceptance sampling in Quality Control, 2nd edition,(Statistics: A series of Textbooks and Monographs) hard cover – March 2, 2009. Chapman and hall/ CRC.
3. Parimal Mukhopadhyay,(1999),Applied Statistics , New Central Book Agency Pvt Ltd,Kolkata.

Course – Basic Details

Course Code & Title : 2164622 & Design of Experiments

Semester: V

Course Type : Core

Credits: 4

Learning outcomes:

Upon finishing this course, students will be able to

1. know the basic principles of experimental design
2. Learn the difference between one way and Two-way ANOVA
3. Understand the classification of one way and two-way analysis
4. Understand the applications of CRD, RBD and LSD
5. know the factorial experiment 6. Obtain the importance of design of experiments in quality control.

Course Content:

UNIT - 1:

Fundamental Principles of Experiments - Replication, Randomization and Local Control Techniques - Size of experimental unit-Methods of determination of experimental units -Basic linear model and its assumptions- simple problems.

UNIT - 2:

Analysis of Variance - one-way, two-way classification (without interaction) Multiple range tests: Newman Keul's test- Duncan's multiple range test- Tukey's test.

UNIT - 3:

Completely Randomized Design (CRD), Randomized Block Design (RBD), Latin Square Design (LSD) and its analysis.

UNIT - 4:

Missing plot technique- estimating missing observation- RBD and LSD - Analysis of covariance in CRD with single covariate, difference between ANOVA and ANCOVA.

UNIT - 5:

Factorial experiments and their need, 2^2 , 2^3 and 2^k factorial experiments and their analysis - Principles of confounding-Partial and Complete confounding in 2^2 , 2^3 .

Suggested Readings

Books for Study:

1. Dass M.N and Giri N.C (1986) Design and Analysis of Experiments, Wiley Eastern, New Delhi.
2. Montgomery, D (1972) Design and Analysis of Experiments, John Wiley and Sons

Books For Reference:

1. Kempthorne, (1956) Design and Analysis of Experiments, John Wiley. New York
2. Giri N.C (1986) Analysis of Variance, South Asian publishers .
3. Parimal Mukhopadhyay, (1999), Applied Statistics , New Central Book Agency Pvt Ltd, Kolkata.

Course – Basic Details

Course Code & Title : 2164623 & Actuarial Statistics

Semester: VI

Course Type : Core

Credits: 4

Learning outcomes:

Upon finishing this course, students will be able to

1. Explain the concept of probability and describe and derive the different types of annuities.
2. Derive formula to different types of perpetuity and redemption of loans by uniform yearly payment and sinking fund.
3. Explain the concept of mortality and construction life tables.
4. Know the principles of insurances and to compute the problems related to it.
5. Know the concept of net premium of assurance and annuities and to compute simple problems related to it.

Course Content:

UNIT – 1:

Elements of compound interest-nominal and Effective rates of interest, annuities certain, present values accumulated amounts, deferred annuities – the functions included in compound interest - tables and their uses.

UNIT – 2:

Redemption of loans – sinking funds – the average yield on the life fund of an assurance office.

UNIT – 3:

Premiums – general principles – natural premiums – level premiums – office premiums – loading for expenses – with profit and without profit premiums – adequacy of premiums relative consistency.

UNIT – 4:

Life office valuations – general principles – policy values – retrospective and prospective methods of valuation of liabilities.

UNIT – 5:

Surplus - Sources of Surplus, Principle methods of surplus (Numerical problems can be asked in the theory question paper).

Suggested Readings

Books for Study:

1. Federation of Insurance Institutes Study Courses – Mathematical Basis of Life Assurances F1, 2
2. Donald. D. W . (1970) – Compound Interest and Annuities, Heinemann, London

Books for Reference:

1. Elandt – Johnson. R.C, Johnson. N.L (1980), Survival Models and Data Analysis, John Wiley.

Course – Basic Details

Course Code & Title: 2164624 & Time Series, Index Numbers and Official Statistics

Semester: VI Course Type : Core

Credits:5

Learning outcomes:

Upon finishing this course, students will be able to

1. To know about concepts of Time series, measurement of variations
2. To learn the concepts of Index Numbers, Quantity index numbers and Official Statistics.

Course Content:

UNIT - 1:

Time series - Concept - Components of time Series - Additive and multiplicative models- Measurement of trend – free hand method- semi average method-Moving average method - Least square method.

UNIT - 2:

Measurement of seasonal variations - Simple average method - Ratio to trend method -Ratio to moving average method - Link relative method – Variate Difference method.

UNIT - 3:

Index Numbers - uses, classification of index numbers - Problems in the construction of index numbers - Methods of constructing index numbers - Unweighted index numbers -weighted index numbers.

UNIT - 4:

Quantity index numbers - Fixed and chain base index numbers - Optimum test for index numbers - Time reversal test - factor reversal test - cost of living index numbers.

UNIT - 5:

Official Statistics: Statistical System in India CSO and NSSO and their functions – Present structure of the Indian statistical system - Functions of a statistical system – Agricultural statistics - Industrial statistics - Trade statistics - Labour statistics - Transport Communication statistics and Health statistics.

Suggested Readings

Books for Study:

1. Saluja,M.R (1972): Indian official statistical systems: Statistical publishing society, Calcutta and The Indian Econometric Society, Hyderabad.
2. Goon, A.M. Gupta, M.K., and Das Gupta, B. (1980): An outline of statistical theory, Vol.I,6th revised ed. World Press limited, Calcutta.

Books For Reference:

1. Croxton, F.E and Cowdon, D.J. (1973): Applied general statistics, Prentice Hall
2. Parimal Mukhopadhyay, (1999),Applied Statistics , New Central Book Agency Pvt Ltd, Kolkata.
3. T.M.J.A. Cooray, Applied Time series Analysis and Forecasting, Narosha Publishing House.

Course – Basic Details

Course Code& Title : 2164207 & Practical I
Course Type : Core

Semester: II
Credits: 4

Learning outcomes:

1. Learn about constructions of Uni-variate, Bi-variate frequency distributions and applied problems practically.
2. Understand the concepts of Computation of correlation co-efficient, Rank correlation coefficient

Record 40 Marks, Practical Examination 60 Marks

Duration of the Examination: Three Hours.

Six questions are to be set without omitting any unit. Candidates are to answer any four questions.

All questions carry equal marks.

Course Content:

1. Construction of Uni-variate, Bi-variate frequency distributions, and graphical representations.
2. Ogives, Lorenz curves.
3. Measures of location, dispersion
4. Measures of skewness and kurtosis for both grouped and ungrouped data.
5. Measures of skewness and kurtosis using moments.
6. Principle of least squares and fitting of first, second degree and exponential curves.
7. Computation of correlation co-efficient.
8. Rank correlation coefficient.
9. Fitting of Single linear Regression Equations.
10. Partial and Multiple correlations.
11. Association of Attributes.

Pedagogy

Assignments/ Seminars / Self study/ Internship / Field visits / Study tour / Library work / Laboratory / Dissertation

Policies

Attendance : As per University of Madras Norms

Evaluation Scheme : (Continuous Assessment / Written test / ~~Minimum marks to pass / Maximum marks / Grading~~)

Course Schedules; ~~Lecture / Tutorial / Practical / Library hrs / Lab hrs~~

Course – Basic Details

Course Code & Title : 2164208 & Practical II
Course Type : Core
Credit equivalence : NA
Pre-requisites : NA

Semester: II
Credits: 2

Learning Outcomes:

Upon finishing this course, students will be able to handle excel

1. To know how to clean the data for analysis
2. To do graphical presentation of a data
3. To do Statistical analysis of the data
4. To interpret the data and output of the analysis

(Based on core paper II)

Record 40 Marks, Practical Examination 60 Marks

Duration of the Examination: Three Hours.

Six questions are to be set without omitting any unit. Candidates are to answer any four questions.

All questions carry equal marks.

Course Content:

1. Enter data / Import data from web and clean data for missing values, repetition, duplication, outliers.
2. Enter data with multiple variables to find basic characteristics of the data- Mean, Median, Mode, Standard deviation, Max, Min,
3. Enter data and identify Outliers and handle it.
4. Data visualization –Diagrams and Graphs.
5. Fitting of mathematical functions and Curve fitting in a data
6. Fitting of Distributions using Excel.
7. Correlation using formula in excel and also using Excel functions.
8. Illustrate the use of simple regression model

Course – Basic Details

Course Code & Title : 2164415 & Practical III
Course Type : Core
Credit equivalence : NA
Pre-requisites : NA

Semester: IV
Credits: 4

Learning outcomes:

1. Learn about distributions and applied problems practically
2. Understand the concepts of Chi-square distribution and F-distribution.

(Based on core paper IV and V)

Record 40 Marks, Practical Examination 60 Marks

Duration of the Examination :Three Hours.

Six questions are to be set without omitting any unit. Candidates are to answer any four questions.

All questions carry equal marks.

Course Content:

1. Fitting of Binomial Distribution.
2. Fitting of Poisson Distribution.
3. Fitting of Normal Distribution.
4. Test of Hypothesis:
Power of the test , level of significance.
5. Test of significance
 - i. Mean and variance.
 - ii. Difference of means.
 - iii. Equality of two variances from normal distribution
 - iv. Correlation coefficients.
 - v. Specified proportions.
 - vi. Difference of proportions.
6. Confidence interval for mean and proportion.
7. Test based on Chi-square distribution and F-distribution.

Course – Basic Details

| | | |
|---------------------|--------------------------|--------------|
| Course Code & Title | : 2164627 & Practical IV | Semester: VI |
| Course Type | : Core | Credits: 4 |
| Credit equivalence | : NA | |
| Pre-requisites | : NA | |

Learning outcomes:

1. Applying concept of Simple Random Sampling, X-bar Chart ,R Chart, σ chart practically
2. Learn how to applying concepts of Analysis of Variance, design of experiment practically

(Based on core paper IV and V)

Record 40 Marks, Practical Examination 60 Marks

Duration of the Examination : Three Hours.

Six questions are to be set without omitting any unit. Candidates are to answer any four questions.

All questions carry equal marks.

Course Content:

1. Non-parametric methods :
 - a. Sign test
 - b. Wilcoxon Signed rank test
 - c. Mann Whitney U-test
 - d. Median test
 - e. Test of randomness of sample.
2. Simple Random Sampling.
3. Stratified Random Sampling- Proportional Allocation and Optimum Allocation.
4. Systematic Sampling.
5. Estimation of parameters by the methods of Moments.
6. Estimation of parameters by the methods of MLE.
7. X-bar Chart ,R Chart, σ chart.
8. p, np and c chart.
9. Analysis of Variance - one-way and two-way.
10. Design of Experiment –CRD, RBD, LSD.
11. Factorial experiments – 2^2 , 2^3 experiments with total and partial confounding.
12. Moving average method (3 year and 5 year)
13. Ratio to trend, Ratio to moving average, Link relative method.
14. Fixed and chain base index numbers.
15. Time reversal test, Factor reversal test.
16. Cost of living index numbers.

Course – Basic Details

| | | |
|---------------------|---------------------------|-------------|
| Course Code & Title | : 2164521(A) & Demography | Semester: V |
| Course Type | : Elective | Credits : 5 |
| Credit equivalence | : NA | |
| Pre-requisites | : NA | |

Learning outcomes:

1. To know about concept of Sources of Demographic data.
2. To understand the concept of Life table, Mortality and Fertility.

Elective Paper I

Course Content:

UNIT - 1:

Sources of Demographic data – Civil Registration- Population Census – Population Registers – Errors in Demographic data – Methods of Improvement.

UNIT – 2:

Mortality measurements –Merits and Demerits - general and specific rates – standardized rates – age pyramid of sex composition – Ratios, proportions and percentage rates – Population pyramids, sex ratio, crude rate, specific rates, standard rates – direct and indirect.

UNIT -3:

Fertility, Measures of fertility, General fertility rate, Specific fertility rate, Net reproduction rate, Gross reproduction rate, Crude Rate of natural increase. Definition – stable population and stationery population.

UNIT - 4:

Life table - Structure - Construction – Relationship between function of the life table – abridged life table (Concept only)

UNIT – 5:

Population estimation and projection, component method of population projection Forces of mortality - Gompertz and Makcham law logistic curve fitting and its use.

Suggested Readings

Books for Study :

1. Srivastava, O.S (1983): A text book Demography, Vikas Publishing

Books for Reference:.

1. Bogue, Donald, . J: Principles of Demography, (1976), John Wiley, New York.

Course – Basic Details

Course Code & Title : 216452(B) & 1 Statistical Applications with R-Programming
Semester : V Course Type : Elective Credits: 5
Credit equivalence : NA
Pre-requisites : NA

Learning outcomes:

1. Basics of R programming language.
2. Exposure to latest analytics Tool.
3. Features available in R for data analysis.
4. To create formulae and use existing functions in R.

Elective Paper I

Course Content:

Unit 1:

Introduction to R: R as a calculator, statistical software and a programming language, R preliminaries, getting help, data inputting methods (direct and importing from other spread sheet applications like Excel), data accessing, and indexing, Graphics in R, built in functions, saving, storing and retrieving work.

Unit 2:

Descriptive statistics: diagrammatic representation of univariate and bivariate data (box plots, stem and leaf diagrams, bar plots, pie diagram, scatter plots), measures of central tendency (mean, median and mode), partition values.

Unit 3:

Measures of dispersion (range, standard deviation, mean deviation and inter quartile range), summaries of a numerical data, skewness and kurtosis.

Unit 4:

Correlation- Karlpearson's co-efficient, Spearman's rank correlation coefficient, Regression Equations - partial and multiple correlation - simple problems.

Unit 5:

Statistical Inference: classical tests: One- and two-sample tests, z test, t-test, F- test, chi-square test of independence and goodness of fit, interval estimation for mean, difference of mean and variance.

Suggested Readings

Books for Study:

1. Michale J. Crawley (2009), THE R BOOK, John Wiley & Sons, England
2. Sudha G. Purohit (2008), Statistics Using R, Narosa Publishing House, India
3. John Verzani, simple R-Using R for Introductory Statistics,

([http:// www.math.csi.cuny.edu/Statistics/R/SimpleR/Simple](http://www.math.csi.cuny.edu/Statistics/R/SimpleR/Simple))

Books for References:

1. W. N. Venables, D. M. Smith and the R Core Team (2012), An Introduction to R Notes on R: A Programming Environment for Data Analysis and Graphics, Version 2.15.2

(<http://www.r-project.org>)

Note: Either one from must be selected from two elective paper for Semester V.

Course – Basic Details

Course Code & Title : 2164625 & Stochastic Processes Semester: VI
Course Type : Elective Credits: 5

Learning outcomes:

Upon finishing this course, students will be able to

1. Understand the difference between Random variable and Random Process (Stochastic Process)
2. Apply Markov property for estimating the future behavior of the process
3. Fit the Poisson distribution in time domain
4. Define the continuous time Markov chain as birth and death processes.
5. Classify the queuing models.

Core Elective Paper II

Course Content

UNIT - 1:

Basic Concepts : Definition and examples of stochastic process, classification of general stochastic processes into discrete and continuous time, discrete and continuous state spaces, types of stochastic processes, elementary problems.

UNIT - 2:

Markov chains: Definition and examples of Markov chain, Transition Probability Matrix, classification of states, recurrence concepts, simple problems only. (No Derivations)

UNIT - 3:

Basic limit theorem of Markov chain (statement only), stationary probability distribution, and its applications.

UNIT - 4:

Continuous Time Markov chain: Pure birth process and Poisson process, Birth and Death process, problems.

UNIT - 5:

Branching process: Definition and examples of discrete time branching process, probability generating function, mean and variance, probability of extinction - simple problems.

Suggested Readings

Books For Study:

1. Medhi, J. (1996): Stochastic processes, New Age International (p) Ltd.
2. Taylor, H.M. and Karlin, S. (1999): Stochastic Modelling, Academic press.

Books for Reference:

1. Hoel, P.M.G., Port, S.C. and Stone, C.J. (1991): Introduction to Stochastic processes, Universal Book Stall.
2. Parzen, E. (1962): Stochastic processes, Holden-Day. Ross, S.M. (1983): Stochastic processes, John Wiley.

Course – Basic Details

| | | |
|---------------------|---|------------|
| Course Code & Title | : 2164625 & Differential Equations, Fourier Series and Fourier Transforms | |
| Semester | : VI | |
| Course Type | : Elective | Credits: 5 |
| Credit equivalence | : NA | |
| Pre-requisites | : NA | |

Learning outcomes:

1. To know about concept of Differential Equations.
2. To understand the concept of Fourier series and transformations.

Core Elective Paper II

Course Content:

Unit – 1

First order and First degree equations of Bernouli – Differential equations of first order and higher degree. Clairaut's equation.

Unit – 2

Second order differential equations with constant coefficients – Linear operator Dn solution for homogenous equations. Methods of obtaining particular integral for e^{ax} , x^m , $e^{ax} \sin mx$, $e^{ax} \cos mx$.

Unit – 3

Linear homogenous equation – Lagrange's Linear equation – Cauchy – Euler equation and their problems (no derivation)

Unit – 4

Fourier Series – Fourier coefficients expansion of function using Fourier series of period 2 . Fourier Series for odd and even functions. Half range Fourier series.

Unit –5

Fourier Transformation – Infinite Fourier transform.(no derivation) Sine and Cosine Form, simple properties and their problems.

Suggested Readings

Books for Study:

1. P.Kandasamy K.Thilagavathy K. Gunavathy. Engineering Mathematics Vol3: S.Chand & Co.
2. Dr.S.Sudha Differential Equations and Integral Transforms : Emerald Publishers.

Books for Reference:

1. M.K.Venkataraman Engineering Mathematics Vol 3: National Publishing Co.
2. Dr. A. Singaravelu. Transforms and Partial differential equations, Meenakshi agency.

Note: Either one from must be selected from two elective paper for Semester VI.

Course – Basic Details

Course Code & Title : 2164626 & Mathematical Economics Semester: VI
Course Type : Elective Credits: 5

Learning outcomes:

1. To know the concept of Mathematical Economics
2. To learn the important of Economics related to market structure, core analysis

Core Elective Paper III

Course Content:

Unit 1:

Scope and methods of Mathematical Economics – Laws of demand, Demand schedule(Individual and Market) - Demand function - Factors influencing the demand - Exception to the law of demand – Elasticity of demand with respect to price and income
- Factors affecting the elasticity of demand - Partial elasticity of demand with respect to price - Simple problems in elasticity of demand.

Unit 2:

Supply - Factors affecting the supply of a commodity - Relation between demand and supply – Utility - Concept of utility - Concept of human wants - Maximization of utility -Marginal and total utility - Law of diminishing marginal utility - Indifference curves and map - Properties of indifference curve - Price line.

Unit 3:

Cost Analysis – Different types of cost - Total, average and marginal cost functions -Relation between average and marginal costs - Problems related to total, average and marginal costs – Revenue - Total, average and marginal revenue functions and their relationship - Simple problems related to maximization of total revenue

Unit 4:

Market Structure – Definition of Market - Perfect competition - Pure competition - Monopolistic competition and duopolistic competition (Only concept) – Profit maximization – Profit function - Cournot solution to monopoly problem for maximization problem - Joint monopoly and discriminating monopoly - Problems related to profit maximization under monopoly. Duopoly - Conjectural variation and reaction curves - Simple maximization problem under duopoly.

Unit 5:

Theoretical Production functions – Mathematical definition of production function
-Constant product curves (Isoquant) - Average and marginal productivity – Homogenous production functions – Properties of linearly homogeneous production function – Cobb-Douglas production function – C. E. S. production function.

Suggested Readings

Books for Study:

3. Mehta and Madhnani (2001): Mathematics for Economists, Sultan Chand,
4. R.G.D.Allen(1976) Mathematical Analysis for Economists,Macmillian

Books for Reference:

- 1) Varma and Agarwal (1998): Managerial Economics, Sultan Chand and Company, New Delhi.
- 2) R.G.D. Allen Mathematics for Economics.
- 3) Varshney and Maheswari Managerial Economics
- 4) K.P. M.Sundaram Busniess Economics
- 5) Dr. S. Shankarn Managerial Economics.

Course – Basic Details

Course Code & Title : 2164626(B) & International Trade

Semester: VI

Course Type : Elective

Credits: 5

Learning outcomes:

1. To know the concept of International Trading
2. To learn about import and export management
3. Important of World trade organization and International economics organization

Core Elective Paper III

Course Content:

UNIT 1:

International Trade- Importance of International Trade – Theories of Foreign Trade – Theories of Adam Smith, Ricardo , Haberler, Heckscher.

UNIT 2:

Balance of Trade – Balance of Concept – Causes of Disequilibrium – Method of Correct Disequilibrium – Fixed and Floating exchange rates – Euro – Dollar market.

UNIT 3:

Export Management – Export procedure and document – Export finance – Export promotions- Export pricing.

UNIT 4:

International economics organization and its functions – International Monetary Fund(IMF),- International Bank for Reconstruction and Development (IBRD)[World Bank] – International Development Association (IDA)-International Finance Corporation (IFC) – Asian Development Bank(ADB) – United Nations Conference on trade and Development (UNCTAD) – United Nations Industrial development organization (UNIDO).

UNIT 5:

(WTO) World trade organization and Trade liberalisation – Liberalisation of Trade in manufacturing and in Agricultural trade – (TRIPS) Trade related intellectual property Rights – Trade related Investment Measures (TRIMS) – Indian patent Law.

Suggested Readings

Books for Study:

- 1) Francis Cherunilam, International Trade and Export Management, Himalaya Publishing House 2003.
- 2) Dr. S. Sankaran, International Economics, Margham Publications.

Books for References:

- 1) B. Santhanam, International Trade and Foreign Exchange, Margham Publications.
- 2) Paul K. Krugman and Maurice, International Economics.
- 3) Robert J. Karbough, International Economics.

Note: Either one from must be selected from two elective paper for Semester VI.

Course – Basic Details

| | | |
|--------------------|--|-------------|
| Course Code& Title | : 2164102 & Mathematics for Statistics | Semester: I |
| Course Type | : Allied | Credits:5 |
| Credit equivalence | : NA | |
| Pre-requisites | : NA | |

Learning Outcomes:

Upon finishing point of this course, students will be able to

1. Know the role of reciprocal equations in theory of equations.
2. Obtain the characteristic roots and vectors.
3. Obtain the reductions of quadratic and canonical forms.
4. Calculation of inverse of a matrix using Cayley Hamilton theorem.

Course Content:

UNIT – 1:

Matrix theory-definition and type of matrices, scalar, Elementary, Symmetric, Skew Symmetric, Hermitian, Skew - Hermitian, independent and unitary matrices- algebraic operations on matrices and their properties-elementary transformations of matrices – determinant of matrix, definition of a row rank– column rank and rank of a matrix – determination of rank of a matrix.

UNIT – 2:

Inverse of a square matrix – computation of the inverse of the square matrix - solution of linear equations – Homogenous and non-homogenous systems of equations–solutions space – consistency characteristic equations– root and vectors of a square matrix – left and right eigen vectors – Cayley –Hamilton theorem.

UNIT – 3:

Logarithmic differentiation, Differentiation of implicit functions, Concavity, Convexity – Points of inflexion – Euler’s Theorem - Total differential coefficients (proof not needed) –Simple problems only.

UNIT – 4:

Successive differentiation – Leibnitz theorem – Partial Differentiation – Maxima and Minima of functions of two variables.

UNIT – 5:

Integration – Properties of definite integrals – Reduction formula – Bernoulli’s formula.

Suggested Readings

Books for Study:

- 1) Narayanan and T. K. Manickavachagam Pillai (1996): Calculus (Vol I & II) S.V. Publications.
- 2) Shanti Narayanan: Differential and Integral Calculus, Chand & Co.

Books for Reference:

- 1) S.Narayanan and others , Calculus,S.Viswanathan publications.

Course – Basic Details

Course Code& Title : 2164206 & Real Analysis

Semester: II

Course Type : Allied

Credits: 5

Learning Outcomes:

Upon finishing this course, students will be able to

1. Comprehend the perception of differentiation and integration
2. Be familiar with the relationship between Gamma and Beta function
3. Be acquainted with differential equation
4. Understand the Laplace transform

Course Content:

UNIT – 1:

Sets, Operations on sets – real valued functions – countability – real numbers bounds, supremum and infimum – sequence of real numbers – limit inferior and limit superior and limits of real sequences– limit theorems.

UNIT – 2:

Convergence and divergence of a series –Geometric series –simple tests for convergence of a Series (Comparison tests, ratio test, root test, Leibnitz test) – conditional convergence and absolute convergence of alternating series – Simple problems.

UNIT – 3:

Continuous function and its properties – (Simple theorems only) – Uniform Continuity – Rolle’s Theorem – Mean Value Theorem – Taylor’s Theorem – Maclaurin Series.

UNIT – 4:

Riemann integrals, sufficient condition for Riemann integrability, Darboux theorem, fundamental theorem of integral calculus – first mean value theorem.

UNIT – 5:

Laplace transformation (LT) – definitions, LT of the function t , e^{at} , $\cos at$, $\sin at$, $e^{at} \cos bt$, $e^{at} \sin bt$, transform $f'(t)$, $f''(t)$ - Inverse LT relating to the above standard functions.

V- Suggested Readings

Books for Study:

1. D.Somasundram and B.Choudhary (2002): A first course in Mathematical Analysis, Narosa Publishing house.
2. Gold berg, R.R (1970): Method of Real Analysis, Oxford and IBH.

Books for Reference:

1. Narayanan and T. K. Manickavachagam Pillai – Ancillary Mathematics Book II
2. Bartle , R. G &Shebert, D. R. (1982): Introduction to Real Analysis, Wiley Eastern & Sons.
3. Bartle, R.G.Real 1976. Analysis, John Wiley and sons Inc.,
4. Malik, S.C. and Savita Arora (1991). Mathematical Analysis, Wiley Eastern Limited.New Delhi,
5. Sanjay Arora and Bansi (1991). Introduction to Real analysis, Satya Prakashan, New Delhi.
6. W. Rudin (1976): Principles of Mathematical Analysis, 3/e, McGraw Hill company.

Course – Basic Details

Course Code & Title : 2164311 & C- Programming Language

Course Type : Allied

Semester : III

Credits : 4

Learning Outcomes:

Upon finishing this course, students will be able to

1. Analyze the big data using c programming.
2. Compute the mean and variance using C program.
3. Create and update sequential and random file.
4. Understand the Pointer expressions.
5. Learn the statements of C language.
6. Understand the importance of functions.
7. Creation of file processing

Course Content:

UNIT -1:

Introduction to “C”, variables, data types - declarations, type conversions, increment and decrement, Bitwise, Logical and Assignment operators.

UNIT-2:

Expression and conditional expressions, control structures, IF-ELSE, SWITCH, WHILE, FOR and DO WHILE loop structures. Break continue, GO and Lable statements. Function, function returning, Non-integers, Function arguments-Static and register variables..

UNIT-3:

Arrays and Strings-Array Declaration, Multidimensional Arrays Strings/ Character Arrays, Array initialization-Pointers and addresses. Pointers and Arrays Pointer to function.

UNIT-4:

Standard input and output -formatted output-output-Access to the standard library.

UNIT-5:

File Access, File handling in C-File descriptions - Error handling - „Low level i/o- Read and Write". Open, Create, Close, Unlike.

Suggested Readings

Books For Study:

1. Balagurusamy,E.(1997):ANSI,,C“Programming,Tata-McGrawHillPublishers Ltd.
2. B.W.Kernighan,D.M.Ritchie C programming Language 2nd Edition,

Books for Reference:

1. Yaswant Kanetkar (1997): Let Us „C“,BPB Publications, New Delhi.
2. Bruce,H.Hunter: Introduction to „C“. K.N. King, C Programming – A Modern Approach.

Course – Basic Details

Course Code & Title : 2164414 & Numerical Methods
Course Type : Allied
Credit equivalence : NA
Pre-requisites : NA

Semester: IV
Credits: 4

Learning outcomes:

Upon finishing this course, students will be able to

1. Understand the concept of finite difference
2. Learn about interpolations
3. To know the concept of Numerical differentiation and Integrations

Course Content:

UNIT – 1:

Finite differences-forward and backward differences, operators E and Δ , and their basic properties, Interpolation with equal intervals: Newton's forward and backward differences-simple problems.

UNIT –2 :

Interpolation with unequal intervals:Divided differences and their properties, Newton's divided differences formula and Lagrange's formula for interpolation – simple problems.

UNIT- 3 :

Central difference interpolation formula-gauss forward and backward differences formulae - Stirling, Bessel's Everett's central difference formula.

UNIT – 4 :

Inverse interpolation -Lagrange's method - iteration of successive approximation method - simple problems. Numerical differentiation - Numerical differentiation upto 2nd order only-simple problems.

UNIT –5:

Numerical intergration -Trapezoidal rule - simpsons 1/3rd and 3/8th rules-Weddle's rule-Euler's summation formula. Numerical method of solution of ordinary differential equations -Taylor's series method - Euler method and Runga Kutta upto second order – simple problems.

Suggested Readings

Books for Study :

1. B.D. Gupta , Numerical Analysis, Konark Publishing.
2. Saxena, Calculus of finite differences and Numerical Analysis S. Chand & Co.

Books for Reference:

1. Gupta-Malik, Krishna Prakastan Mandir, Calculus of finite differences and Numerical analysis, Meerut.
2. M.K. Venkataraman, Numerical methods in Science and Engineering, National publishing house, Chennai.
3. M.M. Ramasamy and Palaniappan, Numerical mathematics

Course – Basic Details

Course Code & Title : 2164312 & Programming in C

Semester: III

Course Type : Allied Practical I

Credits: 2

Credit equivalence : NA

Pre-requisites : NA

Learning outcomes:

1. Understand concept of Matrices and other topics through this C programming language

Course Content:

A. Summation of Series :

1. Sin(x), 2. Cos(x), 3.Exp(x) (Comparison with built in functions)

B. String Manipulation :

1. Counting the no. of vowels, consonants, words, white spaces in a line of text and array of lines
2. Reverse a string & check for palindrome.

C. Matrix Manipulation : 1.Addition &

Subtraction

2. Transpose, and trace of a matrix

Course – Basic Details

Course Code & Title : 2164416 & Numerical Methods with C Programming Semester: IV
Course Type : Allied Practical II Credits: 2
Credit equivalence : NA
Pre-requisites : NA

Learning outcomes:

1. Learn about how to find solution of Newton Rapson method and Trapezoidal, Simpson's and Weddle's rules using C language program.

Course Content:

1. Solution of polynomial equation-Newton Rapson method
2. Solution of system of simultaneous equation-Gauss elimination method.
3. Lagrange interpolation.
4. Numerical integration by Trapezoidal, Simpson's and Weddle's rules.
5. Calculate the value of Π (up to five decimal places).
6. Check the accuracy of the built in functions $\text{Sin}(x)$, $\text{Cos}(x)$, $(x$ in radians) e^x , e^{-x} .
7. Generation of Fibonacci Sequence.
8. Solution of simultaneous equations by Iterative methods and by using inverse.

Learning outcomes:

Value are socially accepted norms to evaluate objects, persons and situations that form part and parcel of sociality. A value system is a set of consistent values and measures. Knowledge of the values are inculcated through education. It contributes in forming true human being, who are able to face life and make it meaningful. There are different kinds of values like, ethical or moral values, doctrinal or ideological values, social values and aesthetic values. Values can be defined as broad preferences concerning appropriate courses of action or outcomes. As such, values reflect a person's sense of right and wrong or what "ought" to be. There are representative values like, "Equal rights for all", "Excellence deserves admiration". "People should be treated with respect and dignity". Values tend to influence attitudes and behavior and help to solve common human problems. Values are related to the norms of a culture.

Course Content:

UNIT I: Value education-its purpose and significance in the present world – Value system – The role of culture and civilization – Holistic living – balancing the outer and inner – Body, Mind and Intellectual level – Duties and responsibilities.

UNIT II: Salient values for life – Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity, and inclusiveness, Self esteem and self confidence, punctuality – Time, task and resource management – Problem solving and decision making skills – Interpersonal and Intra personal relationship – Team work – Positive and creative thinking.

UNIT III: Human Rights – Universal Declaration of Human Rights – Human Rights violations – National Integration – Peace and non-violence – Dr.A P J Kalam's ten points for enlightened citizenship – Social Values and Welfare of the citizen – The role of media in value building.

UNIT IV: Environment and Ecological balance – interdependence of all beings – living and non-living. The binding of man and nature – Environment conservation and enrichment.

UNIT V: Social Evils – Corruption, Cyber crime, Terrorism – Alcoholism, Drug addiction – Dowry – Domestic violence – untouchability – female infanticide – atrocities against women – How to tackle them.

Books for Reference :

1. M.G. Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi, 2003.
2. Chakravarthy, S.K: Values and ethics for Organizations: Theory and Practice, Oxford University Press, New Delhi, 1999.
3. Satchidananda, M.K: Ethics, Education, Indian Unity and Culture, Ajantha Publications, Delhi, 1991.
4. Das, M.S. & Gupta, V.K.: Social Values among Young adults: A changing Scenario, M.D. Publications, New Delhi, 1995.
5. Bandiste, D.D.: Humanist Values: A Source Book, B.R. Publishing Corporation, Delhi, 1999.
6. Ruhela, S.P.: Human Values and education, Sterling Publications, New Delhi, 1986.
7. Kaul, G.N.: Values and Education in Independent Indian, Associated Publishers, Mumbai, 1975.
8. NCERT, Education in Values, New Delhi, 1992.
9. Swami Budhananda (1983) How to Build Character A Primer : Rmakrishna Mission, New Delhi.
10. A Culture Heritage of India (4 Vols.), Bharatiya Vidya Bhuvan, Bombay, (Selected Chapters only)
11. For Life, For the future : Reserves and Remains – UNESCO Publication.
12. Values, A Vedanta Kesari Presentation, Sri Ramakrishna Math, Chennai, 1996.
13. Swami Vivekananda, Youth and Modern India, Ramakrishna Mission, Chennai.
14. Swami Vivekananda, Call to the Youth for Nation Building, Advaita Ashrama, Calcutta.
15. Awakening Indians to India, Chinmayananda Mission, 2003.

The Statistics offering NME for UG Degree:

NON MAJOR ELECTIVE PAPER I

Course Code & Title : 2164103 & BASICS OF STATISTICS
Course Type : NME

Semester: I
Credits: 2

Learning Outcomes:

Upon finishing this course, students will be able to

1. Know the uses of statistics in society
2. Organize, manage and present data

Course Content:

UNIT - 1:

Definition of statistics- limitations of statistics – data Types- complete enumeration, observational studies and sample surveys-Presentation by tables and diagrams-Measures of Locations –Measures of Dispersion – Simple Problems.

UNIT - 2:

Correlation- Scatter diagram, Karlpearson's co-efficient and its properties, Spearman's rank correlation coefficient, principle of least squares and fitting of first curve-Regression Equations- properties of regression equations, regression lines and concept of error in regression - partial and multiple correlation- concepts. Association of attributes and simple problems.

Suggested Readings Books for Study:

- 1) Dr.P.R.Vital (2018)-Mathematical Statistics , Margham Publications.
- 2) SP Gupta (1976) - Statistical Methods - Sulta chand & Sons .

Course Code & Title : 2164209 & BASICS OF PROBABILITY
Course Type : NME

Semester: II
Credits: 2

Learning Outcomes: Upon finishing this course, students will be able to

1. Identify random experiments in real life data and translate real-world problems into probability models.
2. Understand the use of basic probability rules, including additive and multiplicative laws, independent and mutually exclusive events.

Course Content:

UNIT – I

Definition of Probability, Axioms on Probability, Random Experiment, Sample Points and Sample Space. Event and Operations on events. Classical and relative frequency approach to probability-Axiomatic approach to probability and simple problems.

UNIT-II

Addition theorem of Probability –Conditional Probability, Independence of events-Multiplication theorem-Bayes' Theorem (without Proof) Simple problems- Discrete and Continuous Random Variable - simple problems (Related to Discrete Random Variable Problems only)

REFERENCE BOOKS:

1. P.R.Vital : Mathematical Statistics, Margham Publications.
2. K.L. Chung (1983) : Elementary Probability theory with stochastic processes, Springer International student edition.

DEPARTMENT OF M. A. ENGLISH

CHOICE BASED CREDIT SYSTEM (CBCS)

OUTCOME BASED EDUCATION SYLLABUS

M.A. ENGLISH

2021 - 2023 BATCH



DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE

(AUTONOMOUS)

College with Potential for Excellence

Linguistic Minority Institution Affiliated to University of Madras

E.V.R. PERIYAR HIGH ROAD,

ARUMBAKKAM, CHENNAI – 600106, TAMILNADU.

DEPARTMENT OF M. A. ENGLISH

VISION:

To upgrade present status of our department into research leading to degrees of PhD

MISSION:

To enable students to appear for UPSC, UGC, SLET, NET and other competitive examinations

PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)

1. To produce efficient and intellectual postgraduates with strong fundamentals in appreciating literature, criticism and communication and to encourage them to pursue research in the field of literature (PEO1)
2. To make postgraduates capable of attaining employment in teaching, research and industry (PEO2)
3. To enable postgraduates to develop professionally through life-long learning, research and creative intellectual pursuits (PEO3)

PROGRAM SPECIFIC OUTCOMES (PSOS)

At the time of graduation, our postgraduates will be able to:

| | |
|------|---|
| PSO1 | gain a sound understanding of literary periods, authors and theories |
| PSO2 | strengthen literary knowledge and sharpen critical acumen of students to embark on a literary pursuit |
| PSO3 | understand thought, culture and history reflected in the study of literature |
| PSO4 | use communication as an effective instrument |
| PSO5 | understand group dynamics and become a good team player in the workspace |
| PSO6 | succeed in competitive examinations |
| PSO7 | use technological tools relevant to the work space |

PROGRAMME OUTCOMES

At the completion of the M.A. English program, the students will be able to:

| S.No | GRADUATE ATTRIBUTES | PROGRAMME OUTCOMES |
|------|---------------------|--------------------|
|------|---------------------|--------------------|

| | | |
|----|--|---|
| 1. | Scholarship and Knowledge | attain concrete knowledge about major time periods, authors and theories with relation to the respective historical and socio-political contexts (PO1) |
| 2. | Critical Thinking | analyse and critique texts by exhibiting a clear understanding of literary theories and concepts (PO2) |
| 3. | Research Skill | demonstrate skills which enable students to defend interpretations and research practices by using texts and secondary sources (PO 3) |
| 4. | Usage of relevant modern tools | employ technical skills in the professions of English Language Teaching, technical writing, creative writing and writing for different media (PO 4) |
| 5. | Communication | develop skills to evaluate, analyze and interpret information and to communicate effectively within the workplace and society at large (PO 5) |
| 6. | Independent and Reflective Learning | exhibit self-awareness and acquire appropriate skills to understand and analyse issues on local and global scales (PO 6) |

**MASTER OF ARTS DEGREE COURSE IN
ENGLISH LITERATURE**

**CHOICE BASED CREDIT SYSTEM (CBCS) WITH GRADING
SEMESTER SYSTEM WITH CREDITS**

**Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous)
Shift - II**

M.A. (English Literature)

(Effective from the Academic year 2021-23)

REGULATIONS

1. ELIGIBILITY FOR ADMISSION

Candidates for admission to the first year of the M.A. Degree programme shall be required to have passed the B.A. English or any degree with Foundation course Part II English offered by the University of Madras or any college / university / institution recognized by the UGC.

2. ELIGIBILITY FOR AWARD OF DEGREE

A Candidate shall be eligible for the award of the M.A. Degree Programme only if he/she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than two academic years and passed the examinations of all the four Semesters prescribed, earning a minimum of 91 credits [as per the distribution given in Regulation 4] and also fulfilled such conditions as may have been prescribed thereof.

3. DURATION OF THE COURSE

1. The PG course is of two year duration with four semesters.
2. Each academic year shall be divided into two semesters. The first academic year shall comprise the first and second semesters, the second academic year the third and fourth semesters, and the third academic year as the fifth and sixth semesters.
3. The odd semester include the period from June to November and the even semester from December to April. There shall not be less than 90 working days for each semester.

4. COURSE OF STUDY, CREDITS AND SCHEME EXAMINATION

(a) The main subject of study for M.A. Degree Programme shall consist of the following:

Total Number of Credits shall be 91 credits.

The credits for different subjects is as given below:

| Title of the Course / Components | No. of Courses | | Credits |
|---|-----------------------|--------|----------------|
| Core Subject including Project | 15 | 15 X 4 | 60 |
| Elective Courses | 5 | 5 X 3 | 15 |
| Extra disciplinary courses | 2 | 2 X 3 | 6 |
| Soft Skill | 4 | 4 X 2 | 8 |
| Internship | 1 | 1 X 2 | 2 |
| Total Credits | | | 91 |

5. SCHEME OF EXAMINATIONS:

- (a) Students shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination. For this purpose Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.
- (b) Marks for **Continuous Internal Assessment (CIA) & End Semester Examinations (ESE)**

| Category | Theory Subjects |
|--|-----------------|
| Continuous Internal Assessment (CIA) | 40 |
| End Semester Examinations (ESE) | 60 |
| Total Marks | 100 |

The components for the Continuous Internal Assessment shall be prescribed by the Board of Studies duly approved by the Academic Council from time to time. 5 Multiple Choice Questions to be included in the CIA

(c) The **question paper pattern** for end semester examinations (ESE) is as below :

| Section | No. of Questions | Marks |
|----------------------------|----------------------------------|-------------|
| A | 10 Questions out of 12 questions | 10 X 2 = 20 |
| B | 5 Questions out of 7 Questions | 5 X 7= 35 |
| C | 3 Questions out of 5 Questions | 3 X 15 = 45 |
| Total marks for ESE | | 100 Marks |

(d) The Project work evaluation and conduct of VIVA VOCE shall be done by Internal and External Examiners.

(e) For Internship, the report (in the form of Presentation) shall be evaluated by Internal and External Examiners.

(f) **Passing Minimum :**

(i) There shall be no passing minimum for Continuous Internal Assessment.

(ii) For End Semester Examination, passing minimum shall be 50% [Forty Percentage] of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva-Voce.

(iii) In the aggregate [External/Internal] the passing minimum shall be of 50%.

(iv) He/She shall be declared to have passed the whole examination, if he/she passes in all the papers and practical wherever prescribed as per the scheme of the examinations by earning 91 CREDITS.

(v) **Instant Examinations** is conducted for the students who appeared in the final semester examinations. Eligibility criteria for appearing in the Instant Examinations are prescribed by the Academic council from time to time.

(vi) **For Revaluation, Retotaling, supply of photocopy of the evaluated answer scripts**, the procedures and guidelines shall be prescribed by the academic council from time to time.

6. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTERS: a) Eligibility:

Students shall be eligible to go to subsequent semester only if they earn sufficient attendance as prescribed therefore by the Syndicate from time to time.

b) Attendance:

All Students must earn 75% and above of attendance for appearing for the University Examination. (Theory/Practical)

c) Condonation of shortage of attendance:

If a Student fails to earn the stipulated minimum attendance (i.e. 75%), the Principal shall condone the shortage of attendance up to a maximum limit of 10% (i.e. between 65% and above and less than 75%) after collecting the prescribed fee towards the condonation of shortage of attendance. Such fees collected and should be remitted to the University.

d) Non-eligibility for condonation of shortage of attendance:

Students who have secured less than 65 % but more than 50 % of attendance are NOT ELIGIBLE for condonation of shortage of attendance and such Students will not be permitted to appear for the regular examination, but will be allowed to proceed to the next year/next semester of the program and they may be permitted to take next University examination by paying the prescribed condonation fee. Such fees shall be remitted to the University.

Name of such Students should be forwarded to the University along with their attendance details in the prescribed format mentioning the category (3 copies) Year wise/Branch wise/Semester wise together with the fees collected from them, so as to enable them to get permission from the University and to attend the Theory/Practical examination subsequently without any difficulty.

e) Detained students for want of attendance:

Students who have earned less than 50% of attendance shall be permitted to proceed to the next semester and to complete the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the University from time to time.

f) Condonation of shortage of attendance for married women students:

In respect of married women students undergoing PG programs, the minimum attendance for condonation (Theory/Practical) shall be relaxed and prescribed as 55% instead of 65 % if they conceive during their academic career. Medical certificate from the Doctor(D.G.O) attached to the Government Hospital and the prescribed fee ofRs.250/-therefor together with the attendance details shall be forwarded to the university to consider the condonation of attendance mentioning the category.

g) Zero Percent (0%) Attendance:

The Students, who have earned 0% of attendance, have to repeat the program (by rejoining) without proceeding to succeeding semester and they have to obtain prior permission from the University immediately to rejoin the program.

h) Transfer of Students and Credits:

The strength of the credits system is that it permits inter Institutional transfer of students. By providing mobility, it enables individual students to develop their capabilities fully by

permitting them to move from one Institution to another in accordance with their aptitude and abilities. Transfer of Students is permitted from one Institution to another Institution for the same program with same nomenclature

Provided, there is a vacancy in the respective program of Study in the Institution where the transfer is requested.

Provided, the Student should have passed all the courses in the Institution from where the transfer is requested.

- i) The marks obtained in the courses will be converted and grades will be assigned as per the University norms.
- j) The transfer students are eligible for classification.
- k) The transfer students are not eligible for Ranking, Prizes and Medals.
- l) Students aspiring / applying to go to foreign Universities upto two semesters or Project Work with the prior approval of the Departmental/College Committee are allowed to get transfer of credits and marks which will be converted into Grades as per the University norms and are eligible to get CGPA and Classification; they are not eligible for Ranking, Prizes and Medals.
- m) The decision of the Principal of the College remains final and binding in all respects.

7. CLASSIFICATION OF SUCCESSFUL STUDENTS:

(a) Classification:

Successful Students passing all the Examinations prescribed

- (a) 60 percent and above in the aggregate marks (CIA + ESE) shall be declared to have passed the examination in the FIRST CLASS
- (b) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in SECOND class respectively;
- (c) Candidates who obtain 75% of the marks in the aggregate (CIA + ESE) shall be deemed to have passed the examination in First Class with Distinction, provided they pass all the examinations (theory papers, practical, project and viva-voce) prescribed for the course in the First appearance.

(d) Marks and Grades:

The following table shows the marks, grade points, letter grades and classification to indicate the performance of the Student in the subjects prescribed.

| Range of Marks | Grade points | Letter Grade | Description |
|----------------|--------------|--------------|-------------|
| 90 – 100 | 9.0 - 10.0 | O | Outstanding |
| 80 – 89 | 8.0 – 8.9 | D+ | Excellent |
| 75 – 79 | 7.5 – 7.9 | D | Distinction |
| 70 – 74 | 7.0 – 7.4 | A + | Very Good |
| 60 – 69 | 6.0 – 6.9 | A | Good |
| 50 – 59 | 5.0 – 5.9 | B | Average |

| | | | |
|---------|-----|-----|-----------|
| 00 – 49 | 0.0 | RA | Re-Appear |
| ABSENT | 0 | AAA | ABSENT |

- (e) **Computation of Grade Point Average (GPA) in a Semester, Cumulative Grade Point Average (CGPA) and Classification**

$$\text{GPA for a Semester:} = \frac{\sum_i C_i G_i}{\sum_i C_i}$$

That is, GPA is the sum of the multiplication of grade points by the credits of the courses divided by the sum of the credits of the courses in a semester.

CGPA for the entire programme: = $\frac{\sum_n \sum_i C_{ni} G_{ni}}{\sum_n \sum_i C_{ni}}$ That is, CGPA is the sum of the multiplication of grade points by the credits of the entire programme divided by the sum of the credits of the courses of the entire programme

Where, C_i = Credits earned for course i in any semester, G_i = Grade Points obtained for course i in any semester n = Semester in which such courses were credited.

- (f) **Letter Grade and Class:**

| CGPA | Grade | Classification of Final Result |
|-------------------------------|-------|--------------------------------|
| 9.5 and above but below 10.00 | O+ | First Class - Exemplary* |
| 9.0 and above but below 9.5 | O | |
| 8.5 and above but below 9.0 | D++ | First Class with Distinction* |
| 8.0 and above but below 8.5 | D+ | |
| 7.5 and above but below 8.0 | D | |
| 7.0 and above but below 7.5 | A++ | First Class |
| 6.5 and above but below 7.0 | A+ | |
| 6.0 and above but below 6.5 | A | |
| 5.5 and above but below 6.0 | B+ | Second Class |
| 5.0 and above but below 5.5 | B | |
| 0.0 and above but below 4.0 | RA | Re Appear |

* The Students who have passed in the first appearance and within the prescribed semester of the PG Programme (Core, Elective, Internship courses only) are eligible.

- (e) **RANKING:**

Students who pass all the examinations prescribed for the Program in the FIRST APPEARANCE ITSELF ALONE are eligible for Ranking / Distinction, provided in the case of Students who pass all the examinations prescribed for the Program with a break in the First Appearance due to the reasons as furnished in the

Regulations are only eligible for Classification.

8. CONCESSIONS FOR DIFFERENTLY- ABLED STUDENTS

a) Dyslexia students:

For students who are mentally disabled, learning disability and mental retardation, who are slow learners, who are mentally, impaired having learning disorder and seizure disorder and students who are spastic and cerebral Palsy, the following concessions shall be granted: i) Part I Foundation course Tamil or any other Language can be exempted.

- ii) One-third of the time of paper may be given as extra time in the examination.
- iii) Leniency in overlooking spelling mistakes, and
- iv) Amanuensis for all courses provided the request is duly certified by the Medical Board of the Government Hospital/ General Hospital/ District headquarters Hospitals and they shall be declared qualified for the degree if they pass the other examinations prescribed for the degree.

b) Hearing, Speaking Impaired & Mentally retarded:

- i) For students who are hearing and speaking impaired and who are mentally challenged, the following concessions shall be granted:
- ii) One Language paper either Part I Foundation course Tamil or any other Language or Part II English or its equivalent can be exempted ii) Part IV Non-Major Elective (NME) or Basic Tamil or Advanced Tamil can be exempted.

c) Visually Challenged students:

- i) Exempted from paying examination fees.
- ii) A scribe shall be arranged by the College and the scribe be paid as per the College decision.

9. MAXIMUM PERIOD FOR COMPLETION OF THE PROGRAMS TO QUALIFY FOR A DEGREE

- a) A Student who for whatever reasons is not able to complete the program within the normal period (N) or the Minimum duration prescribed for the programme, may be allowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (Time Span = N + 2 years for the completion of programme.)
- b) In exceptional cases such major accidents, childbirth, etc., an extension of one year be considered beyond maximum span of time. (Time Span = N + 2 +1 years for the completion of the programme).
- c) Students qualifying during the extended period shall not be eligible for RANKING.

10. COURSE CURRICULUM:

Dwaraka Doss Goverdhan Doss Vaishnav College (Autonomous), Chennai – 600 106

[Affiliated to University of Madras]

M.A. (English Literature)

Curriculum

(Batch 2021 – 2023 Onwards)

| Semester – I | Credits | Hrs | Semester – II | Credits | Hrs |
|--------------|---------|-----|---------------|---------|-----|
|--------------|---------|-----|---------------|---------|-----|

| | | | | | |
|--|---------------|-------------|---|---------------|-------------|
| 1. Poetry - I From Chaucer to 17 th century (Core I) | 4 | 5 | 1. American Literature (Core V) | 4 | 5 |
| 2. Drama - I Elizabethan and Jacobean drama (Core II) | 4 | 5 | 2. Poetry – II Eighteenth to Nineteenth century (Core VI) | 4 | 5 |
| 3. Fiction – I Origins and Developments upto 18 th century (Core III) | 4 | 5 | 3. Drama – II Restoration to twentieth century (Core VII) | 4 | 5 |
| 4. Indian Writing in English and in Translation (Core IV) | 4 | 5 | 4. Fiction - II Nineteenth to Twentieth century (Core VIII) | 4 | 5 |
| 5. Classics in Translation (Elective I) | 3 | 4 | 5. English for Careers (Elec. III) | 3 | 4 |
| 6. Spoken English (Elective II) | 3 | 4 | 6. English for Professional Communication (Extra –Dis.I) | 3 | 4 |
| 7. Soft Skill - I | 2 | 2 | 7. Soft Skill - II | 2 | 2 |
| Total | 24 | 30 | Total | 24 | 30 |
| Semester – III | Credit | Hour | Semester – IV | Credit | Hour |
| | s | s | | s | s |
| 1. Shakespeare Studies (Core IX) | 4 | 5 | 1. Twentieth Century Poetry (Core XII) | 4 | 5 |
| 2. English Language & Linguistics (Core X) | 4 | 5 | 2. Writings by and on Women (Core XIII) | 4 | 5 |
| 3. Literary Criticism and Literary Theory (Core XI) | 3 | 4 | 3. Postcolonial Literature (Core XIV) | 4 | 5 |
| 4. Literature, Analysis, Approaches and Copy Editing (Extra. Dis. II) | 3 | 4 | 4. Research Methodology and Project Writing (Core XV) | 4 | 5 |
| 5. Introduction to Translation Studies (Elective – IV) | 2 | 2 | 5. Film Studies (Elective V) | 3 | 4 |
| 6. Soft Skills – II | 2 | | 6. Soft Skills - IV | 2 | 2 |
| 7. Internship**** | | | | | |
| Total | 22 | 25 | Total | 21 | 26 |

**** Internship will be carried out during the summer vacation of the first year and marks should be sent to the University by the College and the same will be included in the Third Semester Marks Statement.

M.A. (English Literature)

FIRST SEMESTER

| Sl.No | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|---|---------------------|---------|-------------------|------------|-----|
| | | | | | CIA | ESE |
| 1 | Core I -Poetry - I From Chaucer to 17 th century | 5 | 4 | 3 | 40 | 60 |

| | | | | | | |
|---|--|-----------|-----------|---|----|----|
| 2 | Core II - Drama - I Elizabethan and Jacobean drama | 5 | 4 | 3 | 40 | 60 |
| 3 | Core III - Fiction – I Origins and Developments upto 18 th century | 5 | 4 | 3 | 40 | 60 |
| 4 | Core IV-Indian Writing in English and in Translation | 5 | 4 | 3 | 40 | 60 |
| 5 | ELECTIVE I - Classics in Translation | 4 | 3 | 3 | 40 | 60 |
| 6 | ELECTIVE II - Spoken English | 4 | 3 | 3 | 40 | 60 |
| 7 | Softskills – I | 2 | 2 | | | |
| | Total | 30 | 24 | | | |

SECOND SEMESTER

| SL.No | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|--|---------------------|-----------|-------------------|------------|-----|
| | | | | | CIA | ESE |
| 1 | Core V - American Literature | 5 | 4 | 3 | 40 | 60 |
| 2 | Core VI - Eighteenth to Nineteenth Century | 5 | 4 | 3 | 40 | 60 |
| 3 | Core VII - Restoration to Twentieth Century | 5 | 4 | 3 | 40 | 60 |
| 4 | Core VIII - Nineteenth to Twentieth Century | 5 | 4 | 3 | 40 | 60 |
| 5 | EXTRA DISCIPLINARY I - English for Professional Communication | 4 | 3 | 3 | 40 | 60 |
| 6 | ELECTIVE III - English for Careers | 4 | 3 | 3 | 40 | 60 |
| 7 | Softskills – II | 2 | 2 | | | |
| | Total | 30 | 24 | | | |

THIRD SEMESTER

| SL.No | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|------------------------------------|---------------------|---------|-------------------|------------|-----|
| | | | | | CIA | ESE |
| 1 | Core IX Shakespeare Studies | 5 | 4 | 3 | 40 | 60 |

| | | | | | | |
|---|---|-----------|-----------|---|----|----|
| 2 | Core X English Language and Linguistics | 5 | 4 | 3 | 40 | 60 |
| 3 | Core XI Literary Criticism and Literary Theory | 5 | 4 | 3 | 40 | 60 |
| 4 | EXTRA DISCIPLINARY I - Literature, Analysis, Approaches and Copy Editing | 4 | 3 | 3 | 40 | 60 |
| 5 | ELECTIVE – IV Introduction to Translation Studies | 4 | 3 | 3 | 40 | 60 |
| 6 | Soft Skills – III | 2 | 2 | 2 | 40 | 60 |
| 7 | Internship **** | | 2 | | 40 | 60 |
| | Total | 25 | 22 | | | |

**** Internship will be carried out during the summer vacation of the first year and marks should be sent to the University by the College and the same will be included in the Third Semester Marks Statement.

FOURTH SEMESTER

| Sl.No | Name of the Course | Instructional Hours | Credits | Examination Hours | Max. Marks | |
|-------|--|---------------------|-----------|-------------------|------------|-----|
| | | | | | CIA | ESE |
| 1 | Core XII Twentieth Century Poetry | 5 | 4 | 3 | 40 | 60 |
| 2 | Core XIII Writings by and on Women | 5 | 4 | 3 | 40 | 60 |
| 3 | Core XIV Postcolonial Literature | 5 | 4 | 3 | 40 | 60 |
| 4 | Core XV Research Methodology and Project Writing* | 5 | 4 | Project | | |
| 5 | Elective V - Film Studies | 4 | 3 | 3 | 40 | 60 |
| 6 | Soft Skills – IV | 2 | 2 | 3 | 40 | 60 |
| | Total | 26 | 21 | | | |

* Research Methodology and Project Writing

Internal Evaluation - 20 Project Content - 40 Project Viva-Voce - 40 Total - 100 Marks

FIRST SEMESTER

Course Structure: Paper I

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

| | | | |
|-----------------------------|---|---------------------|--------------------------------|
| Title of the Course / Paper | CORE PAPER-I Poetry I From Chaucer to 17th Century | | |
| Category of the Course C | Year & Semester First Year & First Semester | Credits 4 | Subject Code 1965101 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Understand the origin of English Poetry (k2) CO2: Sketching the evolution of the British Poetic forms(k3) CO3: Distinguish types of poetic forms (k4) CO4: Delineate the features related to poetic forms(k4) CO5: Understand the form and context of poems (k2) CO6: Critically appreciate a poem (k5) | | |
| Course Outline | UNIT I Chaucer and Medieval England Geoffrey Chaucer The Nun's Priest's Tale from The Canterbury Tales | | |
| | UNIT 2 Poetic Forms During 16th Century Edmund Spenser Prothalamion Wyatt and Surrey (2 sonnets) Wyatt - Whoso List To Hunt Surrey - The Golden Gift that Nature Did Thee Give | | |
| | UNIT 3 Poetic Forms during 17th Century Metaphysical Poetry John Donne The Canonisation Ecstasy | | |
| | UNIT 4 Satire John Dryden Absalom and Achitophel | | |
| | UNIT 5 Epic John Milton Paradise Lost Book IX | | |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | M | L | H | H | H | L | M | L |
| CO2 | H | H | H | L | L | M | L | H | H | H | L | M | L |
| CO3 | H | H | H | L | L | H | L | H | H | H | L | M | L |
| CO4 | H | H | H | L | L | H | L | H | H | H | L | M | L |
| CO5 | H | H | H | L | L | H | L | H | H | H | L | H | L |
| CO6 | H | H | H | L | L | H | L | M | H | H | L | H | H |

Recommended Texts:

1. 1973, **The Oxford Anthology of English Literature Vol. I.** The Middle Ages Through the 18th century. OUP, London
2. Standard editions of texts **Reference Books:**
 1. T.S. Eliot, 1932, “**The Metaphysical Poets**” from **Selected Essay**; Faber and Faber limited, London.
 2. H.S. Bennett, 1970, **Chaucer and the Fifteenth Century**, Clarendon Press, London.
 3. Malcolm Bradbury and David Palmer, ed., 1970 **Metaphysical Poetry**, Stratford - upon – Avon Studies Vol. II, Edward Arnold, London.
 4. William R. Keast, ed., 1971, **Seventeenth Century English Poetry: Modern Essays in Criticism**, Oxford University Press, London.
 5. A.G. George, 1971, **Studies in Poetry**, Heinemann Education Books Ltd., London.
 6. David Daiches, 1981, **A Critical History of English Literature Vols. I & II.**, Secker & Warburg, London.
 7. Thomas N. Corns, ed., 1993, **The Cambridge Companion to English Poetry: Donne to Marvell**, Cambridge University Press, Cambridge.
 8. H.J.C. Grierson, “**Metaphysical Lyrics and Poems of the Seventeenth Century**” OUP, 1983 , London.

Website, e-learning resources

<http://www.english.org.uk/chaucer/htm> **Course Structure: Paper II**

| | | | | |
|-----------------------------|--|---------------------|--------------------------------|-----------------------|
| Course Code : | | | | Credits : 04 |
| L:T:P:S : 4:0:0:0 | | | | CIA Marks : 40 |
| Exam Hours : 03 | | | | ESE Marks : 60 |
| Title of the Course / Paper | CORE PAPER- II Drama I Elizabethan and Jacobean Drama | | | |
| Category of the Course C | Year & Semester First Year & First Semester | Credits 4 | Subject Code 1965102 | |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | | |
| Course Outcomes | CO1: Understand the origin of drama in Britain (K2) CO2: Deduce the stages of evolution of British drama (K4) CO3: Correlate the context of theater and culture (K4) CO4: Examine the characteristics of Tragedy and Comedy (K4) CO5: Appraise the representative writers in their social and political milieu (K4) CO6: Critically analyse the representative texts from the Elizabethan and Jacobean Periods (K5) | | | |
| Course Outline | UNIT I Beginnings of Drama Miracle and Morality Plays – Everyman | | | |
| | UNIT 2 The Senecan and Revenge Tragedy Thomas Kyd The Spanish Tragedy | | | |
| | UNIT 3 Elizabethan Theatre Theatres, Theatre groups, audience, actors and conventions | | | |
| | UNIT 4 Tragedy and Comedy Christopher Marlowe The Jew of Malta Ben Jonson The Alchemist | | | |
| | UNIT 5 Jacobean Drama John Webster The White Devil | | | |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | M | L | H | M | H | L | L | L |
| CO2 | H | M | H | L | L | M | L | H | H | H | L | L | L |
| CO3 | M | H | H | L | L | H | L | H | H | H | L | L | M |
| CO4 | M | M | L | L | L | M | L | H | H | H | L | L | L |
| CO5 | H | H | H | L | L | H | L | H | H | H | L | L | M |
| CO6 | H | H | M | L | L | H | L | H | H | H | L | L | M |

Recommended Texts: Standard editions of texts

Reference Books:

1. Bradbrook, M.C., 1955, **The Growth and Structure of Elizabethan Comedy**, London.
2. Tillyard E.M.W., 1958, **The Nature of Comedy & Shakespeare**, London.
3. Una Ellis-Fermor, 1965, **The Jacobean Drama: An Interpretation**, Methuen & Co., London.
4. John Russell Brown and Bernard Harris, eds., **Elizabethan Theatre**, Stratford - upon - Avon Studies Vol9., Edward Arnold, London.
5. Allardyce Nicoll, 1973, **British Drama**, Harrap, London.
6. Bradbrook, M.C., 1979, **Themes and Conventions of Elizabethan Tragedy**, Vikas Publishing House Pvt., Ltd., (6thed) New Delhi.
7. Michael Hathaway, 1982, **Elizabethan Popular Theatre : Plays in Performance**, Routledge, London.
8. Kinney, Arthur .F., 2004, **A Companion to Renaissance Drama**, Oxford: Blackwell Publishing.

Website, e-learning resources

<http://www.clt.astate.edu/wmarey/asste%20http://eb.com>

_____(Encyclopaedia Britannica – restricted site)

<http://en.wikipedia.org/wiki>

(qualified search results on Elizabethan Theatre, Restoration Drama, Comedy of Manners, realism, naturalism, Abbey Theatre, Gaelic Revival, Modern Celts, Epic Theatre, Political Theatre, Experimental Theatre, etc. and on individual authors.)

<http://www.questia.com> _____(online library for research)

Course Structure: Paper III

| | | | |
|-----------------------------|---|---------------------|--------------------------------|
| Course Code : | Credits : 04 | | |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 | | |
| Exam Hours : 03 | ESE Marks : 60 | | |
| Title of the Course / Paper | CORE PAPER- III Fiction I Origins and Developments upto 18th Century | | |
| Category of the Course C | Year & Semester First Year & First Semester | Credits 4 | Subject Code 1965103 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Understand the origin of the British Novel (k2) CO2: Illustrate the development of the British Novel upto the 18 th Century (k3) CO3: Delineate various concepts and theories of the novel (k4) CO4: Distinguish types of novel forms (k4) CO5: Understand the poetics of the novel (k2) CO6: Critically appreciate a novel (k5) | | |
| Course Outline | UNIT I Novel as a Form, Concepts and Theories about the Novel; Poetics of the Novel – definition, types, narrative modes: omniscient narration. | | |
| | UNIT 2 Allegory and Satire John Bunyan The Pilgrim’s Progress Jonathan Swift Gulliver’s Travels | | |
| | UNIT 3 The New World Novel Daniel Defoe Robinson Crusoe | | |
| | UNIT 4 Picaresque Novel Charles Dickens Hard Times | | |
| | UNIT 5 Middle Class Novel of Manners Jane Austen Emma | | |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | H | L | H | M | H | L | L | M |
| CO2 | H | H | H | L | L | M | L | H | H | H | L | L | H |
| CO3 | H | H | H | L | L | H | L | H | H | H | L | L | H |
| CO4 | M | H | M | L | L | H | L | H | H | H | L | L | M |
| CO5 | H | H | M | L | L | H | L | H | H | H | L | L | H |
| CO6 | H | H | H | L | L | H | L | H | H | H | L | L | H |

Recommended Texts: Standard editions of texts

Reference Books:

1. Wayne C. Booth, 1961, **The Rhetoric of Fiction**, Chicago University Press, London.
2. F.R. Leavis, 1973, **The Great Tradition**, Chatto&Windus, London.
3. Ian Watt, 1974, **Rise of the English Novel**, Chatto&Windus, London.
4. Frederick R Karl, 1977, **Reader’s Guide to the Development of the English Novel till the 18th Century**, The Camelot Press Ltd. Southampton.
5. Ian Milligan, 1983, **The Novel in English: An Introduction**, Macmillan, Hong Kong.
6. Watt, Ian. *The Victorian Novel: Modern Essays in Criticism* . OUP, 1991. Website, e-learning resources <http://en.wikipedia.org/wiki/novel>

Course Structure: Paper IV

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 |
| Exam Hours : 03 | ESE Marks : 60 |

| | |
|---|--|
| A Scratch | |
| Kamala Das An Introduction, Dance of the Eunuchs | |
| UNIT 3 Drama Girish Karnad Hayavadana | |
| UNIT 4 Prose and Fiction Prose M.K. Gandhi Chapters 4,7,8,9&13 from Hind Swaraj B.R. Ambedkar Extracts 4, 5 and 6 from Annihilation of Caste ed. Mulik Raj Anand (Delhi: Arnold Publishers, 1990, pp. 47- 54) | |
| UNIT 5 Fiction Shashi Deshpande Dark Holds No Terrors Short Story The following selections from Routes: Representations of the West in Short Fiction from South India in Translation eds. Vanamala Viswanatha, V.C. Harris, C. Vijayashree and C.T. Indra (Macmillan 2000). Kannada Masti Venkatesa Iyengar The Sorley Episode Malayalam P. Surendran Synonyms of the Ocean Tamil PudumaiPithan Teaching | |

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | H | L | H | M | H | L | M | M |
| CO2 | H | H | H | L | L | M | L | H | M | H | L | H | H |
| CO3 | M | M | H | L | L | M | L | H | H | H | L | H | H |
| CO4 | H | H | H | L | L | H | L | H | H | H | L | H | H |
| CO5 | H | H | H | L | L | H | L | H | H | H | L | H | H |
| CO6 | M | H | H | L | L | M | L | H | H | H | L | H | H |

Recommended Texts: Standard editions of texts

Reference Books:

1. K.R. SrinivasaIyengar, 1962, –**History of Indian Writing in English**, Sterling Publishers, New Delhi.
2. Herbert H. Gowen, 1975, **A History of Indian Literature**, Seema Publications, Delhi.
3. William Walsh, 1990, **Indian Literature in English**, Longman, London.
4. Subhash Chandra Sarker, 1991, **Indian Literature, and Culture**, B.R. Publishing Corporation, Delhi.
5. M.K. Naik&Shyamala A Narayan, 2001, **Indian English Literature 1980-2000: A Critical Survey** ,D.K. Fine Art Press (P) Ltd., New Delhi.
6. TabishKhair, 2001, **Babu Fictions: Alienation in Contemporary Indian English Novels.**, OUP.
7. RajulBharagava Ed., 2002, **Indian Writing in English: The Last Decade**,Rawat Publications, New Delhi.
8. K. Satchidanandan, 2003, **Authors, Texts, Issues: Essays on Indian literature**, Pencraft International, New Delhi.
9. P.K. Rajan ed., 2004, **Indian Literary Criticism in English: Critics, Texts, Issues**,Rawat Publications, New Delhi.
10. Bruce King, 2001, **Modern Indian Poetry in English**, OUP, New Delhi.
11. Amit Chaudri, 2001, **The Picador Book of Modern Indian Literature**, Macmillan, London.
12. A.K. Mehrotra, 2003, **An Illustrated History of Indian Literature in English**. Permanent Black, New Delhi. Website, e-learning resources

http://en.wikipedia.org/wiki/indian_wring_in_english

Course Structure ELECTIVE-I

| | | | | |
|--|--|---|--------------|--------------------------------|
| Course Code : | Credits : 03 | | | |
| L:T:P:S : 3:0:0:0 | CIA Marks : 40 | | | |
| Exam Hours : 03 | ESE Marks : 60 | | | |
| Title of the Course / Paper | ELECTIVE PAPER- I Classics in Translation. | | | |
| Category of the Course - E (Elective within the department) | <table border="1"> <tr> <td>Year & Semester First Year & First Semester</td> <td>Credits 3</td> <td>Subject Code 1965105</td> </tr> </table> | Year & Semester First Year & First Semester | Credits 3 | Subject Code 1965105 |
| Year & Semester First Year & First Semester | Credits 3 | Subject Code 1965105 | | |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | | |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | M | H | H | L | L | M | L | H | H | M | L | L | M |
| CO2 | H | H | H | L | L | H | L | H | H | H | L | L | H |
| CO3 | H | H | H | L | L | H | L | H | H | H | L | L | H |
| CO4 | H | H | H | L | L | M | L | H | H | H | L | L | H |
| CO5 | H | H | H | L | L | H | L | H | H | H | L | L | H |

Recommended Texts: Standard editions of texts.

Reference Books:

1. Lau Magnesm, **A Dictionary of Modern European Literature.**
2. Raymond Williams, **Drama from Ibsen to Brecht.**
3. J.M. Cohen, **A History of Western Literature.**

Website : <http://en.wikipedia.org/wiki/Drama>

Course Structure : Elective-II

| | |
|-----------------------------|--|
| Course Code : | Credits : |
| | 02 |
| L:T:P:S : 2:0:0:0 | CIA Marks : |
| | 40 |
| Exam Hours : 03 | ESE Marks : 60 |
| Title of the Course / Paper | ELECTIVE PAPER-II Spoken English (Art of Conversation, Role-play - Developing Conversational Ability) |

| | | | |
|--|--|--------------|--------------------------------|
| Category of the Course - E (Elective for other Departments) | Year & Semester First Year & First Semester | Credits 2 | Subject Code 1965106 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Construct their thoughts and speak with confidence (K6) CO2: Understand the context and converse with relevance (K2) CO3: Employ proper diction in oral communication (K3) CO4: Use proper pronunciation and intonation (K3) | | |

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | L | L | L | H | H | H | L | L | L | L | L | H | M |
| CO2 | L | L | L | H | H | H | L | L | L | L | M | H | H |
| CO3 | L | L | L | H | M | M | L | L | L | L | M | H | M |
| CO4 | L | L | L | H | M | M | L | L | L | L | M | H | M |

Recommended Reading:

Study Speaking: A Course in Spoken English for academic purposes. **Kenneth Anderson, Joan Maclean and Tony Lynch. Cambridge: Cambridge University Press, 2004**

SECOND SEMESTER

Course Structure: Paper V

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : |
| | 04 |
| L:T:P:S : 4:0:0:0 | CIA Marks : |
| | 40 |
| Exam Hours : 03 | ESE Marks : 60 |

| | | | |
|-----------------------------|--|---------------------|--------------------------------|
| Title of the Course / Paper | CORE PAPER-V American Literature | | |
| Category of the Course C | Year & Semester First Year & Second Semester | Credits 4 | Subject Code 1965207 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Illustrate the origin and development of American Literature (K3) CO2: Trace the change in writing from the time of the settlers and colonies to the postmodern era (K2) CO3: Display a knowledge of different movements in American literature - the flowering of New England, the American Renaissance and the Harlem Renaissance (K 3) CO4: Analyse the influence of Urbanization and post-war society, the economic depression and the civil war on fiction and drama (K4) CO5: Appraise the key concepts of American literature like Transcendentalism, Individualism and Multiculturalism (K5) CO6: Critically interpret the interplay of social issues and literature (K5) | | |
| Course Outline | UNIT I Concepts and Movements: Beginnings of American Literature; Transcendentalism; Individualism; The American South; The Frontier; Counter – Culture; Harlem Renaissance; Rise of Black Culture and Literature; Multiculturalism. | | |
| | UNIT 2 Poetry Walt Whitman Crossing Brooklyn Ferry Emily Dickinson Success is Counted Sweetest The Soul Selects her own society Because I could not stop for death Robert Frost Home Burial Wallace Stevens Anecdote of the Jar Carl Sandburg Four Preludes on Playthings of the Wind Gwendolyn Brooks Kitchenette Building | | |
| | UNIT 3 Drama Arthur Miller The Crucible Marsha Norman 'Night, Mother | | |
| | UNIT 4 Fiction Ernest Hemingway A Farewell to Arms | | |
| | Alice Walker The Color Purple | | |

| | |
|--------------|---|
| UNIT 5 | Prose |
| R.W. Emerson | Self – Reliance(An Anthology: American Literature of the Nineteenth Century. ed. Fisher, Samuelson & Reninger, Vaid |
| Amy Tan | Mother Tongue |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|------------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | H | L | H | M | H | L | L | H |
| CO2 | H | H | M | L | L | M | L | H | H | H | L | L | H |
| CO3 | H | M | H | L | L | H | L | H | H | H | L | L | H |
| CO4 | H | H | H | L | L | H | L | H | H | H | L | L | H |
| CO5 | H | M | H | L | L | H | L | H | H | H | L | L | H |
| CO6 | H | H | H | L | L | H | L | H | H | H | L | L | H |

Recommended Texts:

1. Egbert S. Oliver ed., **An Anthology: American Literature, 1890-1965**, Eurasia Publishing House (Pvt) Ltd., New Delhi.
2. Mohan Ramanan ed., 1996, **Four Centuries of American Literature**, Macmillan India Ltd., Chennai.
3. Tan, Amy. *The Joy Luck Club*. Penguin, 2006.
4. Standard Editions of texts

Reference Books :

1. John Russell Brown and Bernard Harris, ed., 1970, **American Theatre**, Edward Arnold.

2. Daniel Hoffman ed., 1979, **Harvard Guide to Contemporary American Writing**, Oxford University Press, New Delhi.
3. Lacroix, Jean Paul. *The Meaning of Modern Atheism*. Macmillan, 1965.
4. Spiller, Robert E. *The Cycle of American Literature*. Macmillan, 1955.

Website, e-learning resources

www.gonzago.edu/faculty/cample/enl311/litfram.html

Course Structure: Paper VI

| | | | |
|-----------------------------|--|-----------------------|--------------------------------|
| Course Code : | | Credits : 04 | |
| L:T:P:S : 4:0:0:0 | | CIA Marks : 40 | |
| Exam Hours : 03 | | ESE Marks : 60 | |
| Title of the Course / Paper | CORE PAPER-VI- Poetry II Eighteenth to Nineteenth Century | | |
| Category of the Course C | Year & Semester First Year & Second Semester | Credits 4 | Subject Code 1965208 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Sketch the evolution of English Poetry from Augustans to the beginnings of the Romantic Period (k3) CO2: Position eloquent writers and their works in context (k3) CO3: Delineate certain exclusive poetic qualities of these two periods(k4) CO4: Distinguish the different poetic forms of these two periods (k4) CO5: Understand the form and content of poetry (k2) CO6: Critically analyse the poem of these two periods (k5) | | |
| Course Outline | UNIT I Classicism and Augustan Ideals: Wit, Taste, Decorum, Propriety, Purity of Genre and Poetic Diction; Heroic Couplet; Verse Satire and Urbanism; Romantic Revolt; Pre-Raphaelites UNIT 2 Augustan Satire Alexander Pope The Rape of the Lock, Canto I (The Rape of the Lock ed.GeoffreyTillotson. Methun & Co. Ltd. London. 1941). | | |

2. Standard editions of text.

Reference Books:

1. Douglas Grant, 1965, **New Oxford English Series**, OUP, Delhi.
2. Shiv K. Kumar, 1968, **British Romantic Poets: Recent Revaluations**, University of London Press Ltd., London.
3. A. E. Dyson, ed., 1971 **Keats ODES**, Case Book series, Macmillan Publication Ltd., London.
4. Malcolm Bradbury, David Palmer, eds., 1972, **Stratford-upon-Avon Studies**, Arnold-Heinemann, New Delhi.
5. Graham Hough, 1978, **The Romantic Poets**, Hutchinson & Co., London.
6. David Daiches, 1981, **A Critical History and English Literature Vols. II& III**. Secker & Warburg, London.

Website, e-learning resources

http://en.wikipedia.org/wiki/English_poetry

Course Structure: Paper VII

| | | | |
|-----------------------------|--|-----------------------|--------------------------------|
| Course Code : | | Credits : 04 | |
| L:T:P:S : 4:0:0:0 | | CIA Marks : 40 | |
| Exam Hours : 03 | | ESE Marks : 60 | |
| Title of the Course / Paper | CORE PAPER-VII- Drama II Restoration to Twentieth Century | | |
| Category of the Course C | Year & Semester First Year & Second Semester | Credits 4 | Subject Code 1965209 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Identify and appreciate different forms of drama (k2, k4) CO2: Delineate the trajectory of drama from the Restoration period to the Twentieth Century (k 2) CO3: Correlate the different trends in drama with the context of production (k2) CO4: Examine the impact of the historical context on drama (k4) CO5: Evaluate the impact of philosophy and politics on drama (k4) CO6: Identify the current trends in drama in the context of changing socio-cultural values (k2, k5) | | |

4. Kennedy, Andrew, 1976, **Six Dramatists In Search of A Language**, Cambridge University Press, London.
5. Una Ellis – Fermor, 1977, **The Irish Dramatic Movement**, Methuen and Company Ltd.
6. G.J. Watson, 1983, **Drama: An Introduction**, Macmillan, Hong Kong.
7. Banham, Martin, 1995, **The Cambridge Guide to Theatre**, Cambridge University Press, Cambridge.
8. Arnold P. Hinchliffe, 1999, **The Absurd (The Critical Idiom)**, Methuen and Co., London.
9. Innes, Christopher, 2002, **Modern British Drama The Twentieth Century**, Cambridge University Press, Cambridge.
10. Rabey, David Ian, 2003, **English Drama Since 1940**, Pearson Education Ltd., London. Website, e-learning resources

http://en.wikipedia.org/wiki/English_drama <http://eb.com>

(Encyclopaedia Britannica – restricted site)

<http://en.wikipedia.org/wiki> <http://www.questia.com>

(online library for research)

Course Structure: Paper VIII

| | | | |
|-----------------------------|---|-----------------------|---------------------------------|
| Course Code : | | Credits : 04 | |
| L:T:P:S : 4:0:0:0 | | CIA Marks : 40 | |
| Exam Hours : 03 | | ESE Marks : 60 | |
| Title of the Course / Paper | CORE PAPER- VIII- Fiction II Nineteenth to Twentieth Century | | |
| Category of the Course C | Year & Semester First Year & Second Semester | Credits 4 | Subject Code 1965210 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Analyse the trajectory of the British novel from the 18 th century to the 20 th century (k4) CO2: Demonstrate the impact of the changing knowledge systems on the novel form (k3) CO3: Identify narrative techniques, characterization and space-time treatment used in the novels (k2) CO4: Examine the influence of the cultural, social and political milieu on the writing of fiction (k4) CO5: Appreciate the diversity of fictional writing (k5) | | |

| | |
|-------------------|--|
| Course Outline | UNIT I French Revolution – Victorian Social Scene Gender– Industrial Development – Colonial Expansion – Issues – Class, Liberal Humanism and the Individual – Individual and the Environment – Man and Fate, realism, multiple narration, stream of consciousness, point of view. |
| | UNIT 2 The Victorian Socio - Political and Economic Scenario Joseph Conrad Heart of Darkness. |
| | UNIT 3 Women’s Issues Charlotte Bronte Jane Eyre |
| | UNIT 4 Liberal Humanism, Individual Environment and Class Issues D.H. Lawrence The Rainbow Virginia Woolf To the Lighthouse |
| | UNIT 5 Quest James Joyce Portrait of the Artist as a Young Man |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | H | L | H | M | H | L | L | H |
| CO2 | M | H | M | L | L | H | L | H | H | H | L | L | M |
| CO3 | H | H | H | L | L | H | L | H | H | H | L | L | H |
| CO4 | H | H | H | L | L | H | L | H | H | H | L | L | H |
| CO5 | H | H | H | L | L | H | L | H | H | H | L | L | H |

Recommended Texts: Standard editions of texts in Macmillan Classics Series.

Reference Books:

1. Arnold Kettle, 1967, **An Introduction to English Novel Vol. II**, Universal Book Stall, New Delhi.

2. Raymond Williams, 1973, **The English Novel: From Dickens to Lawrence**, Chatto&Windus, London.
3. Malcom Bradbury and David Palmer. Eds., 1979, **Contemporary English Novel**, Edward Arnold Press, London.
4. Ian Watt, 1991, **The Victorian Novel: Modern Essays in Criticism**, OUP, London.
5. Dennis Walder, Ed., 2001, **The 19th Century Novel; Identities**, Routledge, London.
6. Sagar, Keith. *The Art of D.H. Lawrence*. CUP, 1975. Website, e-learning resources

http://en.wikipedia.org/wiki/English_literature

Course Structure: Extra Disciplinary-I

| | | | |
|---|---|-----------------------|--------------------------------|
| Course Code : | | Credits : 03 | |
| L:T:P:S : 3:0:0:0 | | CIA Marks : 40 | |
| Exam Hours : 03 | | ESE Marks : 60 | |
| Title of the Course / Paper | English for Professional Communication | | |
| Category of the Course E (Elective for other departments) | Year & Semester First year & Second Semester | Credits 3 | Subject Code 1965211 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Understand theories related to communication (k2) CO2: Listen and accurately deliver information in specific work situations (k6) CO3: Speak proficiently in the workplace (k6) CO4: Write formal letters of application and complaint (k6) CO5: Interpret digital representations of data efficiently (k4) | | |
| Course Outline | UNIT I Communication Theory <ol style="list-style-type: none"> 1. Mode of Communication 2. Importance of Communication Theory 3. Types of Communication (Intrapersonal, Interpersonal, Group, Mass Communication) 4. Key Terms in Communication (Self Concept, Proxemics, Noise) 5. Models of Communication (Aristotle's Model, Shannon-Weaver Model, Helical Model, Schramm's Model) | | |

| |
|---|
| <p>UNIT 2 Effective Speaking - Effective Listening Work ethics, Gender, Culture, and Workplace skills,</p> |
| <p>UNIT 3 Introduction to Modern Communication Media Websites and Blogs, LinkedIn, Facebook, Twitter, Instagram</p> |
| <p>UNIT 4 Workplace Communication Skills Online video conference GD, Interviews and Meeting</p> |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | M | H | M | H | H | H | H | M | H | L | H | H | H |
| CO2 | L | L | L | H | H | M | L | L | L | L | H | H | H |
| CO3 | L | L | L | H | H | L | L | L | L | L | H | H | H |
| CO4 | L | L | L | H | H | L | L | L | L | L | H | H | H |
| CO5 | L | L | L | H | H | H | L | L | L | L | H | H | H |

Reference Books :

1. Robert Heller, 1998, **Communicate Clearly** – Dorling Kindersley Ltd., London.
2. Matthukutty M. Monippally, 2001, **Business Communication Strategies**, Tata McGraw Mill.
3. T.M. Farhatullah, 2002, **Communication Skills for Technical Students**, Orient Longman.
4. 2004, Write to the top – **Writing for Corporate Success**; Deborah Dumame; Random House
5. JayashreeBalan, 2005, **Spoken English**, Vijay Nicole Imprints.

Course Structure: Elective Paper- III

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 03 |
| L:T:P:S : 3:0:0:0 | CIA Marks : 40 |

Exam Hours : 03**ESE Marks : 60**

| | | | |
|---|--|------------------|-----------------------------|
| Title of the Course / Paper | Elective Paper III- English for Careers | | |
| Category of the Course E (Elective for other departments) | Year & Semester First year & Second Semester | Credits 3 | Subject Code 1965212 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Identify the necessary competence required in the field of Knowledge Management (K2) CO2: Develop mastery over presentation skills (K6) CO3: Edit newsletters and press releases (K6) CO4: Articulate better in public speaking (K3) | | |
| Course Outline | UNIT I Basic concepts in effective business writing <ol style="list-style-type: none"> Internal and External Communication Formal/Professional language usage Principles and Significance of Written Communication Knowledge Management <ol style="list-style-type: none"> Tacit and Explicit Knowledge Components of Knowledge Management Stages of Development | | |
| | UNIT 2 Basic official correspondence Memo, reports, emails, letters, MOM Newsletters <ol style="list-style-type: none"> Types of Newsletters Purpose Press Releases <ol style="list-style-type: none"> Components of a press release Writing guidelines Benefit and Purpose | | |
| | UNIT 3 Public Speaking [FOR OTHER DEPARTMENTS ONLY] | | |
| | UNIT 4 Writing for a website [FOR OTHER DEPARTMENTS ONLY] | | |

C – Core; E – Elective; ED – Extra disciplinary **MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:**

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | L | L | L | M | M | H | L | L | M | M | M | H | M |
| CO2 | L | L | L | H | H | M | M | L | L | L | H | H | H |
| CO3 | L | L | L | M | L | L | H | L | L | L | H | M | H |
| CO4 | L | L | L | H | H | M | L | L | L | L | L | H | M |

Reference Books :

1. Robert Heller, 1998, **Communicate Clearly** – Dorling Kindersley Ltd., London.
2. Matthukutty M. Monippally, 2001, **Business Communication Strategies**, Tata McGraw Mill.
3. T.M. Farhatullah, 2002, **Communication Skills for Technical Students**, Orient Longman.
4. 2004, Write to the top – **Writing for Corporate Success**; Deborah Dumame; Random House
5. JayashreeBalan, 2005, **Spoken English**, Vijay Nicole Imprints.

THIRD SEMESTER

Course Structure: Paper IX

| | | | | |
|--|--|--|---------------------|--------------------------------|
| Course Code : | Credits : | | | |
| L:T:P:S : 4:0:0:0 | 04 | | | |
| Exam Hours : 03 | CIA Marks : 40 | | | |
| | ESE Marks : 60 | | | |
| Title of the Course / Paper | CORE PAPER-IX- Shakespeare Studies | | | |
| Category of the Course C | <table border="1"> <tr> <td>Year & Semester 2nd Year & Third Semester</td> <td>Credits 4</td> <td>Subject Code 1965312</td> </tr> </table> | Year & Semester 2nd Year & Third Semester | Credits 4 | Subject Code 1965312 |
| Year & Semester 2nd Year & Third Semester | Credits 4 | Subject Code 1965312 | | |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | | |

| | |
|-----------------|--|
| Course Outcomes | <p>CO1: Understand and enjoy Shakespeare’s plays and sonnets (K2)</p> <p>CO2: Interpret Criticism of Theatre (K3)</p> <p>CO3: Examine the plays in the context of Elizabethan England (K4)</p> <p>CO4: Delineate the sources, problems of categorization and trends in Shakespeare Studies upto the 19th Century (K4)</p> <p>CO5: Evaluate the contemporary relevance of Shakespeare’s works (K5)</p> <p>CO6: Examine the plays using mythical, archetypal, feminist, post-colonial and New historicist modern approaches (K4)</p> |
| Course Outline | <p>UNIT I</p> <p>Shakespeare Theatre; Audience; Theatre Conventions; Sources; Problems of categorization; Trends in Shakespeare Studies upto the 19th Century; Sonnet and court politics; famous actors; theatre criticism; Shakespeare into film & play production</p> |
| | <p>UNIT 2</p> <p>Sonnets Sonnets – 12, 65, 86,130</p> <p>Comedies Much Ado About Nothing</p> |
| | <p>UNIT 3 Tragedy Othello</p> <p style="text-align: center;">Hamlet</p> |
| | <p>UNIT 4 History</p> <p style="text-align: center;">Julius Caesar</p> |
| | <p>UNIT 5 Shakespeare Criticism</p> <p>A.C. Bradley (extract)Chapter V & VI and the New Introduction by John Russell Brown in Shakespearean Tragedy by A.C.Bradley, London , Macmillan, Third Edition , 1992</p> <p>Samuel Johnson Preface to Shakespeare</p> <p>Wilson Knight The Wheel of Fire</p> |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | M | H | H | L | L | H | L | H | M | H | L | L | H |
| CO2 | M | H | M | L | L | H | L | H | H | H | L | L | M |
| CO3 | H | H | H | L | L | H | L | H | H | H | L | L | H |
| CO4 | H | M | H | L | L | H | L | H | H | H | L | L | H |
| CO5 | M | H | M | L | L | M | L | H | H | H | L | L | H |
| CO6 | M | H | H | L | L | H | L | H | H | H | L | L | H |

Recommended Texts:

1. Bradley, A.C. *Shakespearean Tragedy*. Macmillan, 1904.
2. Standard editions of texts.

Reference Books:

1. Spurgeon, 1935, C.F.E. **Shakespeare's, Imagery and what It Tells us**, Cambridge UP, Cambridge.
2. E.M.W. Tillyard, 1943, **Elizabethan World Picture**, Chatto and Windus, London.
3. Knight G.W., 1947, **The Crown of Life: Essays in Interpretation of Shakespeare's Final Plays**, Oxford.
4. Harrison, 1951, G.B. **Shakespeare's Tragedies**, Routledge, London.
5. Henn, T.R., 1956, **The Harvest of Tragedy**, London.
6. Knight G.W., 1957, **The Wheel of Fire: Essays in Interpretation of Shakespeare's Sombre Tragedies**, New York.
7. Muir K., 1961, **William Shakespeare: The Great Tragedies**, London.
8. Hunter G.K. William Shakespeare, 1962, **The Late Comedies**, London & New Year.
9. Knights, L.C., 1962, **William Shakespeare: The Histories**, London.
10. Eastman A.M. & G.B. Garrison eds., 1964, **Shakespeare's Critics from Jonson to Auden : A Medley of Judgments**, Michigan.
11. Oscar James Campbell, ed., 1966, **A Shakespeare Encyclopedia**, London, Methuen & Co.
12. Jonathan Dollimore, ed., 1984, **The Radical Tragedy**, The Harvester Press, Cambridge.
13. Shakespeare Surveys, (Relevant Volumes).
14. John f. Andrews, ed., 1985, **William Shakespeare: His World, His Work, His Influence**, Charles Scribner's Sons.

15. Stephen Greenblatt, 1988, **Shakespearean Negotiations**, Oxford University Press.

Website, e-learning resources

<http://www.shakespeare.bham.ac.uk/resources>

Course Structure: Paper X

| | | | |
|-----------------------------|---|-----------------------|--------------------------------|
| Course Code : | | Credits : 04 | |
| L:T:P:S : 4:0:0:0 | | CIA Marks : 40 | |
| Exam Hours : 03 | | ESE Marks : 60 | |
| Title of the Course / Paper | CORE PAPER-X- English Language & Linguistics | | |
| Category of the Course C | Year & Semester 2nd year & Third Semester | Credits 4 | Subject Code 1965313 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Understand the English Language from a historical perspective (k2) CO2: Analyse sounds and identify patterns of sounds in the English Language (k 4) CO3: Understand the functioning of brain and its role in speech production (k2) CO4: Appraise the different approaches to second language acquisition (k4) CO5: Compare and contrast language in terms of systematic differences (k4) CO6: Adopt and practise English Language Teaching approaches (k6) | | |
| Course Outline | Unit I - Phonology 1) The Sounds of Language 2) The Sound Patterns of Language 3) Transcription & Reverse Transcription | | |
| | Unit II - Linguistics 1) Language and the Brain 2) Language & Regional Variation 3) Language & Social Variation 4) Language & Culture | | |

| | |
|--|---|
| | <p>Unit III - Teaching of English as Second Language (TESL)</p> <ul style="list-style-type: none"> ● English Language Teaching (ELT), English as Foreign Language (EFL), English as Second Language (ESL), English for Specific Purpose (ESP) ● ELT Theories, Approaches, and Methods ● Student Diversity and Classroom Management; Teacher as Facilitator or Mentor ● Classroom Observation; Teacher Reflection; Teaching Journals ● Peer Teaching and Group Teaching; Professional Development of Teachers |
| | <p>Unit IV - Curriculum Development and Language Assessment</p> <ul style="list-style-type: none"> ● Types of Syllabus; Materials Design and Development; Lesson Plans ● Synchronous and Asynchronous Learning, Learning Management Systems (LMS) ● Outcome Based Education (OBE), Bloom’s Taxonomy, ADDIE Model ● Wash-Back Effect; Formative and Summative Assessment ● Test Validity, Reliability, and Practicality; Multiple Choice Questions (MCQ), Item Difficulty, Distractor Analysis ● Common European Framework of Reference for Languages(CEFR) <p>Unit V - Digital Literacy and Action Research</p> <ul style="list-style-type: none"> ● Digital Language Labs - Synchronous and Asynchronous language teaching ● ICT tools, Mobile Learning, Video-Conferencing, Podcasting, Digital Story-telling ● Web 2.0 - Language Learning apps, Blogs, Social Networks, ● Blended Learning, Flipped Classroom ● Fundamental Research, Empirical Research, Evaluative Research, Action Research |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | H | L | H | H | M | H | H | M |
| CO2 | H | H | H | L | L | M | L | M | H | H | H | H | M |
| CO3 | L | H | H | L | L | L | L | M | H | H | H | H | H |
| CO4 | H | H | H | M | L | L | L | M | H | H | H | H | H |
| CO5 | H | H | M | M | L | L | L | M | H | H | H | H | H |
| CO6 | H | H | H | H | H | L | L | M | H | H | H | H | H |

Recommended Texts:

- 1) Balasubramanian.T. A Textbook of English Phonetics for Indian Students . Laxmi Publications, 2013.
- 2) Common European Framework of Reference for Languages: Learning, Teaching, Assessment <http://ebcl.eu.com/wp-content/uploads/2011/11 /CEFR-all-scales-and-all-skills.pdf>
- 3) Crystal, David. *A Dictionary of Linguistics and Phonetics*. Blackwell Publishing, 2008
- 4) Crystal,David. *The Cambridge Encyclopedia of the English Language*. Cambridge University Press, 2003
- 5) David Nunan, *Syllabus Design*, Oxford U P, 1988.
- 6) Jack C. Richards and Charles Lockhart. *Reflective Teaching in Second Language Classrooms*. Cambridge University Press, 1994.
- 7) Jack C.Richards and Theodore Rodgers. *Approaches and Methods in Language Teaching*. Cambridge University Press, 2010.
- 8) Monica and BogdanPatrut (ed.) *Social Media in Higher Education: Teaching in Web 2.0*, Idea Group, 2013.
- 9) Prabhu, N.S. *Second Language Pedagogy*. Oxford U P, 1987.
- 10)Rod Ellis. *The Study of Second Language Acquisition*. Oxford University Press, 1994.
- 11) Thomas M. Haladyna. *Developing and Validating Multiple-Choice Test Items*, Lawrence Erlbaum Associates, 1999.
- 12)Yule, George.*The Study of Language* . Cambridge University Press, 201

| |
|---|
| <p>UNIT 4 Formalism and Structuralism Cleanth Brooks Language of Paradox Northrop Frye The Archetypes of Literature Gerard Genette Structuralism and Literary Criticism</p> <p>UNIT 5 Post Structuralism Roland Barthes - Death of the Author Ann Jefferson - Structuralism and Post Structuralism</p> |
|---|

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | M | L | H | H | H | L | L | M |
| CO2 | H | H | H | L | L | M | L | H | H | H | L | L | L |
| CO3 | H | H | H | L | L | M | L | H | H | H | L | L | L |
| CO4 | H | H | H | L | L | M | L | H | H | H | L | L | L |
| CO5 | M | H | H | L | L | M | L | M | H | H | L | L | L |
| CO6 | M | H | H | L | L | M | L | H | H | H | L | L | L |

Recommended Texts:

1. T.S. Dorsch. Tr., 1965, **Classical Literary Criticism** Penguin Books, Chapters 1 to 3, 6 to 12 & 14.
2. David Lodge, ed., 1972, **Twentieth Century Literary Criticism**, Longman, London.
3. S. Ramaswamy and V.S. Seturaman, 1976, 1979 (Two Vols.), **English Critical Tradition**, Macmillan, Chennai.
4. David Lodge, ed., 1989, **Modern Literary Theory**, Longman, London.
5. V.S. Seturaman, ed., 1989 **Contemporary Criticism**, Macmillan, Chennai.
6. Ashcroft, Griffith & Tiffin, eds., 1995, **Post-Colonial Studies Reader**, Routledge, London.

Reference Books :

1. M.H. Abrams, , 1953, **The Mirror and the Lamp**, OUP, Oxford.
2. Wimsatt and Brooks, ed., 1957, **Literary Criticism – A Short History**, Prentice-Hall, Delhi.

3. David Daiches, 1984, **Critical approaches to Literature**, Revised Edition, Orient Longman, Hyderabad.
4. A.S.D. Pillai, 1997, **Postmodernism: An Introduction, Postmodern Literature, Theory, Critical Essays**, Reliance Publishing House, New Delhi.

| | | | |
|--|--|-----------------------|---------------------------------|
| Course Code : | | Credits : 03 | |
| L:T:P:S : 3:0:0:0 | | CIA Marks : 40 | |
| Exam Hours : 03 | | ESE Marks : 60 | |
| Title of the Course / Paper | EXTRA DISCIPLINARYII- Literature Analysis Approaches and Copy Editing | | |
| Category of the Course (Elective Within the Dept)/ED | Year & Semester 2nd year & Third Semester | Credits 3 | Subject Code 1965315 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Objectives of the Course | CO1: Apply techniques of critical evaluation to an unspecified text (k4&k5) CO2: Write a book review (k6) CO3: Proof read a text and edit it with the relevant tools (k5) CO4: Explore and be equipped the workspace related to language and literature (k 3) CO5: Write effective business-related correspondence and documentation (k6) | | |
| Course Outline | UNIT I Practical Criticism: Critique and Book Review | | |
| | UNIT 2 Publishing Industry: Concept organisation function. | | |
| | UNIT 3 Copy Editing : <ul style="list-style-type: none"> ● Basics Functions Role and Process ● Use of MS Word and Google docs for editing Copy Editor: Role and Responsibility | | |
| | UNIT 4 E- Publishing <ul style="list-style-type: none"> ● Introduction ● Difference between conventional publishing and e – publishing (pros and cons) ● Distribution/Delivery methods ● E-books/ E-journals/ Web publishing | | |

C – Core; E – Elective; ED – Extra disciplinary **MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:**

| CO/PO/PSO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | H | L | L | H | M | H | M | L |
| CO2 | H | H | H | L | L | M | L | L | H | M | H | H | H |
| CO3 | L | H | M | L | L | H | H | L | H | M | H | M | L |
| CO4 | L | H | L | H | H | L | H | L | H | M | H | H | L |
| CO5 | L | H | L | H | H | L | H | L | H | H | H | H | H |

Recommended Text:

Rob Kitchin & Duncan Fuller, 2005, *The Academic's Guide to Publishing*, Vistaar Publications, New Delhi.

Reference Books:

1. Practical Criticism : D.H. Rawlinson, **The Practice of Criticism** V.S. Seturaman et.al., **Practical Criticism** C.B. Cox: **The Practice of Criticism**.
2. **Resource books for teachers** (eds) Krishnaswamy & Sivaraman. **Interface between Literature and Language** (ed) Durant & Fabb. **Reading Literature**, Gower & Pearson.
3. Kamath, M.V. **The Journalist 's Handbook**, VaniEducational Books, New Delhi, 1986.
4. Kamath, M.V. **Professional Journalism**.
5. Teal, L. and Taylor R. **Into the Newsroom: An Introduction to Journalism**.
6. Warren, Thomas, L. , 1985, **Technical Writing. Purpose, Process and Form**, Wadsworth Publishing Company.
7. Itule, Bruce. D., 1994, **News Writing and Reporting for Today's Media**. McGraw Hill.
8. Gerson, Sharon, J. and Steven, M. Gerson., 2000, **Technical Writing: Process and Product**, Prentice Hall.

Course Structure: ELECTIVE PAPER-IV

| | |
|--------------------------|-----------------------|
| Course Code : | Credits : 03 |
| L:T:P:S : 3:0:0:0 | CIA Marks : 40 |

Subject: INTRODUCTION TO TRANSLATION STUDIES**Subject Code: 1965316****COURSE OUTCOMES**

- CO1: Identify the role of translation in society (K 2)
- CO2: Illustrate basic concepts of translation (K3)
- CO3: Demonstrate fundamental skills in translation (K3)
- CO4: Examine translation in the Indian context (K4)
- CO5: Perform practical tasks in translation (K6)

Unit 1 Basic concepts of Translation**(10 Hrs)**

- 1.1 Kinds of Translation
 - 1.1.1. Interlingual
 - 1.1.2. Intralingual
 - 1.1.3. Intersemiotic
- 1.2 Concepts to be derived from practice
 - 1.2.1 Source Language and Target Language
 - 1.2.2 Equivalence
 - 1.2.3 Word for word, Sense for Sense

Unit 2 Translation in the Indian context**(15 Hrs)**

- 1.3 Introduction to Short Fiction from South India by Mini Krishnan
- 1.4 Translating Culture Codes

Unit 3 Literary Texts in translation**(10 Hrs)**

- 3.1 VM Basheer - Poovan Banana
- 3.2 Ki. Rajanarayanan - 'The Chair' in *Tamil Story*, Ed. Dilip Kumar
- 3.3 C.S. Chellappa - Vaadivasal (OUP)
- 3.4 Rajam Krishnan - Lamps in the Whirlpool (OUP)

Unit 4 Application of Translation (10 Hrs)

- 4.1 Dubbing and Subtitling
- 4.2 Advertisements
- 4.3 Film Harry Potter and the Order of the Phoenix

Suggested Reading

Munda, Jeremy. 'New Directions From the New Media'. Introducing Translation Studies. Routledge, New York. 2008.

Unit 5 Practical Application Tasks (7 Hrs) MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | L | M | H | M | L | M | L | L | M | H | L | L | M |
| CO2 | M | M | M | L | L | M | L | L | M | M | L | L | L |
| CO3 | L | L | M | M | L | L | L | L | L | L | L | M | L |
| CO4 | H | M | H | L | L | M | L | M | H | H | H | L | L |
| CO5 | L | M | L | H | M | L | M | L | L | L | L | M | M |

Recommended Reading

Baker, Mona, In Other Words: A Course Book on Translation. London: Routledge

Bassnet, Susan. Translation Studies. London & New York : Routledge, 1991.

Catford, J.C. A Linguistic Thoery of Translation: An Essay in Applied Linguistics

Duff, Alan, Translations. Oxford: OUP, 1989.

London: OUP, 1965.

Newmark, Peter. A Textbook of Translation. London: Prentice Hall, 1988.

Savory, Theodore. The Art of V. London: Cape, 1957.

Steiner George. After Babel: Aspects of Language and Translation._____ V. London:

FOURTH SEMESTER

| | |
|--|--|
| Dylan Thomas R. S. Thomas | Do Not Go Gentle Into That Good Night Here |
| UNIT 5 Seamus Heaney Craig Raine | Post-Modern Poetry Digging A Martian Sends a Post Card Home |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | H | L | H | H | M | L | L | M |
| CO2 | M | H | M | L | L | M | L | M | H | H | L | L | H |
| CO3 | M | H | H | L | L | H | L | H | H | H | L | L | H |
| CO4 | H | M | H | L | L | M | L | H | H | H | L | L | H |
| CO5 | H | H | H | L | L | H | L | H | H | H | L | L | H |
| CO6 | H | H | H | L | L | H | L | H | H | H | L | L | H |

Recommended Texts:

1. Michael Schmidt, ed., 1980, **Eleven British Poets: An anthology**, Methuen & Co. Ltd., Cambridge.
2. Richard Ellmann & Robert O'Clair, 1988, **The Norton Anthology of Modern Poetry**, Norton & Company, New York.

References Books:

1. Cleanth Brooks, 1939, **Modern Poetry and the Tradition**, University of North Carolina, Press.
2. T.H. Jones, 1963, **Dylan Thomas**, Oliver & Boyd Ltd.
3. Norman Jeffares, 1971, **Yeats: Profiles in Literature**, Routledge & Kegan Paul London.
4. Harold Bloom, 1972, **Yeats**, Oxford University Press, London.
5. 1974, **Eight Contemporary Poets**, Oxford University Press. London,

6. 1976, **Poetry of the First World War**, J.M. Gregson Studies in English Literature Series Edward Arnold, London.
7. John Unterecker, 1977, **A Reader's Guide to William Butler Yeats**, Thames and Hudson Southampton.
8. 1978, **The Pelican Guide to English Literature: The Modern Age**, Penguin Books.
9. P.R. King, 1979, **Nine Contemporary Poets: Critique of poetry**, Methuen, London.
10. Rajnath, 1980, **T.S. Eliot's The Theory and Poetry**, Arnold Hienemann: New Delhi.

Website, e-learning resources

http://en.wikipedia.org/wiki/English_literature

<http://en.wikipedia.org/wiki/poetry>

Course Structure: Paper XIII

| | | | |
|------------------------------------|--|-----------------------|---------------------------------|
| Course Code : | | Credits : 04 | |
| L:T:P:S : 4:0:0:0 | | CIA Marks : 40 | |
| Exam Hours : 03 | | ESE Marks : 60 | |
| Title of the Course / Paper | CORE PAPER-XIII- Writings by and on Women | | |
| Category of the Course C | Year & Semester 2nd year & Fourth Semester | Credits 4 | Subject Code 1965418 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Objectives of the Course | <p>CO1: Demonstrate an understanding of the politics of gender and authorship (k 3)</p> <p>CO2: Examine patriarchy and its influence on women’s lives and creative processes (k4)</p> <p>CO3: Identify and critique gendered oppression (k2&k4)</p> <p>CO4: Examine how women writers have challenged gender-based oppression (k 4)</p> <p>CO5: Understand the intersectionality of gender, class, caste, race, etc. (k2)</p> <p>CO6: Read texts within the theoretical framework of feminism (k5)</p> | | |
| Course Outline | <p>UNIT 1: Varieties of Feminism – concept of gender – androgyny- Language of women – environment and women- double marginalisation.</p> | | |
| | <p>UNIT 2: Poetry:</p> <p>Anne Bradstreet Prologue</p> <p>Marianne Moore Poetry</p> <p>Sylvia Plath Lady Lazarus.</p> <p>Maya Angelou Still I Rise</p> <p>Charmaine D’Souza When God made me a Whore</p> <p>(Rajani P, V. Rajagopalan, Nirmal Selvamony, eds., Living & Feeling, Dept. of English., M.C.C.)</p> | | |
| | <p>UNIT 3: Prose:</p> <p>John Stuart Mill On subjection of women (V.S. Seturaman & C.T. Indraed., 1994, Victorian Prose, Macmillan India, Chennai. pp-318)</p> <p>Virginia Woolf A Room of One’s Own</p> | | |

| | |
|--|--|
| | (chapters 3 & 4) (Jennifer Smith |
| | ed., 1998, A Room of One's Own by Virginia Woolf , Cambridge UP, New Delhi.) Vandana Shiva "Introduction to Ecofeminism" (Vandana Shiva & Maria Mies, 1993, Ecofeminism , Kali for Women, New Delhi. Alice Walker In Search of Our Mother's Garden |
| | UNIT 4: Fiction Arundathi Roy The God of Small Things Jean Rhys Wide Sargosa Sea Kate Chopin The Awakening |
| | UNIT 5: Drama Lorraine Hansberry Raisin in the Sun Jane Harrison Stolen |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PO/PSO | PSO | | | | | | | PO | | | | | |
|------------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | H | H | H | L | L | M | L | H | H | H | L | L | M |
| CO2 | H | H | H | L | L | L | L | M | H | H | L | L | H |
| CO3 | H | H | H | L | L | L | L | M | H | H | L | L | H |
| CO4 | H | H | H | L | L | M | L | M | H | H | L | L | H |

| | | | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO5 | H | H | H | L | M | L | L | M | H | H | L | L | H |
| CO6 | H | H | H | L | L | M | L | H | H | H | L | L | M |

Recommended Texts:

1. Sandra M. Gilbert and Susan Gubar, ed., 1985, **The Norton Anthology of Literature by Women**, New York.
2. Rajani P. , V. Rajagopalan, and NirmalSelvamony, **Who says my hand a needle better fits: An Anthology of American Women Writing**, Dept. of English, Madras Christian College, Tambaram.
3. Standard editions of texts.

Reference Books :

1. Lisa Tuttle, 1986, **Encyclopedia of Feminism**, Facts on File Publications, New York.
2. Catherine Belsey& Jane Moore, eds., 1977, **The Feminist Reader**, II ed., Macmillan, London.
3. Kathy J. Wilson, 2004, **Encyclopedia of Feminist Literature**, Greenwood Press, Westport.

Core Structure: Paper XIV

| | | | | | | | | | | | |
|-----------------------------|--|--------------|--------------|-----------------|----------------------------|----------------|--|-------------------|--|---------------------|---------------------------------|
| Course Code : | Credits : 04 | | | | | | | | | | |
| L:T:P:S : 4:0:0:0 | CIA Marks : 40 | | | | | | | | | | |
| Exam Hours : 03 | ESE Marks : 60 | | | | | | | | | | |
| Title of the Course / Paper | CORE PAPER XIV- Postcolonial Literature | | | | | | | | | | |
| Category of the Course C | Year & Semester 2nd year & Fourth Semester | Credits 4 | Subject Code | | | | | | | | |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | | | | | | | | | |
| Objectives of the Course | <p>CO1: Demonstrate an understanding of the concepts related to the study of postcolonialisms (k3)</p> <p>CO2: Examine imperialism and its impact on the history, culture and language of various once colonised nations (k4)</p> <p>CO3: Identify and critique racism as a colonial construct (k2&k4)</p> <p>CO4: Examine how writers from former colonies question the hegemony of the colonial histories (k4)</p> <p>CO5: Understand the importance of multiplicity of stories (k2)</p> <p>CO6: Read texts within the theoretical framework of postcolonial studies (k5)</p> | | | | | | | | | | |
| Course Outline | <p style="text-align: center;">UNIT 1: Key Concepts in Post-coloniality (14 concepts)</p> <p>Abrogation, appropriation, binarism, cartography, centre/margin, dependency theory, ethnicity, ecological imperialism, hegemony, hybridity, orality, other, post-colonialism/postcolonialism, subaltern</p> <hr/> <p style="text-align: center;">UNIT 2: India, Pakistan and Srilanka</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Agha Shahid Ali</td> <td style="width: 50%;">Dacca Gauzes (India- poem)</td> </tr> <tr> <td>Nissim Ezekiel</td> <td>A Very Indian Poem in Indian English (India- poem)</td> </tr> <tr> <td>Alagu Subramaniam</td> <td>Solomon’s Justice (Sri Lanka- short story)</td> </tr> <tr> <td>Sa’adat Hasan Manto</td> <td>Khol do! (Pakistan short story)</td> </tr> </table> <p>(From “Orientalism” Extract in A Post Colonial Studies Reader) Edward Said</p> | | | Agha Shahid Ali | Dacca Gauzes (India- poem) | Nissim Ezekiel | A Very Indian Poem in Indian English (India- poem) | Alagu Subramaniam | Solomon’s Justice (Sri Lanka- short story) | Sa’adat Hasan Manto | Khol do! (Pakistan short story) |
| Agha Shahid Ali | Dacca Gauzes (India- poem) | | | | | | | | | | |
| Nissim Ezekiel | A Very Indian Poem in Indian English (India- poem) | | | | | | | | | | |
| Alagu Subramaniam | Solomon’s Justice (Sri Lanka- short story) | | | | | | | | | | |
| Sa’adat Hasan Manto | Khol do! (Pakistan short story) | | | | | | | | | | |

| | |
|--|---|
| | <p>UNIT 3: Australia, New Zealand and Canada</p> <p>Henry Lawson The Drover’s Wife (Australia- short story)</p> |
| | <p>Witi Ihimera The Whale (New Zealand- short story)</p> <p>A.D. Hope Australia (Australia- poem)</p> <p>Jack Davis Kullark (Australia- drama)</p> |
| | <p>UNIT 4: African Subcontinent and West Indies</p> <p>Kofi Awoonor The Weaver Bird (Ghana poem)</p> <p>Chinua Achebe Things Fall Apart (Nigeria- novel)</p> <p>Chinmamanda Adichie The Danger of a Single Story (prose)</p> <p>Benjamin Zephaniah - Dis Poetry (West Indies- poem)</p> <p>Bob Marley – Buffalo Soldier (West Indies- song)</p> |
| | <p>UNIT 5: Canada</p> <p>Margaret Atwood Surfacing (Canada- novel)</p> <p>George Ryga Ecstasy of Rita Joe (Canada - drama)</p> |

C – Core; E – Elective; ED – Extra disciplinary

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PO/ PSO | PSO | | | | | | | PO | | | | | |
|---------------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | M | H | M | L | L | M | L | H | H | M | L | L | M |
| CO2 | H | H | H | L | L | M | L | H | H | M | L | L | H |
| CO3 | L | L | H | L | M | M | L | M | H | M | L | L | M |
| CO4 | H | M | H | L | L | M | L | H | H | H | L | L | M |
| CO5 | M | H | H | L | L | M | L | M | H | M | L | L | M |
| CO6 | H | H | H | L | L | M | L | H | H | M | L | L | L |

Recommended Texts:

1. Bill Ashcroft, Gareth Griffiths and Helen Tiffin, 1998, **Key Concepts in Post-Colonial Studies**, London

2. Ken Goodwin and Alan Lawson, 1990, *The Macmillan Anthology of Australian Literature*, Melbourne.
3. Alagu Subramaniam, 1964, *The Big Girl*, Ceylon.
4. Ashcroft, Griffith & Tiffin, eds., 1995, *Post-Colonial Studies Reader*, Routledge, London.
5. Standard editions of texts.

Reference Books/Websites:

1. King, Bruce, ed. *The New National and Postcolonial Literatures: An Introduction*, Oxford: Clarendon, 1996.
2. Killam, G. D. *The Novels of Chinua Achebe*. *Studies in African Literature Series*, London: Heinemann, 1978. P –
3. Sarkar Parama, *Postcolonial Literatures*, Orient Black Swan, 2016
4. NPTEL course on Postcolonial Literature
<https://nptel.ac.in/noc/courses/noc17/SEM1/noc17-hs12/>
5. Chimamanda Ngozi Adichie: The danger of a single story
https://www.ted.com/talks/chimamanda_ngozi_adichie_the_danger_of_a_single_story/transcript?language=en

Course Structure: Elective

| | | | |
|---|--|-----------------------|--------------------------------|
| Course Code : | | Credits : 03 | |
| L:T:P:S : 3:0:0:0 | | CIA Marks : 40 | |
| Exam Hours : 03 | | ESE Marks : 60 | |
| Title of the Course / Paper | ELECTIVE PAPER- V- Film Studies | | |
| Category of the Course E (Elective within the department) /ED | Year & Semester Second Year & Fourth Semester | Credits 3 | Subject Code 1965420 |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: Identify different kinds of films (k1) CO2: Identify various technical aspects of cinema (k1) CO3: Sketch the evolution of cinema in India (k3) CO4: Critically analyse cinema from various perspectives (k4) CO5: Appreciate and review films (k6) | | |
| Course Outline | UNIT I History of Cinema in India; Major landmarks in India Cinema UNIT 2 Kinds of Films Historical Patriotic Documentary Thrillers etc. UNIT 3 Art of Film Making: Some Important Techniques Acting/ Photography/Direction/Script Writing etc UNIT 4 Films and Entertainment Films and Social Responsibility UNIT 5 Review of Films The Godfather Shutter Island | | |

C – Core; E – Elective; ED – Extra disciplinary **MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:**

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | L | H | H | L | L | L | H | L | L | H | H | L | L |
| CO2 | L | L | L | L | L | L | M | L | L | H | H | H | L |
| CO3 | M | M | H | L | L | L | M | H | L | H | H | M | H |
| CO4 | M | M | M | L | L | L | M | L | L | H | H | L | L |
| CO5 | L | M | M | L | L | L | L | L | H | H | H | H | L |

1.Recommended Texts:

1. Ed. Bill Nichols, 1993 ,**Movies and Methods** Vol. I, Edition ,Seagull Books, Calcutta.
2. Ed. Bill Nichols, 1993, **Movies and Methods** Vol. II, Edition Seagull Books, Calcutta.
3. Susan Hayward, 2004, **Key Concepts in Cinema** Studies, Routledge, London.
4. Rajadhyaksha, Ashish. *Indian Cinema: A Very Short Introduction*. OUP, 2016.

Reference Books :

1. Louis Giannetti, 1972, **Understanding Movies**, Prentice Hall, New Jersey.
2. Ed. S. Vasudevan, 2000, **Making Meaning in Indian Cinema**, OUP, New Delhi.

Website: www.academicinfo.net/film.html.

FOURTH SEMESTER

Research Methodology and Project Writing

| | |
|--------------------------|---------------------------------|
| Course Code : | Credits : 04 |
| L:T:P:S : 4:0:0:0 | Internal Evaluation : 20 |
| Exam Hours : 03 | Project Content : 40 |
| | Project Viva : 40 |

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

Course Structure: Extra Disciplinary

| CO/PSO/PO | PSO | | | | | | | PO | | | | | |
|-----------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | L | H | L | L | L | H | M | H | H | H | L | H | H |
| CO2 | L | H | L | L | L | H | M | H | H | H | H | H | H |
| CO3 | L | H | L | L | L | H | M | H | H | H | L | H | H |
| CO4 | L | H | L | L | L | H | L | H | H | H | L | H | H |
| CO5 | H | H | L | L | L | H | L | L | H | H | H | H | H |

| | | | |
|---|--|---------------------|--------------|
| Course Code : | | Credits : 02 | |
| L:T:P:S : | | CIA Marks : | |
| Exam Hours : | | ESE Marks : | |
| Title of the Course / Paper | DEBATING AND PUBLIC SPEAKING | | |
| Category of the Course E (Elective within the department) /ED | Year & Semester | Credits 2 | Subject Code |
| Pre-requisites | Minimum Entry requirements for the course / Eligibility | | |
| Course Outcomes | CO1: To enable students to communicate in English in such a way that they are able to address an audience without fear CO2: To familiarise the students with the various stages involved in public speaking. CO3: To acquaint the students with the speeches of the great speakers all over the world through audio/video. | | |
| Course Outline | UNIT I The elements of Public speaking | | |
| | UNIT 2 What makes a good speech? Who is a good speaker? | | |

| |
|--|
| UNIT 3 How to prepare the speech? Body Language Etiquette |
| UNIT 4 The role of voice Making the content relevant and interesting |
| UNIT 5 Beginning and Ending Various Occasions |

C – Core; E – Elective; ED – Extra disciplinary

Course duration - 3 weeks

Assessment criteria - Oral evaluation

Required Reading

| | |
|----------|-----------------------------|
| Carnegie | Public Speaking |
| Carnegie | Art of Speaking Made Simple |
| Carnegie | Art of Good Speech |

MAPPING OF COURSE OUTCOMES TO PROGRAM OUTCOMES:

| CO/PSO /PO | PSO | | | | | | | PO | | | | | |
|---------------|-----|---|---|---|---|---|---|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO1 | L | L | L | H | H | M | M | L | L | L | M | H | H |
| CO2 | L | L | L | H | H | M | L | L | L | L | L | H | M |
| CO3 | L | M | L | H | M | M | L | L | L | L | M | H | H |

D.D.G.D. Vaishnav College
Arumbakkam, Chennai

Department of English

SYLLABUS 2021-22

FOUNDATION ENGLISH

I B.A., B.Sc., B.Com, BBA, BCA, BBM

&

II B.A., B.Sc.

Semester I to IV

Foundation English

Objectives

- To impart knowledge of English to students belonging to different disciplines spread over four semesters
- To help students enhance their skills in the English language through its varied and comprehensive syllabus, covering components of language, literature and functional English
- To introduce students to an array of engaging literary works which would give them an insight into issues, challenges and ways of life in the modern world
- To help students unleash their creativity with its emphasis on creative writing and linguistic ability
- To facilitate students to acquire proficiency in the English language with its stress on grammar and usage
- To help students enhance their vocabulary in English
- To enable students to comprehend grammar concepts
- To ensure that students build their confidence as users of English language

Semester I

English I

Course objectives

- To teach English with a fresh perspective
- To sensitise students to the issues and problems in today's globalized world
- To enhance the students' comprehensive abilities and critical thinking faculties
- To inculcate the habit of reading among the students
- To develop the basic writing skills of the students
- To help the students improve their vocabulary
- To help the students acquire good speaking and writing skills

Course Outcome

On completion of the course, the student will be able to

- Understand, identify and describe ideas and themes as reflected in the chosen literary texts
- CO1 read, comprehend and comment on different styles of prose writing
- CO2 understand and appreciate poetry in terms of content and style
- CO3 demonstrate an ability to rethink contemporary values and ethics through a reading of select short-stories
- CO4 recognise the elements of drama as a medium reflecting real-life issues
- CO5 recall basic grammar concepts and display their skills in writing

Semester I

English I

No. of hours per week: 4

Course Content

Unit I: Prose

- | | |
|--|-----------------|
| 1. Madras to me... | Baradwaj Rangan |
| 2. Learning to Fly: Lessons from a Butterfly | Prakash Iyer |

Unit 2: Poetry

- | | |
|------------------------|---------------------|
| 3. Leave this Chanting | Rabindranath Tagore |
| 4. Common Cold | Ogden Nash |

Unit 3 : Short Fiction

- | | |
|------------------|-------------------------|
| 5. Blue Umbrella | Ruskin Bond |
| 6. Legal Alien | Rutange Crystal Butungi |

Unit 4 : Drama

- | | |
|----------------------------|--------------------|
| 7. The Beggar and the King | Winthrop Pankhurst |
| 8. The Proposal | Anton Chekov |

Unit 5 : Grammar & Composition

- Basics of Grammar
- Reading Comprehension
- Developing Hints
- Paragraph Writing

Further Reading

1. *The Hindu*, 16th October, 2014
2. *The Habit of Winning* – Prakash Iyer, Penguin Books, 2011
3. *Gitanjali* (Song 11)-Scriber, 1997
4. *poemhunter.com*
5. “The Blue Umbrella” – Ruskin Bond, Rupa Publication, 1992
6. *Ssubi*, an anthology of short-stories(online), 2016
7. *The Beggar and the King* – Winthrop Pankhurst, Createspace Independent Publisher, 2013
8. *The Proposal*- Anton Chekov, Kersinger Publishing Co. LLC, 2004

Semester II

English II

Course objectives

- To impart knowledge of English language through the reading of literary texts
- To help students comprehend the intricacies of the written language
- To guide students to understand and react to issues and problems discussed in the texts
- To hone their speaking skills by providing them opportunities to express themselves
- To help enhance the language skills of the students through a variety of activities

Course Outcome

On completion of the course, the student will be able to

- Gain an insight into the nuances of English language through the study of select literary texts and demonstrate an understanding of the content

CO1 display the skills to describe and demarcate key ideas of the prose texts

CO2 appreciate poetry, comprehend themes and motifs and develop an understanding of the issues dealt with

CO3 explain the plot and summarise short-stories that bring out human values

CO4 employ effective reading skills to comprehend and explore the workings of the dramatic form

CO5 define concepts in grammar with clarity and attempt to use language confidently through various writing activities

Semester II

English II

No. of hours per week: 4

Course Content

Unit I: Prose

- | | |
|-----------------------------------|----------------|
| 1. The Legacy of Gandhi and Nehru | Shashi Tharoor |
| 2. The Test of My Life | Yuvaraj Singh |

Unit 2: Poetry

- | | |
|----------------|-----------------|
| 3. Jambul Tree | Marilyn Noronha |
| 4. Democracy | Langston Hughes |

Unit 3 : Short Fiction

- | | |
|-----------------------|--------------|
| 5. After Twenty Years | O' Henry |
| 6. A Shadow | R.K. Narayan |

Unit 4 : Drama

- | | |
|------------------------------|---------------------|
| 7. Mine Eyes Have Seen | Alice Dunbar Nelson |
| 8. Othello (Act 5; Scene II) | William Shakespeare |

Unit 5 : Grammar & Composition

- Tenses
- Clauses
- Phrases and Phrasal Verbs
- Modifiers and Gerunds
- Creative Writing
- Note Making
- Digital Marketing Content

Further Reading

1. *The Elephant, the Tiger and the Cellphone* – Shashi Tharoor, 2007
2. *The Test of My Life* – Yuvaraj Singh, Penguin eBury Press, 2020
3. *Different Faces* – Allied Publishers, Mumbai, 2003
4. *Poemhunter.com*
5. *The Four Million - A Collection of Short Stories*, Createspace Independent Publishers 2015
6. *Malgudi Days* – Indian Thought Publications, 2000
7. *Mine Eyes Have Seen* – Alice Dunbar Nelson, Graphic Arts Publication, 2013
8. *Othello* – William Shakespeare, Maple Press, 2013

Semester III

English III

Course objectives

- To motivate the students to respond and react to the themes and ideas in the text
- To stimulate creative thinking among students
- To kindle the spirit of inquiry in students
- To expose them to the different styles of writing
- To introduce concepts of etymology for a better understanding of words
- To assign tasks in grammar to enable the students to understand the nuances of the language

Course Outcome

On completion of the course, the student will be able to

- Discover the relatedness between the text and the society that it represents and demonstrate their skills as confident users of the language
- CO1 review the issues and the concerns presented in the prose works and infer meaning out of these texts
- CO2 recognise the intrinsic features of the poetic form, identify and comprehend the ideological and sociological references
- CO3 explain and describe the styles and techniques employed in narrating experiences through story-telling and make sense of the context and develop empathy
- CO4 examine the features of the art form, the structure of the texts and interpret themes
- CO5 understand grammatical structures, their meaning and purpose and apply the same in practice in real life contexts

Semester III

English III

No. of hours per week: 4

Course Content

Unit I: Prose

- | | |
|---------------------------------|--------------------|
| 1. After the World Trade Center | Amitav Ghosh |
| 2. Turning Coal into Diamonds | Craig Merriweather |

Unit 2: Poetry

- | | |
|-------------------|-----------------------|
| 3. The City and I | Arundhati Subramanian |
| 4. Nature Trail | Benjamin Zephaniah |

Unit 3 : Short Fiction

- | | |
|---------------------------|-----------------|
| 5. The Fall of an Eyelash | Kanishk Tharoor |
| 6. The River Namunas | Antony Doerr |

Unit 4 : Drama

- | | |
|---------------------|---------------------------------------|
| 7. The Valiant | Holworthy Hall & Robert Middlemass |
| 8. 3, Sakina Manzil | Ramu Ramanathan |

Unit 5 : Grammar & Composition

- Types of Sentences
- Direct and Indirect Speech
- Active and Passive Voice
- Question Tags
- Product description
- Drafting a notice
- Essay Writing

Further Reading

1. www.Amitavghosh.com
2. www.innerself.com
3. Poem Hunter.com
4. *Swimmer Among the Stars* – Kanishk Tharoor, Aleph Book Company, 2016
5. *Memory Wall Stories* – Antony Doerr, Fourth Estate, 2017
6. *The Valiant* – Holworthy Hall and Robert Middlemass, Boston: *Baker's Plays*, 1997
7. *3, Sakina Manzil and Other Plays* – Orient Blackswan, 2012

Semester IV

English IV

Course objectives

- To sensitise students to the various issues represented in the texts
- To help students develop logical reasoning
- To widen and broaden their outlook towards life
- To enhance their competency in writing through a variety of writing tasks
- To help students use dictionary and online sources to enhance their vocabulary
- To help students identify and avoid common errors

Course Outcome

On completion of the course, the student will be able to

- Interpret, assess and evaluate the contextual relevance and significance of the chosen literary texts
- CO1 examine and appraise one's self-worth and identity as the texts suggest
- CO2 build and formulate opinions on topical issues like gender sensitivity, environmental concerns and relationships as reflected in the poems
- CO3 develop critical thinking and a deep engagement with societal values and attitudes
- CO4 perceive and judge individuals on the basis of their own merit and character
- CO5 plan, organize thoughts and ideas in a coherent, meaningful and creative manner

Semester IV

English IV

No. of hours per week: 4

Course Content

Unit I: Prose

- | | |
|-----------------------|------------------|
| 1. Riches | Ramachandra Guha |
| 2. A Family Shattered | Normitsu Onishi |

Unit 2: Poetry

- | | |
|-----------------------------|----------------------|
| 3. Vendor of Fish | G.S. Sharath Chandra |
| 4. Harlem on a Winter Night | Kofi Awnoor |

Unit 3 : Short Fiction

- | | |
|--------------------|-----------------------------|
| 5. The Flood | Thakazhi Sivasankara Pillai |
| 6. Softball People | Stacey Becker |

Unit 4 : Play

- | | |
|-------------------------------|--------------------|
| 7. Brides are Not for Burning | Dinah Mehta |
| 8. Home | Maurice Materlinck |

Unit 5 : Grammar & Composition

- Transformation of Sentences: Simple, Compound and Complex
- Summarising
- Paraphrasing
- Dialogue Writing

Further Reading

1. *India After Gandhi* – Ramachandra Guha, Picador, 2017
2. www.nytimes.com
3. www.afrilingual.wordpress.com
4. www.kochipost.com
5. *Brides are Not for Burning* – Dinah Mehta, Rupa & Co., 1993
6. www.One-act-plays.com

Question Paper Pattern – English I to IV

Section A

10 questions x 2 marks = 20 (objective questions from grammar and vocabulary)

Section B

5 questions x 7 marks = 35 (4 textual questions with internal choice and one question on composition with internal choice)

Section C

3 questions x 15 marks = 45 (q.no. 16 compulsory question on composition and 17 and 18 textual with internal choice)

Total 100 marks

Break-up of marks

ESE - 50 marks

CIA - 50 marks

100 marks

CIA break-up

2 tests 30 marks

**(each conducted for 50 marks
converted to 30 marks)**

Generic skills activity 15 marks

Attendance 5 marks

50 marks