



USHA MARTIN UNIVERSITY, RANCHI
CENTRE FOR DISTANCE AND ONLINE EDUCATION

PROGRAMME PROJECT REPORT

Index Page

| Sl. No | PPR |
|---------------|-------------------------------------|
| 1 | MASTER OF BUSINESS ADMINISTRATION |
| 2 | BACHELOR OF BUSINESS ADMINISTRATION |
| 3 | MASTER OF COMPUTER APPLICATION |
| 4 | BACHELOR OF COMPUTER APPLICATION |

[Handwritten signature]

Registrar
कुल सचिव
Usha Martin University
उषा मार्टिन विश्वविद्यालय
Ranchi-835103/रांची-835103

USHA MARTIN UNIVERSITY, RANCHI
CENTRE FOR DISTANCE AND ONLINE
EDUCATION



PROGRAMME PROJECT REPORT

MASTER OF BUSINESS ADMINISTRATION

2025-26


Registrar
कुल सचिव
Usha Martin University
उषा मार्टिन विश्वविद्यालय
Ranchi-835103/रांची-835103

Introduction

The Master of Business Administration (MBA) is a globally recognized postgraduate degree program meticulously structured to cultivate advanced competencies in business management, entrepreneurial leadership, and organizational strategy. It is designed to equip students with the theoretical frameworks and applied skills essential for navigating complex business environments and leading institutions across diverse sectors.

Through a comprehensive curriculum that integrates classroom instruction, case studies, industry interface, and real-time project engagements, the program facilitates the holistic development of students. Emphasis is placed on critical thinking, strategic analysis, and leadership acumen, enabling learners to explore and refine their individual managerial styles and latent professional capabilities.

The MBA program further provides students with the opportunity to deepen their expertise in specialized domains of management while fostering robust professional networks. It prepares graduates to function as catalysts of change—capable of addressing multifaceted business challenges and contributing innovative, sustainable solutions within dynamic organizational contexts.

A. Programme's Mission and Objectives

Mission

Deliver accessible, flexible, and high-quality management education that empowers working professionals and distance learners to become effective leaders and decision-makers in a dynamic business environment.

Objectives

The MBA program at Usha Martin University is structured with a focus on holistic development and industry relevance. It is designed after carefully considering valuable inputs from key stakeholders, including students, alumni, parents, academicians, and industry professionals. The program aims to push learners beyond their comfort zones, enabling them to develop a deeper understanding of contemporary business challenges in both domestic and global contexts. Emphasizing the application of modern management techniques, the curriculum equips students to analyze and resolve strategic problems with efficiency and effectiveness. Additionally, the program fosters the acquisition of specialized knowledge and managerial competencies necessary for practicing high-quality business management in an increasingly globalized Indian economy.

B. Relevance of the Program with HEI's Mission and Goals

The vision and mission of HEI Usha Martin University are:

Vision

To provide value based education relevant for all, nurture local talent, support creation of excellence in teaching, learning and research, produce high quality innovative graduates and contribute towards sustainable development of the state.

Mission

The University shall strive to promote innovative strategies for seamless dissemination and creation of knowledge using latest techniques, available media and technologies so that its graduates acquire skills to get sustainable employment and contribute with a sense of service to national and global society.

To provide the best campus environment to the students and faculty with all facilities to nurture their interest.

The MBA program of Usha Martin University is committed to realizing the University's vision and mission by addressing student-centric concerns on priority and actively engaging with the local community through various social initiatives, including the NSS and the Alumni Association. The University fosters a culture of multidisciplinary and allied research, contributing to a dynamic and joyful learning environment. In alignment with the objective of inclusive education, the Online Learning (OL) mode of the MBA program is designed to provide flexible learning opportunities for qualified individuals who are unable to pursue regular courses due to personal or professional commitments. This mode of learning serves as an effective alternative for working professionals and other aspirants seeking to enhance their knowledge and upgrade their skills. The program also caters to those requiring refresher courses, thereby promoting continuous learning and professional development among a broader spectrum of learners.

C. Nature of Prospective Target Group of Learners

Online Education at Usha Martin University (UMU) is specifically designed to cater to the needs of working professionals, business executives, government officials, academicians and entrepreneurs, who are unable to pursue a full-time MBA program due to professional or personal commitments. The Online MBA program provides a flexible and accessible platform for learners to enhance their managerial competencies and professional credentials without disrupting their existing responsibilities.

Candidates aspiring to enroll in the MBA program through the Online Learning (OL) mode must have successfully completed a graduation degree in any discipline from a recognized university. This program offers an excellent opportunity for distance learners who are unable to attend regular classes, enabling them to pursue higher education and advance their careers at their own pace and convenience.

D. Appropriateness of Programme to be conducted in OL mode to acquire specific skills and competence

The University has identified the following program outcomes and program specific outcomes as acquisition of specific skills and competence for MBA Program.

Programme Outcomes (POs)

| | |
|-----|--|
| PO1 | Apply knowledge of management theories and practices to solve business problems. |
| PO2 | Foster Analytical and critical thinking abilities for decision making using modern tools and techniques. |

| | |
|-----|---|
| PO3 | Ability to develop Value based Managerial Capabilities & Skills. |
| PO4 | Ability to understand, analyses and communicate global, economic, legal, and ethical aspects of business |
| PO5 | Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment. |

Programme Specific Outcomes

| | |
|------|---|
| PSO1 | Critically analyses and ameliorate the core functions of banking and financial institution. |
| PSO2 | To identify and cater to the societal need. |

E. Instructional Design

The program is divided into four semesters and minimum credit requirement is 84 to get MBA degree through OL mode from Usha Martin University. Minimum time period for acquiring MBA degree will be two years and maximum time (extended) period is four years. Students can select one elective.

Evaluation Scheme

| Semester-I | | | | | | |
|-------------------|-------------|--|--------|-----------------------------|---------------------|-------------|
| S.N. | Course Code | Course Name | Credit | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
| | | | | Max.Marks | Max.Marks | |
| 1 | MTMO-2101 | Principles and Practices of Management | 4 | 30 | 70 | 100 |
| 2 | MTMO-2102 | Managerial Economics | 4 | 30 | 70 | 100 |
| 3 | MTMO-2103 | Accounting for Managers | 4 | 30 | 70 | 100 |
| 4 | MTMO-2104 | Business Statistics | 4 | 30 | 70 | 100 |
| 5 | MTMO-2105 | Communication for Management | 4 | 30 | 70 | 100 |
| Total | | | 20 | 150 | 350 | 500 |

| Semester-II | | | | | | |
|-------------|-------------|------------------------------------|--------|-----------------------------|---------------------|-------------|
| S.N. | Course Code | Course Name | Credit | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
| | | | | Max.Marks | Max.Marks | |
| 1 | MTMO-2201 | Entrepreneurship & SMEs Management | 4 | 30 | 70 | 100 |
| 2 | MTMO-2202 | Business Environment | 4 | 30 | 70 | 100 |
| 3 | MTMO-2203 | Research Methodology | 4 | 30 | 70 | 100 |
| 4 | MTMO-2204 | Business Laws | 4 | 30 | 70 | 100 |
| 5 | MTMO-2205 | Human Resource Management | 4 | 30 | 70 | 100 |
| Total | | | 20 | 150 | 350 | 500 |

Note: The students taking an exit programme after securing 40 credits of the first semester shall be awarded Post Graduate Diploma in Business Management

| Semester-III | | | | | | |
|--------------|--|-------------------------|--------|-----------------------------|---------------------|-------------|
| S.N. | Course Code | Course Name | Credit | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
| | | | | Max.Marks | Max.Marks | |
| 1 | MTMO-2301 | Strategic Management | 4 | 30 | 70 | 100 |
| 2 | MTMO-2302 | Organizational Behavior | 4 | 30 | 70 | 100 |
| 3 | Three courses from any one area of the specialization and specialization area will remain same in IIIrd and IV th Semester | | 4 | 30 | 70 | 100 |
| 4 | | | 4 | 30 | 70 | 100 |
| 5 | | | 4 | 30 | 70 | 100 |
| Total | | | 20 | 150 | 350 | 500 |

| Any one specialization area to be opted in the IIIrd semester | |
|--|---|
| Marketing | |
| MTMO-M 2301 | Marketing Management |
| MTMO-M 2302 | E-Marketing |
| MTMO-M 2303 | Retail Management |
| Finance | |
| MTMO-F 2301 | Financial Management |
| MTMO-F 2302 | Security Analysis & Portfolio Management |
| MTMO-F 2303 | Management of Financial Institutions & Services |
| Human Resource Management | |
| MTMO-H 2301 | Industrial Relations & Labour Enactments |
| MTMO-H 2302 | Global HRM |
| MTMO-H 2303 | Negotiation & Counseling |
| Operations Management | |
| MTMO-O 2301 | Project Management |
| MTMO-O 2302 | Logistics and Supply Chain Management |
| MTMO-O 2303 | Advanced Production and Operations Management |

| Semester-IV | | | | | | |
|-------------|--|--|--------|-----------------------------|---------------------|-------------|
| S.N. | Course Code | Course Name | Credit | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
| | | | | Max.Marks | Max.Marks | |
| 1 | MTMO- 2401 | Business Ethics and Corporate Governance | 4 | 30 | 70 | 100 |
| 2 | MTMO- 2402 | Global Business Management | 4 | 30 | 70 | 100 |
| 3 | Three courses from any one area of the specialization and specialization area will remain same in IIIrd and IV th Semester | | 4 | 30 | 70 | 100 |
| 4 | | | 4 | 30 | 70 | 100 |
| 5 | | | 4 | 30 | 70 | 100 |
| 6 | MTMO- 2491 | Dissertation | 4 | 0 | 100 | 100 |
| Total | | | 24 | 150 | 450 | 600 |

| Any one specialization area to be opted in the IV Semester | |
|---|---|
| Marketing | |
| MTMO-M 2401 | Consumer Behavior & Marketing Communication |
| MTMO-M 2402 | Marketing of Services |
| MTMO-M 2403 | Sales and Distribution Management |
| Finance | |
| MTMO-F 2401 | Corporate Financial Restructuring |
| MTMO-F 2402 | Strategic Corporate Finance |
| MTMO-F 2403 | Management of Working Capital |
| Human Resource Management | |
| MTMO-H 2401 | Organization Development |
| MTMO-H 2402 | Group and Team in Organization |
| MTMO-H 2403 | Training and Development |

| Operations Management | |
|------------------------------|------------------------------|
| MTMO-O 2401 | Total Quality Management |
| MTMO-O 2402 | Service operation management |
| MTMO-O 2403 | Management of Technology |

Note: The students will be awarded Master of Business Administration degree in the relevant specialization provided they secure 80 credits.

MOOCS

The University shall give flexibility in opting for MOOC (Massive Online Open Courses) by the students pertaining to the prescribed curriculum and also the credits earned in the MOOC courses may be dealt as part of the evaluation scheme as per UGC (Open and Distance Learning Programmes and Online Programmes) Regulations,2020.

Syllabi and Course Materials

Syllabi, PPR and self-learning materials are developed mostly by experienced faculty members of Usha Martin University in consultation with contents experts and the same will be forwarded to CIQA and BoS/Academic Council/ Executive Council for further suggestions and approval.

Semester-I
Course Name: Principles and Practices of Management

Course Code: MTMO-2101

Credits: 4

Course Objective: The main objective is to teach the students the main functions of management as they need a variety of skills to understand human behavior, communicate with people, motivate employees, adapt to changes, manage new technologies, etc.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|--------|---|-----------------|
| 1. | Extrapolate basics of management theory and its practices. | Understand |
| 2. | Associate the functions of management. | Apply |
| 3. | Identify individual, group and organizational components of organizational behaviour. | Remember |
| 4. | Demonstrate skills related to work motivation and leadership. | Apply |
| 5. | Visualize importance of group management in changing work environment. | Understand |

Block:I Introduction

Unit: 1 Introduction: Meaning, Nature and Scope of Management, Management Approaches, Processes and Functions,

Unit: 2 Managerial Skills, Tasks and Responsibilities of a Professional Manager;

Unit: 3 Evolution of Management Thought, Taylor and Fayol' contribution to Management, Bureaucracy, Hawthorne Studies; Management thinkers,

Block:II Planning

Unit: 4 The Nature and Purpose of Planning, Management by Objectives, Strategies, Policies and Planning Premises. Forecasting.

Unit: 5 Decision Making; Organizing: Nature & Purpose of Organizing. Span of Management,

Unit: 6 Departmentation, Line/ Staff Authority & Responsibility, Effective Organizing & Organizational Culture, Organization Charts and Manuals.

Block: III Staffing

Unit: 7 Staffing: Definition, Nature and Purpose of Staffing

Unit: 8 Human Resource Management and Selection, Performance Appraisal and Career Strategy

Unit: 9 Manager and Organization Development: Managing Change, Organizational Conflicts.

Block: IV Leadership

Unit: 10 Leading: Managing and the Human Factor.

Unit: 11 Motivation: Meaning, Scope and Importance, Approaches, Motivation and Performance, Approaches for Improving Motivation, Quality of Work Life;

Unit: 12 Leadership: Definition, Ingredients, Approaches;

Unit: 13 Communication: Function, Process and Barriers to Communication;

Unit 14: Directing- Meaning, Nature and Scope, Direction and Supervision.

Block: V Controlling

Unit: 15 Controlling: Concept, the System and Process of Control, Control Techniques and IT, Productivity and Operations Control;

Unit: 16 Controlling Methods: Budgetary and non- budgetary, Overall and Preventive Control.

Unit: 17 The Quality Concept Factors affecting Quality, Developing a Quality Control System, Total Quality Control;

Unit 18: International Management: Towards a unified, global Management Theory.

References:

1. Essentials of Management: An International Perspective by Koontz &Weihrich, Tata McGraw Hill Education Private Limited, New Delhi.
 2. Management (Text and Cases) by V.S.P. Rao and V Hari Krishna, Excel Books, New Delhi.
 3. Principles and Practice of Management, L. M. Prasad, Sultan Chand & Sons, New Delhi.
 4. Contemporary Management, Gareth R. Jones and Jennifer M. George, fifth Edition, Tata McGraw-Hill Education Private Limited, New Delhi.
-

Course Name: MANAGERIAL ECONOMICS

Course Code: MTMO-2102

Credits: 4

Course Objective: The objective of this course is to enable the student to understand the different forms of markets. It is hoped that by the end of the course the student will be able to appreciate the subtle and the most fundamental issues involved in running the business.

Course Outcome: At the end of the course student would be able to:

| S.No. | Course Outcomes | Cognitive level |
|-------|---|-----------------|
| 1. | Elaborate various theories and laws of Managerial Economics. | Understand |
| 2. | Visualize concepts related to demand, supply & revenue analysis. | Apply |
| 3. | Examine pricing decisions for various markets. | Apply |
| 4. | Identify various market structures and plan business accordingly. | Apply |
| 5. | Demonstrate understanding of macroeconomic indicators and their impact on business. | Understand |

Block I: Introduction to Managerial Economics

Unit 1: Basic concepts and principles of Economics,

Unit 2: Introduction to Managerial Economics: Nature, Scope,

Unit 3: Importance and Significance in decision making, Managerial Economist-Role, responsibilities and functions.

Block II: Demand, Supply and Revenue Analysis

Unit 4: Demand & supply analysis,

Unit 5: Consumer Preferences and choices.

Unit 6: Demand Elasticity;

Unit 7: Types & its relevance, demand forecasting, revenue analysis.

Block III: Production & Cost Analysis

Unit 8: Cost: Concepts, measurement & analysis,

Unit 9: Production Function & its managerial applications,

Unit 10: Cost curves: traditional & modern approach,

Unit 11: Production Function; Laws of returns.

Block IV: Pricing Decisions & Profit Planning

Unit 12: Market Structures, pricing under different market structures,

Unit 13: Perfect, imperfect and monopoly,

Unit 14: Break Even Analysis; Profit Planning;

Unit 15: Oligopoly (Cournot's model, kinked demand curve model, prisoner's dilemma).

Block V: Macro Economics

Unit 16: Concepts of national Income and methods of its measurement,

Unit 17: Inflation: Theories,

Unit 18: Introduction to business cycles

References:

1. Geetika, Piyali Ghosh, Purba Roy Choudhury (Mc Graw Hill)
2. Mehta PL- Managerial Economics (Sultan Chand)

3. Dwivedi- Managerial Economics (Vikas)
 4. Gupta- Managerial Economics (Tata McGraw-Hill)
-

Course Name: ACCOUNTING FOR MANAGERS**Course Code: MTMO-2103****Credits: 4**

Course Objective: The main objective of this course is to make the students familiar with fundamental concepts and process of accounting, significant tools & techniques of financial analysis which form an important part of management planning & financial control system and help the management in resolving problems effectively.

Course Outcome: At the end of the course student would be able to:

| S.No. | Course Outcomes | Cognitive level |
|-------|---|-----------------|
| 1. | Elaborate various concepts related to Indian and International accounting. | Understand |
| 2. | Apply costing techniques for computing cost of products or services. | Apply |
| 3. | Demonstrate various costing methods used in manufacturing and non-manufacturing concerns. | Understand |
| 4. | Analyze decisions related to make or buy for a particular input. | Analyze |
| 5. | Examine budgetary and financial statements. | Apply |

Block I: Accounting Framework I (Introduction to Accounting)

Unit 1: Introduction, Nature, scope and importance of Accounting, Book Keeping,

Unit 2: Accounting Process, Users of an Accounting information and their needs,

Unit 3: Accounting Equation, Role and Responsibilities of an Accountant; GAAP and Accounting Standards-Indian and international.

Block II: Accounting Framework II (Accounting Books and Final Accounts)

Unit 4: Preparation of Journal, Ledger, Trial balance,

Unit 5: Cash book & other subsidiary books,

Unit 6: Preparation of Trading, Profit & Loss A/c and balance Sheet (with adjustments),

Unit 7: Depreciation Accounting and

Unit 8: Preparation of BRS.

Block III: Cost Accounting

Unit 9: Meaning, importance of Cost Accounting,

Unit 10: Elements and classification of costs and Preparation cost sheet,

Unit 11: Inventory valuation.

Block IV: Management Accounting

Unit 12: Meaning, importance of Management Accounting,

Unit 13: Budgeting & Budgetary Control;

Unit 14: Preparation of Fixed & Flexible budget, Zero Based Budgeting.

Block V: Financial Statements Analysis

Unit 15: Meaning, importance of financial statement,

Unit 16: Ratio Analysis,

Unit 17: Preparation and Analysis of Fund Flow

Unit 18: Cash Flow Statements according to AS-3.

References:

1. Gupta, Shashi K. and Sharma R.K. (2008)- Accounting for Managerial Decisions, Kalyani Publications (Ludhiana)
 2. Tulsian, P.C. (2009)- Financial Accounting, Tata McGraw Hill Publication, New Delhi
 3. Shukla, S.M. (2009)- Advanced Accounting, SahityaBhawan Publication, Agra
 4. Ramachandran, N. and Kakani, R.K. (2008)- Financial Accounting for Management, Tata McGraw Hill Publication, New Delhi
-

Course Name: BUSINESS STATISTICS

Course Code: MTMO-2104

Credits: 4

Course Objective: To a greater extent, modern management is adopting and applying quantitative techniques to aid in the process of decision-making. An intelligent use of appropriate tools reduces highly complex problem to one of manageable dimensions. The course has been designed to develop familiarity with the application of statistical methods in managerial problem solving and decision-making.

Course Outcome: At the end of the course student would be able to:

| S.No. | Course Outcomes | Cognitive level |
|-------|--|-----------------|
| 1. | Demonstrate an understanding of decision making process under uncertainty using statistical tools. | Understand |
| 2. | Explain correlation and regression analysis and their importance in decision making. | Understand |
| 3. | Visualize the concept of time series in business decision making. | Apply |
| 4. | Demonstrate an understanding of probability and probability distributions. | Understand |
| 5. | Explore application of Estimation Theory and Hypothesis Testing in business decision making. | Understand |

Block I: Introduction

Unit 1: Meaning and definitions of Statistical Data; Applications of Statistics in Managerial decision-making;

Unit 2: Frequency Distributions; Measures of Central Tendency: Mean, Median, Mode and their implications;

Unit 3: Measures of Dispersion: Range, Quartile Deviation, Mean Deviation and Standard Deviation.

Block II: Correlation and Regression

Unit 4: Meaning and uses of correlation

Unit 5: Meaning and uses of regression.

Unit 6: Various methods of calculation of Coefficient of correlation and their analysis (Two Variable)

Unit 7: Regression analysis.

Block III: Analysis of Time Series

Unit 8: Concept; Additive model, Multiplication model,

Unit 10: Seasonal variation, Cyclical Variation;

Unit 11: Various methods of Time Series Analysis and their applications in business.

Block IV: Probability

Unit 12: Concept, its uses in business decision-making,

Unit 13: Addition and multiplication theorem of probability; Binomial theorem and its applications

Unit 14: Probability Distribution: Concept, applications of Binomial, Poisson and Normal Distributions.

Block-V: Estimation Theory and Hypothesis Testing

Unit 15: Estimation Theory and Hypothesis Testing: Sampling theory; Formulation of Hypotheses;

Unit 16: Application of Z-test, t-test,

Unit 17: F-test and ANOVA

Unit 18: Chi-Square test. Techniques of association of Attributes & Testing.

Text and Reference Books

1. Business Statistics, 3 rd Edition, JP Sharma, Pearson Publishing
 2. Statistics for Management - Richard Levin, Pearson Publishing
 3. Statistics for Management - G.C. Beri, Tata McGraw-Hill Education, 2010
 4. Statistical Methods - Gupta S. P, Sultan Chand & Sons, 2002.
-

Course Name: COMMUNICATION FOR MANAGEMENT

Course Code: MTMO-2105

Credits: 4

Course Objective: The objective of this course is to equip students with the written and technical communication skills they need to communicate effectively in a complex and ever-changing contemporary work environment.

Course Outcome: At the end of the course student would be able to:

| S.No. | Course Outcomes | Cognitive level |
|-------|--|-----------------|
| 1. | Elaborate basic forms of communication & various communication models. | Understand |
| 2. | Demonstrate verbal and non-verbal communication ability through presentations. | Understand |
| 3. | Explore various forms of modern communication in business communications. | Apply |
| 4. | Identify appropriate methods of report writing. | Apply |
| 5. | Demonstrate understanding of various tools of organizational communication. | Understand |

Block I: Introducing Business Communication

Unit 1: Basic forms of communication; Self Development and Communication Development of positive personal attitude

Unit:2 Communication models and processes

Unit 3: Audience analysis Principles of effective communication, formal and informal communication networks, Grapevine, miscommunication (barriers).

Block II: Effective listening

Unit 4: Principles of effective listening; Factors affecting listening exercise;

Unit 5: Oral, written and video sessions.

Unit 6: Modern forms of communicating:

Unit 7: Fax: E-Mail; Video conferencing etc. nonverbal aspects of communication, Kinesics, Proxemics, Para language, sign language.

Block III: Writing skills

Unit 8: Planning business message; rewriting and editing; the first draft; reconstructing the final draft.

Unit 9: **Business** letters; Appearance of request letters; Good news and bad news letters; Persuasive letters;

Unit 10: Sales letters; Collection letters; Office memorandum, notice and circular.

Unit 11: Writing resume and letter of application.

Block IV:Report writing

Unit 12: Introduction to a proposal, short report and formal report, report preparation,

Unit 13: Sales presentation, training presentation,

Unit 14: Conducting surveys, speeches to motivate.

Block V:Practices in business communication

Unit 15: Group discussions; Mock interviews; Seminars; Effective listening exercises;

Unit 16: Individual and group presentations, Oral presentation:

Unit 17: Principles of oral presentation, Factors affecting presentation,

Unit 18: Interviewing skills: Appearing in interviews; conducting interviews

References:

1. Bovee and Thill- Business communication today; Tata McGraw Hill
 2. Ronald E. Dulek and John S.Fielder- Principles of business communication; McMillan
 3. Randall E.Magors- Business communication :Harper and Row
 4. Balasubramanyam- Business communications; Vikas Publishing House.
-

Semester-II

Course Name: Entrepreneurship and SMEs Management

Course Code: MTMO-2201

Credits: 4

Course objectives: The main objectives of the course are to familiarize students with various concepts used in understanding processes involved in entrepreneurship and business formation and development. Provide context to those processes in the form of differences between small and large firms, and the economic environment.

Course Outcome: At the end of the course student would be able to:

| S.No. | Course Outcomes | Cognitive level |
|-------|---|-----------------|
| 1. | Elaborate fundamentals of entrepreneurship and entrepreneurial process. | Understand |
| 2. | Explain various theories of entrepreneurship. | Understand |
| 3. | Design business plans. | Apply |
| 4. | Describe MSME registration process and MSME promotional policies. | Apply |
| 5. | Explain various concepts related to International Business. | Understand |

Block I: Entrepreneurship: A Conceptual Framework

Unit 1: Introduction: Concept of Entrepreneurship; Role of entrepreneurship in economic Development;

Unit 2: Factors impacting emergence of entrepreneurship; Managerial vs. entrepreneurial approach; Intrapreneurship.

Unit 3: Types of Entrepreneurs. Characteristic of successful entrepreneurs; Entrepreneurship process;

Unit 4: Women Entrepreneurs; Social entrepreneurship; Entrepreneurial challenges.

Block II: Entrepreneurial Growth:

Unit 5: Role of Entrepreneurship in Economic Development, Entrepreneurial Theories; Factors affecting entrepreneurial growth

Unit 6: Entrepreneurial Challenges; New Product

Unit 7: Development and Growth Strategies for Entrepreneurial ventures.

Block III: New Ventures Planning

Unit 7: Ownership Structures; Acquisition; Franchising, Marketing plan,

Unit 8: Marketing research, Marketing Mix; Business Plan-benefits of drivers

Unit 9: Perspectives in business plan preparation, elements of a business plan.

Block IV: MSME Registration and Promotion

Unit 10: MSME registration, MUDRA Loan, Start-up India.

Unit 11: Make In India, Institutional Finance to Entrepreneurs

Unit 12: MSME and Economic Development,

Unit 13: Institutional Support for Small Enterprises.

Block V: International Entrepreneurship:

Unit 14: Export Business Registration, Intellectual Property Protection- Patents,
Unit 15: Trademarks and Copyrights – importance for start-ups,
Unit 16: Legal acts governing business in India;
Unit 17: International entrepreneurship- opportunities and challenges,
Unit 18: Export Documentation in India.

References:

1. Drucker, Peter. Innovation and Entrepreneurship. East-West Press (P) Ltd
 2. Holt, David H. Entrepreneurship-New Venture Creation. Prentice Hall
 3. Hisrich, Robert D and Peters, Michael P. Entrepreneurship: Starting, Developing and Managing a New Enterprise, Prentice Hall
 4. Desai, Vasant: Small Scale Industries and Entrepreneurship. Himalaya
 5. Gupta,C.B. and Srinivasan. Entrepreneurial Development in India. Sultan Chand
 6. Pareek, Udai and Venkateswara Rao, T. Developing Entrepreneurship- A Handbook on Learning Systems
-

Course Name: Business Environment

Course Code: MTMO-2202

Credits: 4

Course Objective:

To analyze the overall business environment and evaluate its various components in business decision making.

Course Outcome: At the end of the course student would be able to;

| S. No. | Course Outcomes | Cognitive level |
|--------|---|-----------------|
| 1 | Visualize various environmental factors that affect business. | Understand |
| 2 | Diagnose impact of various governmental policies on Business. | Analyze |
| 3 | Evaluate impact of socio-cultural environment on Business. | Analyze |
| 4 | Elaborate impact of political-legal environment on Business. | Understand |
| 5 | Identify role of multilateral institutions in facilitating world trade. | Understand |

Block I: Theoretical Framework of Business Environment

Unit 1: Concept, Significance, of Business Environment

Unit 2: Nature, Elements & Dimensions;

Unit 3: Environmental Scanning and Monitoring.

Block II: Economic Environment of Business

Unit 4: Significance and Elements; Economic Systems; Economic planning in India; Government Policies- Industrial,

Unit 5: Fiscal, Monetary, EXIM; Public Sector and economic development; Development banks and its relevance to Indian business;

Unit 6: Economic Reforms, Liberalization and structural adjustment programmes;

Unit 7: Regulation of Financial Markets, SEBI.

Block III: Political and Legal Environment of Business

Unit 8: Critical elements; Government and business;

Unit 9: Changing dimensions of political and legal environment in India;

Unit 10: MRTP Act, Competition Act, FEMA and licensing policy

Unit 11: Consumer Protection Act.

Block IV: Socio-cultural Environment

Unit 12: Social institutions, systems, values, attitudes, groups, etc;

Unit 13: Dualism in Indian society and problems of uneven income distribution;

Unit 14: Rural sector in India; Social Responsibility of Business; Consumerism in India.

Block V: International and Technological Environment

Unit 15: Multinational Corporations; Foreign collaborations and Indian business; NRIs and Corporate sector

Unit 16: International Economic Institutions- WTO, World Bank, IMF and their importance to India; Foreign trade Policies;

Unit 17: Impact of Rupee devaluation; Technological environment in India; Policy on research and development

Unit 18: Intellectual Property Rights; Technology transfer.

References:

1. Adhikari, M- Economic Environment of Business, Sultan Chand & Sons
 2. Alagh, Yoginder K- Indian Development, Planning and Policy, Vikas Publication
 3. Aswathappa, K- Legal Environment of Business, Himalaya Publication
 4. Chakravarty, S- Development Planning, Oxford University Press
 5. Ghosh, Biswanath- Economic Environment of Business, Vikas Publication, New Delhi
 6. Govt. of India- Economic Survey
 7. Raj Agarwal and ParagDiwan, Business Environment; Excel Books
 8. Cherunilam, Francis- Business Environment, Macmillan
-

Course Name: Research Methodology

Course Code: MTMO-2203

Credits: 4

Course Objectives: The objectives of this course are-
To familiarize students with basic of research, research process and enable the participants in conducting research work and formulating research synopsis and report.

Course Outcome: At the end of the course student would be able to;

| S. No. | Course Outcomes | Cognitive level |
|--------|---|-----------------|
| 1 | Elaborate various concepts related to Research. | Understand |
| 2 | Enumerate various kinds of research design & process | Apply |
| 3 | Develop adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis. | Apply |
| 4 | Demonstrate various techniques of data analysis-and hypothesis testing procedures. | Understand |
| 5 | Articulate appropriate research ethics for doing meaningful research. | Understand |

Block I: Research Formulation

Unit 1: Introduction, meaning of research,

Unit 2: Types, Role of research in important area and Process of Research,

Unit 3: Defining research Problems, Hypothesis Formulation.

Block II: Research Elaborated

Unit 4: Research Design, Research plan,

Unit 5: Concept of sample, Sample size, Various types of sampling techniques.

Unit 6: Types of Data and Methods of its Collection; Questionnaire Design,

Unit 7: Precautions in preparation of questionnaire, Measurement scales.

Block III: Data Analysis and Interpretation-1

Unit 8: Processing and Analysis of Data by application of statistical tools,

Unit 9: Various kinds of charts and diagrams used in data analyses

Unit 10: Application of Data Analysis.

Block IV: Data Analysis and Interpretation-2

Unit 11: Hypothesis Testing (F-test, ANOVA, Chi –square test, t-test) ,

Unit 12: Multivariate Statistical techniques- Multiple regression, discriminate analysis,

Unit 13: Factor analysis, Multivariate analysis of variance,

Unit 14: Conjoint analysis, Cluster analysis, Multidimensional Scaling, Role of computer in research, Excel- A tool for statistical analysis, SPSS, Interpretation and conclusion.

Block V: Report Writing

Unit 15: Report Writing, Significance of report writing, Steps in report writing,

Unit 16: Layout of research report, Types of reports; Appendices;

Unit 17: Bibliography, Characteristics of a good report; Precautions for report writing

Unit 18: Ethics in business research.

References:

- 1.Kothari CR- Research Methodology, New Age Publication
 - 2.Panneerselvam R- Research Methodology (PHI)
 - 3.Cooper, Donald, Schindler, Pamela- Business Research (TMH)
 - 4.Bill Taylor, Gautam Sinha, TaposhGhoshal- Research Methodology (PHI)
-

Course Name: Business Laws

Course Code: MTMO-2204

Credits: 4

Course Objective: To acquire knowledge and understanding of major business, commercial and economic laws. The aim of this course is not just to teach Legal Regulatory framework, but to develop students in such a way that they equip with appropriate skills in legal requirements for managing business.

Course Outcome: At the end of the course student would be able to;

| S. No. | Course Outcomes | Cognitive level |
|--------|---|-----------------|
| 1 | Elaborate clear understanding for contracts and subsequently enter valid business propositions | Understand |
| 2 | Articulate legitimate rights and obligations under sale of goods Act, 1930. | Understand |
| 3 | Enumerate various legitimate rights and obligations under Negotiable Instrument Act | Analyze |
| 4 | Acquire skills to initiate entrepreneurial ventures as LLP or other new form of organisation which are widely used across the globe | Understand |
| 5 | Attain insights into various company proceedings through Companies Act-1956 & Company Act-2013 | Apply |

Block I: Contract Act, 1872

Unit 1: Definition & Classification of Contract, Essential elements of a Valid Contract,

Unit 2: Quasi Contract – Various Forms,

Unit 3: Contingent contract,

Unit 4: Discharge & Breach of Contract, Remedies of breach of contract.

Block II: Sales of Goods Act, 1930

Unit 5: Contract of sale of Goods-Meaning, Essentials, etc.

Unit 6: Provisions relating to Conditions and Warranties, Provisions relating to Transfer of Property

Unit 7: Ownership, Provisions relating to Performance of Contract of Sale- Rights and duties of Unpaid Seller and Buyer.

Block III: The Negotiable Instruments Act, 1881

Unit 8: Negotiable Instruments- Meaning, Characteristics, Types, Parties- Holder and Holder in Due Course;

Unit 9: Negotiation and types of endorsements, Dishonour of Negotiable Instruments and Overdue Instrument,

Unit 10: Banker and Customer- Crossing of Cheques, Obligations of a Banker & a Customer, Bouncing of Cheques, Liabilities of parties.

Block IV: Partnership Act, 1932

Unit 11: Definition, Formation, Types and Registration of Partnership,

Unit 12: Kinds, Rights and liabilities of Partners, Minor's Status in Partnership Firm,

Unit 13: Dissolution of Partnership Firm.

Block V: The Companies Act, 1956 & 2013

Unit 14: Company- Definition, Meaning, Features and Types,

Unit 15: Incorporation of a Company- Memorandum & Articles of Association and their Alteration;

Unit 16: Prospectus, Management of company- Directors and Meetings,

Unit 17: Share capital-Account and Audit,

Unit 18: Winding up of companies.

References:

1. Kuchhal, M.C. (2007). Business Law, Vikas Publishing House, New Delhi.
 2. Tulsian, P.C. (2007). Business Law, Tata McGraw-Hill Publications, New Delhi.
 3. Kuchhal, M.C. (2007). Mercantile Law, Vikas Publishing House, New Delhi.
 4. Singh Avtar (2008). Mercantile Law, Eastern Book Company, Lucknow.
 5. Kapoor, N.D. (2008). **Elements** of Mercantile Law, Sultan Chand & Sons Educational Publishers, Delhi.
-

Course Name: Human Resource Management

Course Code: MTMO-2205

Credits: 4

Course Objective: The objective of the course is to familiarize the students about the different aspects of managing people in the organizations from the stage of acquisition to development and retention.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|---------------|---|------------------------|
| 1 | Elaborate HRM and the role of HRM in effective business administration. | Understand |
| 2 | Identify the role that HRM has to play in manpower planning, job analysis and forecast the human resource requirements. | Apply |
| 3 | Explain role of recruitment and selection in relation to the organization's business and HRM objectives. | Understand |
| 4 | Identify job-based compensation scheme and performance management system and appraisals. | Apply |
| 5 | Visualize emerging horizons of HRM and also enduring international HRM, e-HRM, HRIS. | Understand |

Block I: Introduction:

Unit 1: Conceptual foundations; Human aspect of management; Human resource Management- concept, scope and importance;

Unit 2: Competencies of HR manager- employer branding and competency mapping;

Unit 3: Changing role of HRM- workforce diversity, Technological change, restructuring and rightsizing, empowerment; TQM.

Unit 4: Management of ethics.

Block II: Human Resource Planning, Job Analysis, and Job Design:

Unit 5: Assessing human resource requirements; Human resource forecasting;

Unit 6: Work load analysis; Job analysis; Job description and specifications;

Unit 7: Job design; Job characteristic approach to job design.

Block III- Recruitment, Selection, Training, and Development:

Unit 8: Factors affecting recruitment; Sources of recruitment (internal and external);

Unit 9: Basic selection model; Psychological tests for selection; Interviewing; Placement and induction;

Unit 10: Job changes- Transfers, Promotions, and Separations;

Unit 11: An overview of training and development; Emerging trends in recruitment, selection, and development.

Block IV- Compensation Management, Performance Appraisal, and Audit:

Unit 12: Compensation Management- Job evaluation, base compensation and supplementary compensation;

Unit 13: Innovations in compensation management- Pay band system, ESOP; Performance appraisal-

concept, traditional and modern methods-

Unit 14: MBO, 360degree appraisal, 720degree appraisal, behaviourally anchored rating scale, balanced scorecard; Potential appraisal.

Block V- Emerging Horizons of HRM

Unit 15: International HRM, challenges of international HR managers; Green HRM; E-HRM; HRIS (Human Resource Information System);

Unit 16: Human resource audit;

Unit 17: Contemporary issues in human resource management

Unit 18: Moonlighting phenomenon, employee engagement, flexi timing, psychological contract, managing protean career, layoffs.

References:

1. John Storey- Human Resource Management, Thomson Learning
 2. R.S. Dwivedi- Managing Human Resources, Galgotia Publishing Company
 3. Gary Dessler- Human Resource Management, Pearson Education
 4. Aswathapa- Human Resource & Personnel Management, Tata McGraw Hill
 5. Randy. L. Desimone, Jon & David Harris- Human Resource Development, Thomson.
-

Semester-III

Course Name: Strategic Management

Course Code: MTMO-2301

Credits: 4

Course Objective: To expose students to various perspectives and concepts in the field of Strategic Management. The course would enable the students to understand the principles of strategy, formulation, implementation and control in organizations.

Course Outcome: At the end of the course student would be able to

| S. No. | Course Outcomes | Cognitive level |
|--------|---|-----------------|
| 1 | Elaborate the basic concepts and principles of strategic. | Understand |
| 2 | Identify organizational strategies that will be effective in dynamic business environment. | Apply |
| 3 | Demonstrate effective application of concepts, tools & techniques to practical situations for diagnosing and solving organisational problems. | Understand |
| 4 | Acquire capability of making own decisions in dynamic business landscape | Apply |
| 5 | Visualize various strategies for managing global competition. | Understand |

Block I: Strategy-Introduction

Unit 1: Concept, Levels at which strategy operates; Approaches to strategic decision making; Mission and Purpose,

Unit 2: Objectives and Goals; Strategic Business Units (SBUs);

Unit 3: Environmental Analysis & Diagnosis: Environment and its components;

Unit 4: Environmental Scanning & Appraisal; Organizational Appraisal; Strategic Advantage Analysis and Diagnosis.

Block II: Strategy and Structure

Unit 5: Structural considerations, Structures for strategies; Organizational design and change.

Unit 6: Functional Strategies-Marketing, Production & Operations, Personnel,

Unit 7: Financial, R&D plans and policies.

Block III: Strategy Formulation and Choice of Alternatives

Unit 8: Strategies- modernization, diversification, integration;

Unit 9 : Merger, take-over and joint strategies;

Unit 10: Turnaround, divestment and liquidation strategies;

Unit 11: Process of strategic choice, competitor and SWOT analysis;

Unit 12: Factors affecting; Generic competitive strategies- cost leadership, differentiation, focus, value chain analysis.

Block IV: Strategy Implementation

Unit 13: Inter-relationship between formulation and implementation,

Unit 14: Issues in strategy implementation; Resource allocation,

Unit 15: Strategy Evaluation & Control: Overview and Techniques.

Block V: Global Issues in Strategic Management

Unit 16: Global challenges, Advantages & Disadvantages of international operations,

Unit 17: Communication differences across countries, worldwide tax rates & their impact,

Unit 18: Participation of international institutions for international business.

References:

1. Bhattacharya, S.K. and N. Venkataraman- Managing Business Enterprises: Strategies, Structures and Systems, Vikas Publishing House
 2. Budhiraja, S.B. and M.B. Athreya- Cases in Strategic Management, Tata McGraw Hill
 3. Coulter, Mary K- Strategic Management in Action, Prentice Hall
 4. David, Fred R- Strategic Management, Prentice Hall
-

Course Name: Organizational Behavior

Course Code: MTMO-2302

Credits: 4

Course Objective: The objective of the course is to enable students to develop a theoretical understanding about organization structure and its behavior over time. The course will also make them capable of realizing the competitiveness for firms.

Course Outcome: At the end of the course student would be able to:

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1: Understand the concepts of organizational behaviour and its relation with business management. | Understand |
| CO2: Explain concepts of individual behaviour i.e. perception, attitude etc. | Explain |
| CO3: Demonstrate process involved in group behaviour i.e. group dynamics, group decision making etc. | Demonstrate |
| CO4: Describe the methods of leadership of a successful business owner/ manager. | Describe |
| CO5: Explain the organization system and process for smooth business operations. | Explain |

Block- I- Introduction:

Unit-1: Emergence of organizational behavior;

Unit-2: Management and OB; Hawthorne studies and human relations school;

Unit-3: Challenges and opportunities for organizational behavior;

Unit 4 : Positive organizational behaviour.

Block- II- Individual Behavior:

Unit-5: Foundations of individual behavior; Perception; Attribution;

Unit-6: Personality; Attitude; Learning and Values;

Unit-7: Motivation – theoretical and practical dimension.

Unit-8 : Various theories of motivation

Block- III- Group Behavior:

Unit-9: Group dynamics; Cohesiveness and productivity;

Unit-10: Group decision making; managing organizational conflict;

Unit-11: Managing misbehavior at work.

Block- IV- Leadership:

Unit-12:Influence, Power and Politics;

Unit-13: Leadership

Unit-14: Theoretical and practical dimension.

Unit-15: Various theories of Leadership

Block- V- Organization System & Processes:

Unit-16: Organization Structure – foundation and types;

Unit-17: Climate and Ethos;

Unit-18: Communication; Organizational effectiveness & performance, managing change.

References:

1. Robbins, Stephen P. and Timothy A. Judge, Organizational Behaviour, Prentice -Hall, New Delhi.
 2. Robins S.P., and Mathew, M, Organisational Theory: Structure, Design and Application, Prentice Hall of India Pvt. Ltd.
 3. Luthans, Fred, Organizational Behaviour, McGraw-Hill, New York.
 4. Sekaran, Uma, Organisational Behaviour: Text and Cases, Tata McGraw-Hill Publishing Co. Ltd.
-

Course Name: Marketing Management**Course Code: MTMO- M 2301****Credits: 4****Course Objective:**

The objective of this course is to train participants to apply concepts and techniques in marketing so that they become acquainted with the duties of a marketing manager. More specifically, they will be exposed to the development, evaluation, and implementation of marketing management in a variety of business environments.

Course Outcome: At the end of the course student would be able to:

| S.No. | Course Outcomes | Cognitive level |
|-------|---|-----------------|
| 1. | Elaborate various concepts related to marketing. | Understand |
| 2. | Explain concepts related to Marketing Mix. | Apply |
| 3. | Demonstrate process involved with product planning and price determination. | Apply |
| 4. | Describe process involved with promotion and distribution strategy. | Analyze |
| 5. | Explore contemporary issues in marketing. | Understand |

Block I: Introduction

Unit 1: Nature & Scope of Marketing, evolution of Marketing,

Unit 2: Marketing Environment. Segmentation,

Unit-3: Targeting and Positioning & Differentiation Strategies,

Unit 4: Marketing Organizations, Marketing Research

Block II: Product Management

Unit 5: Product, product levels, classifying products,

Unit 6: New Product Development, Product Differentiation,

Unit 7: Product Life Cycle, Branding, types of branding,

Unit-8: Packaging & labelling

Block III: Pricing and Distribution

Unit 9: Concept of Pricing, Relationship between pricing and product cost,

Unit 10: Pricing objectives Pricing Policies and Methods,

Unit 11: Distribution Channel Management, Intermediaries,

Unit-12: channel structure, managing relationships in the channel.

Block IV: Promotion Mix decision

Unit 13: Marketing Communication, Advertising;

Unit 14: Sales Promotion, Publicity & Personal Selling,

Unit 15: Public Relations and Direct Marketing.

Block V: Emerging Trends in Marketing

Unit 16: Marketing Ethics, (e-) marketing; (e-) services; (e-) Customer Relationship

Unit 17: Management; viral marketing,

Unit 18: Ambush marketing, green marketing.

References:

1. Baines, Fill Page and Sinha; Marketing 2013
2. Marketing Management – Philip Kotler (Pearson)
3. Fundamentals of Marketing – Stanton
4. Marketing Management – V S Ramaswamy and S Namakumari (Macmillan)

Course Name: E-Marketing

Course Code: MTMO- M 2302

Credits: 4

Course Objective: This course is designed to impart the students with the knowledge, concepts and skills needed in marketing through digital channels. The course seeks to familiarize the participants with the concepts and techniques applicable to digital marketing. The aim of this course is not just to teach E-Marketing but to develop students in such a way that they equip with adequate skills in E-Marketing for managing business.

Course Outcomes: The successful completion of this course shall enable the student to:

| S. No. | Course Outcomes | Cognitive level |
|--------|---|-----------------|
| 1 | Enumerate basic difference and similarities between non-digital and digital marketing | Understand |
| 2 | Examine consumer behaviour towards digital media. | Apply |
| 3 | Identify and develop digital strategies for Digital Market | Apply |
| 4 | Explain basic concepts of social media marketing. | Understand |
| 5 | Identify various tools for social media, web analytics | Understand |

Block I: Internet penetration and E-marketing

Unit 1: Characteristics of Internet: Web 1.0, Web 2.0 and Web 3.0; Social media;

Unit 2: Similarities and differences between online and offline marketing;

Unit-3: Internet Marketing in India;

Unit 4: Business response to emerging digital revolution; Digital devices, platforms, media, data and technology.

Block II: Digital marketing strategy; Digital conversion funnel:

Unit 5: Customer acquisition, conversion and retention;

Unit 6: Acquisition: search engine optimization; paid advertising, search advertising, display advertising,

Unit 7: Social media marketing, email marketing; measuring success of search engine optimization,

Unit-8: Mapping search engine journey; on page and off page search engine optimization.

Block III: Online consumer behaviour: decision making process;

Unit 9: Problem recognition, information search, evaluation, choice and post purchase behaviour;

Unit 10: Online consumer segmentation; online marketing mix;

Unit 11: Consumer segments and targeting; User experience.

Block IV: Social Media analytics: data type and collection,

Unit 12: Structured and semi-structured data, social media metrics, social media ROI,

Unit 13: Social networks and social network analysis; Social media analytics with unstructured data: text mining,

Unit 14: Social customer relationship management,

Unit-15: Text mining for communication and reputation management; Big data, Internet of things.

Block V: Mobile Marketing, E-marketing; Internet marketing strategy: content marketing

Unit 16: Mobile Marketing,

Unit 17: E-marketing;

Unit 18: Internet marketing strategy: content marketing.

References:

1. Aslam K (2017). The 7 Critical Principles of Effective Digital Marketing. Arizona: Scottsdale, The Stone Soup Hustler Publication.
 2. Bly R.W. (2018). The Digital Marketing Handbook. Entrepreneur Press.
 3. Giovannoni, E (2018). The Digital Marketing Planning. Brisbane: Chasefive.com.
 4. Maity, M (2017). Internet Marketing. New Delhi: Oxford University Press
 5. Rayan D and Russ, H (2017). Digital Marketing for Dummies. NJ: John Wiley.
-

Course Name: Retail Management

Course Code: MTMO- M 2303

Credits: 4

Course Objective: The main objective of course is to providing insights on retail operations. This will enable the students to become good retail planners and decision makers and help focus on change and adaption to change.

Course Outcomes: The successful completion of this course shall enable the student to:

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1 | Identify the basic concepts related to functioning of retail sector in India | Understand |
| 2 | Elaborate main drivers of growth in retail industry of India | Understand |
| 3 | Analyse issues relating to situational analysis in retail industry in India. . | Apply |
| 4 | Explain various strategies of managing retail business in India. | Understand |
| 5 | Visualize various issues emerging in international retailing. | Analyze |

Block I: Introduction

Unit 1: Overview, Evolution of Retailing, cycle of Retailing, Functions of retailing;

Unit 2: Building and sustaining relationships, Structural change, Retailing Market structure,

Unit 3: Planning and development, process, Drivers for growth in retail.

Block II: Situational analysis

Unit 4: Types of retail outlets: Retail institutions by ownership,

Unit-5: Store-based strategy mix; non-store-based, and other forms of nontraditional retailing,

Unit 6: Targeting customers and gathering information; Communicating with customers; Promotional strategies,

Unit 7: Affecting factors in communication for growth, Choosing a store location:

Unit-8: Trading-area analysis; Site selection; Store design and layout-Objectives.

Block III: Managing retail business

Unit 9: Importance of HRM in retailing,

Unit 10: Retail organization and HRM; Operations management: financial and operations dimensions;

Unit 11: Managing retail services; Service characteristics;

Unit-12: Value and lifestyle profiles of Indian shoppers.

Block IV: Delivering the product

Unit 13: Retail Information Systems; Merchandise management, developing and implementing plans,

Unit 14: People in retailing, Merchandise plans for basic stock,

Unit 15: Negotiation in retail, display of merchandise, pricing, Factor affecting in price setting, Bases of pricing.

Block V: International retailing

Unit 16: Internationalization and Globalization; Shopping at World stores; Going International;

Unit 17: The Internationalization process; Culture, business and international management, FDI in retails,

Unit 18: Retailing in US and India, Importance of culture for retailing at global level.

References:

1. Berman B and Evans J R- Retail Management (Pearson Education)
 2. Michael Lervy M and Weitz B W- Retailing Management (Tata McGraw-Hill)
 3. Newman A J and Cullen P- Retailing: Environment and Operations (Vikas)
 4. Varley R and Rafiq M- Principles of Retail Management (Palgrave)
 5. LaMBA- The Art of Retailing (Tata McGraw-Hill)
-

Course Name: Financial Management

Course Code: MTMO- F 2301

Credits: 4

Course Objectives:

To help the students to develop cognizance of the importance of Financial Management in corporate valuation.

Course Outcome: At the end of the course student would be able to;

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1 | Elaborate the core concepts and techniques of financial management. | Understand |
| 2 | Enumerate various techniques related to valuation of assets. | Apply |
| 3 | Demonstrate ability to conduct discounted cash flow analysis and estimate a company's cost of capital. | Understand |
| 4 | Evaluate various Capital Structure Theories and Policies for business decisions. | Understand |
| 5 | Analysis of working capital needs of the company | Analyze |

Block I: Nature of Financial Management

Unit 1: Scope of Finance; Finance Function; Finance Manager's role;

Unit 2: Role of Finance Manager; Financial Goal:

Unit 3: Profit Maximization V/s Wealth Maximization;

Unit-4: Agency Problem; Emerging role of Finance Manager

Block II: Valuation

Unit 5: Time Preference for money; Future Value; Sinking Fund; Present Value;

Unit 6: Valuation of Bonds and Shares: Basics of Bond Valuation,

Unit 7: Valuation of ordinary Shares, Valuation of Preference Share;

Unit-8: Linkages between Share Price, Earning and Dividends.

Block III: Cost of Capital, Operating, Financial Leverage and CoMBIed Leverage

Unit 7: The concept of opportunity cost of capital; Cost of Debt,

Unit-8: Preference Capital and Equity Capital;

Unit 9: The weighted Average Cost of Capital; CAPM V/s Dividend Growth Model;

Unit 10: Financial, operating and CoMBIed Leverage- Concept and Measurement.

Block IV: Capital Structure Theories and Policy

Unit 11: Relevance of Capital Structure: NI and Traditional approach;

Unit 12: Irrelevance of Capital Structure: NOI Approach and MM hypothesis without taxes;

Unit 13: The trade off theory; Determinants of an appropriate Capital structure,

Unit-14: Dividend Theory and Policy.

Block V: Management of Working Capital & Inventory Management

Unit 15: Meaning, significance and types; Methods of assessing Working Capital requirements;

Unit-16: Classification of working capital

Unit 17: Norms of Bank Finance; Sources of Working Capital and factors affecting it;

Unit 18: ABC Analysis, EOQ Model, Safety Stock, Lead Time, etc.

References:

1. Pandey, I.M ; Financial Management, Vikas Publishing House, New Delhi
 2. Tulsian, P.C ; Financial Management, S. Chand & Co, Delhi
 3. Chandra, Prasanna (2008)- Financial Management, Tata McGraw Hill, New Delhi
 4. Khan & Jain: Financial Management, Tata McGraw Hill, New Delhi
 5. Brealey, Richard A and Steward C. Myers (2006)- Corporate Finance, McGraw Hill
-

Course Name: Security Analysis & Portfolio Management

Course Code: MTMO- F 2302

Credits: 4

Course objectives: To provide insight about the relationship of the risk and return and how risk should be measured to bring about a return according to the expectations of the investors and Portfolio management practices in India. Also, to familiarize the students with the fundamental and technical analysis of the diverse investment avenues.

Course Outcome: After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|--|-----------------|
| 1: Describe the Investment concept. | Understand |
| 2: Discuss the Fixed Income Securities | Analyze |
| 3: Describe the fundamental analysis | Understand |
| 4: Explain the technical analysis. | Evaluate |
| 5: Know the basic concepts of Portfolio Analysis and Selection | Understand |

Block-I Investment Concepts

Unit-1: Investment Styles- Active and Passive Investment Styles; Momentum, Growth and Value

Unit-2: Speculation; Gambling; Shorting; Trading; Hedging; Diversification;

Unit-3: Immunization; Arbitrage; Leveraging; margin Trading; ethical Investment

Block-II Fixed Income Securities

Unit-4: Bond Prices and Yields- Present Value Model of bond valuation,

Unit-5: Different bond- yield and return measures, The yield curve- Types,

Unit-6: Interpretation and factors affecting it,

Unit-7: Theories related to yield curve, Duration and fixed income derivatives

Block-III Fundamental Analysis

Unit-8: Perfect Capital Markets; Efficient Market Hypothesis;

Unit-9: Top- down V/s Bottom- up approach of fundamental analysis,

Unit-10: Economic Analysis- Main Macro Economic Variables, business cycles, Inter- Industry and Inter- Firm analysis; Industry Analysis- Industry Life Cycle,

Unit-11: Effect of business cycles on industries, Role of external factors, Demand- Supply analysis,

Unit-12: Role of Pricing practices, Key factors of success, major types of risk faced by business

Block-IV Technical Analysis

Unit-13: Basic Philosophy, The Dow Theory, Select major chart patterns- Japanese Candlestick Charting,

Unit-14: Reversal Pattern in Japanese Candlestick Charting, Head and Shoulder Pattern, Double Top Formation, Rounding Top Formation,

Unit-15: Bar Charts, Points and Figure Charts, Relative Strength Index, Bollinger Bands, Elliot Wave Theory, Candlestick analysis

Block-V Portfolio Analysis and Selection

Unit-16: Portfolio Possibilities Curve, Efficient Frontier, Single Index Model, Multi Index Model,

Unit-17: Constructing the optimal portfolio using single index model, single index with shorting and constant correlation model,

Unit-18: Role of skewness, Beta (β), Capital Asset Pricing Model- Efficient Portfolios, other portfolios, CAPM assumptions, Arbitrage pricing model

References:

1. Amling: Fundamentals of Investment Analysis, Prentice Hall
 2. Bhalla: Investment Analysis, S. Chand & Co
 3. Chandratre, K.R. Capital Issue, SEBI & Listing, Bharat Publishing House
 4. Fabozzi, Frank J: Investment Management, Prentice Hall, International Edition
 5. MachiRaju, H.R.: Merchant Banking; Wiley Eastern Ltd
 6. MachiRaju, H.R.: Working of Stock Exchanges in India; Wiley Eastern Ltd
-

Course Name: Management of Financial Institutions & Services

Course Code: MTMO- F 2303

Credits: 4

Course Objective: To encourage the acquisition of knowledge and skills relating to application of accounting concepts and techniques for business decisions, short-term and long-term/strategic decision-making models, cost management ideas along with budgeting and associated performance measurement practices.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1 - Describe the meaning and scope of financial markets as well as institutions in India. | Understand |
| CO2 – Discuss the concepts of Money Market and Capital Market | Understand |
| CO3 - Detail the Commercial Banking and its Current developments. | Understand |
| CO4 - Explain concept of Non-Banking Financial Companies (NBFC's) | Understand |
| CO5 - Examine the Financial Services Industry | Analyze |

Block-I Introduction

Unit-1: An Introduction to Financial System, Components, Financial System and Economic Development,

Unit-2: Financial Inter-mediation, An overview of Indian Financial System since 1951,

Unit-3: Financial Sector Reforms since liberalization 1990-91.

Block-II: Financial Markets & Capital Markets

Unit-4: Financial Markets: Money Market – functions, organisation and instruments.

Unit-5: Role of central bank in money market.

Unit-6: Indian Money Market – an overview. Capital Markets –Introduction, role and functions.

Unit-7: Components of Capital market. Cash markets- Equity and Debt, Depository (NSDL, CDSL).

Unit-8: Primary and Secondary Markets –NSE, BSE, NIFTY, SENSEX. Role of Stock Exchanges in India. SEBI and Investor Protection.

Block-III: Financial Institutions I

Unit-9: Financial Institutions: Commercial banking – introduction, classification, its role in financing

Unit-10: Commercial and consumer, recent developments like MUDRA financing,

Unit-11: Problem of NPAs, Bankruptcy and insolvency Act, Financial Inclusion.

Block-IV: Financial Institutions II

Unit-12: Life and non-life insurance companies in India:

Unit-13: Public and private. Mutual Funds – Introduction and their role in capital market development.

Unit-14; Types of mutual fund schemes (open ended vs close ended, Equity, Debt,

Unit-15: Hybrid schemes and ETFs. Non-banking financial companies (NBFCs).

Block-V: Financial Services Industry

Unit-16: Overview of financial services industry. Merchant Banking – pre and post issue management, underwriting. Regulatory framework relating to Merchant Banking in India.

Unit-17: Leasing and Hire Purchase, Consumer and Housing Finance, Venture Capital Finance, Factoring Services,

Unit-18: Credit Rating, Financial Advisory and Portfolio Management Services.

Books Recommended/Suggested Readings:

1. Bhole, L.M., Financial Markets and Institutions. Tata McGraw Hill Publishing Company.
 2. Kumar, V., Gupta, K., Kaur, M., Financial Markets, Institutions and Financial Services, Taxmann's Publications.
 3. Khan M.Y. and Jain, P.K Financial Services, Tata McGraw Hill.
-

Course Name: Industrial Relations & Labour Enactments**Course Code: MTMO- H 2301****Credits: 4**

Course Objective: This course is designed to impart the participants with the knowledge, concepts and skills needed in industrial relations management. Industrial relation aims at maintaining healthy, harmonious and cordial relationship between the employees and management and amongst the employees. The course seeks to familiarize the participants with the concepts and techniques of Industrial relations.

Course Outcomes: The successful completion of this course shall enable the student to:

| S. No. | Course Outcomes | Cognitive level |
|--------|---|-----------------|
| 1 | Enumerate conceptual understanding of various constituents of Industrial Relations. | Understand |
| 2 | Elaborate role of trade unions in maintaining harmonious industrial relationship. | Identifying |
| 3 | Identify and develop understanding various labour problems and their solutions | Apply |
| 4 | Acquire knowledge of various labour legislatives | Understand |
| 5 | Identify various tools of human welfare in industrial climate. | Analyze |

Block I: Overview of Industrial Relations

Unit 1: Concept, Nature, Objectives of Industrial Relations;

Unit 2: Role of State; Employers' Organization; ILO in IR,

Unit 3: Central Organisations of Indian Trade unions: INTUC, AITUC, HMS and UTUC.

Block II: Trade Unions

Unit 4: Origin and growth, unions after independence, in the era of liberalisation;

Unit 5: Concept, objectives, functions and role of Trade Unions in collective bargaining;

Unit 6: Workers' participation in management;

Unit-7: Problems of Indian Trade Unions. Main provisions of the Trade unions Act, 1926

Block III: Labour problems

Unit 8: Discipline and misconduct; standing orders,

Unit 9: Grievance handling procedure; Labour turnover; Absenteeism;

Unit 10: Industrial accidents and Industrial unrest; Industrial Dispute Act, 1947;

Unit-11: Industrial Dispute Settlement Machinery in India.

Block IV: Labour legislations

Unit 12: National Wage Policy,

Unit 13: Minimum Wages Act 1948,

Unit-14: Payment of Bonus Act, 1965;

Unit 15: The Equal Remuneration Act, 1976

Block V: Health, Safety, Security and Labour Welfare

Unit 16: Industrial Health & Safety;

Unit 17: The Factories Act, 1948; Workmen's Compensation Act, 1923;

Unit 18: Employees' State Insurance Act, 1948; Payment of Gratuity Act, 1972; Employees Provident Fund Act.

References:

1. Monappa A- Industrial Relations (Tata McGraw-Hill)
 2. Sinha- Industrial Relations, Trade Unions, and Labour Legislation (Pearson Education)
 3. Mamoria CB, Mamoria, Gankar- Dynamics of Industrial Relations (Himalayan Publication)
 4. ND Kapoor, Industrial Relations and Labour Legislation
-

Course Name: Global HRM

Course Code: MTMO- H 2302

Credits: 4

Course Objective: The objective of the course is to acquaint the students with the concepts and strategies of international human resource management and to enhance their skill to effectively manage human resource in international perspective.

Course Outcome: At the end of the course student would be able to

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1 | Explain HRM issues in international contexts | Understand |
| 2 | Analyze role that international culture and diversity in managing business | Apply |
| 3 | Demonstrate various issues related to selection process, expatriate management and repatriation. | Understand |
| 4 | Identify various concepts related to international training, compensation and appraisal. | Apply |
| 5 | Visualize emerging issues related to international mergers and industrial relations. | Analyze |

Block I - Introduction:

Unit 1: Introduction to Global Human resource management;

Unit 2: IHRM in International Firms -the framework; Cross national differences in personnel

Unit-3: organizations- cultural factor in human resource policies;

Unit 4: Complexities and issues in managing human resource across countries; International HRM department and functions; Models of Global HRM.

Block II- International Cultural Environment:

Unit 5: The concept of culture, comparison of cross-cultural behaviour,

Unit 6: managing diversity- causes of diversity, the paradox of diversity,

Unit 7: Cultural orientation in international business, emic vs. etic dilemma- cultural uniqueness vs. pan-culturalism.

Block III-International Staffing:

Unit 8: Hiring– sources of international human resource power;

Unit-9: Staffing for international operations; Selection strategies for overseas assignments;

Unit: 10: Hiring HCN"s and TCN"s; International transfers; Expatriate management-

Unit 11: Problems of repatriation of overseas expatriates and strategies to tackle these problems.

Block IV-Training, Development and Compensation in International Perspective:

Unit 12: Training and development for expatriates; Training and development for international staff

Unit 13: Compensation in international perspective- factors, package,

Unit-14: methods and trends; International reward system;

Unit 15: Motivation in cross-cultural context; Multinational performance appraisal – criteria and process, performance management.

Block V- Industrial Relations and Other Issues in IHRM:

Unit 16: A framework for international industrial relations; Employees participation – practices in various countries; Cross border ethics management;

Unit 17: Designing organizations for dynamic international environment; Comparative study of HRM practices in major global economies;

Unit 18: HRM in cross border mergers and acquisitions; Joint ventures, alliances and SMEs; IHRM trends- complexities, challenges, and choices in future.

References:

1. Aswathappa, K. and Dash, S. (2008). *International human resource management*. India: Mc Graw Hill Education.
 2. Barlett, Christopher and Sumantra, Ghoshal (1998). *Managing Across Borders: The Transnational Solution*. Harvard Business School Press.
 3. Dessler, G. & Varkkey, B. (2008). *Human resource management*. Delhi: Pearson Education
 4. Dowling, Peter J., Festing M. & Engle, A.D. (2013). *International Human Resource Management*. Cengage Learning.
-

Course Name: Negotiation & Counselling**Course Code: MTMO- H 2303****Credits: 4**

Course Objective: The objective of this course is to provide insights into handling behavioral issues at work place by developing counselling skills. It is also intended to facilitate a Describing of the structure and dynamics of negotiation.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|-----------------|
| CO1: Identify the basic concept Counselling. | Apply |
| CO2: Describe Techniques of Counselling. | Understand |
| CO3: Evaluate the problems of Counselling. | Evaluate |
| CO4: Determine the nature and need for negotiation. | Evaluate |
| CO5: Cope the role of negotiation. | Evaluate |

Block:I Introduction to Counselling

Unit 1: Counselling: Introduction, Approaches to Counselling,

Unit 2: Goals and Process of Counselling; Counselling Procedures and Skills,

Unit 3: Organizational Application of Counselling Skills.

Block II: Techniques of Counselling

Unit 4: Changing Behaviours through Counselling;

Unit 5: Specific Techniques of Counselling;

Unit-6: Role conflicts of Managers and Counselling.

Unit 7: Application of Counselling in Specific

Block III Organizational Situations

Unit 8: Organizational Situations: Dealing with problem Subordinates;

Unit 9: Performance Management;

Unit-10: Alcoholism and Other Substance Abuse.

Unit 11: Ethics in Counselling.

Block IV Introduction to Negotiation

Unit 12: Negotiation: Introduction, Nature and need for negotiation, negotiation process,

Unit 13: Types and styles of negotiation; strategies and tactics;

Unit-14: barriers in effective negotiation,

Unit 15: Communication Style, Breaking Deadlocks.

Block V Ethics in negotiation

Unit 16: Role of trust in negotiations; negotiation and IT

Unit 17: Ethics in negotiation; cultural differences in negotiation styles

Unit 18: Gender in negotiations; context of mediation; negotiation as persuasion.

Books Recommended/Suggested Readings:

1. Singh Kavita - Counselling Skills for Managers (PHI)
 2. Carroll, M.: Workplace counseling, Sage Publication.
 3. Kottler, J. A., & Shepard, D. S.: Introduction to counselling: voices from the field, USA: Cengage Learning.
 4. Moursund, J.: The Process of counselling and therapy, New Jersey: Prentice Hall.
-

Course Name: Project management

Course Code: MTMO- O 2301

Credit 4

Course Objective: The objective of this course is to enable the student to understand and analyze the iterative processes of a project correctly. Identify and effectively communicate best practices within the framework of project management. Evaluate and describe the process of progressive elaboration independently. Identify how organizational culture impacts a project.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1. | Extrapolate basics of project management theory | Understand |
| 2. | Associate the functions of project management. | Apply |
| 3. | Identify and effectively communicate best practices within the framework of project management | Remember |
| 4. | Demonstrate and describe the process of progressive elaboration independently | Apply |
| 5. | Visualize importance of how organizational culture impacts a project. | Understand |

Block I: Introduction

Unit 1: Introduction to project and projects. Characteristics and types of projects.

Unit 2: Gaining importance, project life cycle and its phases.

Unit 3: Project selection, non quantitative and scoring models, technical analysis and technology selection, market potential analysis and techniques of long term forecasting.

Block II:

Unit 4: Financial feasibility,

Unit 5: determinants of cost of project, its financing and deciding optimum capital structure.

Unit 6: Cash flows from project and owner's perspective.

Block III:

Unit 7: Project Appraisal.

Unit 8: Financial feasibility with risk. Types of risk, techniques of risk evaluation and its mitigation.

Unit 9: Sensitivity analysis, Hiller's model, scenario analysis, simulation.

Block IV:

Unit 10: Network analysis, construction of networks,

Unit 11: CPM, various types of floats and their application, PERT and its applications.

Unit 12: Time cost relationship, crashing for optimum cost and Optimum time. Resource leveling.

Block V:

Unit 13: Introduction to project software and applications of MS Project.

Unit 14: Human Aspects of Project management: project manager's skills and functions, matrix organization, Social Cost Benefit Analysis, UNIDO approach, shadow pricing.

Unit 15: Project monitoring, Earned Value Analysis, abandonment analysis, Ph 41S, Project Termination and Audit. Reasons for failure.

Text and Reference Books

1. "The Project Management Body of Knowledge (PMBOK Guide)" by the Project Management Institute (PMI),
2. "Project Management: A Systems Approach to Planning, Scheduling, and Controlling" by Harold Kerzner,
3. "Scrum: The Art of Doing Twice the Work in Half the Time" by Jeff Sutherland,
4. "Getting Things Done: The Art of Stress-Free Productivity" by David Allen,
5. "Crucial Conversations: Tools for Talking When Stakes Are High" by Kerry Patterson, Joseph Grenny, Ron McMillan, and Al Switzler,

Course Name: Logistics and Supply Chain Management

Course Code: MTMO- O 2302

Credit 4

Course Objective: The objective of this course is to enable the student to understand and introduce process and functions of physical distribution system. To introduce major building blocks, functions, business process, performance metrics and decision making in supply chain network, and to provide an insight into the role of Internet Technologies and electronic commerce in supply chain management.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1. | Elaborate and describe the increasing significance of logistics and its impact on both costs and service in business and commerce. | Understand |
| 2. | Visualize and incorporate and learn the critical elements of logistics and supply-chain management processes based on the most relevant application in forward-thinking companies | Apply |
| 3. | Examine and develop criteria and standards to achieve improved business performance by integrating and optimizing the total logistics and supply-chain process. | Apply |
| 4. | Identify and describe the ways to shift the business culture from functional work to overall process-driven results | Apply |
| 5. | Demonstrate and explain the rationale for statistical process control in minimizing or eliminating no value-added elements of the overall logistics process such as the cost of excess inventory driven by inaccurate forecasting. | Understand |

Block I:

Unit 1: Physical Distribution

Unit 2: Marketing Channels, Channel Members

Unit3: Market Segmentation

Block II:

Unit 4: Managing the Marketing Channel

Unit 5: Channel Members, Channel Flows

Unit 6: Product issues in channel management

Block III:

Unit 7: Building Blocks of Supply Chain Network

Unit 8: Performance Measurement and Controls

Unit 9: Models for Decision Making.

Block IV:

Unit 10: Supply Chain Inventory Management, Multichannel Inventory System,

Unit 11: Supply Chain Facility Layout, Capacity Planning

Unit 12: Inventory Optimisation, Routing and Scheduling

Block V:

Unit 13: E Business & Logistics,
Unit 14: Business Process Management
Unit 15: Customer Relationship Management

Books Recommended/Suggested Readings:

- 1.D.K. Agarwal, LOGISTICS & SUPPLY CHAIN MANAGEMENT, Macmillan India Pvt. Ltd. New Delhi, 2008
- 2.N. Chandrasekaran, SUPPLY CHAIN MANAGEMENT, Oxford University Press, 2010
- 3.Satish K. Kapoor & Purva Kansal, BASICA OF DISTRIBUTION MANAGEMENT - A LOGISTICAL APPROACH, Prentice – Hall India, 2003.
- 4.Sunil chopra, Meindl & Kalra, SUPPLY CHAIN MANAGEMENT, Pearson Education, India, 2009
- 5.Bowersox & Closs, LOGISTICS MANAGEMENT, Tata McGraw Hill, New Delhi, 2008

Course Name: Advanced Production and Operations Management

Course Code: MTMO- O 2303

Credit 4

Course Objective: The objective of this course is to enable the student to understand the various production and operations design decisions and how they relate to the overall strategies of organizations. Understand the importance of product and service design decisions and its impact other design decisions and operations.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1. | Elaborate various concepts related to production and operations design decisions | Understand |
| 2. | Apply and relate to the overall strategies of organizations. | Apply |
| 3. | Demonstrate various importance of product and service design decisions | Understand |
| 4. | Analyze the impact on other design decisions and operations | Analyze |
| 5. | Examine production and operations plans | Apply |

Block I: Introduction to Operations Management

Unit 1: Introduction: Functional Subsystems of Organization - Definition - Systems Concept of Production.

Unit 2: Types of Production Systems: Flow Shop - Job Shop - Batch Manufacturing – The Project – Productivity.

Unit 3: Strategic Management: Corporate Strategic - Generic Competitive Strategies - Functional Strategies, Line Balancing - World Class Manufacturing.

Block II: Accounting Framework II (Accounting Books and Final Accounts)

Unit 4: Product Design and Analysis New Product Development, Process Planning and Design, Process Research - Work Study - Method Study and Work Measurement.

Unit 5: Value Analysis/Value Engineering: When to Apply Value Analysis - Function - Aims - Value Engineering Procedure - Advantages and Application Areas.

Unit 6: Standardization: Standardization Procedure - Advantages of Standardization - Application of Standardization.

Block III: Cost Accounting

Unit 7: Plant Location: Factors Influencing Plant Location - Single Facility Location Problem - Multifacility Location Problems

Unit 8: Model for Multi-facility Location Problem - Method of Transformation - Model to Determine X-Coordinates of New Facilities - Model to Determine Y-Coordinate.

Unit 9: Plant Layout: Classification of Layout - Advantages and Limitations of Product Layout - Advantages and Limitations of Group Technology Layout - Layout Design Procedures.

Block IV: Management Accounting

Unit 10: Scheduling: Johnson's Problem - Extension of Johnson's rule

Unit 11: Job Shop Scheduling: Introduction - Types of Schedules - Schedule Generation

Unit 12: Heuristic Procedures - Two Jobs and Machines Scheduling

Block V: Financial Statements Analysis

Unit 13: Components of Integrated Materials Management: Materials Planning - Inventory Control - Purchase Management - Stores Management.

Unit 14: Inventory Control: Inventory Decisions - Costs Trade Off - Models of Inventory - Operation of Inventory Systems - Quantity Discount , Purchasing Management

Unit 15: Stores Management: Incoming Materials Control - Store Accounting - Obsolete Surplus and Scrap Management - ABC Analysis - XYZ Analysis - VED Analysis - FSN Analysis - SDE Analysis.

References:

1. Panneerselvam, —Production and Operations Management| PHI.
2. Ajay K Garg, Production and Operations Management, TMH.
3. Prof. L.C. Jhamb: Production Operations Management, 18th edition, Everest Publishing House.
4. Dipak Kumar Bhattacharyya, Production and Operations Management, Universities Press.
5. B. Mahadevan, Operations Management: Theory and Practice, Pearson.
6. Kenneth K. Boyer, Rohit Verma, Operations Management:

Semester-IV
Course Name: Business Ethics and Corporate Governance

Course Code: MTMO- 2401

Credits: 4

Course Objective:

The purpose of this course is to develop the understanding about the role of corporations in society and boards' role in keeping oversight on the functioning of the company, global developments in Governance and Corporate Citizenship.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1 | Elaborate various concepts of Ethics, morals and values to Students. | Understand |
| 2 | Enumerate basic understanding of various ethical theories and approaches | Understand |
| 3 | Identify impact of corporate governance on Business | Apply |
| 4 | Examine role of various board committees, their composition and responsibilities. | Analyze |
| 5 | Visualize various ethical issues such as conflicts of interest and insider trading | Understand |

Block I: Introduction

Unit 1: Introduction to Ethics, Morals & Values,

Unit 2: Ethical Theories and Approaches– Teleological, Deontological,

Unit 3: Virtue and system development theories;

Unit-4: Conflict between moral demands and interest and Ethics in work.

Block II: Ethics in Business

Unit 5: Ethical Aspects in Marketing, Finance, HRM; Global Business Ethics.

Unit 6: Meaning of corporate philanthropy, CSR-an overlapping concept, corporate sustainability reporting,

Unit 7: CSR through triple bottom line, CSR and business ethics,

Unit-8: CSR and corporate governance, environmental aspect of CSR, CSR models; drivers of CSR, global reporting initiatives.

Block III: Corporate Governance

Unit 9; Terminology: Company, corporate governance, promoter, shareholders, directors, managers, chairman, CEO, stakeholders;

Unit 10: Type of Directors: Insider and outsider, executive and non-executive, independent, nominee;

Ownership and Control;

Unit-11: Theories and development of corporate governance; Models: Types and basis of adoption;

Unit 12: Principals of corporate governance; Implications of corporate scams; Global corporate governance movement.

Block IV: Role Players

Unit 13: Role of Board of Direct Role of board; Board composition, independence, and committees; Board leadership: Splitting chairman and CEO, CEO succession, lead director;

Unit 14: Board processes and meetings, Building professional Boards – Directors selection, executive compensation and stock option, directors’ training and competence, board diversity, board evaluation;

Unit 15: Boards oversight of CEO, Auditors, SEBI and Government; SEBI guidelines and clause 49; Growth of Corporate Governance in India.

Block V: Business Ethics and Corporate Governance

Unit 16: Introduction, Importance and need for Business Ethics in Indian Context,

Unit 17: Roots of unethical behaviour and issues,

Unit 18: Corporate governance ethics.

References:

1. Fernando A.C - Corporate Governance: Principles, Policies and Practices – Pearson
 2. Murthy CSV – Business Ethics: Himalaya
 3. Velasquez – Business Ethics: Concepts and cases – Pearson/PHI
-

Course Name: Global Business Management

Course Code: MTMO- 2402

Credits: 4

Course Objective: To expose students to various perspectives and concepts in the field of Global Business Management.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|--------|---|-----------------|
| 1 | Elaborate characteristics and components of Global business Management | Understand |
| 2 | Enumerate internationalization process and managerial implications of internationalization. | Understand |
| 3 | Assess economic, political, cultural, legal, technological and competitive environments and its influence on international markets. | Apply |
| 4 | Identify various concepts and theories of Foreign Direct Investment. | Analyze |
| 5 | Acquire knowledge of multilateral trade agreements and use it in decision making. | Understand |

Block I: Globalization and International Management

Unit 1: Introduction to Global Business, Concept of globalization and international Management,

Unit 2: Reasons for going International, Stages in the Internationalization of Business,

Unit 3: Global Challenges; Global Business Theories.

Block II: International Marketing Environment and Marketing Strategy:

Unit 4: An overview of International Business Environment:

Unit 5: Economic Environment; Political environment; Legal environment;

Unit 6: Demographic Environment; Socio-Cultural Environment in Global perspective

Unit 7: International Marketing & Intelligence system.

Block III: Foreign Direct Investment-Theory and Application:

Unit 8: Nature of FDI, Forms of FDI, Modes of FDI Entry, Theories of FDI,

Unit 9: FDI Theories for Emerging Market Firms,

Unit 10: Effects of Foreign Direct Investment,

Unit-11: Foreign Investment in India, Outbound Indian FDI.

Block IV: Regional Economic Integration:

Unit 12: Levels of Economic Integration: Free Trade Area;

Unit 13: The Customs Union; The Common Market;

Unit-14: The Economic Union;

Unit 15: The Political Union; Effects of Integration; Regional Trading Agreements.

Block V: Trade and Investment Regulations:

Unit 16: Basic principles of Multilateral Trade Negotiations;

Unit 17: General Agreement on Tariffs and Trade; GATT; WTO; TRIPS; TRIPS; GATS; GATT

Unit 18: WTO-Differences; WTO and India.

References:

1. Justin Paul & Rajeev Aserkar: Export -Import Management; Oxford University Press, New Delhi.
 2. Rakesh Mohan Joshi: International marketing, Oxford University.
 3. Sumati Varma: International Business “Concept, Environment& Strategy”, Ane Books Pvt. Ltd., New Delhi
 4. Vyuptakesh Sharan: International Business “Concept, Environment and Strategy”, Pearson Education.
-

Course Name: Consumer Behaviour & Marketing Communication**Course Code: MTMO-M 2401****Credits: 4**

Course Objective: Marketing involves decision making in areas like product, pricing, branding, distribution, and promotion. Consumers and customers subjected to these decisions with an aim to extract desired response. Marketing effectiveness can be significantly improved if these decisions based on consumer insights. Marketing success depends on a thorough understanding of why do consumers behave the way they do to marketing stimuli? The course aims to equip the participants to view marketing phenomena from a customer's perspective.

Course Outcome: After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|-----------------|
| CO1 - Identify the key concepts and theories of consumer behaviour. | Remember |
| CO2 – Describe psychological theories relevant for describing consumer behaviour. | Understand |
| CO3 - Describe the group dynamics and consumer reference groups. | Understand |
| CO4 - Define Integrated Marketing Communication. | Understand |
| CO5 - Develop appropriate marketing strategies Advertising and Media Planning. | Apply |

Block- 1: Introduction to consumer behavior

Unit-1: Marketing success and failure and consumer behavior:

Unit-2: Manager and consumer perspectives, strategy consistency and inconsistency

Unit-3: Consumer behavior models: Mapping consumer's mind, deterministic and probabilistic approaches,

Unit-4: Howard and Sheth, Nicosia and Engle and Blackwell model.

Block 2: Consumer involvement

Unit-5: Consumer involvement: perceived risk, antecedents and consequences Consumer decision making:

Unit-6: Psychology of simplification, elaborate to routine buying Habit: loyalty,

Unit-7: inertia and strategic implications for incumbent and entrant.

Unit 8: Consumer perception and knowledge: categorization process and discrimination, Types of thresholds, consumer memory network,

Unit-9: Consumer learning: connectionist and non-connectionist approaches.

Block- 3: Consumer Motivation

Unit-10: Motivation and drive: theories and means and end chain, Hierarchical value mapping. Personality and self-concept influence:

Unit-11: Personality theories, Freud, Jung and Trait theories, consistency hypothesis, personality and image,

Unit-12: Measurement of personality and self-image, creating aspiration brand

Block- IV: Integrated Marketing Communication

Unit-13: Marketing Communication: Meaning and its objectives, Integrated Marketing Communication (IMC): concepts and process, IMC promotion Mix,

Unit-14: Advertising - Meaning, objectives its role and functions, Classification of advertising, economic, social and ethical issues in advertising,

Unit-15: DAGMAR approach, STP strategies in advertising, Advertising Agencies,

Block 5: Advertising and Media Planning

Unit-16: Process in Advertising

Unit-17: Advertising Creativity

Unit-18: Media Planning and Strategy

References:

1. Berman B and Evans J R- Retail Management (Pearson Education)
 2. Michael Lervy M and Weitz B W- Retailing Management (Tata McGraw-Hill)
 3. Blackwell, R. D., Miniard, P. D., & Engle, J. F. (2009). Consumer behaviour. USA: Thomson-South Western.
 4. Evans, M., Jamal, A., & Foxall, G. (2009). Consumer behaviour (2nd ed.). New Jersey: John Wiley & Sons.
-

Course Name: Marketing of Services

Course Code: MTMO-M 2402

Credits: 4

Course Objective:

The purpose of this course is to familiarize the students with the role of Marketing of Services.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1 | Explains the basic concepts about services. | Understand |
| 2 | Define the marketing mix in terms of service sector. | Understand |
| 3 | Expresses scales related service quality and productivity. | Apply |
| 4 | Identify various Strategies in services marketing | Analyze |
| 5 | Acquire knowledge of recent trends in marketing of services. | Understand |

Block I: Introduction of Services Marketing

Unit 1: Concept, characteristics of services, service marketing triangle,

Unit-2: purchase process of service marketing, challenges of services.

Unit 3: Goods V/S services marketing

Unit 4: Consumer behaviour, positioning a service in Marketplace

Block II: Service Delivery

Unit 5: Service product price mix, promotion and communication mix,

Unit-6: Place/ distribution of services people, Physical evidence.

Unit 7: Branding of services problem and solutions

Unit 8: Options for Service Delivery

Block III: Service quality and productivity

Unit 9: Improving service quality and productivity

Unit 10: Service quality GAP model, Benchmarking,

Unit-11: Measuring service quality

Unit 12: Defining productivity improving productivity

Block IV: Strategies in services marketing

Unit 13: International and global strategies in services marketing

Unit 14: Factors favoring transactional strategy,

Unit 15: Elements of transactional strategy

Block V: Recent trends in marketing of services

Unit 16: Recent trends in marketing of services

Unit 17: Ethics in service marketing

Unit 18: Unethical practices in service sector

References:

1. Verma H.V.: Marketing of Services, Global Business Press. New Delhi.
 2. Nargundhar: Services Marketing Tata McGraw-Hill New Delhi
 3. Rao: Services Marketing Pearson, New Delhi
 4. Verma: Services Marketing Pearson, New Delhi
-

Course Name: Sales & Distribution Management

Course Code: MTMO-M 2403

Credits: 4

Course Objective:

The purpose of this course is to familiarize the students with the role of sales & Distribution Management.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|--|-----------------|
| CO1 - Describe the objectives and Scope of Personal Selling. | Understand |
| CO2 – Detail market potential and sales forecasting methods. | Understand |
| CO3 - Evaluate sales Budget and distribution plans | Evaluate |
| CO4 - Explain distribution with other marketing variables. | Evaluate |
| CO5 - Explain diverse variables affecting the sales & distribution function. | Evaluate |

Block I: Introduction to Sales Management

Unit 1: Introduction to Sales Management: Concept,

Unit 2: Evolution of sales function, Objectives of sales management positions,

Unit 3: Functions of Sales manager and their relation with other executives..

Block II: Salesmanship

Unit 4: Salesmanship: Theories of personal selling,

Unit 5: Types of Sales executives, Qualities of sales executives,

Unit 6: Personal selling process, Showroom & exhibition,.

Block III: Sales Organization and Relationship

Unit 7: Sales Organization and Relationship: Purpose of sales organization,

Unit-8: Types of sales organization structures,

Unit 9: Sales department external relations, Distributive network relations.

Unit 10: Sales Force Management: Recruitment and Selection,

Unit-11: Sales Training, Sales Compensation...

Block IV: Distribution channels

Unit 12: Distribution Planning, Role and Function of Intermediaries;

Unit 13: Selection and Motivation of Intermediaries;

Unit 14: Vertical & Horizontal Marketing; Channel Conflict

Block V: Distribution System and Logistics

Unit 15: Distribution System and Logistics, Physical Distribution System;

Unit-16: Different Modes of Transport in India;

Unit 17: Logistics– Functional Areas; Distribution Costs,

Unit 18: Supply Chain Management.

References:

1. Donaldson B- Sales Management: Theory and Practice (Palgrave)
2. Sahu P K and Raut K C- Salesmanship and Sales Management (Vikas)
3. Spiro- Sales Management (Tata McGraw-Hill)
4. Davar R S- Salesmanship and Publicity (Vikas)

Course Name: Corporate Financial Restructuring

Course Code: MTMO-F 2401

Credits: 4

Objectives: The course aims to facilitate understanding of corporate merger and acquisition activity, restructurings.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|--|-----------------|
| CO1 - Describe the Corporate Finance & Restructuring. | Understand |
| CO2 – Describe the dimensions of Mergers and Acquisitions | Understand |
| CO3 - Understand the valuation aspects of Corporate Restructuring | Understand |
| CO4 - Explain different approaches of valuation. | Evaluate |
| CO5 - Explain dimensions of Corporate Restructuring Financial Restructuring. | Evaluate |

Block – I Introduction to Corporate Finance & Restructuring

Unit: 1 Overview of Corporate Finance & Restructuring Financial Strategy and Planning,

Unit: 2 Risk Evaluation and Capital Budgeting, Dividend and Retention Policies,

Unit-3: Designing Capital Structure

Unit: 4 Introduction to corporate restructuring, different

forms, **Unit-5:** motives & applications of corporate

restructuring, **Block – II Mergers and Acquisitions**

Unit: 6 Dimensions of Mergers and Acquisitions Mergers & acquisitions concept,

Unit-7: Types and process, Accounting for Mergers & Demergers,

Unit: 8 Regulatory frame work of mergers and acquisitions.

Unit: 9 Cross-Border Mergers & Acquisitions.

Block – III Valuation

Unit: 10 Valuation Aspects of Corporate Restructuring Methods of payment for M & A and Calculations of exchange ratio,

Unit: 11 Fundamental and methods of business

valuation, **Unit: 12** Calculations of financial

synergy and return, **Block – IV Approaches of**

valuation

Unit: 13 Different approaches of valuation

Unit: 14 Comparable Company & transaction analysis method,

Unit: 15 DCF, Real Option method, Formula approach for valuation and other important

methods of valuation

Block – V Dimensions of Corporate Restructuring Financial Restructuring

Unit: 16 Dimensions of Corporate Restructuring Financial Restructuring & Divestiture,

Unit: 17 Funding Options for M&A. Strategic Alliances & Joint Ventures,

Unit: 18 Employee Stock Ownership, Going Private & Leveraged Buyouts

Books Recommended/Suggested Readings:

1. Corporate Restructuring, Bhagaban Das and Debdas Raskhit, Himalaya, Latest Edition
 2. Financial Management, M Y Khan & P K Jain, TATA McGraw Hill, Latest Edition
 3. Mergers& Acquisitions, B Rajesh Kumar, TATA McGraw Hill, Latest Edition
 4. Mergers and Acquisitions, Aurora, Shetty and Kale, Oxford, Latest Publication
-

Course Name: Strategic Corporate Finance

Course Code: MTMO-F 2402

Credits: 4

Objectives: The course aims to facilitate understanding of corporate merger and acquisition activity, restructurings.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|--|-----------------|
| CO1 - Identify the key concepts Strategic Corporate Finance. | Remember |
| CO2 – Describe Management Buy-outs and Management Buy-ins. | Understand |
| CO3 - Describe the Restructuring of Firms. | Understand |
| CO4 - Develop appropriate understanding about potential purchaser. | Understand |
| CO5 - Explain the process of business and company valuation | Explain |

Block – I Introduction to Strategic Corporate Finance:

Unit: 1 Introduction to Strategic Corporate Finance: Strategy Vs Planning, significance of strategy in financial decisions,

Unit: 2 Strategic Cost Management: Traditional costing Vs Strategic

Unit-3: Costing, Relevant costs Vs Irrelevant costs, Different types of strategic costing and their relevance

Unit: 4 Alternative sources of financing – Difference between traditional & alternative sources of finance, different types of alternative sources of financing.

Block – II Management Buy-outs and Management Buy-ins

Unit: 5 Management Buy-outs: Establishing feasibility of the buy-out,

Unit-6: negotiating the main terms of the transaction with the vendor including price and structure,

Unit:7 Developing the business plan and financial forecasts in conjunction with the buy-out team for submission to potential funders.

Unit: 8 Management Buy-ins: Management Buy-in/Buy-outs (“BIMBOs”), Vendor initiated buyouts/buy-ins.

Block – III Restructuring of Firms

Unit: 9 Financial Distress and Restructuring: Meaning of Bankruptcy, Factors leading to bankruptcy, symptoms and predictions (models) of bankruptcy,

Unit: 10 Reorganization of distressed firms, liquidation of firms. Company disposals: retirement sale or the sale of a noncore subsidiary, planned exit, forceful retirement and other disposals.

Unit: 11 Exit strategy most appropriate exit route, valuation, timing of sale and tax planning opportunities,

Block – IV Potential purchasers

Unit: 12 Identification of potential purchasers, approaching the potential purchaser

Unit: 13 Negotiate with potential acquirers and selection of a preferred purchaser, calculation of the various tax implications.

Unit: 14 Fundraising: identification of different sources of development capital, determination of capital structure

Unit-15: factors affecting the capital structure, cost of capital and cost saving strategy,

Block – V Business Valuation

Unit: 16 Company Valuation: an overview of valuation, valuation principles, methods, approaches and practices, Value enhancement tools & techniques

Unit: 17 Valuing Real Assets in the Presence of Risk: tracking portfolios and Real Asset valuation, Different Approaches of Valuing Real Assets, Capital Budgeting and Strategic policy, Real options.

Unit: 18 Other Strategic Issues: managing credit ratings, and setting dividend and share repurchase policy, problem of too much cash. The issues of stock liquidity and illiquidity, Strategic risk management,

Books Recommended/Suggested Readings:

1. AswathDamodaran: Corporate finance theory and practice; John Willey Sons, Inc
 2. Jakhotia: Strategic Financial Management (Vikas Publication)
-

Course Name: Management of Working Capital

Course Code: MTMO-F 2403

Credits: 4

Objectives: The objective of the course is to acquaint the students with the importance of the working capital and techniques used for effective working capital management.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|--|-----------------|
| CO1: Describe the conceptual framework of working capital have an understanding the components of working capital. | Understand |
| CO2: Define cash management and Optimal Cash Balance | Demonstrate |
| CO3: Explain objectives of Receivables Management and credit policy. | Understand |
| CO4: Demonstrate Inventory Management and Inventory Control Systems | Understand |
| CO5: Identify sources of finance for Working Capital. | Apply |

Block – I Introduction to Working Capital

Unit: 1 Concepts of Working Capital, Components of Current Assets,

Unit-2: Permanent and Variable Working Capital

Unit: 3 Determinants of Working Capital, Estimating Working Capital Needs,

Unit: 4 Currents Assets Financing Policy, Operating and Cash Conversion Cycle. Case Study

Block – II Cash Management

Unit: 5 Facets of Cash Management, Motives for Holding Cash,

Unit-6: Factors Determining Cash Needs,

Unit: 7 Cash Budgeting, long – term Cash Forecasting,

Unit: 8 Managing Cash Collections and Disbursements, Optimal Cash Balance, Investment of Surplus Cash.

Block – III Receivables Management

Unit: 9 Objectives, Credit Policy: Nature and Goals,

Unit: 10 Optimum Credit Policy, Credit Policy Variables, Credit Evaluation,

Unit: 11 Credit Granting Decisions, Collection Policy, Factoring.

Block – IV Inventory Management

Unit: 10 Nature of Inventories, Need to Hold Inventories,

Unit-12: Objectives of Inventory Management,

Unit: 13 Inventory Management Techniques,

Unit: 14 Analysis of Investment in Inventory, Inventory Control Systems.

Block – V Working Capital Finance

Unit: 15 Accruals, Trade Credit and other current liabilities,

Unit-16: Working Capital Advance by Commercial Banks,

Unit: 17: Regulation of Bank Finance, Public Deposits, Inter-corporate Deposits,

Unit: 18 Short-term Loans from Financial Institutions, Commercial Paper.

Books Recommended/Suggested Readings:

1. V. K. Bhalla, Working Capital Management: Text and Cases, New Delhi: Anmol Publisher, 2008.
 2. M .Y. Khan and P. K. Jain, Financial Management - Text, Problems and Cases, New Delhi: Tata McGraw Hill, 2009
 3. Hrishikesh Bhattacharya, Working Capital Management: Strategies and Techniques, New Delhi: Prentice Hall of India Private Ltd, 2009.
-

Course Name: Organizational Development

Course Code: MTMO-H 2401

Credits: 4

Course Objectives:

To familiarize the students with fundamentals of organizational development, essential interventions and effective methods in organization development.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|--|-----------------|
| CO1 - Identify the basic concept organizational development. | Apply |
| CO2 – Describe Organizational Strategies for Change. | Understand |
| CO3 - Discuss the component of OD. | Analyze |
| CO4 - Explain the activities within an organization and recommend suitable OD interventions. | Evaluate |
| CO5 - Explain the Interpersonal and Team Development. | Evaluate |

Block -I: Introduction of Organisational Development:

Unit: 1: Organisational Development: Introduction, Meaning and Definition,

Unit: 2: History of OD, Relevance of Organisational

Unit: 3: Development for Managers, Assumptions of OD.

Block -II: Change Process and Models:

Unit: 4: Organisational Change, Strategies for Change,

Unit: 5: Theories of Planned Change (Lewin's change model, Action research model, Positive model),

Unit: 6: Action Research as a Process, Resistance to Change.

Block-III: Process of OD

Unit: 7: Process of OD, Components of OD program,

Unit 8: OD program phases, Making an Entry,

Unit: 9: Developing Contract, Launch, Situational Evaluation, Closure. OD Interventions: An overview; **Unit: 10:** Classification of OD Interventions: Team Interventions, Inter group and third party peacemaking interventions,

Unit 11: Comprehensive OD interventions, Structural Interventions.

Block-IV: OD Interventions:

Unit: 12: Evaluating OD Interventions: Evaluation, Types of Evaluation,

Unit: 13: Methods of Evaluating Interventions.

Unit: 14: Future of OD: Organisational Development and Globalization,

Unit 15: Emerging Trends in OD.

Block-V: Team Development

Unit: 16: Interpersonal and Team Development,

Unit: 17: Intergroup and Work Team Development,

Unit: 18: Transforming Entire Systems and Strategic Change

Books Recommended/Suggested Readings:

1. French, W.L., Bell, C.H. and Vohra V, Organization Development: Behavioral Science

Interventions for Organization Improvement, Revised 6th Ed., Pearson.

2. Hackman, J.R. and Suttle, J.L., Improving Life at Work: Behavioural science approach to organisational change, Goodyear, California.

3. Harvey, D.F. and Brown, D.R., An experimental approach to Organization Development, 7th Ed. Prentice-Hall, Englewood Cliffs, N.J.

Course Name: Group and Team in Organization

Course Code: MTMO-H 2402

Credits: 4

Course Objectives:

The objective of the course to orient the students of management towards the art and science of influence and Leadership in organizations.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1 | Elaborate art and science of leadership and attain new insights about the most suited leadership style | Understand |
| 2 | Enumerate understanding of how to develop younger leaders. | Apply |
| 3 | Explain how to adapt and lead teams more effectively | Understand |
| 4 | Identify various skills related to the Interpersonal Communication. | Apply |
| 5 | Discuss importance of interpersonal trust in group decision Making. | Understand |

Block – I Introduction to Leadership

Unit 1: Leadership and management of team,

Unit 2: Approaches to leadership,

Unit 3: Traits, Behavioral,

Unit 4: Sources of powers and influence

Unit 5: Leadership models, the SOAR Peak performance model.

Block – II Leadership Styles

Unit 6: Contingency approach: Fiedlen Model

Unit 7: Situational leadership theory to effective leadership

Unit 8: Situational and Transformational leadership

Unit 9: Leadership in decision-making process.

Block – III Leadership in times of change

Unit 10: Global implications

Unit 11: Global leaders in Indian context – Steel King: strategies approach of steel kings
LaxmiNivas Mittal & Ratan Tata.

Unit 12: Group as a Medium of Learning: Developing and Change.

Block – IV Group Cohesiveness

Unit 13: Influence Processes

Unit 14: Interpersonal Communication

Unit 15: Interpersonal Awareness and Feedback Process.

Block – V Interpersonal Trust

Unit 16: Group Decision Making;

Unit 17: Group Synergy;

Unit 18: Team Building.

References:

1. Hersey P; Blanchard K and Johnson D- Management of Organisational Behaviour, Prentice-Hall
 2. Bennis, W.G. Essay in Interpersonal Dynamics. U.S.A., Dorsey Press
 3. Kolb, D. etc. Organizational Behaviour: An Experiential Approach. Englewood Cliffs, New Jersey, PHI
 4. Yukl-Leadership in Organisations, Pearson education
-

Course Name: Training and Development

Course Code: MTMO-H 2403

Credits: 4

Course Objective: The objective of the course to orient the students of management towards the art and science of influence and Leadership in organizations.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|--|-----------------|
| CO1 - Describe the concept of training and development to companies. | Understand |
| CO2 – Explain the various methods of training and development. | Understand |
| CO3 - Describe the steps of executive development programs. | Understand |
| CO4 - Evaluate the effectiveness of training and development programmes. | Evaluate |
| CO5 - Evaluate the emerging trends in training and development field. | Evaluate |

Block I: Introduction

Unit 1: Training and Development- concept, rationale and nature; Training, Learning and Development interface;

Unit 2: Theories of management training and development and practical application of these theories in today's organisations;

Unit 3: Training needs assessment- meaning and purpose, different levels, various approaches, outputs, methods used in training needs assessment; Training and development as source of competitive advantage.

Block II: Training and Development Methodologies

Unit 4: Training– process and methods; human re-engineering; Principles of learning; Individual differences in learning, learning process.

Unit 5: Learning curves, workmen training, re-training, government initiatives, self-directed work teams; Use of audio-visual aids in training; Computer aided instructions- distance learning, open learning, e- Learning; Technologies convergence and multimedia environment;

Unit 6: Development techniques for enhancing decision-making and interpersonal skills- case-study, in- basket exercise, special projects, multiple management Programme learning, action learning,

Unit 7: Syndicate work, games, action maze, role play.

Block III: Executive Development

Unit 8: Importance of executive development, steps in organisation of a management development program/ executive development program, methods/ techniques of management development program; **Unit 9:** Role of development officers, administrators, consultants, designers and instructors;

Unit 10: Trends towards performance management and its impact on training professionals.

Block IV: Evaluation of Training and Development

Unit 11: Reasons for evaluating training and development programs, problems in evaluation; Evaluation planning and data collection- statistical methods;

Unit 12: Use of appropriate training and development software packages; Different evaluation frameworks, problems of measurement and evaluation, effective training follow-up;

Unit 13: Costing of training, measuring costs and benefits of training program, obtaining feedback of trainees; Kirkpatrick model of training effectiveness;

Unit 14: Training issues resulting from the external environment and internal needs of the company; L&D practices of 5 prominent corporations.

Block V: Emerging Trends in Training and Development

Unit 15: Career development and planning; Career development programmes and counseling; Group projects; Training for international assignments;

Unit 16: Gamification, team training and six sigma training; Electronic Enabled Training Systems (EETS)- concept and types, benefits and challenges in using EETS, concerns in implementation.

Unit 17: EETS- availability, incorporation, extension, and learning renewals for EETS, use of EETS and its up scalability, follow up activities;

Unit 18: Training and development initiatives of some selected companies from private and public sectors and MNCs.

Books Recommended/Suggested Readings:

1. Blanchard, P. N., Thacker, J. W., & Ram, V. A. Effective Training: Systems, Strategies, and Practices. Dorling Kindersley (India) Pvt. Ltd.
 2. Kumar, M., & Talwar, P. Human Resource Development. APH Publishing Corporation.
 3. Lynton, R., & Pareek, U. Training for Development. New Delhi: Vistaar.
 4. Noe, R. A., & Kodwani, A. D. (2012). Employee Training and Development (5th Edition ed.). Tata McGraw Hill.
-

Course Name: Total Quality Management**Course Code: MTMO-O 2401****Credit 4**

Course Objective: To understand the basic concepts and theories of Total quality Management. To appreciate the importance of cost of quality. To be aware of the statistical process control. To develop basic understanding of requirements of TQM.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1. | Demonstrate an understanding of the basic concepts and theories of Total quality Management. | Understand |
| 2. | Explain and appreciate the importance of cost of quality | Understand |
| 3. | Visualize and aware of the statistical process control. | Apply |
| 4. | Demonstrate and develop basic understanding of requirements of TQM | Understand |
| 5. | Explore application of TQM | Understand |

Block I: Introduction

Unit 1: Definition, Historical Review of TQM, TQM Basic Concepts, Barriers in TQM Implementation, Benefits of TQM, 5-S PRINCIPLES, QUALITY CIRCLE

Unit 2: Steps in implementing TQM

Unit 3: strategic tools for TQM

Block II:

Unit 4: Benchmarking, Business Process Re-engineering (BPR)

Unit 5: Various methods of calculation of Coefficients and their analysis:

Unit 6: JIT – Just in time, Quality function deployment (QFD)

Block III:

Unit 7: TAGICHI'S Quality Engineering, POKA YOKE

Unit 8: Quality education, Quality objectives and quality policy

Unit 9: Quality Planning, Quality information feedback

Block IV:

Unit 10: Service Quality

Unit 11: TQM Culture

Unit 12: Quality Audits

Block V:

Unit 13: The ISO 9000 Series, Need for ISO 9000- ISO 9000-2000, Quality system, Process of Obtaining ISO Certification

Unit 14: Essential steps to ISO Certification, Advantages of ISO Certification, New version of ISO Standards, documentation

Unit 15: ISO 14000, Concepts and Requirements of 14000, Benefits of ISO 14000

Text and Reference Books

1. Sherman, Clayton V. "Total Management, Not Total Quality Management." *Journal For Healthcare Quality* 13, no. 1 (January 1991): 26–31. *Statistics for Management* - Richard Levin, Pearson Publishing
2. Gupta, Dr Rakesh. "Role of Total Quality Management in Education." *Global Journal For Research Analysis* 3, no. 2 (June 15, 2012): 7–8
3. Borri, Fabio, and Giuliano Boccaletti. "From total quality management to total quality environmental management." *TQM Magazine* 7, no. 5 (October 1995):
4. Ziegel, Eric R., A. Tenner, and I. DeToro. "Total Quality Management." *Technometrics* 35, no. 4 (November 1993): 466.

Course Name: Service operation management

Course Code: MTMO-O 2402

Credit 4

Course Objective: The objective of this course is to understand major concepts and tools used in the design and use of operations systems in organizations. It introduces the discipline and the role the function plays in a value-creating service organization. Emphasis is given both to familiarization of various production processes and service systems, and to quantitative analysis of problems/ issues arising in the management of operations.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|---------------|---|------------------------|
| 1. | Elaborate and understand major concepts and tools used in the design and use of operations systems in organizations | Understand |
| 2. | Demonstrate discipline and the role the function plays in a value-creating service organization | Understand |
| 3. | Emphasis is given both to familiarization of various production processes and service systems | Apply |
| 4. | Identify quantitative analysis of problems | Apply |
| 5. | Demonstrate issues arising in the management of service operations. | Understand |

Block I: Introduction

Unit 1: Definition and Perspectives of Services, Nature and characteristics of services

Unit: 2 Classification of services and analyzing service operations, Strategic service vision, New service design and development

Unit 3: Service System Design and Delivery Process, Technology and automation, Service Encounter

Block II:

Unit 4: Human resource planning & employee selection, People management in services Work Measurement in services

Unit 5: Defining Service Quality, Quality Service by Design, Service Process Control

Unit 6: Quality Control Tools in services, Quality philosophy and performance excellence, Service recovery and service guarantee

Block III:

Unit 7: Process Analysis of Facility Layouts, Facility location Decision factors, Quantitative models for facility location, Service facility on a line or on a plane

Unit 8: Quantitative models for Facility Location, Based on different objective functions or optimization criteria, Quantitative models for multiple service facilities, Service facility design.

Unit 9: Forecasting demand in service, Smoothing customer demand in services, Service capacity management, Yield management

Block IV:

Unit 10: Resource and workforce scheduling in services, Introduction to Queuing system, Queuing system Characteristics

Unit 11: M/M/1 Queuing Model, M/M/c QUEUING MODEL, M/M/1/N QUEUING MODEL

Unit 12: Service inventory management, Service supply chain, Processes of service supply chain

Block V:

Unit 13: Data Envelopment analysis – I, Data envelopment Analysis- II

Unit 14: Application of Simulation in Services Operations Management

Unit 15: Vehicle routing and scheduling

Suggested Reading:

1. Service Operations Management : Towards Excellence Paperback – 1 January 2019 by Nitin Joshi (Author)
2. Service Operations Management: Improving Service Delivery | Fourth Edition | By Pearson
3. Service Operations Management, Second Edition, 2nd edition David W. Parker

Course Name: Management of Technology

Course Code: MTMO-O 2403

Credit 4

Course objectives:

The aim of this course is:

1. To describe the role of information technology and decision support systems in business and record the current issues with those of the firm to solve business problems.
2. To introduce the fundamental principles of computer-based information systems analysis and design and develop an understanding of the principles and techniques used.
3. To enable students understand the various knowledge representation methods and different expert system structures as strategic weapons to counter the threats to business and make business more competitive.
4. To enable the students to use information to assess the impact of the Internet and Internet technology on electronic commerce and electronic business and understand the specific threats and vulnerabilities of computer systems.
5. To provide the theoretical models used in database management systems to answer business questions.

Course Outcome: At the end of the course student would be able to:

| S.No. | Course Outcomes | Cognitive level |
|--------------|--|------------------------|
| 1. | Relate the basic concepts and technologies used in the field of management information systems; | Understand |
| 2. | Compare the processes of developing and implementing information systems. | Understand |
| 3. | Outline the role of the ethical, social, and security issues of information systems. | Apply |
| 4. | Translate the role of information systems in organizations, the strategic management processes, with the implications for the management. | Apply |
| 5. | Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization | Understand |

Block I:

Unit 1: Managers and Information Technology

Unit 2: Management Involvement and Governance, Information Resource Management

Unit 3: Strategic Management, Operational Management, Centralization versus Decentralization

Block II:

Unit 4: Managing IS Operations

Unit 5: Human Resource Management of IT

Unit 6: Network Management

Block III:

Unit 7: Advanced Technology Management,

Unit 8: Global Information Technology Management

Unit 9: Cultural, Political, and Geoeconomic Challenges

Block IV:

Unit 10: Global Business and IT Strategies,

Unit 11: Global IT Platforms,

Unit 12: The Internet as a Global IT Platform

Block V:

Unit 13: Global Data Issues

Unit 14: Systems Development Strategies,

Unit 15: You and Global IT Management

Suggested Reading

1. Jawadekar, W.S., “Management Information Systems”, Tata McGraw Hill Private Limited, New Delhi, 2009.
2. Kenneth C. Laudon and Jane P. Laudon: “Management Information Systems” 9/e, Pearson Education, New Delhi.
3. Alex Leon and Mathew Leon: “Data Base Management Systems”, Vikas Publishing House, New Delhi.
4. Goyal, D.P.: “Management Information System”, MACMILLAN India Limited, New Delhi, 2008.
5. Mahadeo Jaiswal, Monika Mital: “Management Information System”, Oxford University Press, New Delhi, 2008.
6. Murthy C.S.V.: “Management Information System”, Himalaya Publications, New Delhi, 2008.
7. Panneerselvam R.: “Database Management System”, PHI Private Limited, New Delhi, 2008.

Faculty and Support Staff

The University has identified the dedicated requisite faculty and support staff as mandated by the UGC and they are allocated the positions exclusively for OL mode. The course material prepared by the CDOE faculty is at par with the regulations 2020.

List of Faculty associated with MBA programme is as follows:-

| S. No. | Name of Faculty | Designation | Nature of Appointment | Qualification | Subject |
|--------|----------------------|---------------------|-----------------------|---------------|------------|
| 1 | Dr. Leena Shrivastav | Associate Professor | Full-Time | Ph.D | Management |
| 2 | Dr. Neha Kumari | Assistant Professor | Full-Time | Ph.D./NET | Management |

Delivery Mechanism

The OL of UMU follows a modern ICT (Information & Communication Technology) enabled approach for instruction. The methodology of instruction in OL of UMU is different from that of the conventional/regular programs. Our OL system is more learner-oriented and the learner is an active participant in the teaching-learning process. OL of UMU academic delivery system comprises:

A. Print Material

The printed material of the programme supplied to the students will be unit wise for every course.

B. Counselling Sessions

There will be 6 counselling/ contact classes in face to face mode of two hours each for a course of 4 credits. The counselling sessions / face to face contact classes will be held on the campus of the University on Saturdays and Sundays.

C. Medium of Instruction

Medium of Course Instruction: English

Medium of Examination: English

Student Support Systems

Universities study Centres or Learner Support Centre shall be headed by a coordinator, not below the rank of Assistant professor and shall be augmented with academic and non-academic staff depending on the learner.

The university has made appropriate arrangements for various support services including counselling schedule and resource-oriented-services evaluation methods and dates both on and offline modes for easy and smooth services to the students through distance mode.

At present the university has only one study centre in the campus. The institution is not promoting any study centres outside the campus. All student support services will be provided to the student through a single window method/mode onsite and online.

F. Procedure for Admissions, Curriculum, Transaction and Evaluation Admission Process

Admission to the MBA programme will be done on the basis of screening of candidate's eligibility on first come first serve basis. Admission shall not be a right to the students and UMU, CDOE shall retain the right to cancel any admission at any point of time if any irregularity is found in the admission process, eligibility etc.

Maximum Duration

The maximum duration of the M.B.A. Programme is four years. Thereafter, students seeking completion of the left-over course(s) will be required to seek fresh admission.

The student can complete his programme within a period of 4 years failing which he/she shall seek fresh admission to complete the programme.

Eligibility

A candidate should be a graduate in any discipline of course (10+2+3)/(10+2+4)/(10+3+3) with minimum 50% marks.

Programme Fee Structure

| Name of the Program | Degree | Duration | Year | Tuition Fee/Year | Exam Fee/Year | Total (in Rs.) |
|-----------------------------------|--------|--------------|------|------------------|---------------|----------------|
| Master of Business Administration | PG | 2 to 4 Years | 1 | 25500 | 2000 | 27500 |
| | | | 2 | 24000 | 2000 | 26000 |
| Total | | | | | | 53500 |

Activity Schedule

| S.NO. | Name of the Activity | Tentative months schedule(specify months) during year | | | |
|-------|---|---|------------|-------------|------------|
| | | From(Month) | To (Month) | From(Month) | To (Month) |
| 1 | Admission | Jul | Sep | Jan | Mar |
| 2 | Assignment submission (if any) | Sep | Oct | Mar | Apr |
| 3 | Evaluation of Assignment | Oct | Nov | Apr | May |
| 4 | Examination | Dec | Dec | Jun | Jun |
| 5 | Declaration of Result | Jan | Jan | Jul | Jul |
| 6 | Re-registration | Jul | Jul | Jan | Jan |
| 7 | Distribution of SLM | Jul | Sep | Jan | Mar |
| 8 | Contact Programmes (counselling, Practicals.etc.) | Sep | Nov | Mar | May |

Credit System

UMU, CDOE proposes to follow the 'Credit System' for most of its programs. Each credit amounts to 30 hours of study comprising all learning activities. Thus, a 8 credit course requires 240 hours, 6 credit course requires 180 hours, 5 credit course requires 150 hours, 4 credit course requires 120 hours and 2 credit course requires 60 hours of study. This helps the student to understand the academic effort to complete a course. Completion of an academic programme requires successful clearing of both, the assignments and the term-end examination of each course in a programme.

| Duration of the Programme | Credits | Name of the Programme | Level of the Programme |
|----------------------------------|----------------|------------------------------|-------------------------------|
| 2 Yrs. | 84 | M.B.A. | Master Degree |

Assignments

Distance Education learners have to depend much on self-study. In order to ascertain the writing skill and level of comprehension of the learner, assignment work is compulsory for all learners. Each assignment shall consist of a number of questions, case studies and practical related tasks. The

Assignment Question Papers will be uploaded to the website within a scheduled time and the learners shall be required to respond them within a specified period of time. The response of the learner is examined by a faculty member.

Evaluation: The evaluation system of the programme is based on two components:

Continuous Evaluation in the form of assignments (weightage 30%): This Component carries a weightage of 30%. There will be at least one graded assignment and test per course. These assignments are to be submitted to the Co-ordinator of the CDOE/Study Centre to which the student is assigned or attached with.

Term-end examination (weightage 70%): This will be held twice every year in the months of June and December. The students are at liberty to appear in any of the examinations conducted by the University during the year. A student will be allowed to appear in the Term-End Examination only after she/he has registered for that course and submitted the assignment. For appearing in the Examination, every student has to submit an Examination form through online (www.umu.ac.in) or offline before the due dates as given in the schedule of operations. If a student misses any term-end examination of a course for any reason, s/he may appear for any of them or all the courses subject to the maximum of 8 courses in the subsequent term-end examinations. This facility will be available until a student secures the minimum pass grade in the courses but up to a maximum period of four semesters, since the date of registration of the course is valid for four semesters. Beyond this period s/he may continue for another four semesters by getting Re-registration by paying fee again. In that case, the score of qualified assignments and/or term-end examination will be retained and the student will be required to complete the left out requirements of such re-registered courses. Minimum requirement for passing a course will be 50% marks.

G. Laboratory Support and Library Resources

The library of Usha Martin University aims to empower the teaching mission and intellectual culture of the community through availability through an organized collection of information as well as instruction in its access, relevance and evaluation.

The University Library enriches advance learning and discovery by providing access to a broad array of resources for education, research and creative work to ensure the rich interchange of ideas in the pursuit of knowledge.

The **Centre for Distance and Online Education (CDOE)** at Usha Martin University has initiated the establishment of a dedicated library to support the Online Learning (OL) programs. This initiative includes the acquisition of printed books and e-books, along with access to relevant national and international journals. The University already holds annual subscriptions to a range of academic journals, with plans to expand its access to additional online resources as part of its ongoing digital learning strategy.

The library's collection is both rich and diverse, offering comprehensive coverage across a wide range of disciplines. It includes resources in Management, Commerce, Information Technology, Computer Applications, and other allied fields. The repository consists of textbooks, reference books, peer-reviewed

journals, project reports, dissertations, and access to online journals—ensuring that learners have ample academic material to support their studies and research pursuits.

The University has well equipped Computer Laboratories, Lecture Capturing Systems, Audio Video facilities, ICT enabled class rooms, Wi-Fi facilities etc.

H. Cost Estimate of the Programme and the Provisions

Initial expenses have been done by the University in terms of provision of infrastructure, manpower, printing of self-study material and other. The University intends to allocate expenses out of the total fee collection as per following details:

| | | |
|--|---|-----|
| SLM Development and Distribution | : | 20% |
| Postal Expense | : | 10% |
| Salary and other Administrative expenses | : | 60% |
| Future development | : | 10% |

Once programmes are operational, fee receipt from the programmes budget to be planed as per the guidelines of University Grants Commission.

I. Quality Assurance

The University has established the Centre for Internal Quality Assurance (CIQA) in the University campus. The CIQA will monitor and maintain the quality of the OL programmes. It has the following objectives in making the compliances of quality implementations.

Objectives

The objective of Centre for Internal Quality Assurance is to develop and put in place a comprehensive and dynamic internal quality assurance system to ensure that programmes of higher education in the Open and Distance Learning mode and Online mode being implemented by the Higher Educational Institution are of acceptable quality and further improved on continuous basis.

Functions of CIQA

The functions of Centre for Internal Quality Assurance would be following

1. To maintain quality in the services provided to the learners.
2. To undertake self-evaluative and reflective exercises for continual quality improvement in all the systems and processes of the Higher Educational Institution.
3. To contribute in the identification of the key areas in which Higher Educational Institution should maintain quality.
4. To devise mechanism to ensure that the quality of Open and Distance Learning programmes and Online programmes matches with the quality of relevant programmes in conventional mode.
5. To devise mechanisms for interaction with and obtaining feedback from all stakeholders namely, learners, teachers, staff, parents, society, employers, and Government for quality improvement.
6. To suggest measures to the authorities of Higher Educational Institution for qualitative improvement.
7. To facilitate the implementation of its recommendations through periodic reviews.
8. To organize workshops/ seminars/ symposium on quality related themes, ensure participation of all stakeholders, and disseminate the reports of such activities among all the stakeholders in Higher Educational Institution.

9. To develop and collate best practices in all areas leading to quality enhancement in services to the learners and disseminate the same all concerned in Higher Educational Institution.
10. To collect, collate and disseminate accurate, complete and reliable statistics about the quality of the programme(s).
11. To ensure that Programme Project Report for each programme is according to the norms and guidelines prescribed by the Commission and wherever necessary by the appropriate regulatory authority having control over the programme.
12. To put in place a mechanism to ensure the proper implementation of Programme Project Reports.
13. To maintain a record of Annual Plans and Annual Reports of Higher Educational Institution, review them periodically and generate actionable reports.
14. To provide inputs to the Higher Educational Institution for restructuring programmes in order to make them relevant to the job market.
15. To facilitate system based research on ways of creating learner centric environment and to bring about qualitative change in the entire system.
16. To act as a nodal coordinating unit for seeking assessment and accreditation from a designated body for accreditation such as NAAC etc.
17. To adopt measures to ensure internalization and institutionalization of quality enhancement practices through periodic accreditation and audit.
18. To coordinate between Higher Educational Institution and the Commission for various qualities related initiatives or guidelines.
19. To obtain information from other Higher Educational Institutions on various quality benchmarks or parameters and best practices.
20. To record activities undertaken on quality assurance in the form of an annual report of Centre for Internal Quality Assurance.
21. It will be mandatory for Centre for Internal Quality Assurance to submit Annual Reports to the Statutory Authorities or Bodies of the Higher Educational Institution about its activities at the end of each academic session. A copy of report in the format as specified by the Commission, duly approved by the statutory authorities of the Higher Educational Institution shall be submitted annually to the Commission.

Upon enrolling in the **MBA program (Online Mode)** at Usha Martin University, students begin a transformative journey aimed at developing critical leadership capabilities, strategic thinking, and effective team collaboration skills. The program fosters a learner-centric environment that encourages active participation, problem-solving, and innovation within organizational settings.

By the end of the program, graduates will not only possess a sound understanding of core management principles but will also be equipped to take informed and ethical business decisions. They will be capable of driving operational excellence, aligning business strategies with organizational goals, and fostering synergy across teams and departments. Whether leading their own ventures or contributing to corporate success, MBA graduates from UMU will emerge as dynamic professionals ready to meet the challenges of the global business environment.



Registrar
कुल सचिव
Usha Martin University
उषा मार्टिन विश्वविद्यालय
Ranchi-835103/रांची-835103

USHAMARTIN UNIVERSITY, RANCHI
CENTRE FOR DISTANCE AND ONLINE
EDUCATION



PROGRAMME PROJECT REPORT

BACHELOR OF BUSINESS
ADMINISTRATION

2025-26


Registrar
कुल सचिव
Usha Martin University
उषा मार्टिन विश्वविद्यालय
Ranchi-835103/रांची-835103

Introduction:

The 4-Year Bachelor of Business Administration (Honours) Degree Programme (FYUP) offered through Online Learning (OL) mode is one of the most sought-after undergraduate programs after 12th grade. This programme provides comprehensive knowledge in leadership and management, equipping students with the skills needed to excel in the field of business administration. The BBA (Hons.) degree serves as a gateway to a career in management and entrepreneurship. It covers essential aspects of business operations, preparing students to become effective business managers and future leaders. Regardless of your academic background—whether in Arts, Science, or Humanities—you are eligible to pursue this programme. Highly popular among students, the BBA (Hons.) programme also lays a strong foundation for pursuing advanced studies such as an MBA. To succeed in this field, students are encouraged to develop leadership abilities, decision-making skills, and strong communication—both oral and written. To maintain academic rigor and ensure quality instruction, the programme incorporates partially ICT-supported teaching and learning practices.

A. Programme's Mission and Objectives

Mission: To deliver accessible, flexible, and high-quality undergraduate business education for aspiring professionals and distance learners. It aims to equip students with foundational knowledge, practical skills, and a growth mindset to succeed in evolving business environments and contribute effectively to the economy and society.

Objectives: The BBA Online Programme at Usha Martin University aims to provide flexible, affordable, and quality business education. It builds a strong foundation in core business areas while developing critical thinking, communication, and decision-making skills. The programme also encourages ethical practices, innovation, and social responsibility to shape competent and responsible future professionals.

a. Relevance of the Program with HEI's Mission and Goals

The vision and mission of HEI, Usha Martin University, Ranchi (UMU) are:

Vision

“To provide value based education relevant for all, nurture local talent, support creation of excellence in teaching, learning and research, produce high quality innovative graduates and contribute towards sustainable development of the state”.

Mission

The University shall strive to promote innovative strategies for seamless dissemination and creation of knowledge using latest techniques, available media and technologies so that its graduates acquire skills to get sustainable employment and contribute with a sense of service to national and global society.

The 4-Year Bachelor of Business Administration (Honours) Degree Programme offered by the University is designed to fulfill its vision and mission by prioritizing student-centric initiatives and engaging with the local community through various social clubs such as NSS, Kadam, and the Alumni Association. The University also encourages multidisciplinary and allied research, fostering a vibrant and joyful learning environment. The primary goal of the Online Learning (OL) programme is to extend educational opportunities to all qualified individuals who are unable to attend regular classes due to personal or professional constraints. Many aspiring learners are often restricted by job responsibilities or personal commitments, making it difficult for them to pursue

full-time education. For such individuals, the BBA (Hons.) through distance mode serves as an ideal option for expanding their knowledge and enhancing their skills. This programme also offers an alternative learning pathway for those seeking refresher courses or skill upgrades, catering to a broader audience of potential learners in need of flexible and accessible education.

b. Nature of Prospective Target Group of Learners

The OL programme at Usha Martin University (UMU), Ranchi, is designed to meet the needs of working professionals, executives, and individuals who are unable to attend a full-time course due to personal or professional commitments. The BBA (Hons.) programme offered through the Online Learning (OL) mode is open to all eligible candidates who meet the following criteria:

1. The applicant must have successfully completed 10+2 (in any stream) from a recognized board.
2. A pass in the 10+2 examination is mandatory for admission.

UMU's OL BBA (Hons.) programme is tailored to serve a wide range of undergraduate learners across different disciplines. It especially supports individuals from underserved backgrounds, including those with limited financial resources, rural populations, women, and minority groups who may have restricted access to conventional higher education institutions. The programme aims to make quality education accessible and inclusive for all.

c. Appropriateness of Programme to be conducted in OL mode to acquire specific skills and competence

The University has identified the following program outcomes and program specific outcomes as acquisition of specific skills and competence for BBA (Hons.)Program.

1. Programme Outcomes (PO's)

- PO1. Demonstrate knowledge and skills of business management concepts to analyze and diagnose problems to find suitable solutions in all functional areas.
- PO2. Critically appraise all functional areas of organization by applying modern qualitative & mathematical models using IT & research capabilities.
- PO3. Appraise and implement modern communication tools and techniques through ICT tools deal with all functional areas of business effectively and efficiently.
- PO4. Analyze economic, social, political, legal, and global business environment and use it to identify opportunities & threats for formulating suitable business strategies.
- PO5. Integrate & appraise legal and ethical considerations while making critical business decisions in business for safeguarding Human& Intellectual capital.
- PO6. Use & implement entrepreneurial skills and competency to design & start a new business venture in chosen functional area through research & ICT tools.

2. Programme Specific Outcomes

- PSO 1. Critically evaluate various financial statements pertaining to business and prepare balance sheet & income statement for the business for taking suitable financial decision.
- PSO 2. Differentiate & judge all operational level issues in marketing area associated with businesses to generate suitable marketing strategies.
- PSO 3. Apply & appraise suitable HR management practices and techniques in resolving HR related problems and create HRD mechanism to develop sustainable human resource capital in an organization.

The University has developed the BBA programme for maintaining the quality and to train the students in order to face the competition at the National/International level.

d. Instructional Design

The 4-Year BBA (Hons.) Programme is divided into eight semesters and minimum credit requirement is 160 to get BBA (Hons.) degree through OL mode from Usha Martin University, Ranchi (UMU). Minimum time period for acquiring BBA(Hons.) degree will be four years and maximum time (extended) period is eight years.

The minimum credits required for the award of 3-Year and 4-Year UG programme degree are given in **Table-1**.

Table 1: Credit Requirement for the Award of Degree in Each Category in UGC-NEP, 2020-

| S. No. | Type of Courses | Credits (3-Year UG) | Credits (4-Year UG) |
|---------------|------------------------------------|----------------------------|----------------------------|
| 1. | Major (Core) | 60 | 92 |
| 2. | Minor Stream | 24 | 32 |
| 3. | Interdisciplinary | 09 | 09 |
| 4. | Ability Enhancement Courses (AECs) | 08 | 08 |
| 5. | Skill Enhancement Courses (SECs) | 10 | 10 |
| 6. | Value Added Courses (VACs) | 06 | 06 |
| 7. | Summer Internship | 03 | 03 |
| Total | | 120 | 160 |

Curricular Components of 4-Year BBA (Hons.) Programme:

The curriculum is thoughtfully designed to include a blend of major (core) courses, minor stream courses, and interdisciplinary subjects. It also features language courses, skill enhancement modules, and value-added components such as Environmental Education, Understanding India, Digital and Technological Solutions, Health & Wellness, Yoga Education, and Sports and Fitness. At the end of the second semester, students have the flexibility to either continue with their initially chosen major or opt for a change in their major subject. The minor stream also offers vocational courses aimed at equipping students with practical, job-oriented skills to enhance employability.

An overview of these curriculum components is provided below:

Major Stream (80 credits) – The discipline or subject of main focus and the degree will be awarded in that discipline. Students should secure the prescribed number of credits (about 50% of total credits) through core courses in the major discipline.

Minor Stream (32 credits) – It helps a student to gain a broader understanding beyond the major discipline.

Interdisciplinary (9 credits) – All UG students are required to undergo 3 introductory-level courses relating to any of the broad disciplines. These courses are intended to broaden the intellectual experience and form part of liberal arts and science education. Students are not allowed to choose or repeat courses already undergone at the higher secondary level (12th class or equivalent) in the proposed major and minor stream under this category.

Ability Enhancement Courses (AEC; 08 credits) - Students are required to achieve competency in a Modern Indian Language (MIL) and in the English language with special emphasis on language and communication skills.

Skill Enhancement Courses (SEC; 10 credits) – These courses are aimed at imparting practical skills, hands-on training, soft skills etc. to enhance the employability of the students.

Value-Added Courses (VAC) (Common to all UG students; 06 credits) – The Centre for Distance and Online Education (CDOE) offers two VAC courses as follows:

1. Environmental Education
2. Understating India

Note:

1. The major subject would provide the opportunity for a student to pursue in-depth study of a particular subject or discipline. Students may only be allowed to change major within the broad discipline at the end of the second semester. So, at the end of the second semester, students can decide either to continue with the chosen major or request a change of major.
2. Beyond the major discipline, student would have to choose a minor stream subject for the award of the degree.

Table 2: The Broad Course Structure of the Undergraduate Programmes-

| Semester | Discipline Specific Courses | Minor | Inter-disciplinary courses | Ability Enhancement courses (language) | Skill Enhancement courses/Internship | Value-Added Courses | Total Credits |
|---|-----------------------------|----------------|----------------------------|--|--------------------------------------|---------------------|---------------|
| I | 2 courses (8C) | 2 courses (8C) | | 1 course (2C) | 1 course (2C) | | 20 |
| II | 2 courses (8C) | 2 courses (8C) | | 1 course (2C) | 1 course (2C) | | 20 |
| Students exiting the programme after securing 40 credits will be awarded UG Certificate in the relevant Discipline /Subject. | | | | | | | 40 |
| III | 2 courses (8C) | 1 course (4C) | | 1 course (2C) | 1 course (3C) | 1 course (3C) | 20 |
| IV | 2 courses (8C) | 1 course (4C) | - | 1 course (2C) | 1 course (3C) | 1 course (3C) | 20 |
| Students exiting the programme after securing 80 credits will be awarded Diploma in the relevant Discipline /Subject. | | | | | | | 80 |
| V | 4 courses (14 C) | | 2 courses (6C) | - | | | 20 |
| VI | 4 courses (14 C) | | 1 course (3C) | - | Internship (3C) | | 20 |

| | | | | | | | |
|--------------|--|------------------|-----------|-----------|--------------|-----------|------------|
| | Students who want to undertake 3-year UG programme will be awarded (BBA Degree) in the relevant Discipline / Subject upon securing 120 credits. | | | | | | 120 |
| Total | 60 | 24 | 09 | 08 | 10+03 | 06 | 120 |
| VII | 4 courses (16 C) | 1 course (4C) | - | | | | 20 |
| VIII | 4 courses (16 C) | 1 course (4C) | - | | | | 20 |
| Total | 92 | 32 | 09 | 08 | 10+03 | 06 | 160 |
| | Students will be awarded BBA (Honours) Degree in the relevant Discipline /Subject provided they secure 160 credits. | | | | | | 160 |

- *DSC: Discipline Specific Courses
- *IDC: Interdisciplinary Courses
- *AEC: Ability Enhancement Course
- *SEC: Skill Enhancement Courses
- *VAC: Value Added Courses

Note-

1. Students who opt to exit after completion of the first year and have secured 40 credits will be awarded a **UG certificate**.
2. Students who opt to exit after completion of the second year and have secured 80 credits will be awarded the **UG diploma**.
3. **Students can exit** after completion of six semesters with **120 credits** and will be awarded a **Bachelor's Degree**. For BBA(Hons.) Programme, a student has to earn minimum 60 credits of core courses (**Major discipline**), 24 credits in **Minor discipline**, 09 credits in **Interdisciplinary area**, 08 credits in **Ability Enhancement Area (AEC)**, 10 credits in **Skill Enhancement Area (SEC)** and 6 credits in two **Value-Added Courses** (3 credits each) and 3 credits in one **internship** course as per the course structure (Table 2).
4. **If the student wants to continue in FYUP** then he/she may have to earn 20 more credits in **Core Courses** and 8 credits in **Minor discipline** as per the UGC curriculum. So, after completion of 8 semesters with **160 credits**, the student will be awarded a **Bachelor's Degree (Hons.)** in the selected major subject.

Table 3: Evaluation Scheme, NEP, 2020 (Session: 2025-26)

**Bachelor of Business Administration (Honours)
BBA (Hons.)**

| I – Year : Certificate in Business Administration | | | | | | | |
|--|-----------------------|---|----------|--------|----------------------------------|--------------------------|-------|
| Semester-I | | | | | | | |
| S.No. | Course Code | Course Name | Category | Credit | Continuous Assessment Max. Marks | Term End Exam Max. Marks | Total |
| 1 | MTBO-1101 | Principles of Management and Organizational Structure | DSC | 4 | 30 | 70 | 100 |
| 2 | MTBO-1102 | Financial Accounting | DSC | 4 | 30 | 70 | 100 |
| 3 | MTBO-1103 | Principles of Marketing | Minor | 4 | 30 | 70 | 100 |
| 4 | MTBO-1104 | Principles of Micro Economics | Minor | 4 | 30 | 70 | 100 |
| 5 | ENBO-1101 / HNBO-1101 | Opt one of the language courses (English/Hindi)-I | AEC | 2 | 30 | 70 | 100 |
| 6 | MECO-1101 | Fundamentals of Computer System and Office Automation | SEC | 2 | 30 | 70 | 100 |
| Total | | | | 20 | 180 | 420 | 600 |

| Semester-II | | | | | | | |
|---|----------------------|--|----------|--------|----------------------------------|--------------------------|-------|
| S.No. | Course Code | Course Name | Category | Credit | Continuous Assessment Max. Marks | Term End Exam Max. Marks | Total |
| 1 | MTBO-1201 | Human Resource Management | DSC | 4 | 30 | 70 | 100 |
| 2 | MTBO-1202 | Financial Management | DSC | 4 | 30 | 70 | 100 |
| 3 | MTBO-1203 | Business Environment | Minor | 4 | 30 | 70 | 100 |
| 4 | MTBO-1204 | Indian Economy | Minor | 4 | 30 | 70 | 100 |
| 5 | ENBO-1201/ HNBO-1201 | Opt one of the language courses (English/Hindi)-II | AEC | 2 | 30 | 70 | 100 |
| 6 | MECO-1201 | Reasoning | SEC | 2 | 30 | 70 | 100 |
| Total | | | | 20 | 180 | 420 | 600 |
| Students exiting the programme after securing 40 credits will be awarded UG Certificate in Commerce | | | | | | | |

| Semester-III | | | | | | | |
|--------------|-------------------------|---|----------|--------|----------------------------------|--------------------------|-------|
| S.No. | Course Code | Course Name | Category | Credit | Continuous Assessment Max. Marks | Term End Exam Max. Marks | Total |
| 1 | MTBO-1301 | Management & Cost Accounting | DSC | 4 | 30 | 70 | 100 |
| 2 | MTBO-1302 | Consumer Behaviour | DSC | 4 | 30 | 70 | 100 |
| 3 | MTBO-1303 | Business Law | Minor | 4 | 30 | 70 | 100 |
| 4 | ENBO-1301/ HNBO-1301 | Opt one of the language courses (English/Hindi)-III | AEC | 2 | 30 | 70 | 100 |
| 5 | MECO-1301 | Business Communication | SEC | 3 | 30 | 70 | 100 |
| 7 | VACO-1301 | Environmental Education | VAC | 3 | 30 | 70 | 100 |
| Total | | | | 20 | 180 | 420 | 600 |

| Semester-IV | | | | | | | |
|---|-------------------------|--|----------|--------|----------------------------------|--------------------------|-------|
| S.No. | Course Code | Course Name | Category | Credit | Continuous Assessment Max. Marks | Term End Exam Max. Marks | Total |
| 1 | MTBO-1401 | Basics of Business Statistics | DSC | 4 | 30 | 70 | 100 |
| 2 | MTBO-1402 | Advertising Management | DSC | 4 | 30 | 70 | 100 |
| 3 | MTBO-1403 | Company Law | Minor | 4 | 30 | 70 | 100 |
| 4 | ENBO-1401/ HNBO-1401 | Opt one of the language courses (English/Hindi)-IV | AEC | 2 | 30 | 70 | 100 |
| 5 | MECO-1401 | Personal Selling | SEC | 3 | 30 | 70 | 100 |
| 6 | VACO-1401 | Understanding India | VAC | 3 | 30 | 70 | 100 |
| Total | | | | 20 | 180 | 420 | 600 |
| Students exiting the programme after securing 80 credits will be awarded UG Diploma in Commerce | | | | | | | |

| Semester-V | | | | | | | |
|------------|-------------|--|----------|--------|----------------------------------|--------------------------|-------|
| S.No. | Course Code | Course Name | Category | Credit | Continuous Assessment Max. Marks | Term End Exam Max. Marks | Total |
| 1 | MTBO-1501 | Income Tax | DSC | 4 | 30 | 70 | 100 |
| 2 | MTBO-1502 | Production Management | DSC | 4 | 30 | 70 | 100 |
| 3 | MTBO-1503 | Retail Management | DSC | 4 | 30 | 70 | 100 |
| 4 | MTBO-1504 | Entrepreneurship and Small Business Management | DSC | 2 | 30 | 70 | 100 |
| 5 | MDCO-1501 | Financial Institutions and Market | IDC | 3 | 30 | 70 | 100 |
| 6 | MDCO-1502 | Marketing of Services | IDC | 3 | 30 | 70 | 100 |
| Total | | | | 20 | 180 | 420 | 600 |

Semester-VI

| S.No. | Course Code | Course Name | Category | Credit | Continuous Assessment Max. Marks | Term End Exam Max. Marks | Total |
|---|-------------|--|----------|--------|----------------------------------|--------------------------|-------|
| 1 | MTBO-1601 | Sales management | DSC | 4 | 30 | 70 | 100 |
| 2 | MTBO-1602 | Goods & Service Tax | DSC | 4 | 30 | 70 | 100 |
| 3 | MTBO-1603 | Brand Management | DSC | 4 | 30 | 70 | 100 |
| 4 | MTBO-1604 | Business Ethics and Corporate Governance | DSC | 2 | 30 | 70 | 100 |
| 5 | MDCO-1601 | Business Research Methodology | IDC | 3 | 30 | 70 | 100 |
| 6 | MGBO-3291 | Internship | SEC | 3 | 30 | 70 | 100 |
| Total | | | | 20 | 180 | 420 | 600 |
| Students who want to undertake 3-year UG programme will be awarded BBA Degree in the relevant Discipline / Subject upon securing 120 credits. | | | | | | | |

Semester-VII

| S.No. | Course Code | Course Name | Category | Credit | Continuous Assessment Max. Marks | Term End Exam Max. Marks | Total |
|-------|-------------|----------------------|----------|--------|----------------------------------|--------------------------|-------|
| 1 | MTBO-1701 | International Trade | DSC | 4 | 30 | 70 | 100 |
| 2 | MTBO-1702 | Industrial Relations | DSC | 4 | 30 | 70 | 100 |
| 3 | MTBO-1703 | Project Management | DSC | 4 | 30 | 70 | 100 |
| 4 | MTBO-1704 | Strategic Management | DSC | 4 | 30 | 70 | 100 |
| 5 | MTBO-1705 | E-Commerce | Minor | 4 | 30 | 70 | 100 |
| Total | | | | 20 | 150 | 350 | 500 |

Semester-VIII

| S.No. | Course Code | Course Name | Category | Credit | Continuous Assessment Max. Marks | Term End Exam Max. Marks | Total |
|---|-------------|----------------------------------|----------|--------|----------------------------------|--------------------------|-------|
| 1 | MTBO-1801 | Digital Marketing | DSC | 4 | 30 | 70 | 100 |
| 2 | MTBO-1802 | Customer Relationship Management | DSC | 4 | 30 | 70 | 100 |
| 3 | MTBO-1803 | Supply Chain Management | DSC | 4 | 30 | 70 | 100 |
| 4 | MTBO-1804 | Compensation Management | DSC | 4 | 30 | 70 | 100 |
| 5 | MTBO-1805 | Investing in stock markets | Minor | 4 | 30 | 70 | 100 |
| Total | | | | 20 | 150 | 350 | 500 |
| Students will be awarded BBA (Honours) Degree in the relevant Discipline /Subject provided they secure 160 credits. | | | | | | | |

Table 4: Skill Enhancement Courses (SECs):

| S. No. | Name of the Course | Sem. | Course Code |
|--------|---|------|-------------|
| 1 | Fundamentals of Computer System and Office Automation | I | MECO-1101 |
| 2 | Reasoning | II | MECO-1201 |
| 3 | Business Communication | III | MECO-1301 |
| 4 | Personal Selling | IV | MECO-1401 |

* First two courses are of two credits and rest are of three credits subject specific

Table 5: Ability Enhancement Courses (AECs):

| S. No. | Sem | Course Name | Course Code | Credits | Language | Remarks |
|--------|-----|------------------------------------|-------------|---------|----------|--|
| 1. | I | English Communication | ENBO-1101 | 2 | English | Students are advised to opt one of the language courses |
| 2. | II | Creative Writing | ENBO-1201 | 2 | | |
| 3. | III | Personality Development | ENBO-1301 | 2 | | |
| 4. | IV | Basic Knowledge of English Grammar | ENBO-1401 | 2 | | |
| 5. | I | रचनात्मक और समाचार लेखन | HNBO-1101 | 2 | Hindi | |
| 6. | II | फ़िल्म और मीडिया लेखन | HNBO-1201 | 2 | | |
| 7. | III | पटकथा लेखन | HNBO-1301 | 2 | | |
| 8. | IV | कार्यालयी लेखन | HNBO- 1401 | 2 | | |

Table 6: Interdisciplinary Courses (IDCs):

| S. No. | Name of the Course | Course Code | Offered by Department |
|--------|-----------------------------------|-------------|-----------------------|
| 1 | Financial Institutions and Market | MDCO-1501 | Business Management |
| 2 | Marketing of Services | MDCO-1502 | |
| 3 | Business Research Methodology | MDCO-1601 | |

Table 7: Value-Added Courses (VACs):

| S. No. | Name of the Course | Semester | Course Code |
|--------|-------------------------|----------|-------------|
| 1. | Environmental Education | III | VACO-1301 |
| 2. | Understanding India | IV | VACO-1401 |

MOOCS (Massive Online Open Courses):

The University will offer students the flexibility to enroll in MOOC courses relevant to their prescribed curriculum. Credits earned through these MOOC courses may be considered as part of the overall evaluation framework, in accordance with the UGC (Online Learning Programmes and Online Programmes) Regulations, 2020.

Syllabi and Course Materials:

The Syllabi, PPR and Self Learning Material (SLM) are developed mostly by experienced faculty members of Usha Martin University, Ranchi (UMU) in consultation with content experts and the same will be forwarded to CIQA (Centre for Quality Assurance) and Board of Studies/Academic Council/ Executive Council for further suggestions and approval.

Table 8: List of Major and Minor courses

| YEAR | SEM | COURSE CODE | COURSE NAME | CREDITS | CATEGORY |
|------|------|-------------|---|---------|----------|
| I | I | MTBO-1101 | Principles of Management and Organizational Structure | 4 | Major |
| | I | MTBO-1102 | Financial Accounting | 4 | Major |
| | I | MTBO-1103 | Principles of Marketing | 4 | Minor |
| | I | MTBO-1104 | Principles of Micro Economics | 4 | Minor |
| | II | MTBO-1201 | Human Resource Management | 4 | Major |
| | II | MTBO-1202 | Financial Management | 4 | Major |
| | II | MTBO-1203 | Business Environment | 4 | Minor |
| | II | MTBO-1204 | Indian Economy | 4 | Minor |
| II | III | MTBO-1301 | Management & Cost Accounting | 4 | Major |
| | III | MTBO-1302 | Consumer Behaviour | 4 | Major |
| | III | MTBO-1303 | Business Law | 4 | Minor |
| | IV | MTBO-1401 | Basics of Business Statistics | 4 | Major |
| | IV | MTBO-1402 | Advertising Management | 4 | Major |
| | IV | MTBO-1403 | Company Law | 4 | Minor |
| III | V | MTBO-1501 | Income Tax | 4 | Major |
| | V | MTBO-1502 | Production Management | 4 | Major |
| | V | MTBO-1503 | Retail Management | 4 | Major |
| | V | MTBO-1504 | Entrepreneurship and Small Business Management | 2 | Major |
| | VI | MTBO-1601 | Sales management | 4 | Major |
| | VI | MTBO-1602 | Goods & Service Tax | 4 | Major |
| | VI | MTBO-1603 | Brand Management | 4 | Major |
| | VI | MTBO-1604 | Business Ethics and Corporate Governance | 2 | Major |
| IV | VII | MTBO-1701 | International Trade | 4 | Major |
| | VII | MTBO-1702 | Industrial Relations | 4 | Major |
| | VII | MTBO-1703 | Project Management | 4 | Major |
| | VII | MTBO-1704 | Strategic Management | 4 | Major |
| | VII | MTBO-1705 | E-Commerce | 4 | Minor |
| | VIII | MTBO-1801 | Digital Marketing | 4 | Major |
| | VIII | MTBO-1802 | Customer Relationship Management | 4 | Major |
| | VIII | MTBO-1803 | Supply Chain Management | 4 | Major |
| | VIII | MTBO-1804 | Compensation Management | 4 | Major |
| | VIII | MTBO-1805 | Investing in stock markets | 4 | Minor |

Semester I

Course Code: MTBO-1101 **L** **T** **P** **C**
Course Title: Principles of Management and Organizational Structure **4** **0** **0** **4**

Course Objective: This course is designed to provide students understanding basic Principles and concept of Management. To provide an overview of the major functions of management. Emphasis is on planning, organizing, controlling, directing, and communicating.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | cognitive level |
|--|-----------------|
| CO1: Demonstrate dynamics of business organizations and management practices. | Understand |
| CO2: Explain varied perspectives related to business environment and entrepreneurship. | Understand |
| CO3: Analyze how organizations adapt to an uncertain environment and decipher decision making techniques managers use to influence and control the internal environment. | Analyze |
| CO4: Analyze the relationship amongst functions of management | Analyze |
| CO5: Compare the change in working pattern of modern organizations. | Understand |

Block I: Evolution of Management Thought

Unit 1: Classical School: F. W. Taylor: Scientific Management Theory, Classical Organization Theory

Unit 2: Fayol's Principles of Management, And Max Webers' Bureaucratic Model.

Unit 3: Behavioural School: Mary Parker Follet, Chester Bearnard, how throne Studies.

Block II: Management Function and Planning

Unit 4: Basics management functions, role of manager, Overview of Planning: Types of Plans & The planning process;

Unit 5: Decision making: Process, Types and Techniques

Unit 6: Control: Function, Process and types of Control

Block III: Organizing & Coordinating Work

Unit 7: Principles of organizing: Common Organizational structures.

Unit 8: Decentralization: Factors affecting the extent of decentralization **Unit 9:** Delegation: Process and Principles of delegation.

Block IV: Ownership

Unit 10: Basic forms of Business Ownership;

Unit 11: Special forms of ownership: Franchising, Licensing, Leasing; choosing a form of Business ownership

Unit 12: Corporate Expansion: mergers and acquisitions, diversification, forward and backward integration, joint ventures, Strategic alliance.

Block V: Staffing

Unit 13: Concept of staffing - Recruitment and Selection.

Unit 14: Orientations; Training and Development.

Unit 15: Career Developments; Performance Appraisal.

References:

Text Books:

1. Principles and Practice of Management: L.M. Prasad
2. Business Organisation & Management: Singh & Chhabra
3. Essentials of Management: Koontz 'O' Donnel
4. Functions and Process of Management: J. K. Jain

Web links

- https://www.tutorialspoint.com/management_principles/management_principles_tutorial.pdf
- <https://study.com/academy/lesson/organizational-structure-definition-types-examples.html>
- <http://www.pearsoncanada.ca/media/highered-showcase/multi-product-showcase/robbins-ch05.pdf>

Course Code: MTBO-1103

L T P C

Course Title: Principles of Marketing

4 0 0 4

Course Objective: This course aims to familiarize students with the marketing function in organizations. It will equip the students with understanding of the Marketing Mix elements and sensitize them to certain emerging issues in Marketing. The course will use and focus on Indian experiences, approaches and cases.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | cognitive level |
|---|------------------------|
| CO1: Learn the basic concepts and principles of marketing and to develop their conceptual skill to be able to manage marketing operations of a business firm. | Understand |
| CO2: Describe the concept of segmentation and targeting | Understand |
| CO3: Demonstrate the complexities involved in various differentiation and positioning decisions | Understand |
| CO4: Take effective decisions for launching new products and to understand the implications of different pricing strategies. | Apply |

Block I: Introduction of Marketing

Unit 1: Introduction to Marketing: Definition of Marketing, Entities that can be marketed

Unit 2: Marketing from an organization's viewpoint

Unit 3: Types of markets, Difference between marketing and selling

Block II: Segmentation and Targeting

Unit 4: Concept of segmentation

Unit 5: Bases for segmentation

Unit 6: Targeting, Targeting strategies

Block III: Differentiation and Positioning

Unit 7: Introductions to Differentiation and Positioning

Unit 8: Differentiated, Undifferentiated and Niche marketing

Unit 9: Differentiation parameters, Competition, Positioning

Block IV: Marketing Strategy – I: Product and Price

Unit 10: Meaning and levels of product: Product classification

Unit 11: Product mix concept, Brand and brand decisions

Unit 12: Introduction to Pricing, Pricing decisions

Block V: Marketing Strategy – II: Place and Promotion

Unit 13: Introduction to Distribution: Distribution channels

Unit 14: Channel design and management, Introduction to Promotion, Promotional vehicles,

Unit 15: Product life cycle

References:

1. Etzel, M. J., Walker, B. J., Stanton, W. J., & Pandit, A. (2010). Marketing (14th ed.). McGraw Hill.
2. Kapoor, Neeru. Principles of Marketing PHI.
3. Kotler, P., Armstrong, G. and Agnihotri, P. (2018). Principles of Marketing (17th edition) Pearson Education. Indian edition.
4. Sharma, K., & Aggarwal S. (2018). Principles of Marketing. Taxmann's.

Course Code: MTBO-1102

L T P C

Course Title: Financial Accounting

4 0 0 4

Course Objective: The objective of this subject is to acquaint students with the accounting concepts, tools and techniques influencing business organizations.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | cognitive level |
|---|------------------------|
| CO1: Define theoretical framework of accounting. | Remember |
| CO2: Explain accounting process and develop the skill of preparation of final accounts. | Understand |
| CO3: Develop understanding of accounting for hire purchase transactions and determine depreciation. | Apply |
| CO4 Illustrate branch and departmental accounting. | Understand |
| CO5: Develop the skill of preparation of Royalty Accounts. | Apply |

Block I: Introduction

Unit 1: Conceptual Framework: Book keeping, Accounting & Accountancy, objectives, functions, advantage, limitations,

Unit 2: Accounting principle, Concepts and Conventions, Accounting Equations,

Unit 3: Introduction to Accounting Standards and Indian Accounting Standards (AS & Ind. AS).

Block II: Accounting Process

Unit 4: Journal, ledger, Cash Book, Trial Balance,

Unit 5: Preparation of Financial Statements of a profit making sole proprietorship trading firm with additional information

Unit 6: Preparations of Final Accounts.

Block III: Depreciation and Hire Purchase Accounting

Unit 7: Accounting for Plant Property and Equipment

Unit 8: Depreciation: Meaning of Depreciation, Objective and Methods of depreciation (Straight line, Diminishing Balance)

Unit 9: Hire Purchase Accounting, Accounting for Installment System (Simple practical problems)

Block IV: Special Types of Accounting

Unit 10: Accounting for Branches (excluding foreign branches): Dependent branches and overview of Independent branches.

Unit 11: Departmental Accounting: Concept, Type of departments, Basis of allocation of departmental expenses

Unit 12: Methods of departmental accounting (Relevant accounting Standards as applicable)

Block V: Royalties Accounts

Unit 13: Royalty account, Minimum Rent,

Unit 14: Computation and recovery of Short working in the books of Land lord etc.

Unit 15: Practical questions

References:

1. Goyal, Bhushan Kumar and H.N. Tiwari, Financial Accounting, Taxmann
2. Kumar, Alok. Financial Accounting, Singhal Publication.
3. Lt Bhupinder. Financial Accounting – Concepts and Applications, Cengage
4. Monga, J R. Financial Accounting: concept and Applications. Mayur paper Backs, New Delhi.

Course Code: MTBO-1104

L T P C

Course Title: Principles of Micro Economics

4 0 0 4

Course Objective:

- To promote the ability to understand the basic concepts of Economics
- To give students the capacity to make relevance of economics in business decisions
- To help them be equipped with economic tools for consumer decision making and business analysis.

Course Outcomes: After completing the course, the student shall be able to

| Course Outcome | cognitive level |
|---|------------------------|
| CO1: Define Basic Concepts and Principles of micro economics. | Remember |
| CO2: Explain the mechanics of supply and demand in allocating goods and services and resources | Understand |
| CO3: Compare the choices made by a rational consumer | Understand |
| CO4: Identify relationships between production and costs | Apply |
| CO5: Demonstrate key characteristics and consequences of different forms of markets | Understand |

Block I: Introduction to Economics

Unit 1: Nature and Characteristics and Scope

Unit 2: Relationship with other disciplines, Concept of Utility

Unit 3: Law of Diminishing Marginal Utility. Concept of Consumer Surplus

Block II: Demand, Supply and Market Equilibrium

Unit 4: Individual demand, market demand, Laws of Demand. Determinants of demand, Elasticity of demand

Unit 5: Determinants of Supply.

Unit 6: Market equilibrium and price determination.

Block III: Factors of Production

Unit 7: Law of returns, Law of variable proportions, Law of returnsto scale, Economics and

Unit 8: Diseconomies of scale.

Unit 9: Types of costs and behavior of costs in short run and long run.

Block IV: Market Structures

Unit 10: Types, Factors affecting types of market structures, Perfect and imperfect competition.

Unit 11: Monopoly, Monopolistic competition and Oligopoly.

Unit 12: Price and Output determination under perfect competition.

Block V: National Income

Unit 13: Concepts, Measurement and

Unit 14: Difficulties in measurement

Unit 15: Inequalities of Income, Causes. Inflation.

References:

1. Ahuja, H.L., Business Economics, S. Chand & Co., New Delhi.
2. Deepa shree, Principles of Micro Economics, Ane Books Pvt Ltd, New Delhi
3. I.C. Dhingra, Microeconomics - Theory & Practice, S. Chand & Co., New Delhi.

Course code: ENBO-1101

Course title: English Communication

Credits-2

Course Objectives:

- To understand the fundamental communication skills in terms of personal, social and professional interactions.
- To develop the ability to share thoughts, emotions and ideas through various means of communication: both verbal and nonverbal.

Course Outcomes: After completion the course, students will be able to communicate effectively and with fluency. They will be able to speak in grammatically correct English with good pronunciation and intonation.

Block I: Self-Introduction

Unit 1: Introducing Self

Unit 2: Skills and Strengths

Unit 3: Speaking about Achievements and Voicing Future Aspects

Unit 4: Body Language

Unit 5: Paralanguage Skills

Block II: Public Speaking Skills

Unit 6: Speeches

Unit 7: Role Play

Unit 8: Debates

Unit 9: Presentation

Unit 10: Story telling or Narration

Text Books:

1. Bell, Judith. "Doing Your Research Project: A Guide for First-Time Researchers." Open University Press, 2010.
2. Covey, Stephen R. "The 7 Habits of Highly Effective People." Simon & Schuster, 1989.
3. Lucas, Stephen E. "The Art of Public Speaking." McGraw-Hill Education, 2014.
4. Pease, Allan, and Barbara Pease. "The Definitive Book of Body Language." Bantam, 2006.
5. Rath, Tom. "StrengthsFinder 2.0." Gallup Press, 2007.
6. Reynolds, Garr. "Presentation Zen: Simple Ideas on Presentation Design and Delivery." New Riders, 2008.

उद्देश्य

हिंदी की प्रमुख गद्य-पद्य विधाओं की लेखन – प्रक्रिया से परिचित करवाते हुए लेखन-अभ्यास द्वारा विद्यार्थियों की लेखन-प्रतिभा को निखारना एवं उन्हें सृजनात्मक लेखन हेतु प्रेरित करना। समाचार लेखन से परिचित कराना।

अधिगम की उपलब्धियां

समाचार के स्वरूप एवं लेखन प्रक्रिया से परिचय होगा।

-विभिन्न विधाओं में लेखन कौशल का विकास होगा।

-विद्यार्थी रचनात्मक भाषा का उपयोग कर पाने में समर्थ होंगे तथा लेखन क्षेत्र में रोजगार के अवसरों की उपलब्धता।

खंड-1: रचनात्मक लेखन

इकाई-1: रचनात्मक लेखन: अर्थ एवं स्वरूप

इकाई-2: कविता लेखन: स्वरूप एवं अभ्यास

इकाई-3: लघुकथा लेखन: स्वरूप एवं अभ्यास

इकाई-4: यात्रा वृत्तान्त- लेखन: स्वरूप एवं अभ्यास

इकाई-5: रिपोर्टाज-लेखन: स्वरूप एवं अभ्यास

खंड-2: समाचार लेखन

इकाई-6: समाचार: अर्थ, परिभाषा एवं तत्त्व

इकाई-7: समाचार के प्रकार, स्रोत

इकाई-8: संवाददाता: गुण और प्रकार

इकाई-9: समाचार लेखन - अभ्यास १

इकाई-10: समाचार लेखन - अभ्यास २

सहायक पुस्तकें

व्यवहारिक निर्देशिका पटकथा लेखन – असगर वजाहत

रचनात्मक लेखन, स. रमेश गौतम

समाचार लेखन – पी के आर्य

सहायक ग्रन्थ

Course Title: Fundamental of Computer System & Office Automation

Course Code: MECO-1101

Credits: 02

Course Objectives:

- Gain proficiency in fundamental computer system concepts and their application in office automation environments.
- Develop skills in utilizing office automation tools to enhance workplace efficiency and productivity.
- Understand the principles of data management and analysis to support informed decision-making within office settings.
- Cultivate effective communication strategies using computer systems and office automation tools for seamless collaboration.
- Acquire problem-solving abilities to troubleshoot common issues encountered in computer systems and office automation setups.

Course Outcomes:

1. Improved efficiency through streamlined workflows enabled by fundamental computer system knowledge and office automation tools.
2. Enhanced productivity resulting from the effective utilization of office automation, minimizing manual tasks and optimizing resource allocation.
3. Cost reduction achieved by leveraging office automation to minimize errors, reduce manual labor, and optimize resource utilization.
4. Enhanced communication facilitated by understanding computer systems, enabling efficient collaboration through email, instant messaging, and collaborative software tools.
5. Informed decision-making empowered by access to relevant data and analysis through computer systems, leading to strategic choices and better outcomes.

Course Content:

Block I: Introduction To Computer & Storage Devices

Unit 1: Brief history of development of computers, computer system concept, characteristics, capabilities and limitations, types of computers.

Unit 2: BIOS, Software, Hardware, Firmware, Booting files & Directory system. Data, information and their need, Levels of information, Quality of information, Comparison of manual & electronic storage of data,

Unit 3: Organization of data as file, Use of information in data processing systems, various data processing methods.

Unit 4: Primary Storage: Storage locations and addresses, storage capacity, RAM, ROM, PROM, EPROM, Cache memory.

Unit 5: Secondary Storage: Sequential & Direct Access devices, Punched paper devices Magnetic

tape, Magnetic Disk, Floppy Disk, Optical Disk, Magnetic Bubble Memory.

Block II: Input-Output, Operating System & Office

Unit 6: Input-Output devices: Keyboard, Pointing Devices: Mouse Trackball, Touch pad, Track point, Joystick, Touch Screen, Scanner, Barcode Reader, Optical Mark Reader.

Unit 7: Basic Elements, Functions and Types of Operating System, Serial Processing, Multi-Programmed, Batch System.

Unit 8: Time Sharing Systems, System Components, Operating System Services, Interrupts, Interrupt Processing,

Unit 9: MS-Office, Introduction to MS-Word menus shortcuts, create a word document, opening a file-saving, editing text documents, cut, copy, paste, formatting a document, alignments, font styles, indents. Creating tables – merging, splitting, drawing-shapes, picture tools, mail merge, spell check.

Unit 10: MS-Excel, Introduction, working spread sheets, formatting spread sheets, creating charts, formula usage.

References:

1. Norton Peter, “Introduction to computers”, 4th Ed., TMH, 2001.
2. Alex Leon & Mathews Leon, “Fundamentals of Information Technology”, Leon Techworld, 1999.
3. Vikas Gupta, “Comdex Computer Kit”, Wiley Dreamtech, Delhi, 2004
4. P. K. Sinha & Priti Sinha, “Computer Fundamentals”, BPB Publications, 1992.
5. V. Raja Raman, “Introduction to Computers”, PHI, 1998.
6. Alex Leon & Mathews Leon, “Introduction to Computers”, Vikas Publishing House, 1999.
7. Computer Architecture and Organization, Nicholas carter, Scaum Series TMH Adaptation, 2010.

Semester II

Course Code: MTBO-1201

L T P C

Course Name: Human Resource Management

4 0 0 4

Course Objective: To enable the students to understand and comprehend the vital issues of HRM in adynamic environment.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|---|------------------------|
| CO1: Describe basic nature and importance of human resource management. | Understand |
| CO2: Analyze the current theory and practice of recruitment and selection. | Analyze |
| CO3: Realize the importance of performance management system in enhancing employee performance. | Understand |
| CO4: Recommend actions based on results of the compensation analysis and design compensation schemes that are cost effective, that increase productivity of the workforce, and comply with the legal framework. | Apply |
| CO5: Discuss the role of modern HRM in meeting challenges of changing business environment. | Analyze |

Block I: Introduction

Unit 1: Meaning, importance and scope of HRM;

Unit 2: Evolution of HRM; functions, status and competencies of HR manager;

Unit 3: Human Resource Planning - quantitative and qualitative dimensions; Job analysis—job description and job specification; HR Policies.

Block II: Recruitment, Selection & Development

Unit 4: Recruitment, selection, placement, induction, and socialization –

Unit 5: An overview; Developing Human Resources; Training – need, types, and evaluation;

Unit 6: Role specific and competency-based training.

Block III: Performance Appraisal

Unit 7: Performance appraisal- nature and objectives,

Unit 8: Methods of performance appraisal, potential appraisal & employee counseling;

Unit 9: Job changes—transfers and promotions; HR audit.

Block IV: Compensation

Unit 10: Job evaluation; Compensation—concept and policies,

Unit 11: Base and supplementary compensation,

Unit 12: Performance linked compensation—individual, group, and organisation level.

Block V: Employee Maintenance and Emerging Issues in HRM

Unit 13: Employee health and safety, employee welfare, Social security (excluding legalprovisions);

Unit 14: Grievance handling and redressal; Industrial disputes and settlement machinery; Emergingissues

Unit 15: Challenges of HRM— employee empowerment, downsizing, work- life balance, use oftechnology in HRM functions.

References:

1. Decenzo, D. A., & Robbins, S. P. (2011). Fundamentals of Human Resource

ManagementIndia: Wiley.

2. Dessler, G. (2017). Human Resource Management. Pearson.
3. Muller-Camen, M., Croucher, R., & Leigh, S. (2016). Human Resource Management: A Case Study Approach. CIPD. Viva Books.
4. Pattanayak, B. (2018). Human Resource Management. Delhi. Prentice Hall of India.

Course Code: MTBO-1202

L T P C

Course Name: Financial Management

4 0 0 4

Course Objective: This course aims to acquaint students with the techniques of financial management and their applications for business decision making.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | cognitive level |
|--|------------------------|
| CO1 - Explain the nature and scope of financial management as well as time value of money and risk return trade off. | Remember |
| CO2 – Analyze capital budgeting process and capital budgeting techniques | Analyze |
| CO3 - Estimate various capital structure theories and factors affecting capital structure decisions in a firm | Understand |
| CO4 - Critically examine various theories of dividend and factors affecting dividend policy | Understand |
| CO5 - Evaluate working capital requirement | Evaluate |

Block I: Introduction

Unit 1: Nature, scope and objectives of financial management

Unit 2: Time value of money

Unit 3: Risk and Return.

Block II: Capital Budgeting

Unit 4: The Capital Budgeting Process, Cash Flow Estimation

Unit 5: Payback Period Method, Accounting Rate of Return

Unit 6: Net Present Value (NPV), Net Terminal Value, Internal Rate of Return (IRR), Profitability Index method.

Block III: Cost of Capital and Financing Decision

Unit 7: Sources of long-term financing, Estimation of components of cost of capital, Method for Calculating Cost of Equity, Cost of Retained Earnings

Unit 8: Cost of Debt and Cost of Preference Capital, Weighted Average Cost of Capital (WACC) and Marginal Cost of Capital.

Unit 9: Capital Structure- Theories of Capital Structure, Operating, Financial and Combined Leverage, EBITEPS, Analysis. Determinants of Capital Structure.

Block IV: Dividend Decision

Unit 10: Theories for relevance and irrelevance of dividend decision for corporate valuation

Unit 11: Walter's Model, Gordon's Model, MM Approach

Unit 12: Forms of dividend payment and Determinants of Dividend policy.

Block V: Working Capital Decision

Unit 13: Concepts of Working Capital, Operating & Cash Cycles,

Unit 14: Sources of short-term finance,

Unit 15: Working capital estimation, cash management, receivables management, inventory management.

References:

1. Pandey, I M. Essentials of Financial Management. Vikas Publications.
2. Rustagi, R.P. Basic Financial Management, Sultan Chand, New delhi
3. Singh, J.K. Financial Management- Theory & Practice, Galgotia Publishing Company.
4. Singh, Surender and Kaur, Rajeev, Basic Financial Management, Scholor Tech Press
New Delhi.

Course Code: MTBO-1203

L T P C

Course Title: Business Environment

4 0 0 4

Course Objective: To enable the students to gain insights into various concepts which characterize the business environment of a business in every aspect.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|--|------------------------|
| CO1 - Describe business environment and its importance | Understand |
| CO2 – Discuss on political and legal issues in business | Understand |
| CO3 - Elaborate knowledge on social beliefs, customs and cultural heritage. | Create |
| CO4 - Acquire knowledge on micro and macroeconomic concepts. | Apply |
| CO5 - Acquire knowledge on various national, international financial service and trade institutions. | Apply |

Block I: Theoretical Framework of Business Environment

Unit 1: Concept of Indian Business Environment,

Unit 2: Significance, Nature, Elements & Dimensions;

Unit 3: Environmental Scanning and Monitoring.

Block II: Economic Trends (overview): Income

Unit 4: Economic Trends (overview)

Unit 5: Income; Savings and investment; Industry

Unit 6: Trade and balance of Payments, Money; finance; Prices.

Block III: The Current Five Year Plan: Major Policies; Resource allocation

Unit 7: The Current Five Year Plan: Major Policies; Resource allocation,

Unit 8: Problems of Growth: Unemployment; Poverty;

Unit 9: Regional imbalances; Social injustice; inflation; Parallel economy; Industrial sickness.

Block IV: Role of Governments

Unit 10: Role of Government: Monetary and fiscal policy;

Unit 11: Industrial Policy; Industrial licensing,

Unit 12: Privatization; Devaluation; EXIM Policy.

Block V: International Environments & Institutions

Unit 13: International Environment: International trading environment (overview)

Unit 14: Trends in world trade and the problems of developing countries;

Unit 15: International economic institutions- GATT, WTO, UNCTAD, World Bank, IMF.

References:

1. Sundaram & Black: The International Business Environment; Prentice Hall.
2. Agarwal A.N.: Indian Economy; Vikas Publishing House.
3. Khan Farooq A: Business & Society; S. Chand
4. Dutt R. and Sundaram K.P.M.: Indian Economy; S.Chand
5. Mishra S,K, and Puri V.K.: Indian Economy; Himalaya Publishing House
6. Hedge Ian: Environmental Economics; Macmillan.

Course Code: MTBO-1204

L T P C

Course Name: Indian Economy

4 0 0 4

Objective: This course seeks to enable the student to grasp the major economic problems in India and their solution.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1 - Describe the concept and related terms in Indian Economy. | Understand |
| CO2 – Describe the Basic Features of the Indian Economy at Independence | Understand |
| CO3 - Explain the planning and import substituting industrialization | Understand |
| CO4 - Classify of Growth, Development and Structural Change in different phases of growth and policy regimes across sectors and regions | Understand |
| CO5 - Determine Sectoral Trends. | Evaluate |

Course Content:

Block I: Basic Issues in Economic Development

Unit 1: Concept and Measures of Development and

Unit 2: Underdevelopment;

Unit 3: Human Development

Block II: Basic Features of the Indian Economy at Independence

Unit 4: Composition of national income and

Unit 5: Occupational structure,

Unit 6: The agrarian scene and industrial structure

Block III: Policy Regimes

Unit 7: The evolution of planning and import substituting industrialization.

Unit 8: Economic Reforms since 1991.

Unit 9: Monetary and Fiscal policies with their implications on economy

Block IV: Growth, Development and Structural Change

Unit 10: The experience of Growth, Development and Structural Change in different phases of growth and policy regimes across sectors and regions.

Unit 11: The Institutional Framework: Patterns of assets ownership in agriculture and industry; Policies for restructuring agrarian relations and for regulating concentration of economic power;

Unit 12: Changes in policy perspectives on the role of institutional framework after 1991. Growth and Distribution; Unemployment and Poverty; Human Development; Environmental concerns. Demographic Constraints: Interaction between population change and economic development.

Block V: Sectoral Trends and Issues

Unit 13: Agriculture Sector

Unit 14: Industry and Services Sector.

Unit 15: Financial Sector

Text Books:

1. Mishra and Puri, Indian Economy, Himalaya Publishing House
2. IC Dhingra, Indian Economics, Sultan Chand & Sons
3. Gaurav Dutt and KPM Sundarum, Indian Economy, S. Chand & Company.
4. Bhagwati, J. and Desai, P. India: Planning for industrialization, OUP, Ch 2

Course code: ENBO-1201

Credits-2

Course Title: Creative Writing

Course Objectives:

- To develop students' creativity and imagination in writing.
- To improve students' writing skills and techniques.
- To help students express themselves effectively through different writing styles and genres.
- To introduce students to various forms of creative writing, such as poetry, short stories, and plays.
- To foster a supportive and collaborative environment for sharing and critiquing each other's work.

Course Outcomes:

- Students will be able to generate original ideas and develop them into well-crafted pieces of writing.
- Students will demonstrate proficiency in different writing styles and techniques.
- Students will be able to effectively communicate their thoughts and emotions through their writing.
- Students will have a solid understanding of various forms of creative writing and their unique characteristics.
- Students will be able to give and receive constructive feedback on their own and others' work.

Block I: Introduction to Creative Writing

Unit 1: Understanding the Basics of Creative Writing

Unit 2: Exploring Different Genres of Writing

Unit 3: Developing a Writing Routine

Unit 4: Understanding the Importance of Feedback

Unit 5: Practicing Self-editing Techniques

Block II: Elements of Creative Writing

Unit 6: Character Development

Unit 7: Setting and Atmosphere

Unit 8: Plot Development

Unit 9: Dialogue and Voice

Unit 10: Theme and Symbolism

Text Books:

1. Creating Characters: How to Build Story People by Dwight V. Swain.
2. "Self-Editing for Fiction Writers: How to Edit Yourself into Print" by Renni Browne and Dave King.

3. "The Creative Writing Coursebook: Forty Authors Share Advice and Exercises for Fiction and Poetry" edited by Julia Bell and Paul Magrs.
4. "The Making of a Story: A Norton Guide to Creative Writing" by Alice LaPlante.
5. "The Power of Point of View: Make Your Story Come to Life" by Alicia Rasley.

उद्देश्य

फ़िल्म के स्वरूप, प्रकार से परिचित कराना।
फ़िल्म के तकनीकी पक्ष का ज्ञान कराना।
मीडिया लेखन के स्वरूप से परिचित कराना।
मीडिया लेखन के विविध रूपों का ज्ञान कराना।

अधिगम की उपलब्धियां

विद्यार्थी फ़िल्म लेखन के स्वरूप, फ़िल्म के प्रकार और फ़िल्म के तकनीकी पक्ष से परिचित होंगे।
मीडिया लेखन के स्वरूप और विविध रूपों का ज्ञान प्राप्त कर सकेंगे।

खंड-1: फ़िल्म लेखन

इकाई-1: फ़िल्म लेखन: स्वरूप एवं महत्त्व
इकाई-2: फिल्म के प्रकार
इकाई-3: फिल्म का कला पक्ष (पटकथा, संवाद, अभिनय, संगीत)
इकाई-4: फिल्म का तकनीकी पक्ष (ध्वनि, प्रकाश, फिल्मांकन, संपादन)
इकाई-5: फिल्म – समीक्षा: स्वरूप एवं महत्त्व

खंड-2: मीडिया लेखन

इकाई-6: मीडिया लेखन: अर्थ, परिभाषा एवं अवधारणा
इकाई-7: प्रिंट मीडिया के विविध रूप (समाचार – पत्र पत्रिकाएँ, पोस्टर, विज्ञापन)
इकाई-8: इलेक्ट्रॉनिक मीडिया के विविध रूप (रेडियो, टेलीविजन, सोशल मीडिया)
इकाई-9: मीडिया लेखन में हिंदी की भूमिका
इकाई-10: मीडिया लेखन की संभावनाएं एवं चुनौतियां

सहायक ग्रन्थ

रचनात्मक लेखन - स. रमेश गौतम
मीडिया लेखन: सिद्धांत और व्यवहार -डॉ. चन्द्रप्रकाश मिश्र
व्यवहारिक निर्देशिका पटकथा लेखन-असगर वजाहत

Course title: Reasoning
Course Code: MECO-1201

Credits-2

Course Objectives:

- Equip learners with the ability to critically analyze, interpret, and evaluate arguments and data, enabling them to solve complex problems with accuracy and efficiency.
- Foster the capacity to think clearly and rationally, understanding logical connections between ideas, challenging assumptions, and evaluating evidence.
- Provide learners with the tools to effectively analyze and interpret data presented in various formats, making accurate conclusions and decisions based on this analysis.
- Teach advanced problem-solving techniques, encouraging creative thinking and enabling learners to approach unfamiliar situations and novel problems with confidence.

Course Outcomes:

Upon completing the course, learners will be able to:

- **Apply Logical and Analytical Reasoning:** Accurately solve a wide range of logical and analytical reasoning questions, using deductive and inductive reasoning skills effectively in both academic and real-world scenarios.
- **Demonstrate Enhanced Critical Thinking:** Critically assess arguments, identify logical fallacies, make informed decisions, and construct coherent arguments of their own, applying these skills in diverse contexts.
- **Interpret and Analyze Data Competently:** Read and interpret complex data from charts, graphs, and tables, and perform data sufficiency tasks with proficiency, essential for success in the quantitative sections of competitive exams.
- **Solve Complex Problems Efficiently:** Utilize advanced problem-solving strategies to tackle challenging puzzles and problems, demonstrating creativity and lateral thinking in developing solutions.

Block 1: Foundational Reasoning Skills

Unit 1: Introduction to Logical Reasoning

Unit 2: Deductive Reasoning

Unit 3: Inductive Reasoning

Unit 4: Analogy based on kinds of relationships

Unit 5: Logical statements- Two premise argument, more than two premise argument using connectives.

Block 2: Application of Reasoning

Unit 6: Venn diagrams

Unit 7: Moods and figures

Unit 8: Problem on Cubes and Dices

Unit 9: Syllogism

Unit 10: Logical Fallacies

Text Books:

1. "A Modern Approach to Logical Reasoning" by R.S. Aggarwal
2. "Introduction to Logic" by Irving M. Copi, Carl Cohen, and Kenneth McMahon
3. "How to Think Logically" by Gary Seay and Susana Nuccetelli

Semester III

Course Code: MTBO-1301

L T P C

Course Name: Management and Cost Accounting

4 0 0 4

Course Objective: To acquaint the students with basic concepts used in cost and management accounting and various methods involved in cost ascertainment systems, and use of costing data for planning, control and decision making.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|-----------------|
| CO1 - Describe thoroughly the conceptual framework of Cost Accounting; identification of differences between different financial and cost accounting. | Understand |
| CO2 – Discuss the cost concepts and elements of cost; preparation of cost sheet, contract costing, and reconciliation statement of cost and financial accounting. | Understand |
| CO3 – Explain the concept of management Accounting. | Understand |
| CO4 - Discuss the basic concepts Analysis and Interpretation of Financial Statements. | Understand |
| CO5 - Describe budgetary control system as a tool of managerial planning and control; ability to understand ratio analysis. | Apply |

Course Content:

Block I: Cost Accounting

Unit 1: Introduction: Nature and scope of cost accounting;

Unit 2: Cost concepts and classification; methods and techniques

Unit 3: Installation of costing system; concept of cost audit.

Block II: Cost Ascertainment

Unit 4: Costing; job, batch and contract costing.

Unit 5: Operating costing; Process costing,

Unit 6: Reconciliation of cost and financial accounts.

Block III: Management Accounting

Unit 7: Definitions, Scope, Objectives, and Limitations;

Unit 8: Difference between Financial Accounting,

Unit 9: Management Accounting, Tools of management accounting, Role of Management Accountant.

Block IV: Analysis and Interpretation of Financial Statements

Unit 10: Methods of analysis and interpretations,

Unit 11: Fund flow analysis and preparation of Fund Flow Statement;

Unit 12: Cash Flow Analysis and preparation of Cash Flow Statement

Block V: Budgets & Ratio Analysis

Unit 13: Definition, Necessity and kinds of Business Budgets,

Unit 14: Types of Budgets; Preparation of Flexible & Cash Budget Zero-base

Unit15: Budgeting concept Ratio analysis: Nature, meaning, scope, advantages and classification of various ratios.

References::

1. Drury- Management & Cost Accounting (Thomson Learning Books)
2. Kaplan- Advanced Management Accounting (Prentice Hall of India)
3. Gupta S. P. – Management Accountancy

Course Code: MTBO-1302

L T P C

Course Name: Consumer Behaviour

4 0 0 4

Course Objective:

The objective of this paper is to give the basic knowledge about the consumer behaviour.

Course Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|-----------------|
| CO1 - Identify the key concepts and theories of consumer behaviour. | Remember |
| CO2 – Describe models for describing consumer behaviour. | Understand |
| CO3 – Learn about perception and consumer behaviour | Understand |
| CO4 –Explain Consumer Decision making process. | Explain |
| CO5 - Develop an understanding about industrial buying behavior | Explain |

Course Content:

Block I: Consumer Behaviour

Unit 1: Introduction- Meaning of consumer behavior, Importance,

Unit 2: Market Analysis, Consumer decision process,

Unit 3: Factors influencing consumer buying decisions.

Block II: Consumer Behavior Models

Unit 4: Economic model, Psycho- analytic model,

Unit 5: Sociological model, Howard & Seth model,

Unit 6: Nicosia model, Engel-Kollat-Blackwell model.

Block III: Perception and consumer behaviour

Unit 7: Individual determinants: Perceptual process,

Unit 8: consumer learning process Introduction: Concept, importance and scope of CB, need for studying,

Unit 9: consumer attitude formation, attitude measurement, meaning and nature of personality, self concept.

Block IV: Influences & Consumer Decision making

Unit 10: Family, reference group, personal, social and cultural influence on CB,

Unit 11: Consumer Decision making process,

Unit 12: Consumer Communication process, consumer satisfaction.

Block V: Industrial Buying Behavior

Unit 13: Participants, characteristics of industrial markets,

Unit 14: factors influencing industrial markets, stages of industrial buying process,

Unit 15: Customer and marketing of services.

References:

1. Suja. R. Nair, Consumer Behaviour in Indian Perspective
2. Schiffman & Kanuk, Consumer Behaviour
3. Loudon & Bitta, Consumer Behaviour
4. Bennet & Kasarji, Consumer Behaviour

Course Code: MTBO-1303

L T P C

Course Title: Business Law

4 0 0 4

Course Objective:

This course aims to acquaint students with general business laws issues to help them become more informed, sensitive and effective business leaders.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | cognitive level |
|--|------------------------|
| CO1: Define basic aspects of contracts for making the agreements, contracts and subsequently enter valid business propositions. | Remember |
| CO2: Demonstrate legitimate rights and obligations under The Sale of Goods Act. | Understand |
| CO3: Explain negotiable instruments. | Understand |
| CO4: Make use of skills to initiate entrepreneurial ventures as LLP. | Apply |
| CO5: Explain the fundamentals of Internet based activities under the Information and Technology Act. | Understand |

Course Content:

Block I: The Indian Contract Act, 1872

Unit 1: Contract– meaning, characteristics and kinds.

Unit 2: Essentials of valid contract -Offer and acceptance, consideration, contractual capacity, free consent, legality of objects.

Unit 3: Void agreements. Discharge of contract – modes of discharge including breach and its remedies. Quasi – contracts.

Block II: The Sale of Goods Act, 1930

Unit 4: Contract of sale, meaning and difference between sale and agreement to sell.

Conditions and warranties.

Unit 5: Transfer of ownership in goods including sale by non-owners.

Unit 6: Performance of contract of sale. Unpaid seller – meaning and rights of an unpaid seller against the goods.

Block III: Negotiable Instrument Act (1981)

Unit 7: Definition of negotiable instruments, features, promissory note,

Unit 8: Bill of exchange and cheque, holder and holder in due course, crossing of a cheque,

Unit 9: Types of crossings, negotiation dishonor and discharge of negotiable instrument.

Block IV: The Limited Liability Partnership Act, 2008

Unit 10: Salient Features of LLP, Difference between LLP and Partnership,

Unit 11: LLP and Company LLP Agreement. Nature of LLP. Partners and Designated Partners. Incorporation Document Incorporation by Registration, Registered office of LLP and change therein.

Unit 12: Change of name. Partners and their Relations. Extent and limitation of liability of LLP and partners. Whistle blowing. Taxation of LLP. Conversion of LLP.

Block V: The Information Technology Act 2000

Unit 13: Definitions under the Act. Digital signature. Electronic governance. Attribution, acknowledgement

Unit 14: Dispatch of electronic records. Regulation of certifying authorities Digital signatures certificates.

Unit 15: Duties of subscribers. Penalties and adjudication. Offences.

References:

1. Singh, Avtar.(2018). The Principles of Mercantile Law. Lucknow. Eastern Book Company.
2. Sharma, J.P. and Kanojia S. (2019). Business Laws. New Delhi. Bharat Law House Pvt.Ltd.
3. Tulsian P.C. (2018). Business Law. New Delhi.Tata McGraw Hill.
4. Jagota R. (2019). Business Laws. MKM Publishers ScholarTech Press.

Course title: Personality Development**Course code:** ENBO-1301**Credits-2****Course Objectives:**

- This course aims to provide participants with a comprehensive framework for personal growth and development. By the end of the course, participants will:
- Gain a deep understanding of the various components that make up an individual's personality, including temperament, character, and traits.
- Develop heightened self-awareness regarding one's strengths, weaknesses, emotions, thoughts, and values.
- Enhance verbal and non-verbal communication skills to interact more effectively with others in personal and professional settings.
- Improve emotional intelligence by learning to manage and express one's emotions constructively and understand the emotions of others.

Course Outcomes-

Upon successful completion of this course, participants will be able to:

- Demonstrate a deeper understanding of their personality, including strengths, limitations, and potential areas for growth.
- Employ improved communication skills, adapting their approach to suit various audiences and contexts.
- Apply emotional intelligence in personal and professional relationships to foster understanding and cooperation.
- Navigate various situations confidently, making decisions assertively and presenting ideas persuasively.

Block I: Understanding Self and Interpersonal Skills

Unit 1: Introduction to Personality Development

Unit 2: Communication Skills

Unit 3: Emotional Intelligence

Unit 4: Time Management

Unit 5: Stress Management

Block II: Enhancing Personal Effectiveness and Building Relationships

Unit 6: Critical Thinking and Problem Solving

Unit 7: Leadership and Teamwork

Unit 8: Adaptability and Resilience

Unit 9: Personal Branding and Networking

Unit 10: Planning for the Future

References:

1. Covey, Stephen R. "The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change." Simon & Schuster, 1989.
2. DeVito, Joseph A. "The Interpersonal Communication Book." Pearson, 2015.
3. Goleman, Daniel. "Emotional Intelligence: Why It Can Matter More Than IQ." Bantam Books, 1995.
4. Kouzes, James M., and Barry Z. Posner. "The Leadership Challenge: How to Make Extraordinary Things Happen in Organizations." Jossey-Bass, 2017.

उद्देश्य

पटकथा लेखन का परिचय कराना।
विद्यार्थियों की लेखन क्षमता का विकास
विद्यार्थियों को लेखन में रोज़गार संबन्धी क्षेत्रों के लिए तैयार करना।

अधिगम की उपलब्धियां

पटकथा-लेखन के स्वरूप और तकनीकी शब्दों से परिचित होंगे।
पटकथा लेखन की जानकारी मिलने के उपरांत विद्यार्थी रोज़गार-बाज़ार के लिए तैयार होंगे।
अभिव्यक्ति कौशल का विकास।
भाषायी संप्रेषण के महत्त्व से अवगत होंगे।

खंड-1 पटकथा लेखन

इकाई-1: पटकथा - लेखन: स्वरूप, तत्त्व
इकाई-2: पटकथा लेखन के प्रकार
इकाई-3: पटकथा लेखन में शोध का महत्त्व
इकाई-4: पटकथा की शब्दावली तथा एक अंक (थ्री एक्ट) और पांच अंक (फ़ाइव एक्ट) को समझना

खंड-2 पटकथा लेखन-2

इकाई-5: वेबसीरीज़ के लिए पटकथा लेखन
इकाई-6: लघु फ़िल्म के लिए पटकथा लेखन
इकाई-7: डॉक्युमेंट्री के लिए पटकथा लेखन
इकाई-8: विज्ञापन फ़िल्म के लिए पटकथा लेखन

सहायक पुस्तकें

व्यवहारिक निर्देशिका: पटकथा लेखन: असगर वजाहत
आइडिया से परदे तक- रामकुमार सिंह
पटकथा कैसे लिखें- राजेन्द्र पांडे
कथा-पटकथा-मन्नू भंडारी

Course title: Business Communication

Course code: MECO-1301

Credits-2

Course Objective:

- To equip students of the B.Com course effectively to acquire skills in reading, writing, comprehension and communication, as also to use electronic media for business communication.
- To enable students analyze communication situations and develop Effective communication strategies
- To develop skills for communicate professionally and persuasively
- To make students learn skills for successful formal and informal presentations

Block I: Introduction

Unit 1: Definition, importance, features, purpose and process of communication.

Unit 2: Dimensions and channels of communication, the 7 c's of communication,

Unit 3: Barriers to communication, guidelines for effective communication.

Block II: Modern techniques and Self Development

Unit 4: Modern techniques like video conferencing, social networking. Strategic importance of e-communication.

Unit 5: Self Development and Communication Development of positive personal attitude

Unit 6: Communication models and processes; Self Development and Communication

Development of positive personal attitude; Corporate

Block III : Verbal and NON-Verbal Aspects of Communicating

Unit 7: Introduction of Verbal and NON-Verbal **communication**

Unit 8 : Body Language, Kinesics, Proxemics, Paralanguage. Effective Listening:

Principles of Effective listening, Factors affecting listening exercises, Oral, Written and video sessions.

Unit 9: Interviewing skills: Appearing in interviews, Writing resume and letter of application.

Block IV : Business language and presentation

Unit 10: Importance of Business language, Vocabulary Words often confused Words often misspelt, Common errors in English.

Unit 11: Oral Presentation Importance, Purpose, Presentation Plan, Power point presentation, Visual aids.

Unit 12: Writing skills: Planning business messages, Rewriting and editing, The first draft and Reconstructing the final draft.

Block V : Report Writing

Unit 13: Identify the types of reports, define the basic format of a report.

Unit 14: Identify the steps of report writing, write a report meeting the format requirements.

Unit 15: Determine the process of writing a report, importance of including visuals such as tables, diagrams and charts in writing report.

References:

1. Shalini Verma, Business Communication: Essential strategies is for 21 centuries manager, Vikas Publication,2014
2. Lesikar, R. V., & Petitt, J. D. Jr. (2005). Business Communication: Skills for Empowering theInternet Generation. 10th Edition. Tata McGraw-Hill Publication.

Course code: VACO-1301

Course Title: Environmental Education

Course Objectives:

- Students will learn about the Earth's natural systems, including ecosystems, biodiversity, and the processes that support life. They will explore the interconnections between these systems and human societies.
- Students will be introduced to global, regional, and local environmental challenges, including pollution, resource depletion, and biodiversity loss, understanding their causes and effects.
- The course aims to equip students with the knowledge and skills to develop and evaluate sustainable solutions to environmental challenges, emphasizing the role of innovation and technology.

Students will be encouraged to reflect on their roles and responsibilities in mitigating environmental issues, promoting a sense of stewardship towards the planet.

Course Outcomes:

Upon successful completion of this course, students will be able to:

- Demonstrate a comprehensive understanding of environmental systems and the interdependencies between humans and the natural world.
- Identify key environmental challenges and critically assess their causes, impacts, and the complexities involved in addressing them.
- Apply knowledge of environmental science and sustainable practices to develop, propose, and evaluate solutions to environmental problems.
- Exhibit a commitment to environmental responsibility in personal and professional contexts, including sustainable lifestyle choices and advocacy for environmental causes.

Block I: Understanding Natural Resources

Unit 1: Introduction to Natural Resources

Unit 2: Water Resources

Unit 3: Soil Resources

Unit 4: Forest Resources, Forest management and conservation

Unit 5: Mineral and Energy Resources

Block II: Ecosystems and Biodiversity

Unit 6: Basics of Ecology and Ecosystems

Unit 7: Terrestrial Ecosystems

Unit 8: Aquatic Ecosystems

Unit 9: Urban Ecosystems

Unit 10: Global Biodiversity Hotspots

Block III: Pollution and its prevention

Unit 11: Pollution: Meaning and types

Unit 12: Solid Waste Management

Unit 13: Sustainable Practices in Industries

Unit 14: Energy Conservation and Renewable Energies

Unit 15: Environmental Policies and Legislation

References:

Miller, G. Tyler, and Scott Spoolman. "Living in the Environment." Cengage Learning, 18th edition, 2015.

Chiras, Daniel D. "Environmental Science." Jones & Bartlett Learning, 9th edition, 2013.

Chapin III, F. Stuart, Pamela A. Matson, and Peter Vitousek. "Principles of Terrestrial Ecosystem Ecology." Springer, 2011.

Gaston, Kevin J., and John I. Spicer. "Biodiversity: An Introduction." Blackwell Science, 2nd edition, 2004.

Raven, Peter H., Linda R. Berg, and David M. Hassenzahl. "Environment." Wiley, 8th edition, 2011.

McKinney, Michael L., Robert M. Schoch, and Logan Yonavjak. "Environmental Science: Systems and Solutions." Jones & Bartlett Learning, 5th edition,

Semester IV

| | | | | |
|--|----------|----------|----------|----------|
| Course Code: MTBO-1401 | L | T | P | C |
| Course Title: Basics of Business Statistics | 4 | 0 | 0 | 4 |

Course Objective:

The objective of course is to provide basic knowledge of quantitative methods and their commercial application for decision making in business.

Course Outcomes: After completing the course, the student shall be able to:

| Course Outcome | cognitive level |
|---|------------------------|
| CO1: Explain meaning, scope and functions of statistics and data processing. | Understand |
| CO2: Apply various measurement of central tendency | Apply |
| CO3: Apply various measurement of dispersion and skewness. | Apply |
| CO4: Describe relationship between two variables using concepts of correlation and regression and its use in identifying and predicting the variables. | Analyze |
| CO5: Learn patterns revealed by the time series data and to use it to make predictions for the future. | Apply |

Course Content:

Block I: Introduction

Unit 1: Meaning, Characteristics, scope and function, limitations & misuse of statistics

Unit 2: Primary & secondary data, collection & editing of data

Unit 3: Classification, Frequency distribution and statistical series, Tabulation of data.

Block II: Measures of Central Tendency

Unit 4: Concept and properties of mathematical averages including arithmetic mean, geometric mean and harmonic mean.

Unit 5: Positional Averages including Mode and Median

Unit 6: Partition values - quartiles, deciles, and percentiles with graphic presentation.

Block III: Measures of, Dispersion and Skewness

Unit 7: Measures of Dispersion: absolute and relative. Range, Quartile deviation, Mean deviation

Unit 8: Standard deviation, and their coefficients; Properties of standard deviation/variance.

Unit 9: Moments: Calculation and significance; Skewness: Meaning and Measurement (Karl Pearson and Bowley's measures); Kurtosis.

Block IV: Simple Correlation and Regression Analysis

Unit 10: Simple correlation – Karl Pearson formula in grouped and ungrouped. Data, Ranking method, con-current deviations method

Unit 11: Regression Analysis: Principle of least squares and regression lines; Regression equations and estimation

Unit 12: Properties of regression coefficients; Relationships between Correlation and Regression coefficients.

Block V: Time Series

Unit 13: Meaning, Importance and Component of Time series

Unit 14: Additive model, Multiplication model, Measurement of Trend

Unit 15: Semi average method, Moving average method and Methods of Least squares.

References:

1. Anderson, Sweeney and William. Statistics for Students of Economics and Business. Cengage
2. Gupta, S.P. and Gupta, Archana. Statistical Methods. Sultan Chand and Sons, New Delhi.
3. Levin, Richard, David S. Rubin, Rastogi, and Siddqui . Statistics for management, Pearson Education.
4. Thukral, J.K., Business Statistics, Taxmann Publications
5. Vohra, N.D. Business Statistics, McGraw Hill

Course Code: MTBO-1402

L T P C

Course Name: Advertising Management

4 0 0 4

Course Objective:

The aim of the course is to build knowledge and understanding of advertisement among the student. The course seeks to give detailed knowledge about the subject matter by instilling them basic ideas about advertising Management.

Course Learning Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|-----------------|
| CO1 –Understand about advertisement and its use in business.. | Understand |
| CO2 – Learn about Integrated Communication Mix | Evaluate |
| CO3 –Explain about Promotional marketing. | Understand |
| CO4 –Understand about components & types of advertising copy. | Understand |

Course Content:

Block I: Advertising Management

Unit 1: Introduction, Scope, importance in business,

Unit 2: Role of advertising in social and economic development of India,

Unit 3: Ethics and truths in Indian Advertising.

Block II: Integrated Communication Mix (IMC)

Unit 4: Introduction, meaning, importance

Unit 5: The Role of Advertising in IMC and Marketing Strategy

Unit 6: Branding-meaning, importance in advertising.

Block III: Promotional Marketing;

Unit 7: Introduction, objectives, importance, Promotional Marketing Strategies,

Unit 8: DAGMAR- Objectives, DAGMAR Model,

Unit 9: Advertising Budget- importance, establishing the budget.

Block IV: Advertising Copy

Unit 10: Meaning, components, types of advertising copy,

Unit 11: importance of creativity in advertising,

Unit 12: Media planning-importance, strategies, media mix.

Block V: Advertising Research: importance,

Unit 13: Overview of Advertising Research and importance,

Unit 14: Testing advertising effectiveness market,

Unit 15: International Advertising-importance, international Vs local advertising.

Suggested Readings:

- Advertising and Promotion George E. Beich & Michael A. Belch. T.M.H.
- Advertising Management, Concept and Cases Manendra Mohan, TMH

Course Code: MTBO-1403

L T P C

Course Name: Company Law

4 0 0 4

The objective of the course is to impart basic knowledge of the provisions of the Companies Act 2013. Case studies involving issues in company law are required to be discussed.

Course Learning Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|---|------------------------|
| CO1: Explain the regulatory aspects and the legal documents and their usage essential for registration of company. | Understand |
| CO2: Describe the contents of prospectus, Share capital and debentures. | Understand |
| CO3: Explain management of company. | Understand |
| CO4: Equip the students with framework of dividend distribution and role of auditors in a company. | Apply |
| CO5: Discuss the procedure of winding up. | Apply |

Course Content:

Block I: Incorporation and its Consequences

Unit 1: Formation of a company, Classification of company, Memorandum of association, Articles of association additional documents required for incorporation, certificate of incorporation;

Unit 2: commencement of business, alteration of Memorandum and Articles and limitations on power of alteration,

Unit 3: Conversion of public Ltd. Company to private Ltd. Company and private Ltd. Company to public Ltd. Company.

Block II: Prospectus, Share Capital and Debentures

Unit 4: Prospectus: Meaning of prospectus, contents of prospectus, Registration of prospectus, penalties for misrepresentation in prospectus. Share capital: Shares,

Unit 5: Classification of shares, alteration of capital, reduction of capital, voting rights.

Unit 6: Debentures: Kinds of debentures, Remedies for debentures holders, Creations of charges, mortgages and registration charges.

Block III: Management of Company

Unit 7: Directors: Structure of board of directors, Qualifications, remuneration, powers and duties of directors.

Unit 8: Appointment of directors, Independent directors, resignation and vacation of office of director.

Unit 9: Appointment and remuneration of Managing director.

Block IV: Meetings, Account and Audit of Company

Unit 10: Meetings: Classifications of meetings, General rules for meetings, proxies, quorum, voting rights, special and ordinary resolution.

Unit 11: Account and Audit: Accounts, statutory books, filing accounts with registrar.

Unit 12: Audit: Appointment of auditor, rights, powers and duties of auditor, special audit.

Block V: Winding Up

Unit 13: Meaning of winding up, modes of winding up,

Unit 14: Procedure of winding up, Liquidator: Rights and liabilities of liquidator,

Unit 15: Dissolution of company, consequences of winding up.

References:

1. Hicks, Andrew & Goo S.H., (2017) Cases and Material on Company Law, Oxford University Press.
2. Sharma, J.P. (2018). An Easy Approach to Corporate Laws, Ane Books Pvt. Ltd., NewDelhi
3. Kumar, A., (2019) Corporate Laws, Taxmann Pvt Ltd
4. Chadha R. & Chadha, S. (2018). Company Laws. Scholar Tech Press, Delhi.
5. The Depositories Act,1996. Bare Act.

Course code: ENBO-1401

Credits-2

Course Title: Basic Knowledge of English Grammar

Course Objectives:

- To develop a fundamental understanding of English grammar rules and concepts.
- To improve students' ability to communicate effectively in both spoken and written English.
- To enhance students' confidence in using correct grammar in various contexts.
- To provide students with the necessary foundation for more advanced studies in English language and literature.

Course Outcomes:

- Students will be able to identify and apply key grammar rules, such as subject-verb agreement, tense usage, and sentence structure.
- Students will be able to effectively use parts of speech, including nouns, pronouns, verbs, adjectives, and adverbs.
- Students will be able to recognize and correct common grammatical errors in their own writing.
- Students will be able to demonstrate improved proficiency in grammar through quizzes, exams, and class assignments.
- Students will be able to communicate clearly and confidently in both informal and formal settings using correct grammar.

Block I: Parts of Speech

Unit 1: Nouns

Unit 2: Pronouns

Unit 3: Verbs

Unit 4: Adjectives

Unit 5: Adverbs

Block II: Sentence Structure

Unit 6: Subject-Verb Agreement

Unit 7: Sentence Fragments

Unit 8: Run-on Sentences

Unit 9: Types of Sentences

Unit 10: Sentence Combining

References:

1. Murphy, Raymond. *English Grammar in Use*. Cambridge University Press.
2. O'Conner, Patricia T. *Woe is I: The Grammarphobe's Guide to Better English in Plain English*. Riverhead Books.
3. Strunk Jr., William, and E.B. White. *The Elements of Style*. Pearson.

4. Thurman, Susan. *The Only Grammar Book You'll Ever Need: A One-Stop Source for Every Writing Assignment*. Adams Media.

उद्देश्य

कार्यालयी लेखन से परिचित कराना।

टिप्पण एवं प्रारूपण लेखन एवं उसकी विशेषताओं से परिचित कराना साथ ही उसका अभ्यास कराना।

अधिगम की उपलब्धियां

टिप्पण एवं प्रारूपण-लेखन का कौशल विकसित होगा।
औपचारिक पत्र-लेखन का कौशल विकसित होगा।

खंड-1 कार्यालयी प्रणाली एवं टिप्पण-लेखन

- इकाई-1 सरकारी कार्यप्रणाली
- इकाई-2 टिप्पण का स्वरूप, अर्थ
- इकाई-3 टिप्पण-लेखन की प्रक्रिया और प्रकार
- इकाई-4 टिप्पण लेखन का अभ्यास

खंड-2 प्रारूप-लेखन और सरकारी पत्र-लेखन

- इकाई-5 प्रारूपण: स्वरूप, प्रारूप लेखन-प्रक्रिया
- इकाई-6 प्रारूप लेखन: विशेषताएं और अभ्यास
- इकाई-7 सरकारी पत्रों का स्वरूप एवं प्रकार
- इकाई-8 सरकारी पत्र का अभ्यास

सहायक पुस्तकें

- प्रयोजनमूलक हिंदी-विनोद गोदरे
- प्रयोजनमूलक प्रशासनिक हिंदी-दिनेश चमोला "शैलेश"
- व्यवहारिक हिंदी-ओमप्रकाश सिंघल
- प्रयोजनमूलक हिंदी:सिद्धांत और प्रयोग- दंगल झालटे

Course Code: MECO-1401

L T P C

Course Name: Personal Selling

4 0 0 4

Objective: The purpose of this course is to familiarize the students with the fundamentals of personal selling and the selling process.

Course Objective:

The aim of the course is to build knowledge, understanding and skills in sales management among the student. The course seeks to give detailed knowledge about the subject matter by instilling them basic ideas about sales management.

Course Outcome

The outcome of the course will be as follows –

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1: To provide knowledge about personal selling. | Understand |
| CO2: Understand theory and modern sales approaches. | Understand |
| CO3: To give an overview about buying motives and their uses in personal selling. | Understand |
| CO4: To provide knowledge about selling process. | Understand |
| CO5: To give an overview about sales planning and control. | Understand |

Course Contents

Block: I: Introduction to Personal Selling

Unit 1 : Nature and importance of personal selling, Difference between Personal Selling, Salesmanship and Sales Management, Myths of selling,

Unit 2 : Relationship Marketing and Role of Personal Selling.

Unit 3 : Characteristics of a good salesman, Types of selling situations, Types of salespersons; Career opportunities in selling, Measures for making selling an attractive career.

Block: II: Theories of Selling

Unit 4 : Traditional and Modern: AIDAS Model of Selling,

Unit 5 : Problem Solving Approach,

Unit 6 : Right Set of Circumstances Theory and Modern Sales Approaches.

Block: III: Buying Motives

Unit 7 : Concept of motivation, Maslow's theory of need hierarchy;

Unit 8 : Dynamic nature of motivation;

Unit 9 : Buying motives and their uses in personal selling.

Block: IV: Selling Process

Unit 10 : Prospecting and qualifying; Pre-approach; Approach;

Unit 11 : Presentation and demonstration; handling of objections and complaints; Closing the sale; techniques for closing the sale;

Unit 12 : Customer Relations, Follow up and Dealing customer concerns and complaints.

Block: V: Sales Planning and Control

Unit 13 : Sales Forecasting, Sales Budget,

Unit 14: Sales Territories, Sales quota,

Unit 15: Ethical aspects of Selling.

References:

1. Spiro, Stanton, and Rich, Management of the Sales force, McGraw Hill.
2. Rusell, F. A. Beach and Richard H. Buskirk, Selling: Principles and Practices, McGraw Hill
3. Futrell, Charles, Sales Management: Behaviour, Practices and Cases, The Dryden Press.
4. Still, Richard R., Edward W. Cundiff and Norman A. P. Govoni, Sales Management: Decision Strategies and Cases, Prentice Hall of India Ltd., New Delhi,

Course code: VACO-1401

Course Title: Understanding India

Course Objectives:

- To provide students with a foundational understanding of the historical events and philosophies that influenced the formation of the Indian Constitution and shaped the nation's identity.
- To familiarize students with the structure, features, and key components of the Indian Constitution, including its unique blend of federalism, parliamentary governance, and judicial independence.
- To examine the fundamental rights and duties outlined in the Constitution, their implications for Indian citizens, and the balance between individual freedoms and social responsibilities.
- To delve into the intricacies of India's system of governance at both the Union and State levels, including the roles and functions of the executive, legislature, and judiciary.

Course Outcomes:

Upon completing this course, students will:

- Have a deep understanding of the Indian Constitution, its historical context, and its current application.
- Be knowledgeable about the fundamental rights and duties of Indian citizens and their significance.
- Understand the roles and functions of various pillars of Indian democracy, including the executive, legislature, and judiciary.
- Be aware of the socio-political challenges facing India and the measures being taken to address them.
- Be able to critically analyze contemporary issues in the Indian socio-political context and their constitutional implications.

Block 1: The Indian Constitution

Unit 1: Historical Background of the Constitution

Unit 2: Basic structure of the Constitution

Unit 3: Salient Features of Indian Constitution

Unit 4: Union and its Territory, Citizenship

Unit 5: Fundamental Rights

Block 2: System of Government

Unit 6: Fundamental Duties & Directive Principles of State Policy

Unit 7: Parliamentary System & Federal system

Unit 8: Parliament

Unit 9: Prime Minister & President

Unit 10: Chief Minister& Governor

Block 3: Various Bodies

Unit 11: Panchayati Raj System

Unit 12: Supreme Court & High Court

Unit 13: Judicial Review, Judicial Activism, Public Interest Litigation

Unit 14: Constitutional Bodies

Unit 15: Non - Constititonal Bodies

Suggested Readings:

1. Laxmikanth, M. (2019). Indian Polity: A comprehensive guide to Indian constitutional and political systems. Publisher.
2. Basu, D. D. (2019). Introduction to the Constitution of India. Publisher.
3. Kashyap, S. C. (2019). Our Constitution: An Introduction to India's Constitution and Constitutional Law. Publisher.

Semester V

| | | | | |
|---------------------------------|----------|----------|----------|----------|
| Course Code: MTBO-1501 | L | T | P | C |
| Course Title: Income Tax | 4 | 0 | 0 | 4 |

Course Objective:

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|-----------------|
| CO1 - Describe the basic concepts and determination of Residence & Tax Liability. | Understand |
| CO2 – - Identify the five heads in which income is categorised and to compute income under the heads ‘Salaries’. | Apply |
| CO3 - Compute income under the heads ‘Income from House Property’. And ‘Income from Profits and gains from Business or Profession’. | Apply |
| CO4 - Compute income under the head ‘Capital gains’ and ‘Income from othersources’ | Apply |
| CO5 - Compute total tax liability of individuals. | Apply |

Contents:

Block I: Introduction

Unit 1: Introduction, Important Definitions: Previous Year, Assessment Year, Person, Assesse, Income (including agricultural income),Gross Total Income, and total Income.

Unit 2: Income which do not form part of total income,

Unit 3: Residence & Tax Liability (Basis of Charge).

Block II: Computation of Income –I

Unit 4: Income from Salaries-I

Unit 5: Income from Salaries-II

Unit 6: Income from Salaries-III

Block III: Computation of Income –II

Unit 7: Income from House property-I

Unit 8: Income from House property-II

Unit 9: Income from Profits and gains from Business or Profession

Block IV: Computation of Income -III

Unit 10: Income from Capital Gains

Unit 11: Income from other sources.

Unit 12: Clubbing of Income

Block V: Computation of Total Income and Tax Liability

Unit 13: Set-off and carry-forward of losses

Unit 14:, Deductions from gross total income as applicable to an individual

Unit 15:Computation of total income and tax liability of an individual.

References:

1. V.B. Gaur & Narang, "Income Tax Law And Practice", Kalayani Publishers, 2001.
2. T.S. Reddy & Y. Hari Prasad Reddy, "Income Tax Law and Practice"
Margham Publications, 2008.
3. Dr Vinod K. Singhanian, "Income Tax Law and Practice", Taxmann Publications
Pvt. Limited, 2005.
4. V. Bala Chandran, S. Thothadri, "Taxation Law and Practice", Published by Asoke
K. Ghosh, PHILearning Private Limited, Volume 1, 2003

Course Code: MTBO-1502

L T P C

Course Name: Production Management

4 0 0 4

Course objectives:

The objective of this paper is to give the basic knowledge about the Management and cost accounting.

Course Learning Outcomes: After completing the course, the student shall be able to:

| Course Outcomes | Cognitive level |
|--|------------------------|
| CO 1 Explain the concept of production management. | Understand |
| CO 2 Describe thoroughly the conceptual framework of Production Process. | Understand |
| CO 3 Identify the plant location and layout. | Define |
| CO 4 Understand material management and quality control. | Understand |
| CO 4 Examine the quality control. | Examine |

Course Content:

BLOCK-1 PRODUCTION MANAGEMENT-PLANNING

Unit-1-Nature, scope and significance of production management; objectives of production management; difference between production and operations management,

Unit-2- Functions of production management; Characteristics; recent trends in production management, Production systems; Responsibilities of production manager,

Unit-3-Production planning and control, Objectives of PPC.

BLOCK-2- PRODUCTION MANAGEMENT PROCESS, MANUFACTURING SERVICE & ORGANISATIONS.

Unit-4-Production Process.

Unit-5-Manufacturing & Service Organisations; Types of manufacturing systems-Intermitted; continuous systems and others manufacturing systems,

Unit-6- Product design and development.

BLOCK-3- PLANT LOCATION AND LAYOUT

Unit-7-Plant location; Plant location methods, Factors affecting location;

Unit-8-Plant layout; types of plant layout, Factors affecting plant layout, types of plant layout.

Unit-9- Plant environment and maintenance.

BLOCK-4- MATERIAL MANAGEMENT

UNIT-10-Meaning, Objectives and Importance of Material Management, Techniques of Inventory Management, Inventory control,

Unit-11- Purchasing economic lot quantity/Economic order quantity (EOQ); Lead Time, Reorder level,

Unit-12-ABC analysis, Stock keeping, Quality.

BLOCK-5-QUALITY CONTROL

Unit-13-Quality control, Phases of QC, Quality assurance,

Unit-14-Quality circles, Quality cost,

Unit-15-TQM, JIT, Statistical Quality control.

References:

1. Maheshwari S.N., Advanced Problem and Solutions in Cost Accounting
2. Khan & Jain, Management Accounting
3. Gupta, S.P., Management Accounting

Course Code: MTBO-1503

L T P C

Course Title: Retail Management

4 0 0 4

Course objectives:

This course provides the student with a comprehensive view of retailing, an analysis of the retail environment and exposure to issues and developments in the industry. Retailing is changing today, and the successful business will know how to identify, adapt, and plan with these changes.

Course Learning Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|-----------------|
| CO1. Become familiar with the fundamental concepts and how the retail industry works. | Understand |
| CO2. Able to understand about retail consumer. | Examine |
| CO3. Identify the retail locations | Examine |
| CO4. Explain the Merchandise buying and Pricing Decisions | Understand |
| CO5. Describe the Operations Pricing and Space Management | Understand |

Course Content:

Block 1: Introduction to Retailing and Retail types

Unit 1 : Concept of retailing, Functions of retailing, Terms & Definition, Introduction to Retailing and Retail types,

Unit 2 : Retailing Channels, Retail Industry in India, Importance of retailing,

Unit 3 : Changing trends in retailing.

Block 2: Retail Consumer

Unit 4 : Retail consumer behaviour, Factors influencing the Retail consumer,

Unit 5 : Retail Customer Buying Behaviour, Customer decision making process,

Unit 6 : Market research for understanding retail consumer, Responding and Targeting Consumers

Block 3: Retail Locations

Unit 7 : Importance of Retail locations, Types of retail locations, Factors determining the location decision,

Unit 8 : Steps involved in choosing a Retail Site Location, Measurement of success of location,

Unit 9 : Store Layout and Design, Merchandising and Assortment Planning

Block 4: Merchandising

Unit 10 : Meaning of Merchandising, Factors influencing Merchandising, Merchandise planning,

Unit 11 : Merchandise buying, Pricing Decisions,

Unit 12 : Retail Communication Mix, and International Aspects of Retailing.

Block 5: Operations Pricing and Space Management

Unit 13 : Store administration, Premises and Inventory Management, Store Management, Receipt Management,

Unit 14 : Customer service, Retail Pricing, Factors influencing retail prices, Retail Information System, Operations Management in Retail.

Unit 15 : Definition of Space Management, Store layout and Design, Visual Merchandising, Retail Communication Mix, POP Displays.

References:

1. Swapna. P (2011) Retailing Management: Text and Cases, ISBN-007015256X, Tata McGraw Hill Reference
2. Michael. L, Barton. W & Watson. D. (2014) Retailing Management, Tata McGraw Hill
3. Berman, B, Joel R. Evans & Chatterjee, P (2017) Retail Management: A strategic Approach Pearson Education Asia, ISBN-0133796841
4. Hammond, R (2013) Modern Retail Management: Practical Retail Fundamentals in the Connected Age, Kogan Page, ISBN-0749465867

Course Code: MTBO-1504

L T P C

Course Name: Entrepreneurship for Small Business Management

2 0 0 2

Course objectives:

The main objectives of the course are to familiarize students with various concepts used in understanding processes involved in entrepreneurship and business formation and development. Provide context to those processes in the form of differences between small and large firms, and the economic environment.

Course Learning Outcomes: After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|--|------------------------|
| CO1 - Describe entrepreneurship as volition in context of India. | Understand |
| CO2 -Discuss the existing support system for entrepreneurial orientation. | Understand |
| CO3 -Describe enterprise formation process for gaining ideas as to creation of an enterprise for pursuing a career. | Understand |
| CO4 - Calculate the requirements of post-enterprise creation for effective operation of the business. | Apply |
| CO5 - Acquire on available growth strategies for implementing effective suitable strategy for expansion and growth. | Apply |

Block I: Introduction

Unit 1: Entrepreneurship- meaning and importance, entrepreneurship in Indian context, entrepreneurship as a creative solution provider,

Unit 2: Meaning of various terms related to entrepreneurship-

Unit 3: Entrepreneurship, social entrepreneurship, net entrepreneurship, technopreneurship.

Block II: Entrepreneurial Eco System

Unit 4: Socio-economic support system for entrepreneurship; Public and private system of stimulation;

Unit 5: Role of development institutes, availability of finance, marketing, technology and project related assistance; Role of trade associations and self-help groups for promotion of entrepreneurship;

Unit 6: Types of business entities- micro, small and medium enterprises, role of MSME sector in Indian economy family businesses in India; Conflicts in family business; Startup Action Plan; Make in India initiative.

Block III: Enterprise Formation Process

Unit 7: Understanding and analyzing business opportunities, market demand analysis, project feasibility study; preparation of business plan;

Unit 8: Start ups and basic start ups problems, sources of financing business start ups;

Unit 9: Cases of Indian start ups (practical knowledge on preparation of business plan/project report shall be imparted).

Block IV: Managerial Aspects of Business

Unit 10: Managing finance- preparation of operating/cost budget, cash budget; Understanding

management of short term and long term capital;

Unit 11: Human resource planning; Contract management;

Unit 12: Understanding marketing methods; Understanding of GST and other tax compliances.

Block V: Managing Growth

Unit 13: Business growth strategies specific to small enterprises;

Unit 14: Enterprise life cycle and various growth strategies; Business collaboration and outsourcing of resources;

Unit 15: Network management; Succession planning for sustenance.

References:

1. Brandt, S. C. Entrepreneurship: The Ten Commandments for Building a Growth
Company. MacMillan Business Books.
2. Holt, D. H. Entrepreneurship: New Venture Creation. New Delhi: Prentice Hall of
India.
3. Panda, S. C. Entrepreneurship Development. New Delhi: Anmol Publications.

Course Code: MDCO-1501

L T P C

Course Title: Financial Institutions and Market

3 0 0 3

Course Objective:

To provide students an overview of financial markets & institutions in India and familiarize them with important fee and fund based financial services

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1 - Describe the meaning and scope of financial markets as well as institutions in India. | Understand |
| CO2 – Discuss the concepts of capital Market and foreign exchange market. | Understand |
| CO3 - Detail the specialized financial institutions and its Current developments. | Understand |
| CO4 – Explain about international financial institutions. | Understand |
| CO5 - Explain concept of Non-Banking Financial Companies (NBFC's) | Analyse |

Course Contents:

Block 1 : FINANCIAL SYSTEM IN INDIA

Unit 1: Introduction, Formal & Informal financial system Component of financial system Financial market & its classification

Unit 2: Meaning and characteristics of Indian Money Market Importance of Indian Money Market Function of Indian Money Market

Unit 3: Instruments in Indian Money Market Deficiencies in Indian Money Market

Block 2 : INDIAN CAPITAL MARKET AND FOREIGN EXCHANGE MARKET IN INDIA

Unit4: Meaning and characteristics of Indian Capital Market Importance of Indian Capital Market Functions of Indian

Unit 5: Capital Market Instruments in Indian Capital Market Deficiencies in Indian Capital Market

Unit 6: Meaning of Foreign Exchange Market Need of Foreign Exchange Market Participants in Foreign Exchange Market

Block 3 : SPECIALIZED FINANCIAL INSTITUTIONS

Unit 7 : EXIM Bank NABARD

Unit 8 : IFCI IDFC

Unit 9: HUDCO

Block 4 : INTERNATIONAL FINANCIAL INSTITUTIONS

Unit 10 :World Bank (International Bank for Reconstruction & Development)

Unit 11 :International Monetary Fund

Unit 12 :Asian Development Bank

Block 5 : NON-BANKING FINANCE COMPANIES (NBFCs)

Unit 13 :Housing Finance Companies , Similarities and differences between NBFCs and Bank

Unit 14 :Changing Role of Financial Institutions : Role of banking, financial sector reforms, financial and promotional role of financial institutions,

Unit 15 :Universal banking; concept and consequences.

References:

1. Financial Markets and Services – Gordan & Natarajan Investment and securities markets in
2. India Investment Management - V. A. Avadhani
3. Financial Services – M. Y. Khan

Course Code: MDCO-1502

L T P C

Course Title: Marketing of Services

3 0 0 3

Course Objective: The course is designed to equip students with the knowledge of marketing of all types of services.

Course Outcome: At the end of the course student would be able to

| S. No. | Course Outcomes | Cognitive level |
|--------|--|-----------------|
| 1 | Explains the basic concepts about services. | Understand |
| 2 | Define the marketing mix in terms of service sector. | Understand |
| 3 | Expresses scales related service quality and productivity. | Apply |
| 4 | Identify various Strategies in services marketing | Analyze |
| 5 | Acquire knowledge of recent trends in marketing of services. | Understand |

Course Contents:

Block I: Introduction of Services Marketing

Unit 1: Services Marketing, concept, characteristics of services, service marketing triangle, purchase process of service marketing, challenges of services.

Unit 2: Goods V/S services marketing

Unit 3: Consumer behaviour, positioning a service in Marketplace.

Block II: Service Delivery

Unit 4: Service product price mix, promotion and communication mix, Place / distribution of services people, Physical evidence.

Unit 5: Branding of services problem and solutions

Unit 6: Options for Service Delivery.

Block III: Service quality and productivity

Unit 7: Improving service quality and productivity

Unit 8: Service quality GAP model, Benchmarking, Measuring service quality

Unit 9: Defining productivity improving productivity.

Block IV: Strategies in services marketing

Unit 10: International and global strategies in services marketing

Unit 11: Factors favouring transactional strategy,

Unit 12: Elements of transactional strategy.

Block V: Recent trends in marketing of services

Unit 13: Recent trends in marketing of services

Unit 14: Ethics in service marketing

Unit 15: Unethical practices in service sector

References:

1. Verma H.V.: Marketing of Services , Global Business Press. New Delhi.
2. Nargundhar: Services Marketing Tata McGraw-Hill New Delhi
3. Rao: Services Marketing Pearson, New Delhi
4. Verma: Services Marketing Pearson, New Delhi

Semester VI

Course Code: MTBO-1601

L T P C

Course Title: Sales management

4 0 0 4

Course Objective:

The aim of the course is to build knowledge, understanding and skills in sales management among the student. The course seeks to give detailed knowledge about the subject matter by instilling them basic ideas about sales management.

Course Outcome

The outcome of the course will be as follows –

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1: To provide knowledge about sales management. | Understand |
| CO2: To give an overview about Selling skills & Selling strategies. | Understand |
| CO3: To give an overview about concept of distribution channels. | Understand |
| CO4: To give an overview about importance of sales force in organization. | Understand |
| CO5: To provide knowledge about recent developments in marketing & sales. | Understand |

Course Contents:

BLOCK I Introduction to sales management:

Unit 1: Meaning, Importance, objectives of sales management

Unit 2: sales organizations, qualities and responsibilities of sales manager. Types of sales organizations

Unit 3: Standard sales management process-international sales management

BLOCK II Selling skills & Selling strategies:

Unit 4: Selling and business Styles, selling skills, situations

Unit 5: selling process, sales presentation

Unit 6: Handling customer objections, Follow-up action.

BLOCK III Distribution Network Management:

Unit 7: Types of Marketing Channels

Unit 8: Factors affecting the choice of channel, Types of middlemen and their characteristics

Unit 9: Concept of physical distribution system.

BLOCK IV Sales Force Management:

Unit 10: Recruitment and Selection, Sales Training

Unit 11: Sales Compensation- Meaning, Types of compensation plans and evaluation of sales force by performance and appraisal process

Unit 12: Sales force motivation -Nature of motivation, Importance, Process and factors in the motivation.

BLOCK V Recent developments in marketing & sales:

Unit 13: Retail Sales: Types of retailing – store based and non- store based retailing, Retailing in India: changing scenario.

Unit 14: Recent developments in marketing & sales : Social Marketing, Online Marketing, Direct Marketing, Services Marketing

Unit 15: Green Marketing, Relationship Marketing, Rural marketing

References:

1. Cundiff, Still, Govoni, Sales Management
2. Pradhan, Jakate, Mali, Salesmanship & Publicity
3. S.A. Chunawalla, Sales Management

Course Code: MTBO-1602

L T P C

Course Name: Goods and Service Tax

4 0 0 4

Course objective: the main aim of this course is to provide students with the working knowledge of principles and provisions of GST to understand the relevance of GST in the present Indian tax in scenario and its contribution for economic development.

Course Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1: Connect with the genesis of goods and services tax (GST), decipher the constitutional amendment carried out to install GST in India. | Understand |
| CO2: Describe the meaning of supply under GST law, differentiate between intra-state and inter-state supply, comprehend rules related to the place of supply and compute the value of supply. | Understand |
| CO3: Discuss the utilization of input tax credit, and the reverse charge mechanism of paying GST and to know the procedure for claiming refund under GST law. | Apply |
| CO4: Explain the provisions for registration under GST along with Maintenance of accounts. | Apply |
| CO5: Explain the provisions for Valuation of GST. | Apply |

Course Contents:

Block1: Introduction to GST

Unit 1: Indirect Tax: Meaning, Features, Difference Between Direct And Indirect Tax, Types Of Indirect Tax Before GST, Shortcoming Of Indirect Tax System During Pre GST Era.

Unit 2: GST Meaning Advantages, Disadvantages Of Evaluation of GST,

Unit 3: Structure of GST, CGST, SGST, IGST UTGST, and Important Definition under GST Act.

Block 2: Concept of Supply

Unit 4: Time Of Supply: Meaning of Goods and Services, TOS under Reverse Charge Mechanism, Invoicing Provisions, Provisions Related With Change Changes In GST Rate.

Unit 5: Place Of Supply: POS Meaning, POS of Goods and Services, Intra state And Interstate Supply.

Unit 6: Value Of Supply: Meaning, Provisions Related With Determination Of Value Of Supply Of Goods And Services, Determination of GST Liability.

Block 3: Input Tax Credit & Payment of GST

Unit 7: Input Tax Credit ITC: Meaning of Utilization of ITC, Block Credit, Supply Not Eligible For ITC, Matching, Reversal And Reclaim of ITC.

Unit 8: Payment Under GST: Manner of Payment Of GST Liability, Concept Of Electronic, Cash Credit And Liability Ledger, Refund of Excess GST.

Block 4: Registration, Returns and Accounts and Assessment

Unit 9: Registration: Meaning Of Final Registration, Compulsory Registration, and Procedure For New Registration, Amendment And Cancellation Of Registration.

Unit 10: Accounts And Records: Manner Of Maintenance Of Accounts, Period Of Retention Of Relevant Records. **Invoice:** Format, Types Debit And Credit Note, Voucher

Unit 11: Return: Meaning, Purpose And Importance, Different Types Of Return, Due Date Of Filing Return,

Unit 12: Assessment Under GST:

Meaning, Types Sales Assessment, Provisional Assessment, Summary Assessment, Best Judgment Assessment..

Block 5: Valuations of Goods and Services Under GST and Audit under GST

Unit 13: Valuation under GST

Unit 14: Audit under GST Meaning, Types Mandatory, Departmental And Specific Audit, Penalty Under GST,

Unit 15: E -Way Bill, GST portal- Introduction, GST Eco-system, GST Suvidha Provider (GSP),

References:

1. Anandaday Mishra, GST Law & Procedure, Taxman.
2. Goods and Service Tax Acts.
3. Relevant Goods and Services Tax Rules. Nitya Tax Associates Basics of GST Taxman
4. Publication on GST by the Institute of Chartered Accountants of India (www.icai.org)
5. Publication on GST by the Central Board of Excise and Customs (www.cbec.org).

Course Code: MTBO-1603

L T P C

Course Name: Brand Management

4 0 0 4

Course Objective: To understand the methods of managing brands and strategies for brand Management.

| Course Outcome | cognitive level |
|--|------------------------|
| CO1: Define the main concepts and explain the purpose of branding. | Understand |
| CO2: Describe various terms, brand names and brand extensions. | Understand |
| CO3: Analyse process and methods of brand management. | Analyze |
| CO4: Describe brand loyalty and brand management. | Apply |
| CO5: Examine brand and consumer buying process. | Examine |

Block 1: Branding Concepts

Unit 1: Introduction to Brand; Brand and Branding Basics;

Unit 2: Relationship of Brands with Customers;

Unit 3: Building Successful Brands.

Block 2: Terms associated with Brands

Unit 4: Understanding Various Terms; Brand Names and Brand Extensions;

Unit 5: Co-Branding and Corporate Branding;

Unit 6: Brand Associations and Brand Image.

Block 3: Management of Brand

Unit 7: Brand Loyalty;

Unit 8: Brand Relationship; Brand Equity;

Unit 9: Brand Management

Block 4: Brand Processing

Unit 10: Brand Evolution;

Unit 11: Value of Brand;

Unit 12: Brand Planning and Brand Potential.

Block 5: Brand Selection

Unit 13: Brand and Consumer Buying Process; Consumer Search for Brand Information;

Unit 14: Issues associated with Effective Brand Name; Added Values Beyond Functionalism;

Unit 15: Brand Personality; Branding to make Tangible the Intangible.

References:

1. Branding Concepts and Process by Pati D, Publisher: Macmillan
2. Creating Powerful Brands by McDonald Malcolm and De Chernatony L, Publisher: Amazon.Co.UK
3. Brand Positioning by Subroto Sen Gupta, Publisher: Tata McGraw-Hill
4. Product Management in India by R. C. Majumdar, Publisher: Prentice-hall of India Pvt Ltd.

Course Code: MTBO-1604

L T P C

Course Name: Business Ethics and Corporate Governance

2 0 0 2

Course Objective:

The purpose of this course is to develop the understanding about the role of corporations in society and boards' role in keeping oversight on the functioning of the company, global developments in Governance and Corporate Citizenship.

Course Outcome: At the end of the course student would be able to:

| S. No. | Course Outcomes | Cognitive level |
|---------------|--|------------------------|
| 1 | Elaborate various concepts of Ethics, morals and values to Students. | Understand |
| 2 | Enumerate basic understanding of various ethical theories and approaches | Understand |
| 3 | Identify impact of corporate governance on Business | Apply |
| 4 | Examine role of various board committees, their composition and responsibilities. | Analyze |
| 5 | Visualize various ethical issues such as conflicts of interest and insider trading | Understand |

Course Contents:

Block I: Introduction

Unit 1: Introduction to Ethics, Morals & Values,

Unit 2: Ethical Theories and Approaches– Teleological, Deontological,

Unit 3: Virtue and system development theories;

Unit-4: Conflict between moral demands and interest and Ethics in work.

Block II: Ethics in Business

Unit 5: Ethical Aspects in Marketing, Finance, HRM; Global Business Ethics.

Unit 6: Meaning of corporate philanthropy, CSR-an overlapping concept, corporate sustainability reporting,

Unit 7: CSR through triple bottom line, CSR and business ethics,

Unit-8: CSR and corporate governance, environmental aspect of CSR, CSR models; drivers of CSR, global reporting initiatives.

Block III: Corporate Governance

Unit 9; Terminology: Company, corporate governance, promoter, shareholders, directors, managers, chairman, CEO, stakeholders;

Unit 10: Type of Directors: Insider and outsider, executive and non-executive, independent, nominee; Ownership and Control;

Unit-11: Theories and development of corporate governance; Models: Types and basis of adoption;

Unit 12: Principals of corporate governance; Implications of corporate scams; Global corporate

governance movement.

Block IV: Role Players

Unit 13: Role of Board of Directors; Role of board; Board composition, independence, and committees; Board leadership: Splitting chairman and CEO, CEO succession, lead director;

Unit 14: Board processes and meetings, Building professional Boards – Directors selection, executive compensation and stock option, directors’ training and competence, board diversity, board evaluation;

Unit 15: Boards oversight of CEO, Auditors, SEBI and Government; SEBI guidelines and clause 49; Growth of Corporate Governance in India.

Block V: Business Ethics and Corporate Governance

Unit 16: Introduction, Importance and need for Business Ethics in Indian Context,

Unit 17: Roots of unethical behaviour and issues,

Unit 18: Corporate governance ethics.

References:

1. Fernando A.C - Corporate Governance: Principles, Policies and Practices – Pearson
2. Murthy CSV – Business Ethics: Himalaya
3. Velasquez – Business Ethics: Concepts and cases – Pearson/PHI

Course Code: MDCO-1601

L T P C

Course Name: Business Research Methodology

3 0 0 3

Course Objective:

This course emphasizes the basic methodologies, as well as introduces a variety of techniques, and demonstrates how research applies to field of management.

Course Learning Outcome: After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|--|------------------------|
| CO1: Describe meaning, scope and process of research. | Understand |
| CO2: Familiarize with research terminologies and various types of research design. | Understand |
| CO3: Get an insight into various scaling techniques and sources of data collection. | Apply |
| CO4: Get acquainted with various techniques of data analysis and its implications. | Analyze |
| CO5: Create enhanced Report writing skills | Apply |

Block I: Research Formulation

Unit 1: Introduction, meaning of Business research,

Unit 2: Types; Role of research in important area of business and Process of Research;

Unit 3: Defining research Problems; Hypothesis Formulation.

Block II: Research Elaborated

Unit 4: Research Design- Exploratory;

Unit 5: Descriptive and Experimental; Research plan;

Unit 6: Concept of sample; various types of sampling techniques.

Block III: Data Collection

Unit 7: Methods of Data Collection:

Unit 8: Primary & Secondary,

Unit 9: Including Questionnaires & schedule), Scaling Techniques.

Block IV: Processing and analysis of Data

Unit 10: Processing- Editing , coding, Classification and tabulation of data

Unit 11: Analysis of Data by application of statistical tools and techniques;

Unit 12: Various kinds of charts and diagrams used in data analyses; Interpretation.

Block V: Hypothesis testing and Report Writing

Unit 13: Hypothesis, Concept, Need, Objectives of the hypotheses and types

Unit 14: Hypothesis testing

Unit 15: Report Writing

References:

1. Kothari CR- Research Methodology, New Age Publication
2. Panneerselvam R- Research Methodology (PHI)
3. Cooper, Donald, Schindler, Pamela- Business Research (TMH)
4. Bill Taylor, GautamSinha, TaposhGhoshal- Research Methodology (PHI)
5. Collis J and Hussey R - Business Research (Palgrave)

Semester VII

Course Code: MTBO-1701

L T P C

Course Name: International Trade

4 0 0 4

Course Objective:

The aim of the course is to build knowledge and understanding about International Trade among the student.

Course outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1 - Understand about different methods of international trade. | Understand |
| CO2 - Analyze international trade models and its impact. | Analyse |
| CO3 - Discuss about trade restrictions. | Explain |
| CO4 - Familiarize students with the international trade and development. | Understand |
| CO5 - Explain the significance of different forms of regional economic integration and to appreciate the role played by various international economic organisations. | Understand |

Course Contents:

Block I: - INTERNATIONAL TRADE AND ITS THEORIES

Unit-1- Overview of International Business: Introduction, Definition of International Business,

Unit 2- Difference between international and domestic business, Advantages and Disadvantages of International Business, Benefits and scope of International business,

Unit-3- International business trends in modern world and its impact on world economy.

Unit-4- Framework for analysing International business environment; Terminologies related to International business.

Block II- INTERNATIONAL TRADE MODELS AND ITS IMPACT.

Unit 5-Causes and Consequences of International Trade: Trade Based on Absolute Advantage.

Unit 6-Comparative Advantage and Opportunity Costs, The Standard Trade Model, Factor Endowments and the Heckscher-Ohlin Model,

Unit-7 Intra Industry Trade, Imperfect Competition and Increasing Returns to Scale as determinants of Trade and gains from trade, Effect of changes in tastes, per capita income and technology on Trade and gains from trade.

Block III- TRADE RESTRICTIONS

Unit-8-Trade Restrictions: Partial and General Equilibrium Analysis of a Tariff in a Small and a Large Country,

Unit-9-The Theory of Tariff Structure Non-Tariff Trade Barriers and Protectionism: Import

Quotas, Voluntary Export Restraints, Technical, Administrative, and Other Regulations, International Cartels,

Unit-10-Dumping, Export Subsidies, The Political Economy of Protectionism.

Block IV- INTERNATIONAL TRADE AND DEVELOPMENT

Unit-11-International Trade and Economic Development: The Importance of Trade to Development, The Terms of Trade and Economic Development,

Unit-12-Export Instability and Economic Development, Import Substitution versus Export Orientation, Current Problems Facing Developing Countries.

Block V- REGIONAL ECONOMIC INTEGRATION

Unit 13- Economic Integration: Preferential Trade Agreements, Free Trade Agreements, Customs Union (Trade-Creating and Trade-Diverting).

Unit-14-Common Market and Economic Union The EU, NAFTA, Mercosur and the FTAA, ASEAN and AFTA,

Unit-15- Regionalism and Multilateralism.

References: -

1. Markusen, Melvin, Kaempfer and Maskus, International Trade: Theory and Evidence, McGraw Hill.
2. Kenneth A. Reinert, An Introduction to International Economics: New Perspectives On The World Economy, Cambridge University Press, Supplementary Reading.
3. Krugman Paul R. and Obstfeld Maurice, International Economics, Pearson Education Salvatore Dominick, International Economics, Wiley India.

Course Code: MTBO-1702

L T P C

Course Title: Industrial Relations

4 0 0 4

Course Objective: To make students understand the various concepts of Industrial relations between Employer and Employee.

Course Outcomes: On Successful completion of the Course, Students will be able to:

| Course Outcome | Cognitive level |
|--|-----------------|
| CO1 - Explain the objectives of Industrial Relations and list the factors affecting IR. Justify the role of Trade Unions and employers association and examine the impact of Globalisation on Trade Union. | Understand |
| CO2 - Describe the concepts of Industrial Disputes, Strikes and Lockouts with reference to concerned Legislations. | Analyse |
| CO3 - Discuss the causes of Grievance, need for discipline and punitive measures for Indiscipline. | Explain |
| CO4 - Examine the need for Collective bargaining, Workers Participation in Management and the process involved. | Examine |
| CO5 - Describe the gender sensitization at work place and code of conduct | Understand |

Course Contents:

Block I: INDUSTRIAL RELATIONS

Unit 1 : Industrial Relation: Concept, Objectives, factors influencing IR;

Unit 2 : Trade Union: Meaning - Functions - Trade Union Movement in India – Problems of Trade Unions, Impact of Globalisation on Trade Unions –

Unit 3 : Employers Associations – Objectives of Employers organizations– National Level Associations.

Block II: INDUSTRIAL CONFLICTS & DISPUTES

Unit 4 : Meaning of Dispute – Types – Causes of Disputes – Preventive Measures –

Unit 5 : Strikes and lockouts – Types of Strikes – Measures for Prevention of Strikes –

Unit 6 : Machinery for Settlement of Industrial Disputes.

Block III: GRIEVANCES AND DISCIPLINE

Unit 7 : Meaning – Characteristics – Causes of grievance – Need for Grievance procedure –

Unit 8 : Pre requisites of grievance procedure – Grievance Interview – Open door policy – Grievance Procedure.

Unit 9 : Discipline – Meaning – objectives – Indiscipline – Red hot Stove rule - Causes of Indiscipline – Types of Punishment

Block IV: COLLECTIVE BARGAINING AND WORKERS PARTICIPATION IN MANAGEMENT

Unit 10 : Definition – Characteristics – Importance – Functions of Collective Bargaining – Forms of Collective Bargaining

Unit 11 : Collective Bargaining Process – Conditions for Success of Collective Bargaining;

Unit 12 : Workers Participation in Management (WPM) - Meaning – Objectives of WPM – Forms of WPM.

Block V: GENDER SENSITIZATION AND CODE OF CONDUCT

Unit 13 : Workplace – Gender Sensitization, Rights of Worker,

Unit 14 : Mechanism to address Gender -Based Grievances and Issues Code of Conduct for Workers relating to Professional Ethics,

Unit 15 : Workers Responsibility

References:

1. Dale Yoder ,Personnel Management and Industrial Relations
2. P. SubbaRao, Essentials of Human Resource Management and Industrial Relations , Himalaya Publishers
3. T.N.Bhagoliwal ,Personnel Management and Industrial Relations , Tata McGraw Hill.
4. N.K.Sahni&YogeshKumar, Personal Management and Industrial Relations, Kalyani Publishers
5. Davar ,Personnel Management and Industrial Relations , Vikas Publishers
6. Mamoria ,Mamoria&Gankar, Dynamics Of Industrial Relation

Course Code: MTBO-1703

L T P C

Course Title: Project Management

4 0 0 4

Course objectives:

Students will be able to understand the characteristics of Project and Project Management Knowledge.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|--|-----------------|
| CO1: Understand the characteristics of Project and Project Management Knowledge. | Understand |
| CO2: Understand the managerial process along with tools & techniques used in Project management Knowledge. | Understand |
| CO3: Understand the scheduling and monitoring process in Project. They will be able to apply PERT and CPM method for project scheduling. | Apply |
| CO4: Understand the concept of Monitoring and Control in project. | Understand |
| CO5: Explain role of total Quality management in Projects. | Explain |

Course Contents:

BLOCK-I Introduction

Unit-1- Introduction to project and projects; Characteristics and types of projects; Gaining importance.

Unit-2- Project life cycle and its phases. Project selection, non-quantitative and scoring models,

Unit-3- Technical analysis and technology selection, market potential analysis and techniques of long-term forecasting.

BLOCK-II Financial feasibility

Unit4-Financial feasibility, determinants of cost of project, its financing and deciding optimum capital structure. Cash flows from project and owner's perspective.

Unit-5- Project Appraisal. Financial feasibility with risk. Types of risk, techniques of risk evaluation and its mitigation.

Unit-6- Sensitivity analysis, Hiller's model, scenario analysis, simulation.

BLOCK-III Network analysis

UNIT-7-Network analysis, construction of networks, CPM, various types of floats and their application, PERT and its applications.

UNIT-8-Time cost relationship, crashing for optimum cost and optimum time. Resource leveling.

BLOCK-4 – Monitoring and Control

UNIT_9-Monitoring and Control: Planning- Monitoring and Control Cycle. Project Management Information System. Milestone Analysis and Tracking Gantt chart.

UNIT-10-Earned Value Analysis (EVA): Planned Value (PV), Earned Value (EV), Cost Variance (CV), Schedule Variance (SV), Cost performance Index (CPI), Schedule performance Index (SPI).
Project Termination: Types of Terminations, Project Termination Process.

BLOCK-V – TQM IN PROJECTS

UNIT-11-TQM; History or Origin of TQM, Primary principles of TQM; Introduction Of total Quality management in Projects.

Unit-12-Introduction Inventory Control of project; Taxes & govt policies for projects.

Unit-13-Conflict and Negotiation, The Nature and Type of Negotiation,

Unit-14- Project Review and Administrative Aspects.

Unit-15- Terminologies related to project management.

Refernces:

1. Project Management- A Managerial Approach: Jack R. Meredith Broyhill Samuel J. Mantel, Jr (John Wiley & Sons)
2. Project Management : Mr. Sanjiv Marwah- (Wiley Dreamtech)
3. Project- Preparation, Appraisal, Budgeting and Implementation: Chandra Prasanna - (TMH)
4. Project Management Core Text Book : M R Gopalan (Wiley)

Course Code: MTBO-1704

L T P C

Course Title: Strategic Management

4 0 0 4

Course Objective:

The aim of the course is to build knowledge and understanding about Strategic Management among the student.

Course outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|-----------------|
| CO1 - Identify the Nature & importance of process and levels of strategy. | Apply |
| CO2 – Explain strategic business environment and its models. | Analyze |
| CO3 - Analyze strategic tools and techniques. | Evaluate |
| CO4 - Describe strategic organisation structure. | Analyse |
| CO5 - Evaluate the strategic performance, evaluation techniques. | Evaluate |

Contents:

BLOCK-1 INTRODUCTON, PROCESS AND LEVELS OF STRATEGY

Unit-1- Strategy-Introduction, Definition, Meaning.

Unit 2- Strategy- Objectives, Goals, Policies, Program, Budget.

Unit 3- Strategic management process, Levels of strategy

BLOCK-2 STRATEGIC BUSINESS ENVIRONMENT AND ITS MODELS

Unit-4- Identifying strategic alternatives of business; Environmental appraisal – Internal environment;

Unit-5- Key Success Factors; Role of Resources, Capabilities and Core Competencies;

Unit-6- Competitive Advantage to Competitive Strategies; VRIO Model, External environmental analysis – PESTEL.

BLOCK-3 STRATEGIC TOOLS AND TECHNIQUES

Unit-7- Concept of Value Chain, SWOT Analysis; Tools and Techniques for Strategic Analysis – TOWS Matrix;

Unit-8- Generic Strategies; Competitive Strategies - Porter's 5 Forces Model; The Experience Curve, Grand Strategy, BCG Matrix;

Unit-9- Functional Strategies, Global entry strategies.

BLOCK-4 STRATEGIC ORGANISATION STRUCTURE

Unit-10- Organization Structure; Resource Allocation; Projects and Procedural issues.

Unit 11- Integration of Functional Plans. Leadership and corporate culture;

Unit 12- Evaluation and Control: Organizational Systems.

BLOCK-5 STRATEGIC PERFORMANCE, EVALUATION TECHNIQUES

UNIT-13: - Techniques of Strategic Evaluation.

UNIT-14:- Control techniques of Performance and Feedback.

References:

1. Lawrence, R. Jauch and William F. Glueck; Strategic Management and Business Policy, - McGraw – Hill
2. Wheelen & Hunger, Concepts in Strategic Management and Business Policy, 12th edition, Pearson Education
3. Kazmi, Azhar, (2008), Strategic Management and Business Policy, 3rd Edition, McGraw Hill Education.
4. R. Srinivasan, Strategic Management the Indian context, Prentice Hall of India
5. Tripathi, Vanita and Pawar, Neeti (2019), *Investing in Stock Market*, Taxmann Publications.

Course Code: MTBO-1705

L T P C

Course Name: E-Commerce

4 0 0 4

Course Objective

To enhance skills for effective and contemporary applications of E-commerce.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1: Describe the basics of E-commerce, current and emerging business models. | Understand |
| CO2: Familiarize with basic business operations such as sales, marketing, HR etc. on the web. | Understand |
| CO3: Enhance the students' skills for designing and developing website. | Apply |
| CO4: Identify the emerging modes of e-payment. | Analyze |
| CO5: Discuss the importance of security, privacy, ethical and legal issues of e-commerce. | Apply |

Contents:

Block I: Introduction to E-Commerce

Unit 1: Electronic commerce: Definitions and Concepts, EC Framework and EC Classification,

Unit 2: EC Business Models, Benefits and Limitations of EC E Marketplace, Types of E Marketplace, Intermediation in E-Commerce, EC Market Mechanisms – Electronic Catalog and Auctions,

Unit 3: Impact of EC on Business Processes and Organizations

Block II: E-Retailing and B2B E-Commerce

Unit 4: Internet Marketing and Electronic Retailing, E-Tailing Business Models, Problems and Issues in E-Tailing,

Unit 5: Web Advertising, Advertising Methods, Advertising Strategies

Unit 6: B2B E-Commerce: Concepts, Characteristics and Models One to Many: Sell Side E Marketplaces, Selling via Intermediaries, Selling via Auctions,

Unit 7: One From Many: Buy side Marketplace, Reverse Auctions

Block III: E-Commerce Security

Unit 8: E-Commerce Security: Need for Security, Security is everyone's business, basic security issues,

Unit 9: Types of threats and attacks, Managing EC Security

Unit 10: Securing EC Communications, , Securing EC Networks

Block IV: Electronic Payments Systems

Unit 11: Electronic Payments Systems: Payment Revolution, Using Payment Cards Online, Smart Cards, Stored Value Cards,

Unit 12: E-Micropayments, E Checking, Electronic Bill Presentment and Payment,

Unit 13: B2B Electronic Payments

Block V: Mobile Commerce

Unit 14: Mobile Commerce: Mobile Computing, Mobile Commerce, Pervasive Computing Legal,

Unit 15: Ethical and Social Impacts of EC: Legal Issues versus Ethical Issues, Privacy, Intellectual Property Rights,

Unit 16: EC Fraud and Consumer and Seller Protection

References:

1. Pt Joseph Of E-Commerce Are Indian Perspective Php Learning Private Limited
2. Nidhi Dhawan Introduction To E-Commerce International Book House Private Limited
3. Agarwal Kamlesh And And Agarwal Diksha Bridge To The Online To A Front
New Delhi India Macmillan India (Hindi and English)
4. Manali- Danielle Internet And Internet Engineering Tata Mcgraw-Hill NewDelhi
5. Pandey- Concept Of E-Commerce, S.K. Kataria And Sons(Hindi and English)

Semester VIII

Course Code: MTBO-1801

L T P C

Course Name: Digital Marketing

4 0 0 4

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|------------------------|
| CO1 - Describe the concept, scope, and importance of digitalmarketing. | Understand |
| CO2 – Describe how marketers think, conceptualize, test continuously to optimise their product search on digital platforms. | Understand |
| CO3 - Illustrate how the effectiveness of a digital marketingcampaign can be measured | Understand |
| CO4 - Demonstrate their skills in digital marketing tools such asSEO, Social media, and Blogging for engaging the digital generation. | Understand |
| CO5 - Appreciate the need for regulatory framework for digital marketing in India. | Evaluate |

Block I: Introduction

Unit 1: Concept, scope, and importance of digital marketing.

Unit 2: Traditional marketing versus digital marketing.

Unit 3: Challenges and opportunities for digital marketing. Digital penetration in the Indianmarket.
Digital marketing landscape: an overview.

Block II: Digital Marketing Management

Unit 4: Digital-marketing mix. Segmentation, Targeting, Differentiation, and Positioning:
Concept,levels, and strategies in a digital environment.

Unit 5: Digital technology and customer-relationship management.

Unit 6: Digital consumers and their buying decision process.

Block III: Digital Marketing Presence

Unit 7: Concept and role of Internet in marketing. Online marketing domains.

Unit 8: The P.O.E.S-M framework. Website design and Domain name branding.
Search engineoptimization: stages, types of traffic, tactics.

Unit 9: Online advertising: types, formats, requisites of a good online advertisement. Buying models. Online public relation management. Direct marketing: scope and growth. E-mail marketing: types andstrategies.

Block IV: Interactive Marketing

Unit 10: Interactive marketing: concept and options. Social media marketing: concept and tools.

Unit 11: Online communities and social networks. Blogging: types and role.

Unit 12: Video marketing: tools and techniques. Mobile marketing tools. PPC marketing.
Paymentoptions.

Block V: Ethical and Legal Issues

Unit 13: Ethical issues and legal challenges in digital marketing.

Unit 14: Regulatory framework for digital marketing in India.

Unit 15: Contemporary Discussion in classroom.

References:

1. Chaffey, D, F.E. Chadwick, R. Mayer, and K. Johnston (2015). Internet Marketing: Strategy, Implementation and Practice. Pearson India

Course Code: MTBO-1802

L T P C

Course Name: Customer Relationship Management

4 0 0 4

Course Objective

An understanding of the ways the firm can create and enhance the sources of value to the customer service. To understand strategic frame work of CRM and Impact of CRM on customer experience, satisfaction and loyalty, to understand recent development in usage of CRM.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|--|-----------------|
| CO1. Describe the concept of Customer Relationship Management (CRM) and types and various strategies of Customer viewpoint | Understand |
| CO2. Measure the customer satisfaction and loyalty in terms of CRM. | Examine |
| CO3. Identify the path of Marketing services and its technological implementation of CRM | Understand |
| CO4. Explain the feature of E-CRM and Enterprise Marketing Automation tools for augmentation of business | Understand |
| CO5. Describe the insights of Customer Relationship Management (CRM) and its implementation. | Understand |

Course content:

BLOCK I: Introduction to CRM

Unit 1: CRM concepts: Theoretical perspectives of relationship -CRM Definitions –

Unit 2: Components of CRM - Stakeholders in CRM -Significance of CRM

Unit 3: Types of CRM – strategies of CRM - customer life style and customer interaction.

BLOCK II: Customer Satisfaction

Unit 4: Customer Satisfaction Significance - Components of Customer Satisfaction

Unit 5: Customer Satisfaction Models - Rationale of Customer Satisfaction and measurement

Unit 6: Customer Loyalty - Customer Loyalty Ladder - -Benefits of Customer Loyalty -Dimensions of Customer Loyalty - Determinants of Customer Loyalty - Drivers of Customer Loyalty.

BLOCK III: CRM in Marketing

Unit 7: CRM in Marketing: One-to-one Relationship Marketing - Cross Selling & Up Selling - Customer Retention - Behaviour Prediction

Unit 8: Customer Profitability & Value Modeling , Channel Optimization

Unit 9: CRM and Customer Service: The Call Centre - customer interaction, the functionality, technological implementation, what is ACD (Automatic Call Distribution), IVR (Interactive Voice Response), CTI (Computer Telephony Integration)

BLOCK IV: E-CRM

Unit 10: Features of e-CRM, Advantages of e-CRM, Technologies of e-CRM

Unit 11: Sales Force Automation (SFA) – need and barrier of (SFA) - Field Force Automation

Unit 12: Enterprise Marketing Automation (EMA) Components of EMA, marketing campaign, campaign planning and management, business analytic tools, EMA components (promotions, events loyalty and retention programs), response management.

BLOCK V: Implementation of CRM

Unit 13: CRM Implementation – A comprehensive model –

Unit 14: Developing CRM vision and strategy Management support -Pre-implementation - kick off meeting - requirements gathering - prototyping and detailed proposal generation –

Unit 15: Development of customization - system optimization - follow up.

References:

1. Alok Kumar Rai, CUSTOMER RELATIONSHIP MANAGEMENT CONCEPT & CASES, Prentice Hall of India Private Limited, New Delhi. 2011
2. S. Shanmugasundaram, CUSTOMER RELATIONSHIP MANAGEMENT, Prentice Hall of India Private Limited, New Delhi, 2008
3. Kaushik Mukherjee, CUSTOMER RELATIONSHIP MANAGEMENT, Prentice Hall of India Private Limited, New Delhi, 2008
4. Jagdish Seth, et al, CUSTOMER RELATIONSHIP MANAGEMENT
5. V. Kumar & Werner J., CUSTOMER RELATIONSHIP MANAGEMENT, Willey India, 2008

Course Code: MTBO-1803

L T P C

Course Name: Supply Chain Management

4 0 0 4

This syllabus provides a structured approach to learning supply chain management, incorporating theoretical knowledge, practical applications, and real-world case studies to prepare students for careers in this dynamic field.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive Level |
|---|-----------------|
| CO1 - Develop a sound understanding of the important role of supply chain management in today's business environment. | Understand |
| CO2 - Become familiar with Strategic issues in Supply Chain. | Understand |
| CO3 - Develop a sound understanding about role of procurement in Supply Chain Management. | Apply |
| CO4 – Understand about production and operations management. | Understand |
| CO5 - Develop a sound understanding about logistics and distribution management. | Understand |

Course Contents:

BLOCK I: Introduction to Supply Chain Management

UNIT-1- Definition and Importance of Supply Chain Management; Components of a Supply Chain.

UNIT-2-Supply Chain Objectives and Performance Measures, Key Flows in Supply Chains:
Information, Product, and Financial

UNIT-3- Historical Evolution of Supply Chain Management

BLOCK II: Supply Chain Strategy and Design

UNIT-4- Supply Chain Strategy and Competitive Advantage; Designing the Supply Chain Network.

UNIT-5- Supply Chain Drivers and Metrics, Aligning Supply Chain Strategies with Business Strategies

UNIT-6- Case Studies of Strategic Supply Chain Designs

BLOCK III: Procurement and Supply Management

UNIT-7- Role of Procurement in Supply Chain Management; Strategic Sourcing and Supplier Selection

UNIT-8- Procurement Processes and Technologies; Contract Management and Negotiation Techniques

UNIT-9- Supplier Relationship Management

BLOCK IV: Production and Operations Management

UNIT-10-Production Planning and Control, Lean Manufacturing and Just-In-Time (JIT) ,

UNIT-11-Inventory Management and Optimization; Quality Management in the Supply Chain

UNIT-12- Case Studies in Production and Operations Management

BLOCK V: Logistics and Distribution Management

UNIT-13- Role of Logistics in Supply Chain Management; Transportation Management and Optimization

UNIT-14- Warehousing and Distribution Center Management

UNIT-15- Global Logistics and International Trade; Technology in Logistics: RFID, GPS, and WMS

References:

1. Rushton, A., Croucher,P.and Peter Baker): Handbook of Logistics and Distribution Management, Kogan Page Pub
2. Christopher Martin: Logistics and Supply Chain Management, Creating Value-adding Networks, Pearson Education
- 3.Chopra Sunil and Peter Meindl: Supply Chain Management, Pearson Education

Course Code: MTBO-1804

L T P C

Course Name: Compensation Management

4 0 0 4

This syllabus provides a comprehensive understanding of compensation management, covering key concepts such as job analysis, job evaluation, wage administration, performance management, and employee benefits. It equips BBA students with the knowledge and skills necessary to effectively manage compensation systems in organizations.

Course Learning Outcomes

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1: Acquaint with importance of compensation in organizations. | Understand |
| CO2: Explain methods of job analysis. | Understand |
| CO3: Describe the various principles involved and premise of the grant of bonus, wages, and minimum wages to workers. | Understand |
| CO4: Explain performance management and compensation. | Analyze |
| CO5: know various employee benefits and compensation | Apply |

Course Contents:

BLOCK I: Introduction to Compensation Management

UNIT-1-Overview of compensation management, Importance of compensation in organizations, Objectives of compensation management

UNIT-2- Historical perspective and evolution of compensation management

UNIT-3- Current trends and challenges in compensation management

BLOCK II: Job Analysis and Job Evaluation

UNIT-4- Concept and importance of job analysis; Methods of job analysis: observation, interviews, questionnaires, and job analysis forms

UNIT-5- Job description and job specification

UNIT-6- Concept and purpose of job evaluation; Techniques of job evaluation: ranking method, classification method, point method, and factor comparison method

BLOCK III: Wage and Salary Administration

UNIT-7- Principles of wage and salary administration; Factors influencing wage determination

UNIT-8- Wage structure: basic wage, allowances, and benefits

UNIT-9- Wage payment systems: time-based, performance-based, and incentive-based; Laws and regulations governing wage and salary administration.

BLOCK IV: Performance Management and Compensation

UNIT-10- Performance management process: goal setting, performance appraisal, feedback, and development planning; Performance appraisal methods: graphic rating scale, behaviorally anchored rating scale (BARS), and management by objectives (MBO)

UNIT-11- Link between performance management and compensation; Designing and implementing performance-based compensation systems

UNIT-12- Ethical considerations in performance management and compensation

BLOCK V: Employee Benefits and Compensation

UNIT-13- Overview of employee benefits; Types of employee benefits: health insurance, retirement plans, paid time off, and other fringe benefits

UNIT-14- Legal and regulatory framework governing employee benefits; Designing and managing employee benefit programs

UNIT-15- Cost-benefit analysis of employee benefits.

References:

1. Armstrong, M. And Murlis, H. *Reward Management*. Kogan Page.
2. Chhabra T. N. and Rastogi, S. *Compensation Management*. Sun India
3. Dunn, J. D. and Stephens, E. C. *Management of Personnel*. McGraw, NY
4. Dwivedi, R.S. *Managing Human Resources*. Galgotias publishing house.

Course Code: MTBO-1805

L T P C

Course Name: Investing In Stock Markets

4 0 0 4

Course Objective

To equip students with the basic skills required to operate in stock market.

Course Learning Outcomes

After completing the course, the student shall be able to:

| Course Outcome | Cognitive level |
|---|-----------------|
| CO1: Learn the basics of investing in stock market, the investment environment as well as risk & return | Understand |
| CO2: Analyze Indian securities market including the derivatives market | Analyze |
| CO3: Examine EIC framework and conduct fundamental analysis | Apply |
| CO4: Discuss technical analysis. | Analyze |
| CO5: Learn investing in mutual funds market | Apply |

Contents:

Block 1: Basics of Investing

Unit 1: Basics of Investment, objectives and types on investment.

Unit 2: Investment Environment. Risk and Return,

Unit 3: Instruments of Investment - Equity shares, Preference shares, Bonds and Debentures.

Block II: Indian Security Markets

Unit 4: Primary Markets (IPO, FPO, Private placement, Offer for sale),

Unit 5: Secondary Markets (cash market and derivative market)

Unit 6: Components of derivative market, Futures and Options and its types.

Block III: Market Participants

Unit 7: Different types of brokers: Stock Broker, Investor, Depositories,

Unit 8: Clearing House, Stock Exchanges. Role of stock exchange,

Unit 9: Stock exchanges in India: BSE, NSE, MCX. Security Market Indices: Nifty & Sensex,

Block IV: Financial Informations:

Unit 10: Sources of financial information. Trading in securities: types of orders, using brokerage and analyst recommendations.

Unit 11: Trading mechanism in security market, online trading.

Unit 12: Do's & Don'ts of investing in markets.

Block V: Investing in Mutual Funds

Unit 13: Concept and background on Mutual Funds: Advantages, Disadvantages of investing in Mutual Funds,

Unit 14: Types of Mutual funds: Open ended, close ended, equity, debt, hybrid, money market, and entry load vs. exit load funds.

Unit 15: Factors affecting choice of mutual funds. CRISIL mutual fund ranking and its usage, calculation and use of Net Asset Value.

References:

- Kumar, Vinod and Nangia, Raj Sethi, *Investing in Stock Markets*, Ane books
- Singh J K , Singh Amit Kumar, *Investing in Stock Markets*, A K Publications, Delhi.

Faculty and Support Staff

The University has identified the dedicated requisite faculty and support staff as mandated by the UGC and they are allocated the positions exclusively for OL mode. The course material prepared by the CDOE faculty is at par with the regulations 2020.

List of Faculty associated with BBA (Hons.) program is as follows:-

| S. No. | Name of Faculty | Designation | Nature of Appointment | Qual | Subject |
|--------|----------------------|---------------------|-----------------------|------|------------|
| 1 | Dr. Anupama Verma | Associate Professor | Full-Time | Ph.D | Management |
| 2 | Dr. Meenakshi Kumari | Assistant Professor | Full-Time | Ph.D | Management |

Delivery Mechanism

The OL of UMU follows a modern ICT (Information & Communication Technology) enabled approach for instruction. The methodology of instruction in OL of UMU is different from that of the conventional/regular programs. Our OL system is more learner-oriented and the learner is an active participant in the teaching-learning process. OL of UMU academic delivery system comprises:

A. Print Material

The printed material of the programme supplied to the students will be unit wise for every course.

B. Counselling Sessions

There will be 6 counselling/ contact classes in face to face mode of two hours each for a course of 4 credits. The counselling sessions / face to face contact classes will be held on the campus of the University on Saturdays and Sundays.

C. Medium of Instruction

Medium of Course Instruction: English

Medium of Examination: English

D. Student Support Systems

Universities study Centers or Learner Support Centre shall be headed by a coordinator, not below the rank of Assistant professor and shall be augmented with academic and non-academic staff depending on the learner.

The university has made appropriate arrangements for various support services including counselling schedule and resource-oriented-services evaluation methods and dates both on and off line modes for easy and smooth services to the students through distance mode.

At present the university has only one study center in the campus. The institution is not promoting any study centers outside the campus. All student support services will be provided to the student through a single window method/mode onsite and online.

F. Procedure for Admissions, Curriculum, Transaction and Evaluation Admission Process

Admission to the BBA (Hons.) programme will be done on the basis of screening of candidate's eligibility on first come first serve basis. Admission shall not be a right to the students and UMU, CDOE shall retain the right to cancel any admission at any point of time if any irregularity is found in the admission process, eligibility etc.

Maximum Duration-

- A. The maximum duration of the BBA (Hons.) Programme is eight years. Thereafter, students seeking completion of the left-over course(s) will be required to seek fresh admission.
- B. The student can complete his programme within a period of 8 years failing which he/she shall seek fresh admission to complete the programme.

Eligibility

10+2 in any stream from any recognized board.

Fee Structure

| Name of the Program | Degree | Duration | Year | Program Fee/Year | Exam Fee/Year | Total (in Rs.) |
|---|--------|--------------|------|------------------|---------------|----------------|
| Bachelor of Business Administration (Honours) | UG | 4 to 8 Years | 1 | 13500 | 2000 | 15500 |
| BBA(Hons.) | | | 2 | 12000 | 2000 | 14000 |
| | | | 3 | 12000 | 2000 | 14000 |
| | | | 4 | 12000 | 2000 | 14000 |
| Total | | | | | | 57500 |

Activity Schedule

| S.NO. | Name of the Activity | Tentative months schedule(specify months) during year | | | |
|-------|---|---|------------|--------------|------------|
| | | From(Month) | To (Month) | From(Month) | To (Month) |
| 1 | Admission | Jul | Sep | Jan | Mar |
| 2 | Assignment submission (if any) | Sep | Oct | Mar | Apr |
| 3 | Evaluation of Assignment | Oct | Nov | Apr | May |
| 4 | Examination | Dec | Dec | Jun | Jun |
| 5 | Declaration of Result | Jan | Jan | Jul | Jul |
| 6 | Re-registration | Jul | Jul | Jan | Jan |
| 7 | Distribution of SLM | Jul | Sep | Jan | Mar |
| 8 | Contact Programmes (counselling, Practical's. etc.) | Sep | Nov | Mar | May |

Credit System

UMU, CDOE proposes to follow the 'Credit System' for most of its programs. Each credit amounts to 30 hours of study comprising all learning activities. Thus, a 8 credit course requires 240 hours, 6 credit course requires 180 hours , 4 credit course requires 120 hours and 2 credit course requires 60 hours of study. This helps the student to understand the academic effort to complete a course. Completion of an academic programme requires successful clearing of both, the assignments and the term-end examination of each course in a programme.

| Duration of the Programme | Credits | Name of the Programme | Level of the Programme |
|---------------------------|---------|-----------------------|------------------------|
| 4 Yrs. | 160 | BBA (Hons.) | Bachelor's Degree |

Assignments

Distance Education learners have to depend much on self-study. In order to ascertain the writing skill and level of comprehension of the learner, assignment work is compulsory for all learners. Each assignment shall consist of a number of questions, case studies and practical related tasks. The Assignment Question Papers will be uploaded to the website within a scheduled time and the learners shall be required to respond them within a specified period of time. The response of the learner is examined by a faculty member.

Evaluation: The evaluation system of the programme is based on two components:

- A. Continuous Evaluation in the form of assignments (weightage 30%):** This Component carries a weightage of 30%. There will be at least one graded assignment and test per course. These assignments are to be submitted to the Co-ordinator of the CDOE/Study Centre to which the student is assigned or attached with.
- B. Term-end examination (weightage 70%):** This will be held twice every year in the months of June and December. The students are at liberty to appear in any of the examinations conducted by the University during the year. A student will be allowed to appear in the Term-End Examination only after she/he has registered for that course and submitted the assignment. For appearing in the Examination, every student has to submit an Examination form through online (www.umu.ac.in) or offline before the due dates as given in the schedule of operations. If a student misses any term-end examination of a course for any reason, s/he may appear for any of them or all the courses subject to the maximum of 8 courses in the subsequent term-end examinations. This facility will be available until a student secures the minimum pass grade in the courses but up to a maximum period of four semesters, since the date of registration of the course is valid for four semesters. Beyond this period s/he may continue for another four semesters by getting Re-registration by paying fee again. In that case, the score of qualified assignments and/or term-end examination will be retained and the student will be required to complete the left out requirements of such re-registered courses. Minimum requirement for passing a course will be 40% marks.

G. Laboratory Support and Library Resources

The library of Usha Martin University, Ranchi (UMU) aims to empower the teaching mission and intellectual culture of the community through availability through an organized collection of information as well as instruction in its access, relevance and evaluation.

The University Library enriches advance learning and discovery by providing access to a broad array of resources for education, research and creative work to ensure the rich interchange of ideas in the pursuit of knowledge.

Centre for Distance and Online Education of Usha Martin University, Ranchi (UMU) has initiated the process of setting up a dedicated Library for OL program and acquiring printed books and e-books for this purpose. The required International and National subject journals are also provided. We already have annual journal subscriptions and the capacity can be enlarged at later stages as the University lines up with more online journals.

The collection of the Library is rich and diverse especially in terms of the breadth and depth of coverage. Collection encompasses subjects in Management, Commerce, Information Technology, Computer Applications, and other allied areas. This collection further includes Books, Research Journals, Project Reports/Dissertations and online Journals.

The University has well equipped Computer Laboratories, Lecture Capturing Systems, Audio Video facilities, ICT enabled class rooms, Wi-Fi facilities etc.

H. Cost Estimate of the Programme and the Provisions

Initial expenses have been done by the University in terms of provision of infrastructure, manpower, printing of self study material and other. The University intends to allocate expenses out of the total fee collection as per following details:

| | | |
|---|---|-----|
| a) SLM Development and Distribution | : | 20% |
| b) Postal Expense | : | 10% |
| c) Salary and other Administrative expenses | : | 60% |
| d) Future development | : | 10% |

Once programmes are operational, fee receipt from the programmes budget to be planed as per the guidelines of University Grants Commission.

I. Quality Assurance

The University has established the Centre for Internal Quality Assurance (CIQA) in the University campus. The CIQA will monitor and maintain the quality of the OL programmes. It has the following objectives in making the compliances of quality implementations.

Objectives

The objective of Centre for Internal Quality Assurance is to develop and put in place a comprehensive and dynamic internal quality assurance system to ensure that programmes of higher education in the Online Learning mode and Online mode being implemented by the Higher Educational Institution are of acceptable quality and further improved on continuous basis.

Functions of CIQA

The functions of Centre for Internal Quality Assurance would be following

- 1) To maintain quality in the services provided to the learners.
- 2) To undertake self-evaluative and reflective exercises for continual quality improvement in all the systems and processes of the Higher Educational Institution.
- 3) To contribute in the identification of the key areas in which Higher Educational Institution should maintain quality.
- 4) To devise mechanism to ensure that the quality of Online Learning programmes and Online programmes matches with the quality of relevant programmes in conventional mode.
- 5) To devise mechanisms for interaction with and obtaining feedback from all stakeholders namely, learners, teachers, staff, parents, society, employers, and Government for quality improvement.
- 6) To suggest measures to the authorities of Higher Educational Institution for qualitative improvement.
- 7) To facilitate the implementation of its recommendations through periodic reviews.
- 8) To organize workshops/ seminars/ symposium on quality related themes, ensure participation of all stakeholders, and disseminate the reports of such activities among all the stakeholders in Higher Educational Institution.
- 9) To develop and collate best practices in all areas leading to quality enhancement in services to the learners and disseminate the same all concerned in Higher Educational Institution.
- 10) To collect, collate and disseminate accurate, complete and reliable statistics about the quality of the programme (s).
- 11) To ensure that Programme Project Report for each programme is according to the norms and guidelines prescribed by the Commission and wherever necessary by the appropriate regulatory authority having control over the programme.

- 12) To put in place a mechanism to ensure the proper implementation of Programme Project Reports.
- 13) To maintain a record of Annual Plans and Annual Reports of Higher Educational Institution, review them periodically and generate actionable reports.
- 14) To provide inputs to the Higher Educational Institution for restructuring of programmes in order to make them relevant to the job market.
- 15) To facilitate system based research on ways of creating learner centric environment and bringing about qualitative change in the entire system.
- 16) To act as a nodal coordinating unit for seeking assessment and accreditation from a designated body for accreditation such as NAAC etc.
- 17) To adopt measures to ensure internalization and institutionalization of quality enhancement practices through periodic accreditation and audit.
- 18) To coordinate between Higher Educational Institution and the Commission for various quality related initiatives or guidelines.
- 19) To obtain information from other Higher Educational Institutions on various quality benchmarks or parameters and best practices.
- 20) To record activities undertaken on quality assurance in the form of an annual report of Centre for Internal Quality Assurance.
- 21) It will be mandatory for Centre for Internal Quality Assurance to submit Annual Reports to the Statutory Authorities or Bodies of the Higher Educational Institution about its activities at the end of each academic session. A copy of report in the format as specified by the Commission, duly approved by the statutory authorities of the Higher Educational Institution shall be submitted annually to the Commission.

After enrolling in the 4-year B.B.A. (Hons.) Programme at Usha Martin University, Ranchi (UMU) in online mode, students will develop leadership abilities and the capacity to collaborate effectively in team environments. Upon successful completion of the programme, students will be equipped to participate in business decision-making processes and contribute strategically to their professional ventures, fostering innovation and synergy in organizational settings.



Registrar
कुल सचिव
Usha Martin University
उषा मार्टिन विश्वविद्यालय
Ranchi-835103/रांची-835103

USHA MARTIN UNIVERSITY, RANCHI
CENTRE FOR DISTANCE AND ONLINE EDUCATION



PROGRAMME PROJECT REPORT
MASTER OF COMPUTER APPLICATION (MCA)
2025–26

[Handwritten signature]

Registrar
कुल सचिव
Usha Martin University
उषा मार्टिन विश्वविद्यालय
Ranchi-835103/रांची-835103

Introduction

The Master of Computer Applications (MCA) Programme is a transformative educational offering that combines the flexibility of virtual learning with the rigor of a comprehensive curriculum. It has been designed to meet the needs of students and professionals in today's fast-paced digital age, the MCA Online Learning (OL) Programme offers unparalleled opportunities for academic excellence and career advancement, making it an invaluable pathway to success in the dynamic world of computer science and information technology. In an era where digital transformation is reshaping industries and redefining professional landscapes, the MCA Online Learning (OL) Programme stands as a beacon of accessibility, innovation, and excellence. It allows students to pursue advanced education without geographical or temporal constraints, ensuring that learners from diverse backgrounds can acquire critical skills and knowledge.

The online format of the program offers the following key advantages like flexibility in learning, where learners can balance their academic pursuits with personal and professional responsibilities, accessing high-quality education anytime, anywhere. It also enhances accessibility by catering students from remote and underserved regions, ensuring inclusivity.

The MCA Online Learning (OL) Programme has been designed to maintain the same level of academic rigor and depth as its traditional counterpart. With a curriculum curated by academic experts and industry professionals, the programme ensures that students gain a robust understanding of core subjects such as software development, database systems, computer networks, cybersecurity, artificial intelligence, and emerging technologies. It also supports customized learning methods like online resources, interactive content, and personalized support which provide a tailored learning experience to meet individual needs. The MCA Online Learning (OL) Programme is crafted to align with current industry demands and future trends, ensuring that students are equipped to excel in competitive job markets. The programme offers opportunities to engage in practical projects, simulations, and industry collaborations that reflect real-world challenges. It also focuses on critical areas such as cloud computing, data analytics, machine learning, and cybersecurity, which are highly sought after by employers. The programme provides guidance on professional development to ensure career readiness as well as internship opportunities with leading companies which enable students to gain valuable practical experience and insights into industry best practices.

With a commitment to diversity and inclusion, the MCA Online Learning (OL) Programme connects students from anywhere on the globe, creating a vibrant community of learners. This global network not only enhances the learning experience but also provides opportunities for cross-cultural collaboration and exposure to international perspectives. It is more than an academic qualification; it is a stepping stone to a world of possibilities. By integrating cutting-edge technology, a rigorous curriculum, and a learner-centric approach, the programme equips students with the skills, knowledge, and confidence to excel in academia and the industry. Whether aspiring for a career in software development, data science, cybersecurity, or entrepreneurial ventures, the MCA Online Learning (OL) Programme ensures that students are prepared to lead and innovate in the digital economy.

A. Programme's Mission and Objectives

Mission:

The MCA Programme is dedicated to:

- Provide high-quality education in computer science and information technology to learners worldwide, regardless of geographical or socio-economic barriers.
- Equip students with the skills and knowledge that align with current and future industry needs, fostering career readiness and innovation.
- Cultivate a culture of innovation, encouraging students to develop creative solutions for complex technological challenges.
- Empower learners to continuously upgrade their skills and adapt to the evolving demands of the digital era.
- Build a diverse and inclusive online community that enriches the learning experience and promotes cross-cultural collaboration.
- Prepare students for leadership roles in a globalized economy by imparting cutting-edge knowledge and fostering a growth mindset.

Objectives:

The objectives of MCA Online Learning (OL) programme are to provide a thorough understanding of fundamental and advanced concepts in computer science and IT, ensuring students are well-prepared for professional challenges. It also offers hands-on training and real-world project experiences that enable students to effectively apply theoretical knowledge. The programme curriculum is aligned with current industry standards, ensuring graduates possess the skills most in demand by employers. The programme encourages creative problem-solving and innovative approaches to tackling technological challenges. To instill a culture of continuous self-improvement, enabling students to keep pace with rapidly evolving technologies, the MCA Online Learning (OL) programme prepares students for the international job market by fostering cross-cultural understanding and global perspectives.

B. Relevance of the Programme with HEI's Vision and Goals

The vision and mission of HEI, USHA MARTIN UNIVERSITY, of Ranchi are:

Vision:

To provide value-based education relevant for all, nurture local talent, support creation of excellence in teaching, learning and research, produce high quality innovative graduates and contribute towards sustainable development of the state.

Mission:

The University shall strive to promote innovative strategies for seamless dissemination and creation of knowledge using latest techniques, available media and technologies so that its graduates acquire skills to get sustainable employment and contribute with a sense of service to national and global society.

Goals:

The relevance of the MCA programme to Higher Education Institutions' (HEIs) goals lies in its alignment with the broader mission and objectives of the institution. Here's how the programme can contribute to the HEI's goals:

- **Academic Excellence in Virtual Platforms:** Delivering a high-quality online education experience that combines theoretical knowledge with practical applications in computer science and IT, accessible to a global audience.
- **Innovation and Research in Digital Environments:** Promoting a culture of inquiry and innovation through virtual labs, collaborative tools, and online research projects, enabling students and faculty to tackle cutting-edge challenges.
- **Global and Community Engagement:** Strengthening connections through virtual service-learning projects, online collaborations, and community outreach initiatives, demonstrating a commitment to societal impact.
- **Career Readiness in a Digital Economy:** Equipping students with the skills and experience required to excel in an online-first professional world, including proficiency in remote teamwork and digital tools.
- **Diversity and Inclusion in Online Education:** Creating an inclusive and accessible learning environment by leveraging technology to bridge geographic, socioeconomic, and cultural barriers.
- **Lifelong Learning and Continuous Improvement:** Supporting a culture of ongoing education by providing flexible, scalable, and adaptive learning pathways that evolve with industry needs.

Overall, the MCA programme can serve as a key driver of the institution's goals, enhancing its reputation, impact, and contribution to the broader community.

C. Nature of Prospective Target Group of Learners

The Online Learning (OL) of USHA MARTIN UNIVERSITY (UMU) shall target the working professionals, executives as well as those who cannot attend a full-time programme due to prior occupation or other assignments. The candidates desirous of taking admission in Master in Computer Application (M.C.A) programme shall have to meet the eligibility norms as follows –

- To obtain admission in M.C.A programme offered through OL mode, the learner must have completed BCA or equivalent programme from recognized board.
- The OL MCA programme offered by USHA MARTIN UNIVERSITY (UMU) caters the needs of diverse groups of undergraduate learners from all disciplines located in diverse regions and social structures such as learners from a low level of disposable income, rural dwellers, women and minorities who have little access to formal institutions of higher learning.

D. Appropriateness of Programme to be conducted in OL mode to acquire specific skills and competence

The University has identified the following **Programme Outcomes (POs)** and **Programme Specific Outcomes (PSOs)** as acquisition of specific skills and competence in MCA Programme.

Programme Outcomes (POs)

After completing the MCA programme, students will be able to:

| |
|---|
| PO1. Computational knowledge: Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements. |
| PO2. Problem analysis: Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines. |
| PO3. Design/development of solutions: Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. |
| PO4. Conduct investigations of complex Computing problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. |
| PO5. Modern tool usage: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations. |
| PO6. Innovation and Entrepreneurship: Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large. |
| PO7. Societal and Environmental Concern: Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices. |
| PO8. Professional Ethics: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices. |
| PO9. Individual and teamwork: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments. |
| PO10. Communication efficacy: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions. |
| PO11. Project management and finance: Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| PO12. Life-long learning: Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional. |

Programme Specific Outcomes (PSOs)

| |
|--|
| PSO1. Advanced Computing Proficiency: Demonstrate a high level of expertise in computer applications by applying advanced concepts of data acquisition, data analytics, big data and knowledge discovery to solve complex computing problems. |
| PSO2. Professional and Entrepreneurial Competence: Develop the ability to work with the latest computing technologies, pursue diverse career opportunities in IT industries, academia, and |

research, and engage in entrepreneurial ventures by leveraging skills in human-computer interaction and intelligent system design.

PSO3. Research and Innovation: Independently conduct research and development activities to address real-world challenges, fostering innovation and contributing to the advancement of computing technologies with a strong foundation in ethical, social, and legal considerations.

E. Instructional Design

The MCA programme is structured into four semesters, with a minimum credit requirement of 80 to obtain the degree. In OL (Online Learning) mode from USHA MARTIN UNIVERSITY (UMU), the minimum time period for completing the MCA degree is two years, while the maximum allowable time period is four years.

USHA MARTIN UNIVERSITY (UMU)

Master of Computer Application (MCA)

Course structure and Syllabi

(2025-26)

Total Program Credits for MCA

| S.No. | Semester | Credits |
|-------|----------|---------|
| 1 | I | 20 |
| 2 | II | 20 |
| 3 | III | 20 |
| 4 | IV | 20 |
| Total | | 80 |

Induction Program

Conduction of induction program as per UGC/Regulatory Body's guideline.

Evaluation Scheme

| SEMESTER – I | | | | | | |
|---------------------|-------------|--|-----------|-----------------------------|---------------|-------------|
| S.No. | Course Code | Course Name | Credit | Continuous Assessment Marks | Term End Exam | Grand Total |
| | | | | Max. Marks | Max. Marks | |
| 1 | CAMO-2101 | Data Communication & Computer Networks | 4 | 30 | 70 | 100 |
| 2 | CAMO-2102 | Computer Organization & Architecture | 3 | 30 | 70 | 100 |
| 3 | CAMO-2103 | Professional Communication | 2 | 30 | 70 | 100 |
| 4 | CAMO-2104 | Discrete Mathematics | 4 | 30 | 70 | 100 |
| 5 | CAMO-2105 | Accountancy and Financial Management | 3 | 30 | 70 | 100 |
| 6 | CAMO-2106 | Programming with 'C' | 2 | 30 | 70 | 100 |
| 7 | CAMO-2117 | Programming with 'C' Lab | 2 | 30 | 70 | 100 |
| TOTAL | | | 20 | 210 | 490 | 700 |

| SEMESTER – II | | | | | | |
|----------------------|-------------|---------------------------------|-----------|-----------------------------|---------------|-------------|
| S.No. | Course Code | Course Name | Credit | Continuous Assessment Marks | Term End Exam | Grand Total |
| | | | | Max. Marks | Max. Marks | |
| 1 | CAMO-2201 | Web Programming | 4 | 30 | 70 | 100 |
| 2 | CAMO-2202 | Advance Cyber Security | 3 | 30 | 70 | 100 |
| 3 | CAMO-2203 | Management Information & system | 3 | 30 | 70 | 100 |
| 4 | CAMO-2204 | Design & Analysis of Algorithm | 3 | 30 | 70 | 100 |
| 5 | CAMO-2205 | Data Structure using C++ | 3 | 30 | 70 | 100 |
| 6 | CAMO-2216 | DAA and Web Programming Lab | 2 | 30 | 70 | 100 |
| 7 | CAMO-2207 | Data Structure using C++ | 2 | 30 | 70 | 100 |
| TOTAL | | | 20 | 210 | 490 | 700 |

Note: The students taking an exit from programme after securing 40 credit of the first and second semester shall be awarded a PG Diploma in Computer Applications.

SEMESTER – III

| S.No. | Course Code | Course Name | Credit | Continuous Assessment Marks | Term End Exam | Grand Total |
|--------------|---------------------------------------|--|-----------|-----------------------------|---------------|-------------|
| | | | | Max. Marks | Max. Marks | |
| 1 | CAMO-2301 | Artificial Intelligence and Machine Learning | 3 | 30 | 70 | 100 |
| 2 | CAMO-2302 | Data Science using R Programming | 3 | 30 | 70 | 100 |
| 3 | CAMO-2303 | OOP's Technologies and Java Programming | 3 | 30 | 70 | 100 |
| 4 | CAMO-2304 | Advanced DBMS | 3 | 30 | 70 | 100 |
| 5 | CAMO-2305/ CAMO-2306/ CAMO-2307 | Elective – I | 4 | 30 | 70 | 100 |
| 6 | CAMO-2318 | Java Programming Lab | 2 | 30 | 70 | 100 |
| 7 | CAMO-2319 | Data Science using R Programming Lab | 2 | 30 | 70 | 100 |
| TOTAL | | | 20 | 210 | 490 | 700 |

Elective – I

| Any One Course from the Following 03 (Electives Course – CAMO-2305/ CAMO-2306/ CAMO-2307) | | | | | | |
|---|-----------|--|---|----|----|-----|
| 1 | CAMO-2305 | Data Warehousing and Data Mining | 4 | 30 | 70 | 100 |
| 2 | CAMO-2306 | Soft Computing Techniques | 4 | 30 | 70 | 100 |
| 3 | CAMO-2307 | Cloud Computing and Internet of Things | 4 | 30 | 70 | 100 |

SEMESTER – IV

| S.No. | Course Code | Course Name | Credit | Continuous Assessment Marks | Term End Exam | Grand Total |
|--------------|-------------------------|-----------------------------|-----------|-----------------------------|---------------|-------------|
| | | | | Max. Marks | Max. Marks | |
| 1 | CAMO-2401 | Big Data Analytics | 3 | 30 | 70 | 100 |
| 2 | CAMO-2402/ CAMO-2403 | Elective – II | 3 | 30 | 70 | 100 |
| 3 | CAMO-2404 | Natural Language Processing | 3 | 30 | 70 | 100 |
| 4 | CAMO-2405 | Python Programming | 2 | 30 | 70 | 100 |
| 5 | CAMO-2406 | Quantum Computing | 3 | 30 | 70 | 100 |
| 6 | CAMO-2417 | Python Programming Lab | 2 | 30 | 70 | 100 |
| 7 | CAMO-2491 | Project | 4 | 30 | 70 | 100 |
| TOTAL | | | 20 | 210 | 490 | 700 |

Elective – II

| Any One Course from the Following 02 (Electives Course – CAMO-2402/ CAMO-2403) | | | | | | |
|--|-----------|------------------|---|----|----|-----|
| 1. | CAMO-2402 | Mobile Computing | 3 | 30 | 70 | 100 |
| 2. | CAMO-2403 | Deep Learning | 3 | 30 | 70 | 100 |

Note: The students who want to undertake two year PG Programme will be awarded Master in Computer Applications (MCA) degree upon securing 80 credits.

SEMESTER – I

Course Code: CAMO – 2101

Credit: 4

Course Name: Data Communication & Computer Networks

Course objectives:

- To provide students with a comprehensive understanding of the fundamental principles of data communication and computer networks, including the various types of networks, network topologies, protocols, and standards.
- To equip students with the knowledge and skills necessary to design, implement, and manage computer networks, covering both local area networks (LANs) and wide area networks (WANs), as well as emerging network technologies.
- To develop students' abilities to analyze and evaluate network performance, identify potential security threats, and implement effective measures to enhance network security and reliability.
- To provide practical experience through hands-on labs and projects, enabling students to use network simulation tools, configure network devices, troubleshoot network issues, and apply theoretical knowledge in real-world scenarios.
- To introduce students to advanced topics in data communication and networking, such as wireless networks, cloud computing, Internet of Things (IoT), and next-generation networking technologies, preparing them for future trends and innovations in the field.

Course Outcomes (CO's):

On successful completion of this practical lab session, students will be able to:

1. Understand the fundamental principles and concepts of data communication and computer networks, including network architectures, protocols, and transmission technologies.
2. Develop proficiency in designing, implementing, and troubleshooting computer networks to meet specific communication requirements.
3. Gain knowledge of network security principles and techniques, enabling the identification and mitigation of potential security threats and vulnerabilities.
4. Acquire skills in analyzing network performance and optimizing network resources for efficient data transmission.
5. Prepare students for professional roles in network engineering, system administration, and cyber security through practical experience and theoretical understanding of data communication and computer networks.

Block-I: Fundamental Concepts & Network Architecture

Unit-1: Introduction to Computer Networks – Goals, Applications, and Benefits

Unit-2: Network Structures, Architectures, and Topologies

Unit-3: OSI and TCP/IP Reference Models – Layers, Functions, and Protocols

Unit-4: Physical Layer – Transmission Media, Switching Techniques, ISDN, and Terminal Handling

Block-II: Data Link Layer & Network Layer

Unit-5: Channel Allocation – LAN Protocols, ALOHA Variants (Pure & Slotted ALOHA)

Unit-6: Medium Access Control – CAMOA/CD, CAMOA/CA, Collision-Free Protocols, IEEE Standards (Ethernet, Wi-Fi, FDDI)

Unit-7: Data Link Layer – Framing, Error Detection & Correction, Sliding Window Protocols, HDLC

Unit-8: Network Layer Functions – Addressing, Routing Algorithms, Congestion Control

Block-III: Transport Layer & Network Services

Unit-9: IP Addressing & Networking – IPv4, IPv6, Subnetting, CIDR, Internetworking

Unit-10: Transport Layer – Functions, Protocols, and Design Issues

Unit-11: Connection-Oriented & Connectionless Services, TCP Window Management

Unit-12: User Datagram Protocol (UDP) and Transmission Control Protocol (TCP)

Block-IV: Application Layer & Network Security

Unit-13: Flow Control, Error Control, and Quality of Service (QoS) in Transport Layer

Unit-14: Network Security Fundamentals – Encryption, Hashing, Firewalls, Intrusion Detection

Unit-15: Secure Communication – DES, AES, RSA, Digital Signatures, Domain Name System (DNS)

Unit-16: Internet Protocols & Services – SMTP, FTP, HTTP, SNMP, Cryptography & Compression Techniques

References:

1. A. S Tanenbaum, “Computer Networks, 3rd Edition”, PHI, 2010.
2. W. Stallings, “Data and Computer Communication”, 10th edition, Macmillan Press, 2021.
3. Comer, “Computer Networks & Internet”, 6th edition, PHI, 2015.
4. Comer, “Internetworking with TCP/IP”, 6th edition, PHI, 2013.

Course Code: CAMO – 2102

Credit: 3

Course Name: Computer Organization & Architecture

Course Objective:

- To introduce students to the fundamental concepts of computer organization and architecture, including the structure and function of computer hardware components.
- To teach students about the design and operation of processors, covering topics such as instruction sets, microarchitecture, and control unit design.
- To provide knowledge on different types of memory systems, including cache, main memory, and storage devices, and how they interact within a computer system.
- To explain the principles and mechanisms of input/output (I/O) systems and how they interface with the central processing unit (CPU) and memory.
- To equip students with the skills to evaluate and optimize the performance of computer systems, understanding factors such as throughput, latency, and power consumption.

Course Outcomes:

At the end of the course, the students would be able to:

1. Comprehend the core concepts of computer architecture, including CPU, memory, and I/O systems.
2. Analyze and optimize computer systems by applying knowledge of instruction set architectures and data representation.
3. Demonstrate the ability to design and implement efficient processor architectures and memory hierarchies.
4. Acquire skills in assembly language programming and performance evaluation techniques for computer systems.
5. Evaluate emerging trends and technologies, ensuring readiness to address future challenges in computer organization and design.

Block I: Representation of Information and Basic Building Blocks

Unit 1: Introduction to Computer, Computer hardware generation, Number System: Binary, Octal, Hexadecimal, Character Codes (BCD, ASCII, EBCDIC).

Unit 2: Logic gates, Boolean Algebra, K-map simplification, Half Adder, Full Adder, Subtract or, Decoder, Encoders, Multiplexer, De-multiplexer.

Unit 3: Carry look ahead adder, Combinational logic Design, Flip-Flops, Registers, Counters (synchronous & asynchronous).

Unit 4: ALU, Micro-Operation. ALU- chip, Faster Algorithm and Implementation (multiplication & Division).

Block II: Basic Organization

Unit 5: Von Neumann Machine (IAS Computer), Operational flow chart (Fetch, Execute), Instruction Cycle, Organization of Central Processing Unit.

Unit 6: Hardwired & micro programmed control unit, Single Organization, General Register Organization, Stack Organization.

Unit 7: Addressing modes, Instruction formats, data transfer & Manipulation, I/O Organization, Bus Architecture, Programming Registers.

Block III: Memory Organization & I/O Organization

Unit 8: Memory Hierarchy, Main memory (RAM/ROM chips), Auxiliary memory, Associative memory, Cache memory, Virtual Memory.

Unit 9: Memory Management Hardware, hit/miss ratio, magnetic disk and its performance, magnetic Tape etc.

Unit 10: Peripheral devices, I/O interface, Modes of Transfer, Priority Interrupt, Direct Memory Access, Input-Output Processor.

Unit 11: Serial Communication. I/O Controllers, Asynchronous data transfer, Strobe Control, Handshaking.

Block IV: Process Organization

Unit 12: Basic Concept of 8-bit micro Processor (8085) and 16-bit Micro Processor (8086), Assembly Instruction Set.

Unit 13: Assembly language program of (8085): Addition of two numbers, Subtraction, Block Transfer, find greatest number.

Unit 14: Table search, Numeric Manipulation, Introductory Concept of pipeline, Flynn's and Feng's Classification, Parallel Architectural classification.

Unit 15: Parallel Processing Concepts: Understanding parallel processing concepts including parallelism types (task-level, data-level, instruction-level) and parallel architectures (SIMD, MIMD), Multiprocessing Systems, Scalability and Load Balancing.

Unit 16: System-Level Organization: System Architectures, Analyzing system architectures including single-processor systems, multiprocessor systems, and distributed systems. Scalability and Reliability: Evaluating system-level scalability and reliability considerations in large-scale computing environments.

References:

1. William Stalling, "Computer Organization & Architecture", 11th Edition, Pearson education Asia, 2019.
2. Mano Morris, "Computer System Architecture", 3rd Edition, PHI, 2017.
3. Zaky & Hamacher, "Computer Organization", 6th Edition, McGraw Hill, 2012.
4. B. Ram, "Computer Fundamental Architecture & Organization", 6th Edition, New Age, 2020
5. Tannenbaum, "Structured Computer Organization", 6th Edition, PHI, 2012.

Course Code: CAMO-2103
Course Name: Professional Communication

Credit: 2

Course Objective:

- To develop students' ability to write clear, concise, and professional documents such as emails, reports, proposals, and other business correspondence, ensuring they can convey information effectively in written form.
- To enhance students' oral communication skills, enabling them to deliver engaging and informative presentations, participate in meetings, and communicate confidently and persuasively in professional settings.
- To foster strong interpersonal communication skills, including active listening, empathy, conflict resolution, and teamwork, ensuring students can build and maintain productive working relationships.
- To equip students with the skills to use various digital communication tools and platforms effectively, understanding the nuances of virtual communication and the importance of digital etiquette.
- To prepare students for the global business environment by developing their ability to communicate effectively across cultures, understanding cultural differences, and adapting their communication style to diverse audiences.

Course Outcomes:

By the end of this course, students will be able to:

1. Demonstrate an understanding of the principles and theories of professional communication.
2. Write clear, concise, and persuasive business documents, such as e-mails, job application, resume and cover letters)
3. Deliver effective presentations using appropriate visual aids and speaking techniques.
4. Collaborate with others in a professional setting, demonstrating effective teamwork and leadership skills.

Block 1: Foundations of Professional Communication

Unit 1: Introduction to Professional Communication

Unit 2: Written Communication Skills (E-mail, Job application, Resume and Cover letter)

Unit 3: Verbal Communication Skills

Unit 4: Interpersonal and Team Communication

Unit 5: Digital Communication Tools and Impact of technology

Block 2: Advanced Professional Communication Strategies

Unit 6: Visual and Multimedia Communication

Unit 7: Effective Presentation strategies: Introduction, Defining purpose, Analyzing Audience and Locale

Unit 8: Understanding Nuances of Delivery

Unit 9: Group discussion as a part of selection process

Unit 10: Ethics and Legal Considerations in Professional Communication

References:

1. "Improve Your Writing ed. V.N. Arora and Laxmi Chandra, 1st Edition, Oxford Univ. Press, New Delhi, 2013.
2. Technical Communication – Principles and Practices by Meenakshi Raman & Sangeeta Sharma, 3rd Edition, Oxford Univ. Press 2007, New Delhi, 2015.
3. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, 6th Edition, Tata McGraw Hill & Co. Ltd., New Delhi, 2019.
4. How to Build Better Vocabulary by M. Rosen Blum, Bloomsbury Pub. London.
5. Word Power Made Easy by Norman Lewis, W. R. Goyal Pub. & Distributors; Delhi, 2024.
6. Developing Communication Skills by Krishna Mohan, Meera Banerji- 2nd Edition, Macmillan India Ltd. Delhi, 2009.

Course Code: CAMO – 2104
Course Name: Discrete Mathematics

Credit: 4

Course Objective:

- To provide students with a solid foundation in the fundamental concepts of discrete mathematics, including sets, relations, functions, logic, and proof techniques.
- To teach students the principles of combinatorics and graph theory, enabling them to solve problems related to counting, graph traversal, graph coloring, and network flows.
- To introduce students to basic algorithms and their complexity, helping them understand how to analyze the efficiency of algorithms and solve problems using algorithmic thinking.
- To develop students' knowledge of discrete structures such as lattices, Boolean algebras, and algebraic structures, and their applications in computer science and related fields.
- To enhance students' mathematical reasoning and problem-solving skills, equipping them with the ability to apply discrete mathematics concepts to real-world problems and theoretical computer science.

Course Outcomes:

At the end of the course, the students would be able to:

1. Verify the correctness of an argument using symbolic logic and truth tables.
2. Construct proofs using mathematical induction.
3. Define algebraic structures and other group related terms
4. Analyse the concept lattice and related properties
5. Introduce the language and related terms

Block I: Relation

Unit 1: Type and compositions of relations, Equivalence relations, Partial order relation.

Unit 2: Function: Types, Composition of function, recursively defined function

Unit 3: Mathematical Induction: Piano's axioms, Discrete Numeric Functions and Generating functions, Asymptotic Behavior of numeric functions

Unit 4: Algebraic Structures, Semi group, Monoid, Group, Abelian group, properties of group, Subgroup, Cyclic group, Cosets, Permutation groups, Homomorphism, Isomorphism and Automorphism of groups.

Block II: Propositional Logic

Unit 5: Proposition, First order logic, Basic logical operations, Tautologies, Contradictions, Algebra of Proposition, Logical implication, Logical equivalence, Predicates and quantifiers.

Unit 6: Lattices: Introduction, ordered set, Hasse diagram of partially ordered set.

Unit 7: Consistent enumeration, Isomorphic ordered set, well ordered set, Lattices.

Unit 8: Properties of lattices, Bounded lattices, Distributive lattices and Complemented lattices.

Block III: Introduction to defining language

Unit 9: Introduction to language: Kleene Closure, Arithmetic expressions

Unit 10: Chomsky Hierarchy, Regular expressions, Generalized Transition graph.

Block IV: Regular expression

Unit 11: Deterministic finite automata, strings & transition function

Unit 12: Non-deterministic finite automata, with epsilon transitions & languages

Block V: Non-regular language

Unit 13: Push Down Automata & CFG to PDA Conversion

Unit 14: Turing machine & chomsky hierarchy

References:

1. Hari Kishan, Shiv Raj Pundir, Discrete Mathematics, Pragati Prakashan, 13th edition, Meerut, 2021.
2. J. P. Tremblay and R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw-Hill, 2008.
3. S. Lipschutz and M. L. Lipson, Schaum's Outline of Theory and Problems of Discrete Mathematics, 2nd Ed., Tata McGraw-Hill, 1999.
4. K. H. Rosen, Discrete Mathematics and its applications, Tata McGraw-Hill, 6th Ed., 2007.
5. David Liben-Nowell, Discrete Mathematics for Computer Science, Wiley publication, July 2017.

Course Code: CAMO – 2105

Credit: 3

Course Name: Accountancy and Financial Management

Course Objective:

- To provide students with a solid understanding of fundamental financial principles and concepts, including financial statements, accounting principles, and financial analysis techniques.
- To teach students how to prepare and interpret financial statements, including balance sheets, income statements, and cash flow statements, and analyse financial performance using ratios and other tools.
- To introduce students to managerial accounting concepts and techniques, including cost analysis, budgeting, variance analysis, and decision-making using relevant financial information.
- To explore topics related to corporate finance, such as capital budgeting, risk and return, cost of capital, and capital structure decisions, enabling students to evaluate investment opportunities and make informed financial decisions.
- To familiarize students with financial management practices and strategies, including financial planning, working capital management, risk management, and corporate governance, to ensure efficient use of financial resources and maximize shareholder value.

Course Outcomes:

At the end of the course, the students would be able to:

1. Familiarize the principles and concepts accounting which involved in business transactions
2. Prepare trial balance, bank reconciliation statement, identify and rectify the errors in entries.
3. Prepare final accounts and financial statement.
4. Describe about accounting standards to prepare effective and ethical financial statement.

Block-I: Overview of Accounting

Unit-1: Accounting concepts, conventions and principles;

Unit-2: Accounting Equation, International Accounting principles and standards;

Unit-3: Matching of Indian Accounting Standards with International Accounting Standards.

Unit-4: Double entry system of accounting, journalizing of transactions;

Block-II: Mechanics of Accounting

Unit-5: Preparation of final accounts, Profit & Loss Account, Profit & Loss Appropriation account and Balance Sheet,

Unit-6: Policies related with depreciation, inventory and intangible assets like copyright, trademark, patents and goodwill.

Unit-7: Ratio Analysis- solvency ratios, profitability ratios, activity ratios, liquidity ratios, market capitalization ratios

Unit-8: Common Size Statement

Block-III: Analysis of financial statement

Unit-9: Comparative Balance Sheet and Trend Analysis of manufacturing, service & banking organizations.

Block-IV: Funds Flow Statement

Unit-10: Introduction to Funds Flow Statement: Overview of Funds Flow Statement: Understanding the purpose and significance of funds flow statement in financial analysis. Conceptual Framework: Explaining the conceptual framework of funds flow statement and its relationship with other financial statements.

Unit-11: Investing Activities: Cash Flow from Investments: Evaluating cash flows related to investing activities such as purchase and sale of property, plant, and equipment, and investments in securities.

Capital Expenditure Analysis, Return on Investment (ROI).

Unit-12: Meaning, Concept of Gross and Net Working Capital, Preparation of Schedule of Changes in Working Capital.

Unit-13: Preparation of Funds Flow Statement and its analysis;

Block-V: Cash Flow Statement

Unit-14: Introduction to Cash Flow Statement: Overview of Cash Flow Statement: Understanding the purpose, importance, and objectives of the cash flow statement in financial reporting. Conceptual Framework: Explaining the conceptual framework of the cash flow statement and its relationship with other financial statements, Regulatory Requirements.

Unit-15: Cash Flow from Operating Activities: Operating Cash Inflows: Identifying cash inflows from operating activities such as sales revenue, interest income, and dividends received. Operating Cash Outflows: Analyzing cash outflows from operating activities including payments to suppliers, employees, and creditors.

Unit-16: Cash Flow Ratios and Analysis, Liquidity Ratios: Calculating liquidity ratios such as the cash flow ratio, operating cash flow ratio, and cash flow coverage ratio to assess liquidity position. Solvency Ratios, Cash Flow Forecasting: Forecasting future cash flows based on historical data and industry.

Unit-17: Cash Flow Management Strategies, Working Capital Management, Implementing working capital management strategies to optimize cash flow, minimize liquidity risks, and enhance profitability.

Investment Strategies: Developing investment strategies, Financing Strategies.

Unit-18: Cash Regulatory Compliance and Disclosure, Accounting Standards: Ensuring compliance with relevant accounting standards and regulatory requirements, Financial Reporting Practices.

References:

- 1) Narayanswami - Financial Accounting: A Managerial Perspective (PHI, 7 Edition), 2022
- 2) Mukherjee - Financial Accounting for Management (TMH, 5th Edition), 2021
- 3) Ramchandran & Kakani - Financial Accounting for Management (TMH, 5 Edition), 2020
- 4) Ghosh T P - Accounting and Finance for Managers (Taxman, 4 Edition), 2009
- 5) Maheshwari S.N & Maheshwari S K – An Introduction to Accountancy (Vikas, 14 Edition), 2025
- 6) Ashish K. Bhattacharya- Essentials of Financial Accounting (PHI, New Delhi), 6 Edition, 2022
- 7) Ghosh T.P- Financial Accounting for Managers (Taxman, 4 Edition), 2009
- 8) Maheshwari S.N & Maheshwari S K – A text book of Accounting for Management (Vikas, 5 Edition), 2022
- 9) Gupta Amrishi - Financial Accounting for Management (Pearson Education, 7 Edition), 2022
- 10) Chowdhary Anil - Fundamentals of Accounting and Financial Analysis (Pearson Education, 1 Edition).

Course Code: CAMO – 2106

Credit: 2

Course Name: Programming with ‘C’

Course Objectives:

- To provide students with a foundational understanding of programming concepts and logic, using the C programming language as a vehicle for learning basic programming constructs.
- To familiarize students with the syntax and semantics of the C programming language, including variables, data types, operators, control structures, functions, and arrays.
- To develop students' problem-solving skills by providing them with opportunities to apply programming concepts to solve a variety of real-world problems, through hands-on coding exercises and projects.
- To teach students how to debug and troubleshoot C programs effectively, including techniques for identifying and fixing common errors and logical flaws in code.
- To provide students with practical experience in writing, compiling, executing, and debugging C programs in a laboratory environment, reinforcing theoretical concepts through hands-on experimentation and coding exercises.

Course Outcome (CO's):

On successful completion of this course, students should be able to:

1. Demonstrate a thorough understanding of the syntax and semantics of the C programming language.
2. Apply fundamental programming constructs proficiently to solve a variety of computational problems.
3. Implement and manipulate data structures such as arrays, pointers, and linked lists effectively.
4. Perform file processing operations, including reading from and writing to files, with accuracy and efficiency.
5. Develop well-structured and efficient C programs, showcasing strong problem-solving and programming skills.

Block I: Algorithmic Process & Basic of ‘C’ Programming

Unit–1: Algorithms, General Approaches & Analysis, Program and Programming Language, Fundamental Stages of Problem Solving, Feature of Programming Language, Flow Charts.

Unit–2: Learning outcomes, Program and Programming Language, Introduction to C Language, Programming Format of C.

Unit–3: Creating a C Program, Compilation process in C Program, Link and Running C Program, Diagrammatic Illustration.

Block II: Operator and Expressions of ‘C’, Control Flow Mechanisms

Unit–4: Building Blocks – Character set of C, C Tokens, Keywords and Identifiers of the C. Fundamental elements of ‘C’ – Data Types in C, Variables.

Unit–5: Logical and Relational – Operators in ‘C’, Expressions in ‘C’ and Types Conversions in Expressions.

Unit–6: Key Terminologies, Design Control Statements, Loop Control Statements and Exit Function.

Unit–7: Declaring & Accessing Data Elements, Arrays Declaration, Initialization and Passing Functions.

Block III: Strings, Tools for Modular Programming and Pointers

Unit–8: Essential Techniques & Functions, Declaration and Initialization of Strings, Overview and Applications.

Unit–9: Functions Prototypes, Calling a Function, Return Statement, Sets of Variables & Storage Classes and Recursion.

Unit–10: Handle Variables and Parameters, Pointer and their Characteristics, Passing Pointers to Functions and Pointers and Strings.

Block IV: Multiple Data Elements, Pre-processors Directives and Files

Unit–11: Declaration of Structures, Accessing the Members of a Structure, Initializing, Function Arguments and Pointers to Structures.

Unit–12: Defining of Unions, Initialization of Unions and Accessing the Members of an Union.

Unit–13: Translation Phase, ‘C’ Pre-processor, Implement Constants, Reading from other files and Conditional Selection of code and Pre-Processor Commands.

Unit–14: File Handling in C using file Pointers, Input and Output using file Pointers, Sequential Vs Random Access Files and Unbuffered I/O – The UNIX File Routines.

References:

1. Kamthane A. N. and Kamthane A. A.; Programming in C, 3rd Edition, Pearson Education India, 2015.
2. Reema Thareja; Computer Fundamentals and Programming in C, 3rd Edition, Oxford University Press, 2023.
3. Dey P. and Ghosh M.; Programming in C, 2nd edition, Oxford University Press, 2018.
4. Kernighan B. W. and Dennis M. R.; The C Programming Language, 2nd Edition, Pearson Education India, 2015.
5. Kanetkar Y. P.; Let us C, BPB Publications.
6. Jones J. A. and Harrow K.; Problem solving with C, 19th Edition, Pearson Education India, 2022.

Course Code: CAMO – 2117

Credit: 2

Course Name: Programming with ‘C’ Lab

Course Objectives:

- To develop problem-solving skills using C programming.
- To understand fundamental concepts of variables, data types, and operators in C.
- To implement control structures, loops, and functions for efficient coding.
- To apply arrays, pointers, and structures for data manipulation.
- To enhance debugging and error-handling techniques in C programs.

Course Outcome (CO’s):

On successful completion of this course, students should be able to:

1. Demonstrate proficiency in writing, compiling, and executing C programs.
2. Apply control structures, loops, and functions to solve computational problems.
3. Utilize arrays, pointers, and structures for effective memory management.
4. Develop modular programs using functions and file handling techniques.
5. Debug and optimize C programs for efficiency and correctness.

Programming Lab

- Introduction (Overview of the Lab)
- Objectives
- Overall Directions
- Structure of ‘C’ Program
- Salient Features of C
- ‘C’ Program development Environment
 - Phase-I: Creating a Program
 - Phase-II&III: Preprocessing and Compiling a ‘C’ Program
 - Install Visual Studio Code on Windows
- How to design/develop Program
- Structure of ‘C’ Program
- Compile and Run ‘C’ Program
- Practice Sessions (Session 1 to Session 5)

Programs:

1. Write a C program to find roots of a quadratic equation.
2. Write a C program to find the total no. of digits and the sum of individual digits of a positive integer.
3. Write a C program to generate the Fibonacci sequence of first N numbers.
4. Write a C program to compute area of a circle, Square and Rectangle when all the dimension are given.
5. Write a C program to input two matrices and perform matrix multiplication on them.
6. Write a C program to check whether the given string is palindrome or not without using Library functions.
7. Write a C program to count the number of lines and words in a given file.

8. Write a C program to generate prime numbers in a given range using user defined function.
9. Write a C program to find factorial of a given number using recursive function.
10. Write a C program to maintain a record of n student details using an array of structures with four fields - Roll number, Name, Marks and Grade. Calculate the Grade according to the following conditions.

Marks Grade

| | |
|-------|---|
| >= 80 | A |
| >= 60 | B |
| >= 50 | C |
| >= 40 | D |
| < 40 | E |

Print the details of the student, given the student roll number as input.

References:

1. Kamthane A. N. and Kamthane A. A.; Programming in C, 3rd Edition, Pearson Education India, 2015.
2. Reema Thareja; Computer Fundamentals and Programming in C, 3rd Edition, Oxford University Press, 2023.
3. Dey P. and Ghosh M.; Programming in C, 2nd edition, Oxford University Press, 2018.
4. Kernighan B. W. and Dennis M. R.; The C Programming Language, 2nd Edition, Pearson Education India, 2015.
5. Kanetkar Y. P.; Let us C, BPB Publications.
6. Jones J. A. and Harrow K.; Problem solving with C, 19th Edition, Pearson Education India, 2022.

SEMESTER – II

Course Code: CAMO - 2201

Credit: 4

Course Name: Web Programming

Course Objective:

- To introduce students to fundamental web technologies, including HTML, CSS, and JavaScript, and their role in creating dynamic and interactive web pages.
- To teach students how to use JavaScript to add interactivity and functionality to web pages, including form validation, DOM manipulation, and event handling.
- To familiarize students with server-side scripting languages such as PHP, or Node.js, and their use in processing user requests, accessing databases, and generating dynamic content.
- To enable students to integrate databases into web applications, including connecting to databases, executing queries, and displaying query results dynamically on web pages.
- To introduce students to popular web development frameworks such as React, Angular, or Vue.js, and teach them how to use these frameworks to streamline the development process and build scalable web applications.

Course Outcomes:

At the end of the course, the students would be able to:

1. Gain proficiency in HTML, CSS, and JavaScript, as well as other web technologies and frameworks commonly used in web design, enabling them to create responsive and interactive websites.
2. Develop an understanding of design principles such as layout, typography, color theory, and usability, and learn to apply them effectively in designing visually appealing and user-friendly websites.
3. Learn techniques for creating responsive web designs that adapt to different screen sizes and devices, ensuring optimal user experience across desktops, tablets, and smartphones.
4. Learn to incorporate interactive elements such as animations, transitions, and dynamic content using JavaScript and other scripting languages, enhancing user engagement and interactivity.
5. Learn techniques for ensuring cross-browser compatibility and testing websites across different web browsers, platforms, and devices, to ensure consistent performance and functionality.
6. Conduct hands-on projects and exercises, students will apply their knowledge of web design principles and technologies to create real-world websites, gaining practical experience and developing their design and development skills.

Block-I: Introduction

Unit-1: What is Markup Language Basic Structure of HTML

Unit-2 : Difference Between HTML and XHTML

Unit-3: Head Section and Elements of Head Section Meta Tags

Unit-4: CSS Tags Script Tag Table Tag Div Tag Header Tags Paragraph, pan, Pre Tags

Block-II: Designing Pages with HTML & CSS

Unit-5: Anchor Links and Named Anchors Image Tag Object Tag frame Tag Forms Form Tag attributes of Form POST and GET Method

Unit-6: Field set and Legend Text input, Text area Checkbox and Radio Button Dropdown.

Unit-7: Dynamic HTML, Document Object Model, Features of DHTML,

Unit-8: CSSP (Cascading Style Sheet Positioning)

Unit-9: JSSS (Java Script assisted Style Sheet)

Block-III: Java Script

Unit-10: Objects,

Unit-11: Methods, Events and Functions,

Unit-12: Tags, Operators, Data Types,

Unit-13: Literals and Type Casting in JavaScript,

Unit-14: Programming Construct Array and Dialog Boxes

Block-IV: Front Page

Unit-15: Front Page Basics,

Unit-16: Web Terminologies,

Unit-17: Phases of Planning and Building Web Sites,

Unit-18: the FTP, HTTP and WPP.

References:

1. Teach Yourself HTML 4.0 with XML, DHTML and Java Script by Stephanie, Cottrell, Bryant; 1st Edition, IDG Books India Pvt. Ltd., New Delhi, 2000
2. Dynamic Web Publishing – Unleashed Tech Media

Course Code: CAMO - 2202

Credit: 3

Course Name: Advance Cyber Security

Course objectives:

- To provide students with advanced knowledge and skills in analysing cybersecurity threats, including malware analysis, threat intelligence gathering, and reverse engineering techniques.
- To equip students with the ability to respond effectively to cybersecurity incidents, including incident detection, containment, eradication, and recovery, as well as forensic investigation techniques for collecting and analysing digital evidence.
- To teach students how to design, implement, and manage security operations centres (SOCs), including security monitoring, log analysis, and incident management processes, using industry-standard tools and techniques.
- To enable students to identify, assess, and mitigate vulnerabilities in systems and networks, including vulnerability scanning, penetration testing, and patch management strategies.
- To familiarize students with cybersecurity governance frameworks, regulations, and compliance standards, including GDPR, HIPAA, ISO 27001, and NIST Cybersecurity Framework, and how to implement cybersecurity controls to achieve compliance.

Course Outcomes (CO's):

On successful completion of this practical lab session, students will be able to:

1. Apply IT ACT (Cyber law) to the given case/problem and infer from the given case and analyze the gap if it exists.
2. Analyze the working of cyber security principles in designing the system.
3. Develop a strategy (physical, logical or administrative controls) to mitigate the problem and articulate consequences on Society and National Economy.
4. Examine relevant network defense / web application tools to solve given cyber security problems and evaluate its suitability.
5. Investigate the influence of Block chain technology for the cyber security problem and evaluate its role.

Block I: Introduction to Cybercrime and Laws

Unit 1: Introduction, Cybercrime: Definition and Origins of the word, Cybercrime and information Security.

Unit 2: Cybercriminals, Classifications of Cyber Crimes.

Unit 3: Criminals Plan Them – Introduction, How Criminals Plan the Attacks.

Unit 4: Cybercafé and Cybercrimes, Botnets, Attack Vector.

Unit 5: Basic text markup; Images; Hypertext Links; Lists.

Block II: Tools and Methods used in Cybercrime

Unit 6: Introduction, Proxy Server and Anonymizers, Password Cracking. Key loggers and Spyware, Virus and Worms, Trojan and backdoors, Steganography.

Unit 7: DOS and DDOS attack.

Block III: Phishing and Identity Theft

Unit 8: Introduction, Phishing – Methods of Phishing.

Unit 9: Phishing Techniques, Phishing Toolkits and Spy Phishing. Identity Theft – PII.

Unit 10: Types of Identity Theft, Techniques of ID Theft.

Unit 11: Digital Forensics Science, Need for Computer Cyber forensics.

Block IV: Command lines and Backtracking

Unit 12: Unix Command Lines, Backtrack Linux.

Unit 13: Mac Ports, Cygwin.

Unit 14: Windows Power Shell, Net Cat Commands.

Unit 15: Net Cat Uses, SSH.

Block V: Network Defense tools and block chain technology

Unit 16: Firewalls and Packet Filters: Firewall Basics, Packet Filter Vs Firewall.

Unit 17: Firewall Protects a Network, Packet Characteristic to Filter, Stateless Vs Stateful Firewalls.

Unit 18: Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks.

References:

1. Anti-Hacker Tool Kit (Indian Edition) by Mike Shema, Publication McGraw Hill. (Chapters: 2, 7, 8, 11) 2014,4th edition.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Nina Godbole and Sunit Belpure, Publication Wiley 2011.
3. Yogesh Singh, “Software Testing”, Cambridge University Press, 1st Edition, New York, 2011.
4. Marc Roper, “Software Testing”, McGraw-Hill Book Co., London.
5. Boris Beizer, “Software System Testing and Quality Assurance”, Van Nostrand Reinhold, New York.

Course Code: CAMO - 2203

Credit: 3

Course Name: Management Information & System

Course objectives:

- To introduce students to the fundamentals of information systems, including their role in organizations, types of information systems, and their strategic importance for decision-making and competitive advantage.
- To provide students with knowledge and skills in database management systems (DBMS), including database design, implementation, querying, and administration, to support organizational data management needs.
- To familiarize students with enterprise resource planning systems and their role in integrating business processes across functional areas, including modules such as finance, human resources, supply chain management, and customer relationship management.
- To teach students how to use business intelligence tools and techniques to analyze organizational data, generate insights, and support decision-making processes, including data visualization, reporting, and predictive analytics.
- To enable students to understand the principles of information security, risk management, and cybersecurity, including threats, vulnerabilities, risk assessment, and mitigation strategies, to protect organizational assets and ensure compliance with regulatory requirements.

Course Outcomes (CO's):

On successful completion of this practical lab session, students will be able to:

1. Leverage information technology for strategic decision-making and organizational performance optimization.
2. Analyze, design, and manage information systems to meet organizational information needs and strategic objectives.
3. Utilize information technology for strategic decision-making and organizational performance enhancement.
4. Analyze and design information systems to meet organizational information requirements.
5. Implement and manage information systems effectively to support business processes and operations.
6. Leverage data and business intelligence tools for informed decision-making and competitive advantage.

Block I: System Engineering, Information and Knowledge

Unit 1: System concepts, system control, types of systems, handling system complexity, Classes of systems, General model of MIS.

Unit 2: Need for system analysis, System analysis for existing system & new requirement, system development model, MIS & system analysis

Unit 3: Information concepts, classification of information, methods of data and information collection.

Unit 4: Value of information, information: A quality product, General model of a human as information processor, Knowledge.

Block II: Introduction of MIS & Strategic Management of Business

Unit 5: MIS: Concept, Definition, Role of the MIS, Impact of MIS, MIS and the user, Management as a control system.

Unit 6: MIS support to the management, Management effectiveness and MIS, Organization as system. MIS: organization effectiveness.

Unit 7: Concept of corporate planning, Essentiality of strategic planning, Development of the business strategies, Type of strategies, short-range planning, tools of planning, MIS: strategic business planning.

Block III: Development of MIS & Developing Business/IT Strategies/IT Solutions

Unit 8: Development of long-range plans of the MIS, Ascertaining the class of information, Determining the information requirement.

Unit 9: Development and implementation of the MIS, Management of information quality in the MIS, Organization for development of MIS, MIS development process model.

Unit 10: Planning fundamentals (real world cases), Organizational planning, planning for competitive advantage, (SWOT Analysis), Business models and planning. Business/IT planning,

Unit 11: Identifying business/IT strategies, Implementation Challenges, Change management., Developing business systems, (real world case), SDLC, prototyping, System development process, implementing business system.

Block IV: Business Process Re-Engineering & Technology of Information System

Unit 12: Introduction, Business process, process model of the organization, value stream model of the organization.

Unit 13: What delay the business process, relevance of information technology, MIS and BPR.

Unit 14: Introduction, Data processing, Transaction processing, Application processing, information system processing.

Unit 15: TQM of information systems, Human factors & user interface, Strategic nature of IT decision, MIS choice of information technology.

Block V: Decision Making and DSS, Data resource Management

Unit 16: Decision making concepts; decision making process, decision-making by analytical modeling, Behavioral concepts in decision making.

Unit 17: Organizational decision-making, Decision structure, DSS components, Management reporting alternatives.

Unit 18: Managing data sources, Foundation concepts of data, types of databases, traditional file processing, DBMS approach, Database structure, Database development.

Unit 19: Enterprise business system – Introduction, cross-functional enterprise applications, real world case, Functional business system, - Introduction, marketing systems, sales force automation, CIM, HRM.

Unit 20: Online accounting system, Customer relationship management, ERP, Supply chain management, Electronic commerce fundamentals, e-Commerce applications and Issues, (real world cases).

References:

1. Management Information Systems: Managing the Digital Firm" by Kenneth C. Laudon and Jane P. Laudon, 18th Edition, Pearson Education, 2025.
2. Information Systems for Managers: Texts and Cases" by Gabe Piccoli, 5th ed., Prospect Press, 2021.
3. Essentials of Management Information Systems" by Kenneth C. Laudon and Jane P. Laudon, 15th ed., Pearson Education, 2023.
4. Information Systems: A Manager's Guide to Harnessing Technology" by John Gallaughier, 2024.

5. Business Information Systems by Paul Bocij, Andrew Greasley, and Simon Hickie, (6th ed.). Pearson, 2018.

Course Code: CAMO - 2204
Course Name: Design & Analysis of Algorithm

Credit: 3

Course objectives:

- To introduce students to various algorithm design techniques, including greedy algorithms, divide and conquer, dynamic programming, and backtracking, enabling them to develop efficient algorithms for solving computational problems.
- To teach students how to analyse the efficiency of algorithms in terms of time complexity and space complexity, using mathematical tools such as big-O notation, and to understand the implications of algorithmic efficiency on performance and scalability.
- To familiarize students with essential data structures such as arrays, linked lists, stacks, queues, trees, and graphs, and their applications in algorithm design and implementation.
- To develop students' problem-solving skills by providing them with opportunities to apply algorithm design techniques to solve a variety of computational problems, including sorting, searching, graph algorithms, and optimization problems.
- To explore advanced algorithmic paradigms such as approximation algorithms, randomized algorithms, and parallel algorithms, and their use in solving complex computational problems efficiently.

Course Outcomes (CO's):

On successful completion of this practical lab session, students will be able to:

1. Design efficient algorithms for solving complex computational problems.
2. Analyze algorithm performance and complexity using mathematical techniques.
3. Enhance problem-solving skills through the application of algorithmic design paradigms.
4. Evaluate and compare different algorithmic approaches for optimizing computational tasks.
5. Understand algorithmic principles to address real-world challenges in computer science and engineering.

Block – I: Introduction to Algorithms

Unit -1: Basics of an Algorithm and its properties: Introduction, Objective, Example of an Algorithm, Basics building blocks of Algorithms, A survey of common running time, Analysis & Complexity of Algorithm, Types of problems, Problem Solving Techniques, Deterministic and Stochastic Algorithms.

Unit 2: Some pre-requisites and Asymptotic Bounds: Introduction, Objectives, Some Useful Mathematical Functions & Notations Functions & Notations Modular Arithmetic/Mod Function, Mathematical Expectation, Principle of Mathematical Induction, Concept of Efficiency of an Algorithm.

Unit 3: Analysis of Simple Algorithm: Introduction, Objectives, Complexity Analysis of Algorithms Euclid Algorithm for GCD Polynomial Evaluation Algorithm Exponent Evaluation Sorting Algorithm, Analysis of Non-Recursive Control Structures Sequencing for Construct While and Repeat Constructs Recursive Constructs.

Unit 4: Solving Recurrences: Introduction, Objective, Substitution Methods, Iteration Methods, Recursive Tree Methods, Master Methods.

Block – II: Design Techniques-I

Unit 5: Greedy Technique, Some Examples to understand Greedy Techniques, Formalization of Greedy Techniques.

Unit 6: An overview of local and global optima, Fractional Knapsack problem, Huffman Codes, A task scheduling algorithm.

Unit 7: Divide & Conquer Technique, General Issues in Divide and Conquer Technique, Binary Search.

Unit 8: Algorithm, Sorting Algorithm, Merge Sort, Quick Sort, Matrix Multiplication Algorithm.

Unit 9: Graph Algorithm – I: Basic Definition and terminologies, Graph Representation, Adjacency Matrix, Adjacency List.

Unit 10: Graph Traversal Algorithms, Depth First Search, Breadth First Search, Topological Sort, Strongly Connected Components.

Block – III: Design Techniques – II

Unit 11: Graph Algorithms – II: Minimum Cost Spanning Tree problems, Kruskal’s Algorithm, Prim’s Algorithm, Single Source Shortest Path Problems.

Unit 12: Bellman Ford Algorithm Dijkstra’s Algorithm, Maximum Bipartite Matching Problem.

Unit 13: Dynamic Programming Technique, The Principle of Optimality, Chained Matrix Multiplication, Matrix Multiplication Using Dynamic Programming.

Unit 14: Optimal binary search trees problems, Binomial coefficient computation, Floyd Warshall algorithm.

Unit 15: String Matching Techniques, The naïve String-Matching Algorithm, The Rabin Karp Algorithm, Knuth –Morris Pratt Algorithm.

Block – IV: NP- Completeness and Approximation Algorithm

Unit 16: NP-Completeness, Concepts of Class-P, NP Completeness, NP-Hard, Unsolvable problems, Polynomial-time, Polynomial-time Reductions, Class P with Examples, Knapsack and TSP problems.

Unit 17: NP-Completeness and NP- hard Problems, Polynomial Time verification, Techniques to show NP- Hardness, NP-Complete problems and P Vs NP problems.

Unit 18: Handling Intractability, Approximation algorithms for Vertex Cover problem and minimizing make span as parallel machines (Graham’s algorithm), Parameterized algorithm for Vertex Cover problem, Meta-heuristic Algorithms.

References:

1. Horowitz Sahani, “Fundamentals of Computer Algorithms”, Golgotia, 2nd ed., Universities Press, 2008
2. Coremen Leiserson etal, “Introduction to Algorithms”, 4th Edition, PHI, 2022.
3. Brassard Bratley, “Fundamental of Algorithms”, PHI, 1st Edition, 2015.
4. M T Goodrich etal, “Algorithms Design”, John Wiley, 1st Edition, 2014.
5. A V Aho etal, “The Design and analysis of Algorithms”, Pearson Education.

Course Code: CAMO - 2205

Credit: 3

Course Name: Data Structure using C++

Course objectives:

- To introduce students to fundamental data structures such as arrays, linked lists, stacks, queues, trees, and graphs, and their applications in solving computational problems efficiently.
- To teach students how to implement data structures using object-oriented programming principles in C++, including encapsulation, inheritance, polymorphism, and abstraction.
- To enable students to analyse the time and space complexity of algorithms and data structures, using mathematical tools such as big-O notation, and to understand the implications of algorithmic efficiency on performance and scalability.
- To develop students' problem-solving skills by providing them with opportunities to apply data structures and algorithms to solve a variety of computational problems, including sorting, searching, graph algorithms, and dynamic programming.
- To provide students with practical experience in implementing and using data structures and algorithms through hands-on lab sessions, enabling them to gain proficiency in programming and problem-solving using C++.

Course Outcomes (CO's):

On successful completion of this practical lab session, students will be able to:

1. Demonstrate proficiency in implementing and manipulating fundamental data structures such as arrays, linked lists, stacks, queues, trees, and graphs using C++.
2. Develop competence in analyzing problem requirements and selecting appropriate data structures to efficiently organize and manage data.
3. Apply practical application, master file handling operations, including reading from and writing to files, and navigating directories using C++.
4. Exhibit the ability to design and implement efficient algorithms for various data and file structure manipulation tasks.
5. Apply their knowledge and skills in solving real-world problems requiring the manipulation of data and files using C++.

Block I: Introduction to Algorithms and Data Structures

Unit 1: Analysis of Algorithms: Mathematical Background, Process of Analysis, Calculation of Storage Complexity, Calculation of Run Time Complexity.

Unit 2: Arrays, Pointers and Structures, Arrays and Pointers, Sparse Matrices, Structures, Polynomials, Representation of Arrays, Row Major Representation, Column Major Representation, Applications.

Unit 3: Lists, Abstract Data Type-List, Array Implementation of Lists, Linked Lists-Implementation, Doubly Linked Lists-Implementation, Circularly Linked Lists-Implementation, Skip lists, Applications.

Block II: Stacks, Queues and Trees

Unit 4: Stacks, Abstract Data Type-Stack, Implementation of Stack, Implementation of Stack using Arrays, Implementation of Stack using Linked Lists, Algorithmic Implementation of Multiple Stacks, Applications.

Unit 5: Queues, Abstract Data Type-Queue, Implementation of Queue, Array Implementation, Linked List Implementation, Implementation of Multiple Queues, Implementation of Circular Queues, Array Implementation.

Unit 6: Linked List Implementation of a circular queue, Priority Queues, Implementation of DEQUEUE, Array Implementation of a dequeue, Linked List Implementation of a dequeue.

Unit 7: Trees: Abstract Data Type-Tree, Implementation of Tree, Tree Traversals, Binary Trees, Implementation of Binary Tree.

Unit 8: Binary Tree Traversals, Recursive Implementation of Binary Tree Traversals, Non Recursive Implementations of Binary Tree Traversals, Applications.

Block III: Graph Algorithms and Searching Techniques

Unit 9: Advanced Trees: Binary Search Trees, Traversing a Binary Search Trees, Insertion of a node into a Binary Search Tree, Deletion of a node from a Binary Search Tree, AVL Trees: Insertion of a node into an AVL Tree, Deletion of a node from an AVL Tree, AVL tree rotations, Applications of AVL Trees.

Unit 10: B-Trees: Operations on B-Trees, Applications of B-Trees, Splay Trees, Splaying steps, Splaying Algorithm, Red-Black trees, Properties of a Red-Black tree, AA-Trees.

Unit 11: Graphs: Definitions, Shortest Path Algorithms, Dijkstra's Algorithm, Graphs with Negative Edge costs, Acyclic Graphs, All Pairs Shortest Paths Algorithm.

Unit 12: Minimum cost Spanning Trees, Kruskal's Algorithm, Prim's Algorithm, Applications, Breadth First Search, Depth First Search, Finding Strongly Connected Components.

Unit 13: Searching and Sorting Techniques: Linear Search, Binary Search, Applications, Internal Sorting, Insertion Sort, Bubble Sort, Quick Sort, 2-way Merge Sort, Heap Sort, Sorting on Several Keys, External Sorting Algorithms.

Block IV: File Structures and Advanced Data Structures

Unit 14: Hashing: Introduction, Index Mapping, Collision Handling, Double Hashing, Load Factor and Rehashing.

Unit 15: Advanced Data Structures: Scapegoat Trees, Tries, Binary Tries, X-Fast Tries, Y-Fast Tries.

Unit 16: File Structures: Terminology, File Organisation, Sequential Files, Structure, Operations, Disadvantages, Areas of use, Direct File Organisation, Indexed Sequential File Organisation.

References:

1. Data Structures and Algorithm Analysis in C++" by Mark Allen Weiss, 4th ed., Pearson Education, 2013.
2. Data Structures Using C++" by D. S. Malik, 2nd ed., Cengage Learning, 2009.
3. Data Structures and Algorithms in C++" by Adam Drozdek, 4th ed., Cengage Learning, 2012.
4. Data Structures and Other Objects Using C++" by Michael Main and Walter Savitch, 4th ed., Pearson Education, 2010.
5. Algorithms in C++ Part 1-4: Fundamentals, Data Structures, Sorting, Searching" by Robert Sedgwick
6. Effective C++: 55 Specific Ways to Improve Your Programs and Designs" by Scott Meyers 3rd ed., Addison-Wesley Professional, 2005.

Course Code: CAMO - 2216

Credit: 2

Course Name: DAA and Web Design Lab

Course objectives:

- Implementing and analysing various algorithmic techniques such as greedy algorithms, dynamic programming, divide and conquer, and backtracking.
- Analysing the time and space complexity of algorithms using mathematical tools like big-O notation and understanding their implications on algorithmic efficiency.
- Developing practical skills in web development by designing and building interactive and dynamic web pages using HTML, CSS, and JavaScript.
- Exploring advanced concepts in web design, such as responsive design, web accessibility, and user experience (UX) design, to create user-friendly and visually appealing websites.
- Integrating client-side scripting with server-side scripting languages such as PHP or Node.js to create dynamic and database-driven web applications.

Course Outcomes (CO's):

On successful completion of this practical lab session, students will be able to:

1. Design and analyze algorithms for solving computational problems in DAA Lab.
2. Implement and evaluate various algorithmic approaches for optimization in DAA Lab.
3. Create dynamic and user-friendly websites using HTML, CSS, and JavaScript in Web Design Lab.
4. Design responsive web interfaces and incorporate multimedia elements for enhanced user experience in Web Design Lab.
5. Understand web design principles and techniques to develop functional and visually appealing websites in Web Design Lab.

Lab Sessions:

- There will be practical sessions of which 10 sessions will be on DAA and 10 sessions will be on Web Designing.
- The practice problems for all 20 sessions will be listed session-wise in the lab manual.

References:

For Design and Analysis of Algorithms (DAA):

1. Introduction to Algorithms" by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, (4th ed.). MIT Press, 2022.
2. Algorithm Design" by Jon Kleinberg and Éva Tardos, Pearson, 1st edition.
3. The Algorithm Design Manual" by Steven S. Skiena, 3rd ed., Springer, 2020.

For Web Programming:

4. "Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics" by Jennifer Niederst Robbins, 6th ed., O'Reilly Media, 2025.
5. "JavaScript and JQuery: Interactive Front-End Web Development" by Jon Duckett, 1st ed., Wiley, 2014.

Course Code: CAMO - 2207

Credit: 2

Course Name: Data Structure using C++

Objective:

- To familiarize students with the basic syntax, concepts, and features of the C++ programming language, including variables, data types, control structures, functions, and classes.
- To provide students with practical experience in writing, compiling, and executing C++ programs, covering a variety of programming constructs and problem-solving techniques.
- To reinforce the concepts of object-oriented programming (OOP) through hands-on exercises, including class and object creation, inheritance, polymorphism, and encapsulation.
- To teach students how to debug and troubleshoot C++ programs effectively, including techniques for identifying and fixing common errors and logical flaws in code.
- To enable students to develop applications and projects using C++ programming, applying their knowledge of programming fundamentals and OOP concepts to solve real-world problems and implement software solutions.

Course Outcomes (CO's):

On successful completion of this practical lab session, students will be able to:

1. Implement object-oriented programming concepts and practices in C++ Lab.
2. Develop efficient algorithms and data structures using C++ programming language in C++ Lab.
3. Apply skills in debugging and troubleshooting C++ code to identify and resolve programming errors in C++ Lab.
4. Create robust and scalable software solutions through hands-on coding exercises and projects in C++ Lab.
5. Understand memory management, file handling, and modular programming in C++ for building comprehensive software applications in C++ Lab.

C++ Programming Lab:

Syllabus and Sessions Allocation: (10 Sessions)

Session 1: Basics of C++, data type, I/O, Control Structures etc.

Session 2: Class and Objects, function calling.

Session 3: Constructor and Destructor.

Session 4: Inheritance.

Session 5: Operator Overloading.

Session 6: Polymorphism.

Session 7: Template class and function.

Session 8: I/O and streaming.

Session 9: Exception Handling

Session10: STL.

References:

1. Data Structures and Algorithm Analysis in C++" by Mark Allen Weiss, 4th ed., Pearson Education, 2013.
2. Data Structures Using C++" by D. S. Malik, 2nd ed., Cengage Learning, 2009.
3. Data Structures and Algorithms in C++" by Adam Drozdek, 4th ed., Cengage Learning, 2012.
4. Data Structures and Other Objects Using C++" by Michael Main and Walter Savitch, 4th ed., Pearson Education, 2010.
5. Algorithms in C++ Part 1-4: Fundamentals, Data Structures, Sorting, Searching" by Robert Sedgewick
6. Effective C++: 55 Specific Ways to Improve Your Programs and Designs" by Scott Meyers 3rd ed., Addison-Wesley Professional, 2005.

SEMESTER – III

Course Code: CAMO - 2301

Credit: 3

Course Name: Artificial Intelligence and Machine Learning

Course objectives:

- To provide students with a foundational understanding of artificial intelligence (AI) and machine learning (ML), including key concepts, algorithms, and applications in various domains.
- To introduce students to various machine learning techniques, including supervised learning, unsupervised learning, and reinforcement learning, and their applications in tasks such as classification, regression, clustering, and reinforcement learning.
- To familiarize students with deep learning techniques and neural networks, including convolutional neural networks (CNNs), recurrent neural networks (RNNs), and generative adversarial networks (GANs), and their applications in image recognition, natural language processing, and other domains.
- To teach students how to preprocess and prepare data for machine learning models, including techniques such as data cleaning, feature selection, transformation, and normalization.
- To provide students with practical experience in implementing machine learning algorithms and models using popular libraries and frameworks such as scikit-learn, TensorFlow, and PyTorch, and applying them to real-world datasets and problems.

Course Outcomes (CO's):

On successful completion of this practical lab session, students will be able to:

1. Implement AI and ML algorithms to solve complex real-world problems.
2. Analyze and interpret large datasets using machine learning techniques.
3. Develop intelligent systems capable of learning from data and making informed decisions autonomously.
4. Design and deploy AI models for tasks such as image recognition, natural language processing, and predictive analytics.
5. Understand ethical considerations and societal implications of AI and ML applications in diverse domains.

Block – I: Artificial Intelligence - Introduction:

Unit-1 Introduction to Artificial Intelligence - What is AI? Examples of AI systems, Approaches to AI, Brief history of AI, Comparison Between Artificial intelligence, Machine Learning, and Deep Learning, Intelligent Agent: stimulus response agents. components of intelligence.

Unit-2 Problem Solving using Search – Single agent search: Introduction to State Space Search, Statement of Search problems: state space graphs, Searching explicit state spaces. Feature based state spaces. Problem types, examples (puzzle problem, n-queen, the road map) Two agent search: Adversarial search: Two agent games (alpha-beta pruning). Min Max Search.

Unit-3 Uninformed and Informed Search – Uninformed Search: Formulating the state space, iterative deepening, bidirectional search. Informed Search Strategies: Using evaluation functions. A & AO, admissibility of A, Iterative deepening A, recursive best first search.

Unit-4 Predicate and Propositional Logic – Propositional logic, syntax, semantics, semantic rules, terminology - validity, satisfiability. interpretation, entailment, proof systems. Propositional Logic inference rules, natural deduction, propositional resolution.

Block – II: Artificial Intelligence - Knowledge Representation:

Unit-5 First Order Logic - First Order Logic: Motivation, Syntax, Interpretations, semantics of quantifiers, Entailment in FOL, Interpretation, Inference in FOL: First Order resolution. Conversion to clausal form. Unification. Most general unifier. Resolution with variables Proving validity.

Unit-6 Rule based Systems and other formalism - Rule Based Systems: Forward chaining.

Backward chaining. Conflict resolution. Semantic nets, Frames, Scripts.

Unit-7 Probabilistic Reasoning Reasoning with uncertain information Review of Probability Theory, Introduction to Bayesian Theory, Bayes' Networks, Probabilistic Inference, Basic idea of inferencing with Bayes networks. Other paradigms of uncertain reasoning. Dempster-Scheffer Theory.

Unit-8 Fuzzy and Rough Set Fuzzy Reasoning Introduction to Fuzzy sets, Fuzzy set representation, Fuzzy inferences, Rough Set Theory.

Block – III: Machine Learning - I:

Unit-9 Introduction to Machine Learning Methods – Introduction to Machine Learning, Techniques of Machine Learning, Reinforcement Learning and algorithms, Deep Learning and its Algorithms, Ensemble Methods.

Unit-10 Classification – Understanding of Supervised Learning, Introduction to Classification, Classification Algorithms: Naïve Bayes, K-NN, Decision Trees, Logistic Regression, Support Vector Machines.

Unit-11 Regression – Introduction to Regression, Regression algorithm Linear Regression and Polynomial Regression, Support Vector Regression.

Unit-12 Neural Networks and Deep Learning: Overview of Artificial Neural Networks, Multilayer Feedforward Neural networks with Sigmoid activation functions; Back propagation Algorithm; Representational abilities of feed forward networks, Feed forward networks for Classification and Regression, Deep Learning.

Block – IV: Machine Learning - II:

Unit-13 Feature selection and Extraction: Introduction to Feature Selection and Extraction, Dimensionality Reduction, Principal Component Analysis, Linear Discriminant Analysis, Singular Value Decomposition.

Unit-14 Association Rules – Introduction to Pattern search and its algorithms: Apriori Algorithms. and its variants, FP Tree Growth, Pincer Search.

Unit-15 Clustering – Introduction to Clustering, Types of Clustering, Partition Based, Hierarchical Based, Density Based Clustering Techniques, Clustering algorithms: K Means, Agglomerative and Divisive, DBSCAN, Introduction to Fuzzy Clustering.

Unit – 16 Machine Learning Programming using Python Implementations of various algorithms of this course.

References:

1. Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig, (4th ed.). Pearson, 2020.
2. Pattern Recognition and Machine Learning" by Christopher M. Bishop, 1st ed., Springer, 2006.

3. Machine Learning: A Probabilistic Perspective" by Kevin P. Murphy, 2nd ed., MIT Press, 2022.
4. Deep Learning by Ian Goodfellow, Yoshua Bengio, and Aaron Courville, 1st Edition, MIT Press, 2016.
5. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow" by Aurélien Géron, 2nd ed., O'Reilly Media, 2019

Course Code: CAMO – 2302

Credit: 3

Course Name: Data Science using R Programming

Course Objectives:

- To introduce the fundamentals of data science and its applications using R.
- To develop skills in data manipulation, visualization, and statistical analysis.
- To implement machine learning algorithms using R programming.
- To enhance problem-solving abilities through real-world data analysis.
- To apply data science techniques for predictive modeling and decision-making.

Course Outcome (CO's):

On successful completion of this practical lab session, students will be able to:

1. Understand core concepts of data science and R programming.
2. Perform data manipulation, cleaning, and visualization using R.
3. Implement statistical methods and machine learning models in R.
4. Analyze and interpret real-world datasets for insights and predictions.
5. Develop data-driven solutions for business and research applications.

Block – I: Fundamentals of Data Science

Unit 1: Introduction to Data Science

- Definition and Scope of Data Science
- Types of Data Analysis (Descriptive, Exploratory, Inferential, Causal, Predictive)
- Common Mistakes in Data Analysis (Correlation vs. Causation, Simpson's Paradox, Data Dredging)
- Applications and Life Cycle of Data Science

Unit 2: Probability and Statistics for Data Science

- Basic Concepts: Probability, Dependence & Independence, Conditional Probability
- Bayes' Theorem, Random Variables, Probability Distributions
- Normal Distribution, Central Limit Theorem
- Hypothesis Testing, Confidence Intervals

Unit 3: Data Preparation for Analysis

- Data Preprocessing Techniques
- Data Cleaning and Transformation
- Feature Selection and Extraction
- Data Integration and Knowledge Discovery

Unit 4: Data Visualization and Interpretation

- Types of Plots: Histograms, Boxplots, Scatter Plots
- Regression-related Visualizations
- Data Interpretation with Real-World Examples

Block – II: Big Data and Its Management

Unit 5: Big Data Architecture

- Characteristics of Big Data (Volume, Variety, Velocity, Veracity)
- Structured vs. Semi-Structured and Unstructured Data
- Big Data vs. Data Warehousing
- Hadoop Architecture: HDFS, YARN, MapReduce

Unit 6: Programming with MapReduce

- Fundamentals of MapReduce Processing
- Loading Data into HDFS
- Execution of Map and Reduce Phases
- Algorithms Using MapReduce (Word Counting, Matrix-Vector Multiplication)

Unit 7: Big Data Tools and Technologies

- Apache Spark: Architecture and Functionality
- Data Processing with Hive and HBase
- Overview of Other Big Data Tools

Unit 8: NoSQL Databases

- Column-Based, Graph-Based, Key-Value Pair, and Document-Based Databases
- Use Cases and Applications

Block – III: Big Data Analysis

Unit 9: Mining Big Data

- Finding Similar Items and Jaccard Similarity
- Collaborative Filtering and Similarity Measures
- Euclidean Distance in Data Analysis

Unit 10: Data Stream Processing

- Data Stream Models and Management
- Query Processing in Data Streams
- Challenges and Sampling Techniques
- Filtering and Counting Unique Elements in Streams

Unit 11: Link Analysis & Page Ranking

- Concepts and Mechanisms of Page Rank
- Link Spam Detection and Topic-Sensitive Page Rank
- Hubs and Authorities in Web Search

Unit 12: Web and Social Network Analysis

- Introduction to Web Analytics and Online Advertising
- Recommendation Systems and Utility Matrix
- Social Network Graphs and Distance Measures
- Clustering Techniques in Social Media Analysis

Block – IV: Programming for Data Analysis

Unit 13: Introduction to R Programming

- R Environment and Setup
- Data Types, Variables, Operators
- Decision Making, Loops, and Functions
- Data Structures in R: Vectors, Lists, Data Frames, Matrices, Arrays

Unit 14: Data Interfacing and Visualization in R

- Reading/Writing Data: CSV, Excel, XML, JSON, Databases
- Data Cleaning and Processing in R
- Visualization Techniques: Bar Charts, Box Plots, Histograms, Line Charts, Scatter Plots

Unit 15: Statistical Data Analysis in R

- Chi-square Test, Linear and Multiple Regression
- Logistic Regression and Time Series Analysis

Unit 16: Advanced Data Analysis in R

- Decision Trees and Random Forest
- Classification, Clustering, and Association Rule Mining

References:

1. "Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking" by Foster Provost and Tom Fawcett, O'Reilly Media, 2013.
2. "Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython" by Wes McKinney, 3rd ed., O'Reilly Media, 2022.
3. "Big Data: Principles and Best Practices of Scalable Real-Time Data Systems" by Nathan Marz and James Warren, Manning Publications, 2015.
4. "Data Science from Scratch: First Principles with Python" by Joel Grus, 2nd ed., O'Reilly Media, 2019.

5. "Mining of Massive Datasets" by Jure Leskovec, Anand Rajaraman, and Jeffrey D. Ullman, Cambridge University Press, 2020.

Course Code: CAMO – 2303

Credit: 3

Course Name: OOP's Technologies and Java Programming

Course Objectives:

- To introduce students to the core principles of OOP, including encapsulation, inheritance, polymorphism, and abstraction, and their significance in software development.
- To familiarize students with the syntax, data types, control structures, and basic concepts of the Java programming language, enabling them to write simple Java programs and understand object-oriented concepts in the context of Java.
- To teach students advanced features of Java programming, including generics, collections, exception handling, multithreading, and input/output operations, enabling them to develop robust and efficient Java applications.
- To guide students in applying OOP principles and design patterns to solve real-world problems, including modeling software systems, designing classes and interfaces, and implementing reusable and maintainable code.
- To introduce students to popular Java technologies and frameworks, such as Java EE (Enterprise Edition), Spring Framework, Hibernate, and JavaFX, and their applications in developing web applications, enterprise systems, and desktop applications.

Course Outcome (CO's):

On successful completion of this practical lab session, students will be able to:

1. Develop proficiency in Java syntax, object-oriented principles, and programming constructs.
2. Develop Java applications for various platforms and environments.
3. Implement data structures, algorithms, and design patterns in Java programming.
4. Debug, test, and troubleshoot Java code for robust and efficient software development.
5. Understand Java's role in modern software development and its applications in enterprise systems and web development.

Block–I: Object Oriented Technology and Java

Unit 1: Object Oriented Methodology-1 Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach.

Unit 2: Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Introduction to Common OO Language, Applications of OOPs.

Unit 3: Object Oriented Methodology-2 Classes and Objects, Abstraction and Encapsulation, Inheritance, Method Overriding and Polymorphism.

Unit 4: Java Language Basics Introduction to Java, Basic Features, Java Virtual Machine Concepts, A Simple Java Program, Primitive Data Type And Variables, Java Keywords, Integer and Floating Point Data Type, Character and Boolean Types, Declaring and Initialization Variables, Java Operators.

Unit 5: Expressions, Statements and Arrays Expressions, Statements, Control Statements, Selection Statements, Iterative Statements, Jump Statements, Arrays.

Block–II: Object Oriented Concepts and Exceptions Handling

Unit 6: Class and Objects Class Fundamentals, Creating objects, Assigning object reference variables, Introducing Methods, Static methods, Constructors, Overloading constructors.

Unit 7: Keyword, Using Objects as Parameters, Argument passing, Returning objects, Method Overloading, Garbage Collection, The Finalize () Method.

Unit 8: Inheritance and Polymorphism Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword.

Unit 9: Packages and Interfaces Package, Defining Package, CLASSPATH, Package naming, Accessibility of Packages, Using Package Members, Interfaces, Implementing Interfaces, Interface and Abstract Classes, Extends and Implements Together.

Unit 10: Exceptions Handling Exception, Handling of Exception, Using try-catch, Catching Multiple Exceptions, Using finally clause, Types of Exceptions, Throwing Exceptions, Writing Exception Subclasses.

Block–III: Multithreading, I/O and String Handling

Unit 11: Multithreaded Programming Multithreading: An Introduction, The Main Thread, Java Thread Model, Thread Priorities, Synchronization in Java, Interthread Communication.

Unit 12: I/O in Java I/O Basics, Streams and Stream Classes, Byte Stream Classes, Character Stream Classes, The Predefined Streams, Reading from, and Writing to, Console, Reading and Writing Files, The Transient and Volatile Modifiers, Using Instance of Native Methods.

Unit 13: Strings and Characters Fundamentals of Characters and Strings, The String Class, String Operations, Data Conversion using Value Of () Methods, String Buffer Class and Methods.

Unit 14: Exploring Java I/O Java I/O Classes and Interfaces, I/O Stream Classes, Input and Output Stream, Input Stream and Output Stream Hierarchy, Text Streams, Stream Tokenizer, Serialization, Buffered Stream, Print Stream, Random Access File.

Block–IV: Applets Programming and Advance Java Concepts

Unit 15: Applets: The Applet Class, Applet Architecture, An Applet Skeleton: Initialization and Termination, Handling Events, HTML Applet Tag.

Unit 16: Graphics and User Interfaces Graphics Contexts and Graphics Objects, Color Control, Fonts, Coordinate System, User Interface Components, Building User Interface with AWT, Swing-based GUI, Layouts and Layout Manager, Container.

Unit 17: Networking Features Socket Overview, Reserved Parts and Proxy Servers, Internet Addressing: Domain Naming Services (DNS), JAVA and the net: URL, TCP/IP Sockets.

Unit 18: Advance Java Java Database Connectivity, Establishing A Connection, Transactions with Database, An Overview of RMI Applications, Remote Classes and Interfaces, RMI Architecture, Java Beans.

References:

For Object-Oriented Programming (OOP) Technologies:

1. Object-Oriented Analysis and Design with Applications" by Grady Booch, 3rd Edition, Addison-Wesley Professional, 2007.
2. Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides, 2nd edition, Addison-Wesley, 2024.
3. Object-Oriented Programming in C++" by Robert Lafore, 4th Edition, 2002.

For Java Programming:

4. Effective Java" by Joshua Bloch, 3rd Edition, Addison-Wesley Professional, 2017

5. Java: The Complete Reference" by Herbert Schildt, 13th Edition, McGraw-Hill, 2024.

Course Code: CAMO – 2304

Credit: 3

Course Name: Advanced Database Management System

Course Objectives:

- Understand advanced database concepts, including normalization, indexing, and query optimization.
- Explore distributed databases, NoSQL databases, and modern data storage techniques.
- Implement transaction management, concurrency control, and recovery mechanisms.
- Analyze database security models and access control techniques.
- Develop scalable database solutions using emerging database technologies.

Course Outcome (CO's):

On successful completion of this practical lab session, students will be able to:

1. Apply advanced database design principles for efficient data management.
2. Optimize queries and indexing techniques for improved database performance.
3. Implement distributed and NoSQL databases for handling large-scale data.
4. Ensure data integrity, consistency, and security in multi-user environments.
5. Design and develop real-world database applications with advanced functionalities.

Block – I: Advanced Database Concepts

Unit 1: Introduction to ADBMS - Need for Advanced Databases, Comparison with Traditional DBMS, Database Architectures.

Unit 2: Data Models and Query Processing - Enhanced ER Model, Object-Oriented Databases, XML Databases, JSON Databases.

Unit 3: Normalization and Indexing - Higher Normal Forms (BCNF, 4NF, 5NF), Indexing Techniques (B-Trees, Hashing), Query Optimization.

Unit 4: Query Processing and Optimization - Cost Estimation, Heuristic Optimization, Join Algorithms, Query Caching.

Block – II: Transaction Management and Concurrency Control

Unit 5: Transaction Processing - ACID Properties, Serializability, Schedule Classification, Two-Phase Commit Protocol.

Unit 6: Concurrency Control - Locking Mechanisms, Timestamp Ordering, Deadlock Detection and Prevention.

Unit 7: Recovery Mechanisms - Log-Based Recovery, Checkpointing, Shadow Paging, ARIES Algorithm.

Unit 8: Database Security - Access Control, Authentication, Authorization, SQL Injection, Role-Based Security.

Block – III: Distributed and NoSQL Databases

Unit 9: Distributed Databases - Concepts, Architecture, Data Fragmentation, Replication, and Allocation.

Unit 10: Query Processing in Distributed Databases - Distributed Query Execution, Distributed Transactions, CAP Theorem.

Unit 11: NoSQL Databases - Key-Value Stores, Document-Oriented Databases, Column-Family Stores, Graph Databases.

Unit 12: Big Data and Modern Database Trends - Hadoop, HDFS, MapReduce, Cloud Databases, Data Warehousing.

Block – IV: Advanced Topics and Applications

Unit 13: Object-Relational Databases - Features, ORDBMS Architecture, Case Studies.

Unit 14: XML and JSON Databases - Data Storage and Retrieval, XQuery, XPath, JSON Parsing.

Unit 15: Data Mining and Warehousing - Data Preprocessing, OLAP, Data Cube Computation, Association Rule Mining.

Unit 16: Emerging Database Technologies - Blockchain Databases, In-Memory Databases, Graph Databases in AI/ML Applications.

References:

1. "Database System Concepts" – Abraham Silberschatz, Henry F. Korth, S. Sudarshan, 7th Edition, (McGraw-Hill), 2021.
2. "Fundamentals of Database Systems" – Ramez Elmasri, Shamkant B. Navathe, 7th Edition, (Pearson Education), 2015
3. "Principles of Distributed Database Systems" – M. Tamer Özsu, Patrick Valduriez, 4th Edition, (Springer), 2020
4. "NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence" – Pramod J. Sadalage, Martin Fowler, 1st Edition, (Addison-Wesley)
5. "The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling" – Ralph Kimball, Margy Ross, 3rd Edition, (Wiley), 2013

Course Code: CAMO – 2318

Credit: 2

Course Name: Java Programming Lab

Course Objectives:

- To provide students with hands-on experience in writing, compiling, and executing Java programs, covering basic syntax, data types, control structures, and functions.
- To reinforce the concepts of object-oriented programming (OOP) through practical exercises, including class and object creation, inheritance, polymorphism, and encapsulation.
- To enable students to develop Java applications and projects, including console-based applications, graphical user interfaces (GUIs), and web applications, using Java SE (Standard Edition) and Java EE (Enterprise Edition) technologies.
- To teach students how to connect Java applications to databases using JDBC (Java Database Connectivity), enabling them to perform database operations such as querying, inserting, updating, and deleting data.
- To introduce students to advanced features of Java programming, including multithreading, networking, file handling, and exception handling, and their applications in building robust and efficient Java applications.

Course Outcome (CO's):

On successful completion of this practical lab session, students will be able to:

1. Implement Java programming concepts to solve real-world problems.
2. Design and develop Java applications through hands-on coding exercises.
3. Develop skills in debugging and troubleshooting Java code to ensure program correctness and efficiency.
4. Apply object-oriented design principles to create modular and scalable software solutions.
5. Understand software development methodologies and best practices in Java programming.

Section - I: Java Programming Lab

- Programming with Java
- Path and Class Path Setting
- Example Programs
- List of Lab Assignments

List of 20 Java Programs (10 Basic & 10 Advanced)

Basic Programs

1. **Basic Java Program:** Write a Java program to print "Hello, World!" on the console.
2. **Arithmetic Operations:** Write a Java program to perform addition, subtraction, multiplication, and division using user input.
3. **Check Even or Odd:** Write a Java program to check whether a given number is even or odd.
4. **Find Largest Number:** Write a Java program to find the largest of three numbers using if-else statements.
5. **Factorial Calculation:** Write a Java program to calculate the factorial of a given number using recursion.

6. **Fibonacci Series:** Write a Java program to print the Fibonacci series up to n terms using iteration.
7. **Palindrome Number:** Write a Java program to check whether a given number is a palindrome.
8. **Reverse a String:** Write a Java program to reverse a given string using loops.
9. **Armstrong Number:** Write a Java program to check whether a given number is an Armstrong number.
10. **Array Operations:** Write a Java program to find the sum and average of elements in an array.

Advanced Programs

11. **Class and Object Concept:** Write a Java program to create a class Student with attributes like name, rollNumber, and marks, and display the student details.
12. **Constructor Overloading:** Write a Java program to demonstrate constructor overloading with different types of constructors.
13. **Method Overriding & Inheritance:** Write a Java program to demonstrate method overriding and inheritance using a Base and Derived class.
14. **Multithreading Implementation:** Write a Java program to implement multithreading using the Thread class and Runnable interface.
15. **Exception Handling:** Write a Java program to demonstrate the use of try, catch, finally, and throws for handling exceptions.
16. **File Handling:** Write a Java program to read a file and display its contents on the console.
17. **Interface Implementation:** Write a Java program to implement multiple interfaces in a single class.
18. **Database Connectivity:** Write a Java program to connect to a MySQL database using JDBC and perform CRUD operations.
19. **Swing GUI Application:** Write a Java program to create a simple GUI-based calculator using JFrame, JButton, and JTextField.
20. **Collections Framework:** Write a Java program to demonstrate the use of ArrayList, HashMap, and LinkedList with data insertion, deletion, and iteration.

References:

1. Java: The Complete Reference" by Herbert Schildt, 13th Edition, McGraw-Hill, 2024.
2. "Core Java Volume I – Fundamentals" – Cay S. Horstmann, 13th Edition, (Pearson Education), 2024
3. "Head First Java" – Kathy Sierra, Bert Bates, Third Edition, (O'Reilly Media), 2022.
4. "Java Programming for Beginners" – Mark Lassoff, First Edition, (BPB Publications), 2017.
5. "Effective Java" – Joshua Bloch, 3rd Edition, (Addison-Wesley), 2017.

Course Code: CAMO – 2319

Credit: 2

Course Name: Data Science using R Programming Lab

Course Objectives:

- Develop proficiency in R programming for data manipulation, analysis, and visualization.
- Understand statistical methods and machine learning techniques using R.
- Apply data pre-processing, cleaning, and transformation techniques for real-world datasets.
- Implement data visualization techniques to interpret and communicate analytical results effectively.
- Gain hands-on experience in building predictive models and performing exploratory data analysis.

Course Outcome (CO's):

On successful completion of this practical lab session, students will be able to:

1. Demonstrate the ability to write and execute R scripts for data analysis tasks.
2. Utilize statistical and machine learning libraries in R for data-driven decision-making.
3. Perform data preprocessing, handling missing values, and feature engineering efficiently.
4. Create insightful visualizations to interpret complex datasets and trends.
5. Develop predictive models and evaluate their performance using appropriate R packages.

Data Science Using R Programming

Basic Programs (Fundamentals of R and Data Handling)

1. Write a program to perform basic arithmetic operations in R.
2. Write a program to demonstrate the use of vectors, matrices, lists, and data frames in R.
3. Write a program to import and export data from CSV, Excel, and JSON files.
4. Write a program to implement control structures (if-else, loops) in R.
5. Write a program to perform basic statistical functions (mean, median, variance, standard deviation, correlation).
6. Write a program to visualize data using bar charts, histograms, and scatter plots.
7. Write a program to perform basic data preprocessing, including handling missing values and outliers.
8. Write a program to apply string operations (concatenation, substring, replace, split) in R.
9. Write a program to perform linear regression using the `lm()` function in R.
10. Write a program to create a simple function in R and use it to perform data manipulation.

Advanced Programs (Machine Learning & Data Science Techniques)

11. Write a program to implement multiple linear regression in R.
12. Write a program to implement logistic regression for binary classification.

13. Write a program to perform K-Means clustering on a dataset.
14. Write a program to implement Decision Tree classification using R.
15. Write a program to apply Principal Component Analysis (PCA) for dimensionality reduction.
16. Write a program to perform Association Rule Mining using the Apriori algorithm.
17. Write a program to implement a Naive Bayes classifier on a dataset.
18. Write a program to perform Time Series Forecasting using the ARIMA model in R.
19. Write a program to implement Random Forest classification and evaluate model accuracy.
20. Write a program to perform sentiment analysis on textual data using R.

References:

1. "R for Data Science" – **Hadley Wickham & Garrett Golemund, 2nd Edition, (O'Reilly Media), 2023.**
2. "**The Art of R Programming**" – Norman Matloff, 1st Edition, (No Starch Press), 2011
3. "**Data Science with R: A Hands-On Approach**" – Naveen Kumar & R. Anitha (BPB Publications)
4. "**Machine Learning with R**" – Brett Lantz 4th Edition, (Packt Publishing), 2023
5. "**Hands-On Programming with R**" – Garrett Golemund, 1st Edition, (O'Reilly Media), 2014

Any One Course from the Following 03 (Elective Course – CAMO-2305/ CAMO-2306/ CAMO-2307)

Course Code: CAMO – 2305

Credit: 4

Course Name: Data Warehousing and Data Mining

Course Objectives:

- To introduce students to the concepts, architecture, and components of data warehousing, including data sources, ETL (Extract, Transform, Load) processes, data warehouses, and data marts.
- To teach students how to design and implement dimensional models for data warehouses, including star schemas, snowflake schemas, and fact-dimension tables, to facilitate efficient data storage and retrieval.
- To familiarize students with the process of extracting data from various sources, transforming it into a consistent format, and loading it into a data warehouse or data mart, using tools and techniques such as SQL, scripting languages, and ETL tools.
- To introduce students to data mining concepts and techniques, including classification, clustering, association rule mining, and anomaly detection, and their applications in extracting patterns, trends, and insights from large datasets.
- To develop students' skills in visualizing and interpreting data mining results effectively, using tools and techniques such as data visualization libraries, dashboards, and storytelling, to communicate findings and insights to stakeholders.

Course Outcome (CO's):

On successful completion of this practical lab session, students will be able to:

1. Design and implement data warehouses for efficient storage and retrieval of large-scale data.
2. Utilize data mining algorithms and techniques to uncover hidden patterns and insights from complex datasets.
3. Develop skills in preprocessing and cleansing data to prepare it for analysis and mining tasks.
4. Interpret and visualize mining results to derive actionable insights for decision-making.
5. Understand ethical considerations and privacy concerns in data warehousing and mining practices.

Block – I: Data Warehouse Fundamentals And Architecture

Unit 1: Fundamentals of Data Warehouse, Introduction to Data Warehousing, Evolution of Data Warehousing, Data Warehousing Concepts, Online Transaction Processing Systems, Differences between OLTP Systems and Data Warehouse, Characteristics of Data Warehouse.

Unit 2: Data Granularity, Metadata and Data Warehousing, Functionality of Data Warehouse, Advantages of Data Warehouse, Applications of Data Warehouse, Concerns in Data Warehouse, Types of Data Warehouses, Enterprise Data Warehouse, Operational Data Store, Data Mart.

Unit 3: Data Warehouse Architecture, Introduction to Data Warehouse Architecture, Characteristics of Data Warehouse Architecture, DW Architecture Goals, Components of Data Warehouse, Load Manager, Warehouse Manager, Query Manager, Data Mart, Building Data Marts, DW and Data Marts.

Unit 4: Issues in Building Data Marts, Co-existence of DW and Data Mart, Planning and Requirements, Planning Data Warehouse and Key Issues, Planning and Project Management in constructing Data

Warehouse, Data Warehouse Development Life Cycle, Methodologies - Top- Down, Bottom-Up and Hybrid Development Methodology.

Unit 5: Dimensional Modeling, Introduction to Dimensional Modeling and its Strengths, Identifying Facts and Dimensions, Star Schema, Pros and Cons of Star Schema, Snowflake Schema, Pros and Cons of Snowflake Schema, Aggregate Tables, Need for Building Aggregate Fact Tables, Limitations of Aggregate Fact Tables, Fact Constellation Schema, Aggregate Fact Tables and Derived Dimension Tables, Pros and Cons of Fact Constellation Schema.

Block – II: ETL, OLAP and TRENDS

Unit 6: Extract, Transform and Loading, Overview of ETL, ETL requirements and steps, Data Extraction, Extraction Methods- Logical Extraction Methods and Physical Extraction Methods. Data Transformation, Basic Tasks in Transformation, Major Data Transformation Types, Data loading; Data Loading Techniques, Data Quality.

Unit 7: Introduction to Online Analytical Processing, Need for OLAP, Characteristics of OLAP, OLAP and Multidimensional Analysis, Multidimensional Logical Data Model and its Users, Multidimensional Structure, Multidimensional Operations.

Unit 8: OLAP Functions, Data Warehouse and OLAP: Hypercube & Multi-cubes, OLAP Applications, Steps in the OLAP Creation Process, Advantages of OLAP, OLAP Architectures - MOLAP, ROLAP, HOLAP, DOLAP. Trends in Data Warehouse, Data Lakes Complex Data Marts, Cloud Data Warehousing, Real Time Data Warehousing, Data Warehousing and Hadoop, Data Warehouse Automation.

Block – III: Data Mining Fundamentals and Frequent Pattern Mining

Unit 9: Data Mining – An Introduction, Introduction, Data Mining – Kind of Data, Relational Databases, Data Warehouses, Transactional Databases, Advanced Data and Informational Systems.

Unit 10: Classification of Data Mining Systems, Applications of Data Mining, Data Mining and Data Warehousing, Data Mining Tools, Major Issues in Data Mining.

Unit 11: Data Preprocessing, Introduction, Data Preprocessing Overview, Data Cleaning, Missing Values, Noisy Data, Data Cleaning as a Process, Data Integration and Transformation, Data Integration, Data Transformation.

Unit 12: Data Reduction, Data Cube Aggregation, Attribute Subset Selection, Dimensionality Reduction, Numerosity Reduction, Discretization and Binarization, Measures of Similarity and Dissimilarity-Basics. Mining Frequent Patterns and Associations, Problem Definition, Frequent Item Set Generation.

Unit 13: APRIORI Principle, Support and Confidence Measures, Association Rule Generation, APRIORI Algorithm: Finding Frequent Item set Using Candidate Generation, Generating Association Rules from Frequent Item set, Improving the efficiency of Apriori, Correlation Analysis, From Association Analysis to Correlation Analysis.

Block – IV: Classification, Clustering and Web Mining

Unit 14: Classification, Introduction, Classification: Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers, Classification techniques, Decision Trees-Decision tree Construction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split.

Unit 15: Algorithm for Decision tree Induction, Bayesian Classification, Bayes' Theorem o Naive-

Bayesian Classification, Bayesian Belief Networks, Support Vector Machines, The Case when the data are linearly separable, The Case when the data are linearly inseparable.

Unit 16: Clustering: Problem Definition, Clustering Overview, Categorization of Major Clustering Methods, Partitioning Method o Hierarchical Method, Density-based Method, Grid-Based Method, Model-Based Method, Constraint-based Method, Partitioning Method.

Unit 17: K-Means Algorithm, K-Medoids Hierarchical Clustering, Agglomerative Method, Divisive Method, Key Issues in Hierarchical Clustering, Strengths and Weakness, Outlier Analysis – Outlier Detection methods.

Unit 18: Text and Web Mining: Introduction, Text Data Analysis and Information Retrieval, Dimensionality Reduction for Text, Text Mining Approaches, Web mining, Web content mining, Web structure mining, Mining Multimedia Data on the Web, Automatic Classification of Web Documents, Web usage mining.

References:

1. The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling" by Ralph Kimball and Margy Ross, 3rd Edition, Wiley, 2013.
2. Data Mining: Concepts and Techniques" by Jiawei Han, Micheline Kamber, and Jian Pei, 4th Edition, Morgan Kaufmann, 2022.
3. Building the Data Warehouse" by W. H. Inmon, 4th Edition, Wiley.
4. Data Warehousing in the Real World: A Practical Guide for Building Decision Support Systems" by Sam Anahory and Dennis Murray, 1st Edition, : Addison-Wesley Professional.
5. Data Mining: Practical Machine Learning Tools and Techniques" by Ian H. Witten, Eibe Frank, and Mark A. Hall, 5th Edition, Elsevier, 2025.

Course Code: CAMO – 2306
Course Name: Soft Computing Techniques

Credit: 4

Course Objectives:

- To provide students with an overview of soft computing techniques, including fuzzy logic, neural networks, evolutionary algorithms, and swarm intelligence, and their applications in solving complex and uncertain problems.
- To teach students the principles and techniques of fuzzy logic, including fuzzy sets, fuzzy inference systems, fuzzy rules, and fuzzy control, and their applications in modeling and controlling nonlinear systems.
- To familiarize students with artificial neural networks (ANNs), including feedforward neural networks, recurrent neural networks, and convolutional neural networks, and their applications in pattern recognition, classification, regression, and optimization.
- To introduce students to evolutionary algorithms such as genetic algorithms, genetic programming, and differential evolution, and their applications in optimization, search, and machine learning.
- To enable students to understand swarm intelligence algorithms such as particle swarm optimization (PSO), ant colony optimization (ACO), and bee colony optimization (BCO), and their applications in optimization, routing, and scheduling problems.

Course Outcome (CO's):

On successful completion of this practical lab session, students will be able to:

1. Apply neural networks, fuzzy logic, and evolutionary algorithms to solve complex problems.
2. Design and optimize soft computing models for pattern recognition and decision-making tasks.
3. Implement swarm intelligence techniques for optimization and decision support in diverse domains.
4. Analyze and interpret results from soft computing models to derive actionable insights.
5. Understand the principles and applications of soft computing techniques in various industries and domains.

Block–I: Introduction to Soft Computing

Unit 1: Definition, requirement, necessity and adequacy; various dialects of soft computing – Evolutionary Algorithms, Fuzzy Sets and Fuzzy Logic.

Unit 2: Artificial Neural Networks - their suitability in Searching, optimization, decision matching and pattern related problems; potential areas of applications.

Unit 3: History of Evolutionary Computing: The Appeal of Evolution, Biological Terminology, Elements of Genetic Algorithm, Genetic Algorithms and Traditional Search Methods, Applications of Genetic Algorithm.

Unit 4: Genetic Algorithm in Problem Solving: Evolving Computer Programs, Data Analysis and Prediction.

Block–II: Theoretical Foundations of Genetic Algorithm

Unit 5: Schemas and the Two-Armed Bandit Problem, Royal Roads, Exact Mathematical Models of Genetic Algorithm.

Unit 6: Implementing a Genetic Algorithm: When should a Genetic Algorithm be used , Encoding a Problem for a Genetic Algorithm, Adapting the Encoding, Selection Methods , Genetic Operator.

Block–III: Introduction to Fuzzy Set Theory

Unit 7: Introduction to fuzzy sets and fuzzy logic; difference between classical and fuzzy sets; chance vs fuzziness; limitations of fuzzy systems.

Unit 8: Typical shapes of membership functions and their usage; operations on fuzzy sets: compliment, intersection, union; combinations on operations, aggregation operation.

Unit 9: Cartesian Product; Classical Relations and Fuzzy Relations; Cardinality, operations and properties of crisp and fuzzy relations; Composition of operations, Fuzzy cartesian product.

Unit 10: The linguistic variables, Reasoning in fuzzy logic, Fuzzification and defuzzification; Mamdani and Sugano Fuzzy Inference Systems.

Block–IV: Neural Network & Learning Fundamentals

Unit 11: Overview of biological neurons; McCulloch-Pitts model, Rosenblatt's Perceptron model, difference, capabilities and limitations; Model of generic computational neuron.

Unit 12: Basic activation functions; Basic Learning laws of neurons; Single layer and multilayer architectures; Feedforward and feedback networks.

Unit 13: Learning paradigms, supervised and unsupervised learning, reinforced learning; back propagation algorithm; Radial basis neurons, Generalized Regression Neural network, Probabilistic Neural Networks.

Unit 14: Competitive learning; Self Organizing Features Map, Hopfield networks, associative memories, applications of artificial neural networks. Elasticity vs plasticity dilemma, preprocessing, post processing, early stopping.

Block–V: Evolutionary Algorithms

Unit 15: Problems suitable and not suitable for applying evolutionary algorithms; Various dialects of evolutionary Algorithms; Terminology of Genetic Algorithms; Canonical Genetic Algorithm; Common representations and related reproduction operators.

Unit 16: Premature convergence, schema theorem, minimal deceptive problem and Royal Road function; fitness function, Roulette wheel selection, Rank selection, Tournament Selection; termination criteria, survivor selection, population models; parallel implementations.

References:

1. Artificial Neural Networks: An introduction to ANN Theory and Practice, Peteus J. Braspenning, PHI publication, 1st Edition, 2005.
2. Fuzzy Logic: A spectrum of Theoretical and Practical issues, Paul P. Wang, Pearson publication, 1st Edition, 2007.
3. An Introduction to Genetic Algorithms, Milanie Mitchell, MIT Press, 1998.
4. A Genetic Algorithm Tutorial, Darrell Whitley.
5. Fuzzy Sets, Fuzzy logic, and Fuzzy Systems: Selected Papers- Lotfi Asker Zadeh, George J. Kilr, Bo yuan, 2005.
6. Foundations of Fuzzy logic and Soft Computing: 12th International Fuzzy conference proceeding, 2005.

7.N.K. Sinha & M.M Gupta (Eds), Soft Computing & Intelligent System: Theory & Applications, Academic Press, 2000.

8. S.N Sivanandam, S.N Deepa, Principles of Soft Computing, 2nd Edition, Wiley.

Course Code: CAMO – 2307

Credit: 4

Course Name: Cloud Computing and Internet of Things

Course Objectives:

- To introduce students to the concepts, principles, and models of cloud computing, including infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS), and their applications in various domains.
- To familiarize students with cloud architecture components such as virtualization, containers, orchestration, and microservices, and different deployment models such as public cloud, private cloud, hybrid cloud, and multi-cloud.
- To teach students about various cloud services and technologies, including storage services, compute services, networking services, database services, and serverless computing, and how to leverage them to build scalable and resilient cloud applications.
- To provide students with an understanding of the Internet of Things (IoT) ecosystem, including IoT devices, sensors, actuators, gateways, and communication protocols, and their role in connecting physical objects to the internet.
- To explore various applications and use cases of IoT in different domains such as smart homes, smart cities, healthcare, agriculture, transportation, and industrial automation, and how cloud computing enables IoT data processing, storage, and analysis.

Course Outcome (CO's):

On successful completion of this practical lab session, students will be able to:

1. Deploy and manage cloud-based infrastructure and services for scalable and efficient computing.
2. Develop IoT solutions and integrating sensors, devices, and cloud platforms for data collection and analysis.
3. Develop skills in implementing security measures and protocols to ensure the confidentiality, integrity, and availability of cloud and IoT systems.
4. Design and optimize cloud and IoT architectures to meet performance, cost, and reliability requirements.
5. Understand emerging trends and technologies in cloud computing and IoT for innovation and digital transformation.

Block – I: Cloud Computing Fundamentals and Virtualization

Unit 1: Cloud Computing: Introduction, Traditional Computing Approaches, Evolution of Cloud Computing, Comparison between Cluster, Grid and Cloud Computing, Utility Computing.

Unit 2: Characteristics of Cloud Computing, Benefits of Cloud Computing, Applications of Cloud Computing, Challenges of Cloud Computing.

Unit 3: Cloud Deployment Models, Service Models and Cloud Architecture, Cloud Deployment Models, Public Cloud, Private Cloud, Community Cloud, Hybrid Cloud, Choosing Appropriate Deployment Model, Service Delivery Models of Infrastructure As a Service (IaaS), Platform As a Service (PaaS), Software As a Service.

Unit 4: Resource Virtualization, Virtualization and Underlying Abstraction, Virtualizing Physical Computing Resources, Advantages of Virtualization, Machine or Server Level Virtualization, Hosted Approach, Bare Metal Approach Exploring Hypervisor or V3irtual Machine Monitor, Hypervisor Based

Virtualization Approaches, Operating System Level Virtualization, Other Virtualizations (Network, Storage, Desktop), Xen Server Vs VM ware.

Block – II: Resource Provisioning, Load Balancing and Security

Unit 5: Resource Pooling, Sharing and Provisioning, Resource Pooling, Resource Pooling Architecture, Computer Vs Server Pool, Storage Pool, Network Pool Resource Sharing.

Unit 6: Multi Tenancy, Types of Tenancy, Tenancy at Different Level of Cloud Services, Resource Provisioning and Approaches, Static Approach, Dynamic Approach, Hybrid Approach, VM Sizing,

Unit 7: Scaling, Scaling primitives, Scaling Strategies, Proactive Scaling, Reactive Scaling, Combinational Scaling, Auto Scaling in Cloud, Types of Scaling, Vertical Scaling or Scaling Up, Horizontal Scaling or Scaling Out.

Unit 8: Load Balancing, Importance of Load Balancing, Goals of Load Balancing, What are to Load Balance and how it is done, Levels of Load Balancing, VM Provisioning, Resource Provisioning, Categories of Load Balancing, Static Approach o Dynamic Approach, Dynamic Load Balancing.

Unit 9: Security Issues in Cloud Computing Threats to Cloud Security, Infrastructure Security, Information Security, Identity Management and Access Control, Cloud Security Design Principles, Security as a Service.

Block – III: IoT Fundamentals and Connectivity Technologies

Unit 10: Internet of Things: An Introduction, Introduction to IoT, Characteristics of IoT, IoT Categories, IoT Enablers and Connectivity Layers, Baseline Technologies of IoT, Sensors.

Unit 11: Characteristics of a Sensor, Classification of Sensors, Actuators o Types of Actuators, Computing, IoT Architecture, Applications of IoT, Challenges of IoT.

Unit 12: IoT Networking and Connectivity Technologies, M2M and IoT Technology, Components of Networking, Gateway Prefix Allotment, Impact of Mobility on Addressing.

Unit 13: Multihoming, IoT Identification and Data Protocols, (IPV4, IPV6, MQTT, CoAP, XMPP, AMQP), Connectivity Technologies, (ZigBee, 6LoWPAN, RFID, NFC, Bluetooth, Z-wave etc.)

Block – IV: Application Development, Fog Computing and Case Studies

Unit 14: IoT Application Development, Framework for IoT Applications, Implementation of Device Integration, Data Acquisition and Integration.

Unit 15: Device Data Storage, Unstructured Data Storage on Cloud/Local Server, Authentication, Authorization of Devices, Security Aspects in IoT, Fog Computing and Edge Computing, Introduction to Fog Computing, Cloud Computing Vs Fog Computing, Fog Architecture, Working of Fog, Advantages of Fog, Applications of Fog, Challenges in Fog.

Unit 16: Edge Computing, Working of Edge Computing, Cloud Vs Fog Vs Edge Computing, Applications of Edge Computing. IoT Case Studies • Smart Homes • Smart Grids • Smart Cities • Connected Vehicles • Industrial IoT.

References:

For Cloud Computing:

1. "Cloud Computing: Concepts, Technology & Architecture" by Thomas Erl, Zaigham Mahmood, and Ricardo Puttini, 2nd Edition, Prentice Hall, 2013.
2. "Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS) by Michael J. Kavis, 1st Edition, O'Reilly Media, 2014.

For Internet of Things:

3. "Internet of Things: A Hands-On Approach" by Arshdeep Bahga and Vijay Madisetti, 2nd Edition, VPT, 2021.

SEMESTER – IV

Course Code: CAMO - 2401

Credit: 3

Course Name: Big Data Analytics

Course Objective:

- To introduce students to the concept of big data, including its characteristics such as volume, velocity, variety, veracity, and value, and its significance in generating insights and driving decision-making.
- To familiarize students with big data technologies and platforms, including Hadoop, Spark, Kafka, HBase, Cassandra, and MongoDB, and their role in processing, storing, and analysing large volumes of data efficiently.
- To teach students how to collect, clean, pre-process, and transform big data from various sources, including structured and unstructured data, using tools and techniques such as ETL (Extract, Transform, Load) processes, data wrangling, and data integration.
- To enable students to apply data analysis techniques to big data sets, including descriptive analytics, predictive analytics, prescriptive analytics, and advanced analytics such as machine learning and deep learning, to extract valuable insights and patterns.
- To develop students' skills in visualizing and interpreting big data analytics results effectively, using tools and techniques such as data visualization libraries, dashboards, and storytelling, to communicate findings and insights to stakeholders.

Course Outcomes:

At the end of the course, the students would be able to:

1. Analyze large-scale datasets to extract valuable insights and patterns.
2. Utilize big data tools and technologies for efficient data processing and analysis.
3. Develop skills in implementing predictive models and machine learning algorithms for data-driven decision-making.
4. Interpret and communicate analytical findings to stakeholders effectively.
5. Understand ethical considerations and privacy concerns in big data analytics practices.

Block – I: Understanding Big Data and Business Motivations

Unit 1: Introduction to Data Analytics: Sources and nature of data, classification of data (structured, semi-structured, unstructured), characteristics of data, introduction to Big Data platform.

Unit 2: Need of data analytics, evolution of analytic scalability, analytic process and tools, analysis vs reporting, modern data analytic tools, applications of data analytics.

Unit 3: Data Analytics Lifecycle: Need, key roles for successful analytic projects, various phases of data analytics lifecycle – discovery, data preparation, model planning, model building, communicating results, operationalization.

Unit 4: Marketplace dynamics, Business architecture, Business process management, Information and Communications technology.

Block – II: Enterprise Technologies

Unit 5: Data Analysis: Regression modeling, multivariate analysis, Bayesian modeling, inference and Bayesian networks, support vector and kernel methods.

Unit 6: Analysis of time series: linear systems analysis & nonlinear dynamics, rule induction, neural networks: learning and generalization, competitive learning.

Unit 7: Principal component analysis and neural networks, fuzzy logic: extracting fuzzy models from data, fuzzy decision trees, stochastic search methods.

Unit 8: Online Transaction Processing, Online analytical processing, extract transform load, Data warehouses, data marts.

Block – III: Big Data Processing Concepts

Unit 9: Clusters, File Systems and Distributed File systems, NoSQL, Sharding, Replication, Sharding and Replication, CAP Theorem, ACID and BASE.

Unit 10: Mining Data Streams: Introduction to streams concepts, stream data model and architecture, stream computing, sampling data in a stream, filtering streams, counting distinct elements in a stream.

Unit 11: Estimating moments, counting oneness in a window, decaying window, Real-time Analytics Platform (RTAP) applications, Case studies – real time sentiment analysis, stock market predictions.

Block – IV: Big Data Processing Concepts & Techniques

Unit 12: Parallel data processing. Distributed data processing Hadoop, Processing workloads Cluster, Processing in batch mode.

Unit 13: Quantitative analysis, Qualitative analysis. Data Mining

Unit 14: Statistical Analysis, Machine Learning, Semantic Analysis

References:

1. Big Data: Principles and Best Practices of Scalable Real-Time Data Systems by Nathan Marz and James Warren, 1st Edition, Manning Publications, 2015.
2. Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph" by David Loshin, 1st Edition, Morgan Kaufmann, 2013.
3. Big Data: A Revolution That Will Transform How We Live, Work, and Think by Viktor Mayer-Schönberger and Kenneth Cukier, Houghton Mifflin Harcourt, 2014.
4. Big Data: Concepts, Technologies, and Applications by Kuan-Ching Li, Hai Jiang, Laurence T. Yang, and Alfredo Cuzzocrea, 1st Edition, CRC Press, 2014.
5. Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data" by EMC Education Services, First Edition, Wiley, 2015.

Any One Course from the Following 02 (Elective Course – CAMO-2402/ CAMO-2403)

Course Code: CAMO - 2402

Credit: 3

Course Name: Mobile Computing

Course Objective:

- To introduce students to the basic concepts, principles, and characteristics of mobile computing, including mobility, portability, connectivity, and context awareness.
- To teach students how to develop mobile applications for various platforms, including Android and iOS, using programming languages such as Java, Kotlin, Swift, and Objective-C, and mobile development frameworks such as Android SDK, iOS SDK, and React Native.
- To familiarize students with mobile networking technologies and protocols, including cellular networks, Wi-Fi, Bluetooth, NFC (Near Field Communication), and mobile communication standards such as GSM, CDMA, LTE, and 5G.
- To enable students to understand and implement location-based services (LBS) and geospatial technologies in mobile applications, including GPS (Global Positioning System), GIS (Geographic Information System), and location-based advertising.
- To teach students about mobile security threats and vulnerabilities, including malware, phishing, and unauthorized access, and how to implement security measures such as encryption, authentication, and authorization to protect mobile devices and data.

Course Outcomes:

At the end of the course, the students would be able to:

1. Develop mobile applications for various platforms and devices.
2. Utilize mobile computing technologies for location-based services and context-aware applications.
3. Develop skills in optimizing mobile applications for performance, battery life, and user experience.
4. Design and implement secure and scalable mobile solutions for diverse industries.
5. Understand emerging trends and challenges in mobile computing for innovation and digital transformation.

Block – I: Introduction to Mobile Computing

Unit-1: Introduction to Mobile Communications Introduction Objectives Mobile Communication Multiplexing (TDMA, CDMA, FDMA) GSM GPRS and 2.5G 3G 4G –LTE.

Unit-2: Introduction to Mobile Computing Architecture Introduction Objectives Mobile IP, Cellular and WLAN IEEE 802.11X Networks.

Unit-3: AdHoc Networks Mobile Computing Operating System Client Server Computing using Mobile Computing Architecture Design considerations for Mobile Computing Mobile Computing and the Apps Summary Further Readings.

Unit-4: Mobile Client Devices and Pervasive Computing Introduction Objectives Smart Sensors, Actuators and Mobile Robotic Systems Smart Home and Appliances Automotive Systems Limitations and Devices Design Considerations.

Unit-5: GSM and GPRS Introduction Objectives GSM Architecture Public Land Mobile Network (PLMN) Interface Call Handling Handover SMS GPRS High Speed Circuit Switched Data WLL Application Summary Further Readings

Block – II: Mobile IP and Issues in Mobile Computing

Unit-6: 4G and 5G Networks Introduction Objectives High Speed Packet Access MIMO in HSPA LTE and WIMAX16E Ultra-Wide Band and Broadband Wireless Access 4G Networks: HS-OFDM, LTE Advanced and WiMax 16M Features of 5G Networks.

Unit-7: Mobile IP Network Layer Introduction Objectives Mobile IP IP Header: Encapsulation and Routes Optimization Mobility Binding Cellular IP Mobile IP with IPv6 Voice over IP, IP Security.

Unit-8: Mobile Transport Layer Introduction Objectives, UDP and TCP Indirect TCP Snooping TCP Mobile TCP.

Unit-9: Database Management Issues in Mobile Computing Introduction Mobile Device Database Management Mobile Device Data Store Methods Client Server Computing with Adaptation for Mobile Computing Adaptation Software for Mobile Computing.

Block – III: Introduction to various Network Technologies

Unit-10: Mobile Adhoc Networks Introduction Objectives Introduction to MANETs Routing and Classifications of Routing Algorithms QoS in MANETs Security in MANETs.

Unit-11: WLAN and PAN protocols Introduction Objectives Introduction to WLANs Introduction to WAP Introduction to WML Bluetooth Wi-Max ZigBee and Wi-Fi.

Unit-12: Virtual and Cloud Networks Introduction Objectives Wireless Enterprise Networks Virtual Networks Mobile Cloud Networks.

Unit-13: Mobility, Portability, Replication and Clustering Introduction Objectives Mobile Data Management Data Replication Schemes Adaptive Clustering.

Block – IV: Introduction to Mobile Software Environments

Unit-14: Smart Client and Enterprise Server based Architecture Introduction Objectives Introduction to Smart Client Architecture Data Synchronization Formats Data Synchronization at Clients and Servers Mobile Devices Support Infrastructure and Management.

Unit-15: Mobile Internet Applications Introduction Objectives Introduction to Mobile Applications Development Introduction to XML Handheld Device Markup Language and WML HTML 5

Unit-16: Mobile Application Languages Introduction, Mobile Operating Systems and Development Environments Introduction Objectives Introduction to Mobile Operating Systems Application Programming, Linux for Mobile Devices Development Process Development Tools.

References:

1. Mobile Computing: Principles and Practices" by Reza B'Far, 1st Edition, Cambridge University Press.
2. Mobile Computing" by Asoke K. Talukder and Roopa R. Yavagal, 2nd Edition, McGraw Hill Education, 2017.
3. Android Programming: The Big Nerd Ranch Guide" by Bill Phillips, Chris Stewart, Kristin Marsicano, 5th Edition, Addison-Wesley Professional, 2022.

4. "Fundamentals of Mobile and Pervasive Computing" by Frank Adelstein, Sandeep K.S. Gupta, Golden G. Richard III, and Loren Schwiebert, 1st Edition, McGraw-Hill.
5. "Mobile Computing: Technology, Applications, and Service Creation" by Amjad Umar., 2nd Edition, McGraw-Hill Education.

Course Code: CAMO - 2403

Credit: 3

Course Name: Deep Learning

Course Objective:

- To provide students with a foundational understanding of deep learning concepts, architectures, and algorithms, including artificial neural networks (ANNs), deep neural networks (DNNs), and deep learning frameworks.
- To teach students about various deep learning models and architectures, including convolutional neural networks (CNNs), recurrent neural networks (RNNs), long short-term memory (LSTM) networks, and generative adversarial networks (GANs), and their applications in computer vision, natural language processing, and other domains.
- To familiarize students with popular deep learning frameworks and tools, such as TensorFlow, Keras, PyTorch, and Caffe, and how to use them to build, train, and deploy deep learning models efficiently.
- To enable students to understand and apply training and optimization techniques for deep learning models, including stochastic gradient descent (SGD), mini-batch gradient descent, learning rate scheduling, regularization, and dropout.
- To explore various applications and use cases of deep learning in different domains, including image recognition, object detection, speech recognition, machine translation, recommendation systems, and autonomous driving, and how deep learning is revolutionizing industries and transforming society.

Course Outcomes:

At the end of the course, the students would be able to:

1. Implement advanced neural network architectures for complex problem-solving.
2. Apply deep learning techniques to tasks such as image recognition and natural language processing.
3. Develop skills in training and fine-tuning deep learning models for improved performance and accuracy.
4. Analyze and interpret deep learning results to derive actionable insights.
5. Understand emerging trends and applications in deep learning for innovation and advancement in AI.

Block – I: Introduction to Deep Learning and Neural Network

Unit-1: Fundamentals of Deep Learning: Overview of deep learning and its evolution from traditional machine learning, highlighting key differences and advancements. Introduction to artificial neural networks (ANNs) and the significance of deep networks in handling complex data, Key concepts, Applications of deep learning in various fields.

Unit-2: Basics of Neural Networks: Structure and working of single-layer and multi-layer neural networks, Forward propagation, backpropagation, and the process of training neural networks using gradient descent, Types of neural networks: feedforward neural networks, convolutional neural networks (CNNs), and recurrent neural networks (RNNs).

Unit-3: Activation Functions and Optimization Techniques: Importance of activation functions in introducing non-linearity to neural networks, Common activation functions, Overview of optimization

algorithms such as Gradient Descent, Stochastic Gradient Descent, and Adam Optimizer, Techniques to improve learning and convergence and dropout.

Unit-4: Introduction to Deep Learning Frameworks: Hands-on introduction to popular deep learning frameworks like TensorFlow, Keras, and PyTorch, Basic operations in these frameworks: setting up a model, defining layers, compiling, and training.

Block – II: Convolutional Neural Network (CNNs)

Unit-5: Fundamentals of Convolutional Neural Networks (CNNs): Introduction to CNN architecture, including concepts of convolutional layers, filters, and feature maps. Explanation of CNNs differ and Well-suited for image processing. Overview of concepts such as receptive fields, kernel size.

Unit-6: Pooling and Regularization Techniques in CNNs: Understanding pooling layers, including max pooling and average pooling, to reduce spatial dimensions and control over fitting. Explanation of regularization techniques specific to CNNs.

Unit-7: Popular CNN Architectures and Applications: Exploration of widely used CNN architectures, such as LeNet, AlexNet, VGG, ResNet, and Inception. Applications of CNNs in real-world scenarios, including image classification, object detection, and facial recognition.

Unit-8: Transfer Learning and Fine-Tuning in CNNs: Introduction to transfer learning, Pre-trained CNN models are adapted to new tasks with limited data. Explanation of fine-tuning techniques and Hands-on implementation using popular frameworks to apply transfer learning with CNNs on customized datasets.

Block – III: Recurrent Neural Network (RNNs) and Sequence Modeling

Unit 9: Introduction to Sequence Modeling and Recurrent Neural Networks (RNNs): Overview of sequence data and time-series applications in natural language processing, speech recognition, and predictive analytics. Fundamentals of RNNs: structure, function, and significance in processing sequential data.

Unit 10: Advanced RNN Architectures: Challenges of traditional RNNs: vanishing and exploding gradients. Introduction to advanced RNN architectures: Long Short-Term Memory (LSTM) networks and Gated Recurrent Units (GRUs).

Unit 11: Sequence-to-Sequence Models and Attention Mechanisms: Sequence-to-Sequence modeling for tasks requiring input-output sequence mapping, such as translation and summarization. Encoder-Decoder architecture and its role in Seq2Seq models.

Unit 12: Applications and Practical Implementation of RNNs in Deep Learning Frameworks: Hands-on implementation of RNN, LSTM, and GRU models using deep learning frameworks such as TensorFlow and PyTorch. Practical applications in time-series prediction, financial forecasting, and sequential data analysis.

Block – IV: Advanced Deep Learning Techniques and Optimization

Unit-13: Advanced Neural Network Architectures: Exploration of advanced architectures beyond basic neural networks, including Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and Autoencoders. Introduction to Generative Adversarial Networks (GANs): architecture, training, and applications in image synthesis and data augmentation.

Unit-14: Optimization Techniques in Deep Learning: Fundamentals of optimization in neural networks, focusing on gradient descent and its variants. Advanced optimizers: RMSprop, Adam, and Adagrad, discussing their role in accelerating convergence and improving model accuracy.

Unit-15: Transfer Learning and Pretrained Models: Introduction to transfer learning and its significance in improving efficiency, particularly in scenarios with limited data. Fine-tuning of pretrained models and exploration of popular models like VGG, ResNet, BERT, and GPT.

Unit-16: Advanced Topics: Reinforcement Learning and Deep Reinforcement Learning: Basics of Reinforcement Learning (RL): concepts of agents, environments, rewards, and policy learning. Introduction to Deep Reinforcement Learning (DRL) and the combination of deep neural networks with RL algorithms.

References:

1. Bishop C.M-Pattern Recognition and Machine Learning-Springer, 2006.
2. Yegnanarayana. B- Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
3. Golub, G., H., and Van Loan, C., F., Matrix Computations-JHU Press,2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education, 2004.

Course Code: CAMO - 2404

Credit: 3

Course Name: Natural Language Processing

Course Objective:

- To understand the fundamental concepts and techniques of Natural Language Processing.
- To explore various text processing methods, including tokenization, stemming, and lemmatization.
- To implement NLP tasks such as Named Entity Recognition, Part-of-Speech Tagging, and Parsing.
- To apply machine learning and deep learning models for text classification and sentiment analysis.
- To develop applications using NLP libraries like NLTK, Spacy, and Transformers.

Course Outcomes:

At the end of the course, the students would be able to:

1. Demonstrate proficiency in text preprocessing techniques for NLP applications.
2. Implement various NLP models and algorithms for language understanding.
3. Analyze and extract meaningful insights from textual data using statistical and ML approaches.
4. Develop real-world applications such as chatbots, sentiment analyzers, and translation systems.
5. Utilize advanced NLP frameworks and deep learning techniques for complex language processing tasks.

Block-I: Introduction to Natural Language Processing

Unit 1: Fundamentals of NLP – Introduction, History, Applications, and Challenges.

Unit 2: NLP Pipeline – Tokenization, Stemming, Lemmatization, Stopword Removal.

Unit 3: Language Modeling – N-grams, Smoothing Techniques, Perplexity, Word Embeddings.

Unit 4: Text Preprocessing Techniques – POS Tagging, Named Entity Recognition (NER), Chunking.

Block-II: Syntax, Semantics, and Parsing Techniques

Unit 5: Syntactic Analysis – Context-Free Grammar (CFG), Dependency Parsing.

Unit 6: Statistical Parsing – CYK Algorithm, Earley's Algorithm.

Unit 7: Semantic Analysis – Lexical Semantics, Word Sense Disambiguation (WSD), Ontologies.

Unit 8: Vector Space Models – TF-IDF, Word2Vec, GloVe, FastText.

Block-III: Advanced NLP Techniques

Unit 9: Sentiment Analysis and Text Classification – Naïve Bayes, SVM, LSTMs, BERT.

Unit 10: Named Entity Recognition (NER) and Relation Extraction.

Unit 11: Topic Modeling – Latent Dirichlet Allocation (LDA), Non-Negative Matrix Factorization (NMF).

Unit 12: Machine Translation – Statistical and Neural Machine Translation (NMT), Transformers.

Block-IV: NLP Applications and Deep Learning in NLP

Unit 13: Speech Recognition and Text-to-Speech (TTS) Systems.

Unit 14: Question Answering Systems and Chatbots – Retrieval-based and Generative Models.

Unit 15: Summarization – Extractive and Abstractive Approaches.

Unit 16: Ethical Considerations and Bias in NLP – Fairness, Privacy, and Responsible AI.

References:

1. Speech and Language Processing – Daniel Jurafsky and James H. Martin: A comprehensive introduction to NLP, covering linguistic, statistical, and deep learning approaches, 3rd edition, 2024.
2. Foundations of Statistical Natural Language Processing – Christopher D. Manning and Hinrich Schütze, A fundamental book on statistical methods for NLP, including text classification and language modeling, 1st Edition.
3. Neural Network Methods for Natural Language Processing – Yoav Goldberg, Explores deep learning techniques in NLP, including embeddings, recurrent networks, and attention mechanisms, Springer Nature, 2022.
4. Natural Language Processing with Python – Steven Bird, Ewan Klein, and Edward Loper, A practical guide using Python and NLTK for text processing, parsing, and classification, 1st Edition, O'Reilly Media, 2009.
5. Deep Learning for Natural Language Processing – Palash Goyal, Sumit Pandey, and Karan Jain Covers deep learning-based NLP models, including LSTMs, Transformers, and BERT, with practical implementations, 1st Edition, Apress, 2018.

Course Code: CAMO - 2405

Credit: 2

Course Name: Python Programming

Course Objective:

- To introduce the fundamental concepts and syntax of Python programming.
- To develop problem-solving skills using Python for real-world applications.
- To implement object-oriented programming concepts in Python.
- To utilize Python libraries for data processing, visualization, and automation.
- To enhance coding efficiency and debugging skills for software development.

Course Outcomes:

At the end of the course, the students would be able to:

1. Develop proficiency in Python programming language syntax, data structures, and algorithms.
2. Implement Python applications for various domains and industries.
3. Develop skills in debugging, testing, and optimizing Python code for efficiency and reliability.
4. Apply Python programming concepts to solve real-world problems and tasks.
5. Understand best practices and software development principles in Python programming.

Block – I: Python Basics, Conditional, Loops, String Objects and List Objects

Unit 1: Introduction to Python: History of Python, Need of Python, Packages for Cross platform application of Python, Getting started with Python, Program structure in python, Running the First program.

Unit 2: Installation of Python and python Notebook, Python Objects, Number & Booleans, Strings, Container objects, Mutability of objects, Operators - Arithmetic, Bitwise.

Unit 3: comparison and Assignment operators, Operators Precedence and associativity. Conditions (If else, if-elif, else), Loops (While, for), Break and Continue statements, Range Functions.

Unit 4: String object basics, String methods, Splitting and Joining Strings, String format functions, list object basics, list methods, List as stack and Queues, List comprehensions.

Block – II: Tuples, Set, Dictionaries & Functions, Modules, Exception Handling

Unit 5: Functions and File Handling in Python: Function definition and call, Function Scope, Arguments, Function Objects, Lambda Functions, Anonymous Functions, File Operations, Creating. Opening and using files.

Unit 6: Tuples, Sets, Dictionary Object basics, Dictionary Object methods, Dictionary View Objects.

Unit 7: Functions basics, Parameter passing, Iterators, Generator functions, Lambda functions, Map, Reduce, filter functions.

Unit 8: OOPS Concepts & Working with Files OOPS: Basic concepts, creating classes and Objects. Inheritance, Multiple Inheritance, working with files, Reading and writing files, Buffered read and write, Other File methods.

Unit 9: Modules and Packages: Module Creations and Usage, Module Search Path, Module Vs. Script, Package Creation and Importing, Standard Library Modules.

Unit 10: Using Standard Module, Creating new modules, Exceptions Handling with Try-except, Creating, inserting and retrieving Table, Updating and deleting the data.

Unit 11: Data Ananlysis- Numpy variable, Numpy manipulation, Scipy, Pandas intro. Descriptive analysis, Pandas Input-output, Pandas manipulation, Pandas groupby.

Unit 12: Modules and Packages: Module Creations and Usage, Module Search Path, Module Vs. Script, Package Creation and Importing, Standard Library Modules.

References:

1. Head First Python 2e: A Brain-Friendly Guide Paperback – Illustrated, 16 by Paul Barry, Oreilly.
2. Python: The Complete Reference Paperback – 20 March 2018 by Martin C. Brown (Author), TMH Publication
3. Let Us Python by Yashavant Kanetkar , 1 January 2019, BPB publication.
4. Python Programming, A modular approach, First Edition, By Pearson Publication by Taneja Sheetal and Kumar Naveen, 26 September 2017.

Course Code: CAMO - 2406

Credit: 3

Course Name: Quantum Computing

Course Objective:

- To understand the fundamental principles of quantum computing and its distinction from classical computing.
- To explore quantum mechanics concepts such as superposition, entanglement, and quantum gates.
- To analyze and implement quantum algorithms like Shor's and Grover's for real-world applications.
- To study quantum error correction techniques and hardware implementations.
- To examine the future scope of quantum computing in cryptography, AI, and data science.

Course Outcomes:

At the end of the course, the students would be able to:

1. Demonstrate a deep understanding of quantum computing principles and their applications.
2. Apply quantum algorithms to solve complex computational problems efficiently.
3. Implement quantum programs using frameworks like Qiskit and Cirq.
4. Evaluate the challenges of quantum error correction and hardware limitations.
5. Investigate emerging trends in quantum cryptography, communication, and AI.

Block-I: Introduction to Quantum Computing

Unit 1: Basics of Quantum Computing – History, Motivation, and Applications

Unit 2: Classical vs. Quantum Computing – Key Differences and Advantages

Unit 3: Qubits and Quantum States – Superposition, Entanglement, and Measurement

Unit 4: Quantum Gates and Circuits – Quantum Logic Gates (Pauli, Hadamard, CNOT, Toffoli, etc.)

Block-II: Quantum Algorithms and Computation Models

Unit 5: Quantum Parallelism and Quantum Speedup

Unit 6: Quantum Fourier Transform and its Applications

Unit 7: Shor's Algorithm – Integer Factorization and Cryptography Applications

Unit 8: Grover's Algorithm – Quantum Search Algorithm and Optimization Problems

Block-III: Quantum Error Correction and Hardware Implementations

Unit 9: Quantum Decoherence and Noise – Challenges in Quantum Computing

Unit 10: Quantum Error Correction – Concepts, Techniques, and Codes

Unit 11: Physical Realization of Quantum Computers – Superconducting Qubits, Ion Traps, Topological Qubits.

Unit 12: Quantum Computing Frameworks – Qiskit, Cirq, and Microsoft Q#

Block-IV: Advanced Topics and Future Directions in Quantum Computing

Unit 13: Quantum Cryptography – Quantum Key Distribution (QKD), BB84 Protocol

Unit 14: Quantum Machine Learning – Applications in AI and Data Science

Unit 15: Quantum Internet and Communication – Concepts and Emerging Trends

Unit 16: Future of Quantum Computing – Challenges, Opportunities, and Ethical Considerations

References:

1. "Quantum Computation and Quantum Information" – Michael A. Nielsen and Isaac L. Chuang, 10th Edition, Cambridge University Press, 2010.
2. "Quantum Computing for Computer Scientists" – Noson S. Yanofsky and Mirco A. Mannucci, Cambridge University Press, 2012.
3. "An Introduction to Quantum Computing" – Phillip Kaye, Raymond Laflamme, and Michele Mosca, Oxford University Press, 2020.
4. "Quantum Computing: A Gentle Introduction" – Eleanor G. Rieffel and Wolfgang H. Polak, MIT Press, 2011.
5. "Quantum Computing Explained" – David McMahon, 1st Edition, Wiley-IEEE Computer Society.

Course Code: CAMO - 2417

Credit: 2

Course Name: Python Programming Lab

Course Objective:

- To develop proficiency in writing Python programs for problem-solving.
- To implement control structures, functions, and modules in Python.
- To apply object-oriented programming concepts using Python.
- To work with file handling, data structures, and exception handling.
- To integrate Python libraries for data manipulation and visualization.

Course Outcomes:

At the end of the course, the students would be able to:

1. Demonstrate the ability to write, debug, and execute Python programs efficiently.
2. Implement algorithms using Python's built-in data structures and libraries.
3. Develop modular and reusable code using functions and object-oriented principles.
4. Apply file handling and exception handling techniques in real-world applications.
5. Utilize Python for data processing, analysis, and visualization tasks.

Python Programming Lab:

Basic Programs

1. **Hello World Program** – Print "Hello, World!" to the console.
2. **Simple Calculator** – Perform basic arithmetic operations (addition, subtraction, multiplication, division).
3. **Even or Odd Checker** – Check whether a given number is even or odd.
4. **Factorial Calculation** – Compute the factorial of a given number using recursion.
5. **Prime Number Checker** – Determine whether a given number is prime.
6. **Fibonacci Series** – Generate the Fibonacci sequence up to a specified number.
7. **Reverse a String** – Reverse a given string without using built-in functions.
8. **Palindrome Checker** – Check whether a given string or number is a palindrome.
9. **Simple List Operations** – Perform insert, delete, sort, and search operations on a list.
10. **Student Grade Calculator** – Take marks of different subjects and calculate total, percentage, and grade.

Advanced Programs

11. **File Handling Operations** – Read and write data to a text file.
12. **Bank Account Management System** – Simulate deposit, withdrawal, and balance inquiry using OOP concepts.

13. **Matrix Operations** – Perform addition, subtraction, multiplication, and transpose of matrices.
14. **Regular Expressions** – Extract emails, phone numbers, and special patterns from a text using regex.
15. **Web Scraping** – Extract data from a website using the BeautifulSoup library.
16. **Data Visualization** – Generate bar charts and pie charts using Matplotlib.
17. **Multithreading Example** – Demonstrate thread creation and synchronization.
18. **Chatbot Simulation** – Create a simple chatbot using predefined responses.
19. **API Integration** – Fetch data from an external API using the requests library.
20. **Machine Learning Model (Basic)** – Implement a simple linear regression model using Scikit-learn.

References:

1. **"Python Crash Course"** by Eric Matthes – A hands-on, project-based introduction to Python programming, 3rd Edition, No Starch Press, 2023.
2. **"Learning Python"** by Mark Lutz – A comprehensive guide covering Python fundamentals and advanced topics, 6th Edition, O'Reilly Media, 2025.
3. **"Python Programming: An Introduction to Computer Science"** by John Zelle – A foundational book for learning Python in a computer science context, 4th Edition, Franklin, Beedle & Associates, 2024
4. **"Automate the Boring Stuff with Python"** by Al Sweigart – A practical guide for automating tasks using Python, 3rd Edition, No Starch Press, 2025
5. **"Think Python: How to Think Like a Computer Scientist"** by Allen B. Downey – A structured approach to learning Python with problem-solving techniques, 3rd Edition, O'Reilly Media, 2024.

Course Code: CAMO - 2491

Credit: 4

Course Name: Project / Dissertation

Course Objective:

- The primary objective of the project/dissertation is to provide students with an opportunity to apply the knowledge and skills acquired throughout the MCA programme to solve real-world problems or explore new research areas within the field of computer applications.
- To develop students' research skills, including literature review, problem identification, hypothesis formulation, research design, data collection, analysis, interpretation, and drawing conclusions, through hands-on experience in conducting independent research.
- To enhance students' project management skills, including project planning, scheduling, resource allocation, risk management, and communication, enabling them to effectively manage the entire project lifecycle from initiation to completion.
- To cultivate students' problem-solving and critical thinking abilities by challenging them to identify, analyze, and address complex problems or research questions, using innovative and creative approaches.
- To improve students' communication and presentation skills, both written and oral, by requiring them to document their research findings, methodology, and outcomes effectively, and present them to a diverse audience in a clear, concise, and engaging manner.

Course Outcomes:

At the end of the course, the students would be able to:

1. Demonstrate proficiency in applying theoretical knowledge and practical skills to solve real-world problems or conduct original research.
2. Analyze, design, implement, and evaluate software solutions or research methodologies.
3. Develop scholarly and systematic approaches to project management and execution.
4. Contribute to the advancement of knowledge and innovation in the field of computer applications.
5. Enhance professional skills and experience for future career opportunities in academia, industry, or research.

MOOCs

The University shall give flexibility in opting for MOOC (Massive Online Open Courses)/SWAYAM by the students pertaining to the prescribed curriculum and also the credits earned in the MOOC courses may be dealt as part of the evaluation scheme as per UGC (Online Learning Programmes) Regulations, 2020.

Syllabi and Course Materials

The Syllabi, PPR and Self-Learning Materials (SLMs) are developed mostly by experienced faculty members of **Usha Martin University** in consultation with content experts and the same will be forwarded to CIQA and BOS/Academic Council/ Executive Council for further suggestions and approval.

Faculty and Support Staff

The University has identified the dedicated requisite faculty and support staff as mandated by the UGC and they are allocated the positions exclusively for OL mode. The course material prepared by the CDOE faculty is at par with the regulations 2020.

List of Faculty associated with MCA programme is as follows:

| S.No. | Name of Faculty | Designation | Nature of Appointment | Qualification | Subject |
|--------------|----------------------------|---------------------|------------------------------|----------------------|------------------|
| 1. | Dr. Md. Amir Khusro Akhtar | Professor | Full-Time | Ph.D. & UGC NET | Computer Science |
| 2. | Dr. Narendra Kumar | Assistant Professor | Full-Time | Ph.D. | Computer Science |

Delivery Mechanism

The OL of UMU follows a modern ICT (Information & Communication Technology) enabled approach for instruction. The methodology of instruction in OL of UMU is different from that of the conventional/regular programmes. Our OL system is more learner-oriented and the learner is an active participant in the teaching-learning process. OL of UMU academic delivery system comprises:

A. Print Material

The printed material of the programme supplied to the students will be unit wise for every course.

B. Counselling Sessions

Normally, counselling sessions are held as per a schedule drawn beforehand by the Subject Coordinator. There will be 6 counselling/ contact classes for 4 credit course will be held on the campus on Saturday and on Sunday of 2 hour duration for each course in face to face mode (In case of 2 credit course contact hours are required 6 hours and in case of 6 credit course contact hours required 18 hours). Contact classes will be held in the campus on Saturdays and on Sundays.

C. Medium of Instruction

Medium of Course Instruction: English

Medium of Examination: English

D. Student Support Systems

Universities Study Centres or Learner Support Centre shall be headed by a coordinator, not below the rank of Assistant professor and shall be augmented with academic and non-academic staff depending on the learner.

The university has made appropriate arrangements for various support services including counselling schedule and resource-oriented services evaluation methods and dates both online and offline modes for easy and smooth services to the students of online learning mode.

At present the university have only one study centre on the campus. The institution is not promoting any study centres outside the campus. All student support services will be provided to the student through a single window method/mode onsite and online.

E. Procedure for Admissions, Curriculum, Transaction and Evaluation

Admission Process

Admission to the MCA Programme will be done on the basis of screening of candidate's eligibility on first come first serve basis. The University will follow the reservation policy as per norms of the Government. Admission shall not be a right to the students and UMU, DDOE shall

retain the right to cancel any admission at any point of time if any irregularity is found in the admission process, eligibility etc.

Maximum Duration

- A. The maximum duration of the MCA Programme is four years. Thereafter, students seeking completion of the left-over course(s) will be required to seek fresh admission.
- B. The student can complete his programme within a period of 4 years failing which he/she shall seek fresh admission to complete the programme.

Eligibility

BCA or equivalent course from recognized board.

Fee Structure

| Name of the Programme | Degree | Duration | Year | Tuition Fee / Year | Exam Fee / Year | Total (in Rs.) |
|--------------------------------|--------|--------------|------|--------------------|-----------------|----------------|
| Master of Computer Application | PG | 2 to 4 Years | 1 | 30000 | 1500 | 31500 |
| | | | 2 | 30000 | 1500 | 31500 |
| TOTAL | | | | 60000 | 3000 | 63000 |

Activity Schedule

| S.NO. | Name of the Activity | Tentative months schedule (specify months) during year | | | |
|-------|--|--|------------|-------------|------------|
| | | From(Month) | To (Month) | From(Month) | To (Month) |
| 1 | Admission | Jul | Sep | Jan | Mar |
| 2 | Assignment submission (if any) | Sep | Oct | Mar | Apr |
| 3 | Evaluation of assignment | Oct | Nov | Apr | May |
| 4 | Examination | Dec | Dec | Jun | Jun |
| 5 | Declaration of result | Jan | Jan | Jul | Jul |
| 6 | Re-registration | Jul | Jul | Jan | Jan |
| 7 | Distribution of SLM | Jul | Sep | Jan | Mar |
| 8 | Contact programmes (counselling, practicals, etc.) | Sep | Nov | Mar | May |

Credit System

UMU, CDOE proposes to follow the 'Credit System' for most of its programmes. Each credit amounts to 30 hours of study comprising all learning activities. Thus, a 8 credit course requires 240 hours, 6 credit course requires 180 hours , 4 credit course requires 120 hours and 2 credit course requires 60 hours of study. This helps the student to understand the academic effort to complete a course. Completion of an academic programme requires successful clearing of both, the assignments and the term-end examination of each course in a programme.

| Duration of the Programme | Credits | Name of the Programme | Level of the Programme |
|---------------------------|---------|-----------------------|------------------------|
| 2 to 4 Yrs | 80 | MCA | Master's Degree |

Assignments

In order to ascertain the writing skill and level of comprehension of the learner, assignment work is compulsory for all learners. Each assignment shall consist of a number of questions, case studies and practical related tasks. The assignment question papers will be uploaded to the website within a scheduled time and the learners shall be required to respond them within a specified period of time. The response of the learner is examined by a faculty member.

Evaluation

The evaluation system of the programme is based on two components:

A. Continuous evaluation in the form of assignments (weightage 30%): This Component carries a weightage of 30%. There will be at least one graded assignment and test per course. These assignments are to be submitted to the Co-ordinator of the DDOE/Study Centre to which the student is assigned or attached with.

B. Term-end examination (weightage 70%): This will be held twice every year in the months of June and December. The students are at liberty to appear in any of the examinations conducted by the University during the year. A student will be allowed to appear in the Term-End Examination only after she/he has registered for that course and submitted the assignment. For appearing in the Examination, every student has to submit an Examination form through

<https://www.umu.ac.in>) online or offline before the due dates as given in the schedule of operations. If a student misses any term-end examination of a course for any reason, s/he may appear for any of them or all the courses subject to the maximum of 8 courses in the subsequent term-end examinations. This facility will be available until a student secures the minimum pass grade in the courses but up to a maximum period of four semesters, since the date of registration of the course is valid for four semesters. Beyond this period s/he may continue for another four semesters by getting Re-registration by paying fee again. In that case, the score of qualified assignments and/or term-end examination will be retained and the student will be required to complete the left out requirements of such re-registered courses. Minimum requirement for passing a course will be 40% marks.

C. Laboratory Support and Library Resources

The library of Usha Martin University aims to empower the teaching mission and intellectual culture of the community through availability through an organized collection of information as well as instruction in its access, relevance and evaluation. The University Library enriches advance learning and discovery by providing access to a broad array of resources for education, research and creative work to ensure the rich interchange of ideas in the pursuit of knowledge.

The Usha Martin University has initiated the process of setting up a dedicated Library for OL programme and acquiring printed books and e-books for this purpose. The required International and National subject journals are also provided. We already have annual journal subscriptions and the capacity can be enlarged at later stages as the University lines up with more online journals.

The collection of the Library is rich and diverse especially in terms of the breadth and depth of coverage. Collection encompasses subjects in Management, Commerce, Information Technology, Computer Applications, and other allied areas. This collection further includes Books, Research Journals, Project Reports/Dissertations and online Journals.

The University has well equipped Computer Laboratories, Lecture Capturing Systems, Audio Video facilities, ICT enabled class rooms, Wi-Fi facilities and Learning Management Systems etc.

D. Cost Estimate of the programme and the provisions

Initial expenses have been done by the University in terms of provision of infrastructure, manpower, printing of Self Study Material etc. The University intends to allocate expenses out of the total fee collection as per following details:

| | | |
|---|---|-----|
| a) SLM Development and Distribution | : | 20% |
| b) Postal and ICT Expenses | : | 10% |
| c) Salary and other Administrative expenses | : | 60% |
| d) Future Research development reserve | : | 10% |
| e) Lab Instruments | : | 10% |

Once programmes are operational, the programme budget from fee receipts will be planned as per the guidelines of University Grants Commission.

I. Quality Assurance

The University has established the Centre for Internal Quality Assurance (CIQA) in the University campus. The CIQA will monitor and maintain the quality of the OL programmes. It has the following objectives in making the compliances of quality implementations.

Objectives

The objective of Centre for Internal Quality Assurance is to develop and put in place a comprehensive and dynamic internal quality assurance system to ensure that programmes of higher education in the Online mode being implemented by the Higher Educational Institution are of acceptable quality and further improved on continuous basis.

Functions of CIQA

The functions of Centre for Internal Quality Assurance would be following:

1. To maintain quality in the services provided to the learners.
2. To undertake self-evaluative and reflective exercises for continual quality improvement in all the systems and processes of the Higher Educational Institution.
3. To contribute in the identification of the key areas in which Higher Educational Institution should maintain quality.

4. To devise mechanism to ensure that the quality of Open and Distance Learning programme and Online programme matches with the quality of relevant programme in conventional mode.
5. To devise mechanisms for interaction with and obtaining feedback from all stakeholders namely, learners, teachers, staff, parents, society, employers, and Government for quality improvement.
6. To suggest measures to the authorities of Higher Educational Institution for qualitative improvement.
7. To facilitate the implementation of its recommendations through periodic reviews.
8. To organize workshops/seminars/symposium on quality related themes, ensure participation of all stakeholders, and disseminate the reports of such activities among all the stakeholders in Higher Educational Institution.
9. To develop and collate best practices in all areas leading to quality enhancement in services to the learners and disseminate the same all concerned in Higher Educational Institution.
10. To collect, collate and disseminate accurate, complete and reliable statistics about the quality of the programme(s).
11. To ensure that Programme Project Report for each programme is according to the norms and guidelines prescribed by the Commission and wherever necessary by the appropriate regulatory authority having control over the programme;
12. To put in place a mechanism to ensure the proper implementation of Programme Project Reports.
13. To maintain a record of Annual Plans and Annual Reports of Higher Educational Institution, review them periodically and generate actionable reports.
14. To provide inputs to the Higher Educational Institution for restructuring of programmes in order to make them relevant to the job market.
15. To facilitate system-based research on ways of creating learner centric environment and to bring about qualitative change in the entire system.
16. To act as a nodal coordinating unit for seeking assessment and accreditation from a designated body for accreditation such as NAAC etc.

17. To adopt measures to ensure internalization and institutionalization of quality enhancement practices through periodic accreditation and audit.
18. To coordinate between Higher Educational Institution and the Commission for various qualities related initiatives or guidelines.
19. To obtain information from other Higher Educational Institutions on various quality benchmarks or parameters and best practices.
20. To record activities undertaken on quality assurance in the form of an annual report of Centre for Internal Quality Assurance.
21. It will be mandatory for Centre for Internal Quality Assurance to submit Annual Reports to the Statutory Authorities or Bodies of the Higher Educational Institution about its activities at the end of each academic session. A copy of report in the format specified by the Commission, duly approved by the statutory authorities of the Higher Educational Institution shall be submitted annually to the Commission.

On enrolling in the MCA Programme at Usha Martin University in online learning mode, students are expected to acquire a strong foundation in critical thinking, effective communication, and problem-solving. They will develop a scientific temperament, enabling them to approach challenges with analytical rigor. In addition, the programme will cultivate a sense of ethics and responsibility, encouraging students to adopt a sustainable mindset and contribute positively to the environment. As students' progress through the programme, they will deepen their understanding of emerging technologies and their applications in real-world scenarios. The curriculum has been designed to sharpen technical skills while also fostering creativity and innovation. Students will develop the ability to work collaboratively in virtual environments, ensuring they are prepared for the increasingly digital nature of the modern workplace.

By the time students graduate, they would possess the knowledge and confidence to engage in multiple functional areas of science and technology, ranging from software development to data analytics, cybersecurity, and artificial intelligence. They will be equipped with the tools needed to solve complex problems across various industries. The MCA programme at Usha Martin University aims to shape professionals who are not only technically proficient but also ethically grounded, with a commitment to continuous learning and sustainable practices. Graduates will be well-prepared to pursue dynamic careers and leadership roles, whether in academia, industry, or

entrepreneurial ventures, contributing meaningfully to the technological advancements of tomorrow.

To make the programme NEP compliant we have provided an opportunity to students to get a Post Graduate Diploma in Computer Applications (PGDCA) after 1 year of successful earning of credits.



Registrar
कुल सचिव
Usha Martin University
उषा मार्टिन विश्वविद्यालय
Ranchi-835103/रांची-835103

USHA MARTIN UNIVERSITY, RANCHI
CENTRE FOR DISTANCE AND ONLINE EDUCATION



PROGRAMME PROJECT REPORT
BACHELOR OF COMPUTER APPLICATION (BCA)

2025–26

[Handwritten signature]

Registrar
कुल सचिव
Usha Martin University
उषा मार्टिन विश्वविद्यालय
Ranchi-835103/रांची-835103

Introduction

The Bachelor of Computer Application (BCA) Online Learning Programme is an innovative and flexible 4-year undergraduate (Honors) degree designed to equip students with a strong foundation in computer applications and software development. Tailored for modern learners, this programme leverages the advantages of online education to deliver a comprehensive curriculum that blends academic rigor with practical learning. Recognized for its academic depth, the BCA Online Learning Programme offers students a well-structured path toward advanced education and preparation for competitive examinations. By focusing on the fundamentals of computer science and applications, the programme provides learners with the essential knowledge and skills needed to excel in the evolving field of technology.

Delivered through an interactive online platform, the BCA Online Learning Programme incorporates cutting-edge ICT tools, enabling students to earn a minimum of 160 credits over four years. This flexible format empowers students to balance their studies with personal and professional commitments while ensuring access to high-quality education. The adaptability of the programme and focus on real-world applications make it highly relevant in today's digital age. Graduates of the BCA Online Learning Programme can explore diverse career opportunities, ranging from roles in the technology sector to academic pursuits. Additionally, the programme prepares students for competitive examinations, opening doors to rewarding positions in the government and public sectors.

With its emphasis on accessibility, academic excellence, and career readiness, the BCA Online Learning Programme is a gateway to a future rich with opportunities in technology, academia, and beyond.

Programme's Mission and Objectives

Mission:

The BCA Programme is dedicated to:

- Provide a high-quality, flexible, and accessible online learning experience in computer applications and software development, enabling students from diverse backgrounds to pursue their academic and career goals.
- Equip students with foundational and advanced knowledge in computer science, empowering them with the technical skills required to succeed in the dynamic IT industry.
- Instill culture of continuous self-improvement, ensuring that learners stay adaptable to the rapid advancements in technology and industry trends.
- Develop globally aware professionals who can navigate the challenges of an interconnected world and excel in international and multicultural settings.
- Bridge the gap between education and employability by providing students with the tools and skills needed for meaningful careers in the private and public sectors.
- Nurture a sense of integrity, ethical responsibility, and sustainability in students, ensuring their positive impact on society and the environment.
- Foster spirit of innovation and research among students, preparing them to contribute creatively to technological and societal advancements.

Objectives:

The objectives of the BCA Online Learning (OL) Programme are:

- Provide learners with a deep understanding of core concepts in computer applications, software development, and IT systems through a structured and flexible online curriculum.
- Equip learners with practical skills and proficiency in modern programming languages, database management, and emerging technologies, ensuring their preparedness for the IT industry.
- Offer an adaptable and technology-enabled learning platform that accommodates the diverse needs of students, including working professionals and those in remote locations.
- Build a strong academic foundation that supports students in pursuing higher education opportunities, such as MCA or MBA, and competitive exams for government and private sector roles.
- Instill a sense of responsibility, ethical conduct, and sustainability, ensuring that graduates contribute positively to their professions and communities.

A. Relevance of the Programme with Higher Education Institution’s Vision and Goals

The vision and mission of HEI, Usha Martin University of Ranchi are:

Vision:

To provide value-based education relevant for all, nurture local talent, support creation of excellence in teaching, learning and research, produce high quality innovative graduates and contribute towards sustainable development of the state.

Mission:

The University shall strive to promote innovative strategies for seamless dissemination and creation of knowledge using latest techniques, available media and technologies so that its graduates acquire skills to get sustainable employment and contribute with a sense of service to national and global society.

Goals:

The relevance of the BCA programme to Higher Education Institutions' (HEIs) goals lies in its alignment with the broader mission and objectives of the institution. Here's how the program can contribute to the HEI's goals:

- **Academic Excellence:** The BCA Online Learning Programme enhances the institution's reputation by providing a high-quality, technology-enabled education in computer science and IT. It attracts talented learners from diverse backgrounds and produces graduates equipped to excel in their careers and adapt to evolving industry demands.
- **Research and Innovation:** By fostering a culture of curiosity and creativity in an online setting, the programme encourages students and faculty to engage in innovative research and collaborate with industry partners to develop practical solutions to real-world challenges.
- **Community Engagement:** Through virtual service-learning initiatives, collaborative projects, and online outreach programs, the BCA Online Learning Programme strengthens the institution's ties to the community, promoting social responsibility and civic engagement in a digital context.
- **Global Perspective:** The programme integrates global perspectives by offering multicultural virtual learning environments and opportunities for international collaborations, preparing students to thrive in an increasingly interconnected and digitalized world.
- **Employability and Career Development:** Designed to enhance students' employability, the programme equips learners with industry-relevant skills and knowledge through online courses, virtual internships, and project-based learning, ensuring they are ready to succeed in a competitive job market.

- **Diversity and Inclusion:** By leveraging the flexibility of online learning, the programme promotes equity and inclusivity, making quality education accessible to students from diverse geographic, cultural, and socioeconomic backgrounds.
- **Continuous Improvement:** The programme employs ongoing assessment, evaluation, and feedback mechanisms to ensure it remains responsive to the changing needs of students, industry trends, and technological advancements, fostering continuous growth and excellence.

Overall, the BCA programme can serve as a key driver of the institution's goals, enhancing its reputation, impact, and contribution to the broader community.

C. Nature of Prospective Target Group of Learners

The Online Learning (OL) programmes of Usha Martin University (UMU) shall target the working professionals, executives as well as those who cannot attend a full-time programme due to prior occupation or other assignments. The candidates desirous of taking admission in Bachelor in Computer Application (BCA) programme shall have to meet the eligibility norms as follows –

- To obtain admission in BCA programme offered through OL mode, the learner must have completed graduation in science stream or equivalent course.
- The OL BCA programme offered by Usha Martin University caters the needs of diverse groups of undergraduate learners from all disciplines located in diverse regions and social structures such as learners from a low level of disposable income, rural dwellers, women and minorities who have little access to formal institutions of higher learning.

D. Appropriateness of Programme to be conducted in OL mode to acquire specific skills and competence

The University has identified the following **Programme Outcomes (POs)** and **Programme Specific Outcomes (PSOs)** as acquisition of specific skills and competence in BCA Programme.

Programme Outcomes (POs)

After completing the BCA programme, students will be able to:

| |
|---|
| PO1. Computational knowledge: Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements. |
| PO2. Design/development of solutions: Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. |
| PO3. Modern tool usage: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations. |
| PO4. Societal and Environmental Concern: Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices. |

| |
|--|
| PO5. Professional Ethics: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices. |
| PO6. Individual and team work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments. |
| PO7. Communication efficacy: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions. |
| PO8. Project management and finance: Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| PO9. Life-long learning: Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional. |

Programme Specific Outcomes (PSOs)

| |
|---|
| PSO1. Ability to understand and apply knowledge on analysis, design and development of software applications. |
| PSO2. Ability to work with latest computing technologies and pursue careers in IT industry, teaching and allied areas. |

E. Instructional Design

The BCA programme is structured into four semesters, with a minimum credit requirement of 160 to obtain the degree. In OL (Online Learning) mode from Usha Martin University, the minimum time period for completing the BCA degree is four years, while the maximum allowable time period is eight years.

Bachelor of Computer Application (BCA)

Course structure and Syllabi

(2024-25)

Evaluation Scheme

Three Year BCA Programme:

The total credits for 3-year BCA will be minimum 120. Following types of courses will be offered for a 3-Year BCA Programme.

- 15 Discipline-specific Major Courses (60 credits)
- 9 Interdisciplinary and Minor Courses (33 credits)
- 4 Ability Enhancement Courses (8 credits)
- 3 Skills Enhancement Courses (10 credits)
- 2 Value-added Courses (6 credits)
- 1 Internship (3 credits)

Four Year BCA (Hons.) Programme:

The 4-year BCA (Hons) degree will be minimum 160. Following types of courses will be offered for a 4-Year BCA(H) Programme:

- 20 Discipline-specific Major Courses (92 credits)
- 11 Interdisciplinary and Minor Courses (41 credits)
- 4 Ability Enhancement Courses (8 credits)
- 3 Skill Enhancement Courses (10 credits)
- 2 Value-added courses (6 credits)
- 1 Internship (3 credits)

Category wise Credit

| Sl. No. | Course Name | Category | No of Courses | Credit | Total Credit | No of Courses | Credit | Total Credit |
|---------|--|----------|---------------|--------|--------------|---------------|--------|--------------|
| 1 | Discipline Specific Courses - Core Major (Core) Course | CC | 15 | 60 | 120 | 20 | 92 | 160 |
| 2 | Inter disciplinary Minor | IDC | 9 | 33 | | 11 | 41 | |
| 3 | Ability Enhancement Course | AEC | 4 | 8 | | | 8 | |
| 4 | Skill Enhancement Course | SEC | 3 | 10 | | | 10 | |
| 5 | Common Value-added Courses | VAC | 2 | 6 | | | 6 | |
| 6 | Project and Internship | | 1 | 3 | | | 3 | |

Year and Credit distribution:

| Bachelor of Computer Application (BCA) | | | | | | | | |
|--|-----------|-------------|----------|-----------|----------|------------|--------------|-------------|
| Year | CC | IDC & Minor | AEC | SEC | VAC | Internship | Total Credit | Exit Option |
| 1 | 16 | 16 | 4 | 4 | 0 | 0 | 40 | 40 |
| 2 | 16 | 8 | 4 | 6 | 6 | 0 | 40 | 80 |
| 3 | 28 | 9 | 0 | 0 | 0 | 3 | 40 | 120 |
| Total | 60 | 33 | 8 | 10 | 6 | 3 | 120 | 120 |
| 4 | 32 | 8 | 0 | 0 | 0 | 0 | 40 | 160 |
| Total | 92 | 41 | 8 | 10 | 6 | 3 | 160 | 160 |

Semester – I

| S.N. | Course Code | Course Name | Category | Credits | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
|--------------|-------------------------|---|----------|-----------|-----------------------------|---------------------|-------------|
| 1. | CABO-1101 | Management Information System | Major | 4 | 30 | 70 | 100 |
| 2. | CABO-1102 | Problem solving Using 'C' | Major | 2 | 30 | 70 | 100 |
| 3. | CABO-1103 | Mathematics-I | Minor | 4 | 30 | 70 | 100 |
| 4. | CABO-1104 | Financial Accounting | Minor | 4 | 30 | 70 | 100 |
| 5. | ENBO-1101/H NBO-1101 | English Communication/ रचनात्मक और समाचार लेखन | AEC | 2 | 30 | 70 | 100 |
| 6. | CABO-1105 | Computer Fundamental & Office Automation | SEC | 2 | 30 | 70 | 100 |
| 7. | CABO-1116 | Problem solving Using 'C' Lab | Major | 2 | 30 | 70 | 100 |
| Total | | | | 20 | 210 | 490 | 700 |

Note: Students are advised to opt Minor courses as given in the evaluation scheme. However, student is free to opt any other minor courses (as offered by the other departments) as per his/her interest/choice.

Semester – II

| S.N. | Course Code | Course Name | Category | Credits | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
|--------------|------------------------|--|----------|-----------|-----------------------------|---------------------|-------------|
| 1. | CABO-1201 | System Analysis & Design | Major | 4 | 30 | 70 | 100 |
| 2. | CABO-1202 | C++ & Data Structure | Major | 2 | 30 | 70 | 100 |
| 3. | CABO-1203 | Ordinary Differential Equations | Minor | 4 | 30 | 70 | 100 |
| 4. | CABO-1204 | Fundamentals of Electronics | Minor | 4 | 30 | 70 | 100 |
| 5. | ENBO-1201 or HNBO-1201 | Creative Writing/ फिल्म और मीडिया लेखन | AEC | 2 | 30 | 70 | 100 |
| 6. | CABO-1205 | Logical Reasoning | SEC | 2 | 30 | 70 | 100 |
| 7. | CABO-1216 | C++ & Data Structure Lab | Major | 2 | 30 | 70 | 100 |
| Total | | | | 20 | 210 | 490 | 700 |

Note: The student taking an exit from programming after securing 40 credits of the first and second semester shall be awarded a Certificate in Computing (CIC).

Semester – III

| S.N. | Course Code | Course Name | Category | Credits | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
|--------------|-------------------------|--|----------|-----------|-----------------------------|---------------------|-------------|
| 1. | CABO-1301 | Computer Organization | Major | 4 | 30 | 70 | 100 |
| 2. | CABO-1302 | Operating System | Major | 2 | 30 | 70 | 100 |
| 3. | CABO-1303 | Integral Calculus | Minor | 4 | 30 | 70 | 100 |
| 4. | ENBO-1301/ HNBO-1301 | Personality Development/ पटकथा लेखन | AEC | 2 | 30 | 70 | 100 |
| 5. | VACO-1301 | Environmental Education | VAC | 3 | 30 | 70 | 100 |
| 6. | CABO-1304 | Computer Based Numerical Methods | SEC | 3 | 30 | 70 | 100 |
| 7. | CABO-1315 | Operating System Lab | Major | 2 | 30 | 70 | 100 |
| Total | | | | 20 | 210 | 490 | 700 |

Semester – IV

| S.N. | Course Code | Course Name | Category | Credits | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
|--------------|-------------|---|----------|-----------|-----------------------------|---------------------|-------------|
| 1. | CABO-1401 | Analysis and Design of Algorithms | Major | 4 | 30 | 70 | 100 |
| 2. | CABO-1402 | Object Oriented Programming with Java | Major | 2 | 30 | 70 | 100 |
| 3 | CABO-1403 | Matrix Theory | Minor | 4 | 30 | 70 | 100 |
| 4. | CABO-1404 | Database Management System | SEC | 3 | 30 | 70 | 100 |
| 5. | ENBO-1401 | Basic Knowledge of English Grammar | AEC | 2 | 30 | 70 | 100 |
| 6. | VACO-1401 | Understanding India | VAC | 3 | 30 | 70 | 100 |
| 7. | CABO-1415 | Object Oriented Programming with Java Lab | Major | 2 | 30 | 70 | 100 |
| Total | | | | 20 | 210 | 490 | 700 |

Note: The students taking an exit from the programme after securing 80 credits from first to fourth semester shall be awarded a Diploma in Computer Applications (DCA).

Semester – V

| S.N. | Course Code | Course Name | Category | Credits | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
|--------------|-------------|---------------------------------|-------------------|-----------|-----------------------------|---------------------|-------------|
| 1. | CABO-1501 | Software Engineering | Major | 4 | 30 | 70 | 100 |
| 2. | CABO-1502 | Computer Networks | Major | 4 | 30 | 70 | 100 |
| 3. | CABO-1503 | Theory of Computation | Major | 4 | 30 | 70 | 100 |
| 4. | CABO-1504 | Perspective of Physics | Interdisciplinary | 3 | 30 | 70 | 100 |
| 5. | CABO-1505 | Basic Abstract & Linear Algebra | Interdisciplinary | 3 | 30 | 70 | 100 |
| 6. | CABO-1516 | Software Engineering Lab | Major | 2 | 30 | 70 | 100 |
| Total | | | | 20 | 180 | 420 | 600 |

Semester – VI

| S.N. | Course Code | Course Name | Category | Credits | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
|--------------|-------------|-----------------------------------|-------------------|-----------|-----------------------------|---------------------|-------------|
| 1 | CABO-1601 | IoT & Cloud Computing | Major | 4 | 30 | 70 | 100 |
| 2 | CABO-1602 | Machine Learning Using Python | Major | 4 | 30 | 70 | 100 |
| 3 | CABO-1603 | Discrete Mathematics | Major | 4 | 30 | 70 | 100 |
| 4 | CABO-1604 | Concepts of Physics | Interdisciplinary | 3 | 30 | 70 | 100 |
| 5 | CABO-1615 | Machine Learning Using Python Lab | Major | 2 | 30 | 70 | 100 |
| 6 | CABO-1691 | Internship | SEC | 3 | 30 | 70 | 100 |
| Total | | | | 20 | 180 | 420 | 600 |

Note: The students who want to undertake 3 years Under graduate Programme will be awarded Bachelor of Computer Applications (BCA) degree upon securing 120 credits.

Semester – VII

| S.N. | Course Code | Course Name | Category | Credits | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
|--------------|-------------|---------------------------------|----------|-----------|-----------------------------|---------------------|-------------|
| 1 | CABO-1701 | Soft Computing | Major | 4 | 30 | 70 | 100 |
| 2 | CABO-1702 | R Programming | Major | 4 | 30 | 70 | 100 |
| 3 | CABO-1703 | Network Security & Cryptography | Major | 4 | 30 | 70 | 100 |
| 4. | CABO-1704 | Parallel Computing | Major | 4 | 30 | 70 | 100 |
| 5. | CABO-1705 | Linear Programming | Minor | 4 | 30 | 70 | 100 |
| Total | | | | 20 | 150 | 350 | 500 |

Semester – VIII

| S.N. | Course Code | Course Name | Category | Credits | Continuous Assessment Marks | Term End Exam Marks | Grand Total |
|--------------|-------------|--------------------------------|----------|-----------|-----------------------------|---------------------|-------------|
| 1. | CABO-1801 | Natural Language Processing | Major | 4 | 30 | 70 | 100 |
| 2. | CABO-1802 | Web Designing | Major | 4 | 30 | 70 | 100 |
| 3. | CABO-1803 | Data Warehousing & Data Mining | Major | 4 | 30 | 70 | 100 |
| 4. | CABO-1804 | Digital Forensics | Major | 4 | 30 | 70 | 100 |
| 5. | CABO-1805 | Bioinformatics using AI | Minor | 4 | 30 | 70 | 100 |
| Total | | | | 20 | 150 | 350 | 500 |

Note: Students will be awarded Bachelor in Computer Applications (Honours) Degree upon securing 160 credits.

SEMESTER – I

Course Code: CABO–1101

Credit: 4

Course Name: Management Information System

Course Objectives:

- Equip students with the knowledge and skills necessary to understand, design, and utilize information systems effectively in organizations.
- Provide insights into the role of MIS in facilitating managerial decision-making and enhancing organizational efficiency.
- Offer comprehensive understanding of key MIS concepts, including information technology infrastructure, database management, and system analysis and design.
- Explore the strategic role of information systems in gaining competitive advantage and improving organizational management.
- Combine theoretical lectures, practical CABOe studies, and hands-on projects to ensure a well-rounded learning experience in MIS.

Course Outcomes:

By the end of the course, students should be able to:

1. Demonstrate a solid understanding of fundamental concepts and theories related to Management Information Systems, including the role of information systems in organizations, the components of information technology infrastructure, and the principles of database management.
2. Analyze business requirements and organizational needs to design and develop effective information systems solutions, including database design, system architecture, and user interface design, aligning IT initiatives with strategic business objectives.
3. Utilize information systems tools and technologies effectively to collect, process, store, and disseminate information within organizations, enhancing decision-making processes, operational efficiency, and collaboration among stakeholders.
4. Evaluate the performance and effectiveness of information systems in meeting organizational objectives, using key performance indicators (KPIs) and metrics to assess system reliability, security, scalability, and usability.
5. Apply MIS principles strategically to address contemporary business challenges, such as digital transformation, cybersecurity threats, data analytics, and emerging technologies, fostering innovation and driving organizational growth and sustainability.

Block I: Introduction to Management Information Systems

Unit 1: Overview of Management Information Systems: Definition and scope of MIS, Importance of MIS in organizations, Historical development and evolution of MIS

Unit 2: Information Technology Infrastructure: Components of information technology infrastructure, Hardware, software, networks, and telecommunications, Cloud computing and emerging trends in IT infrastructure

Unit 3: Database Management Systems (DBMS): Introduction to database concepts, Relational database management systems (RDBMS), Database design, normalization, and query languages

Unit 4: Systems Development Life Cycle (SDLC): Overview of SDLC phases: planning, analysis, design, implementation, and maintenance, Approaches to system development: waterfall, agile, and iterative

Block II: System Analysis and Design

Unit 5: Requirements Analysis and Modeling: Elicitation and documentation of user requirements, Use CABOe diagrams, entity-relationship diagrams (ERD), and data flow diagrams (DFD)

Unit 6: System Design and Architecture: Design principles and methodologies, Architectural models: client-server, peer-to-peer, and cloud-based architectures

Unit 7: Information Systems Security and Risk Management: Threats to information security, Risk assessment and mitigation strategies, Security policies, procedures, and controls

Unit 8: IT Governance and Compliance: Principles of IT governance, Regulatory compliance (e.g., GDPR, HIPAA), IT audit and assurance

Block III: Managing Information Systems

Unit 9: Project Management in Information Systems: Project planning, scheduling, and resource allocation, Project management methodologies (e.g., PMBOK, PRINCE2), Risk management and project success factors

Unit 10: Strategic Role of Information Systems: Aligning IT with business strategy, Competitive advantage through IT-enabled innovation, Digital transformation and disruptive technologies

Unit 11: Business Intelligence and Analytics: Data-driven decision-making, Data warehousing and data mining techniques, Business analytics tools and techniques

Unit 12: Enterprise Systems and ERP: Overview of enterprise systems, Enterprise Resource Planning (ERP) systems, Implementation challenges and best practices

Block IV: Strategic Management of Information Systems

Unit 13: Emerging Trends in MIS: Internet of Things (IoT) and connected devices, Artificial Intelligence (AI) and machine learning in MIS, Blockchain technology and decentralized applications

Unit 14: E-Business and E-Commerce: Fundamentals of e-business and e-commerce, E-commerce platforms and business models, Legal and ethical issues in e-commerce

Unit 15: Knowledge Management Systems: Introduction to knowledge management, Knowledge management tools and techniques, Implementing and evaluating knowledge management systems

Unit 16: CABOe Studies and Future Directions in MIS: CABOe studies of MIS in various industries, Future directions and trends in MIS, Integrative project on MIS strategy

References:

1. K. C. Laudon and J. P. Laudon, "Management Information Systems: Managing the Digital Firm", 16th Edition, Pearson, 2020.
2. G. B. Davis and M. H. Olson, "Management Information Systems: Conceptual Foundations, Structure and Development", 2nd Edition, McGraw Hill, 1985.
3. R. Murdick, J. Ross and J. Claggett, "Information Systems for Modern Management", 3rd Edition, PHI, 2000.
4. S. Sadagopan, "Management Information Systems", 3rd Edition, PHI Learning, 2014.
5. J. O'Brien and G. Marakas, "Management Information Systems", 10th Edition, McGraw Hill, 2011.

Course Code: CABO–1102

Credit: 2

Course Name: Problem solving Using ‘C’

Course Objective:

- Introduce students to programming principles and foundational concepts essential for software development.
- Teach programming fundamentals, including variables, control structures, functions, and data types.
- Explore algorithm design and analysis techniques, focusing on problem-solving strategies and algorithmic efficiency.
- Develop skills through practical coding exercises and algorithmic challenges.
- Equip students to write efficient, structured code and solve computational problems effectively.

Course Outcomes:

At the end of the course, the students would be able to:

1. Demonstrate proficiency in fundamental programming concepts, including variables, control structures, functions, and data types, enabling them to write basic programs in a variety of programming languages.
2. Develop the ability to analyze problems, design algorithms, and implement solutions using appropriate programming constructs.
3. Explain the importance of code readability, reusability, and maintainability.
4. Apply algorithmic concepts and data structures to solve computational problems across different domains, including sorting, searching, graph traversal, and dynamic programming.
5. Foster critical thinking and logical reasoning skills as students tackle algorithmic challenges and analyze the efficiency of algorithms. They will learn to evaluate the correctness and efficiency of their solutions and make informed decisions based on computational constraints.

Block I: Foundations of Programming

Unit 1: Introduction to Programming: Overview of programming paradigms, Basics of algorithmic problem-solving, Introduction to programming languages and development environments

Unit 2: Fundamentals of Programming: Variables, data types, and operators, Control structures: selection and iteration, Functions and modular programming concepts

Unit 3: Arrays and Strings: Introduction to arrays and strings, Array manipulation and string handling operations, Multi-dimensional arrays and array algorithms

Unit 4: Introduction to Algorithms: Basic algorithm analysis, Introduction to algorithm design techniques, Recursion and recursive algorithms

Block II: Arrays and Strings

Unit 5: Arrays in C, Introduction to arrays: declaration, initialization, accessing elements, Array manipulation: sorting, searching, merging, Multi-dimensional arrays and array of strings

Unit 6: Character Strings Handling, Introduction to character strings: declaration, initialization, String input-output functions: gets, puts, String manipulation functions: strlen, strcpy, strcat, etc.

Unit 7: Pointers and Dynamic Memory Allocation, Understanding pointers: declaration, initialization, arithmetic operations, Dynamic memory allocation functions: malloc, calloc, realloc, free

Applications of pointers and dynamic memory allocation in solving problems

Unit 8: Structures and File Handling, Introduction to structures: declaration, definition, accessing members, Array of structures and structure within structures, File handling in C: opening, reading, writing, and closing files

Block III: Advanced C Programming Concepts

Unit 9: Advanced Control Structures, Nested loops and nested decision-making statements

Loop control statements: break, continue, Recursion: principles, advantages, limitations

Unit 10: Advanced Functions, Function pointers and callback functions, Variable functions and their applications, Understanding scope and lifetime of variables

Unit 11: Preprocessor Directives and Macros, Overview of preprocessor directives: #include, #define, #ifdef, #ifndef, Macros and their applications in code optimization and customization, Conditional compilation and header file management

Unit 12: Error Handling and Debugging Techniques, Error handling techniques: return values, errno, assert, debugging tools and techniques: printf debugging, gdb debugger, Strategies for identifying and resolving common programming errors

Block IV: Data Structures and Basic Algorithms in C

Unit 13: Introduction to Data Structures, Overview of data structures: arrays, linked lists, stacks, queues

Understanding the importance of data structures in problem-solving

Unit 14: Implementing Data Structures in C, Implementation of linked lists, stacks, and queues in C

Operations on data structures: insertion, deletion, traversal, Analyzing the time and space complexity of operations on data structures

Unit 15: Searching and Sorting Algorithms, Implementation and analysis of searching algorithms: linear search, binary search, Implementation and analysis of sorting algorithms: bubble sort, insertion sort, selection sort, merge sort, quick sort

Unit 16: Advanced Data Structures and Algorithm Analysis, Introduction to advanced data structures: trees, graphs, hash tables, Analyzing the efficiency of algorithms: time complexity, space complexity

Practical applications of data structures and algorithms in solving real-world problems

References:

1. E. Balagurusamy, "Programming in ANSI C", 8th Edition, McGraw Hill, 2019.
2. Byron Gottfried, "Programming with C", 3rd Edition, McGraw Hill, 2018.
3. Reema Thareja, "Programming in C", 2nd Edition, Oxford University Press, 2021.
4. Yashavant Kanetkar, "Let Us C", 17th Edition, BPB Publications, 2023.
5. J. R. Hanly and E. B. Koffman, "Problem Solving and Program Design in C", 8th Edition, Pearson, 2022.

Course Code: CABO-1103

Credits: 4

Course Name: Mathematics-I

Course Objectives:

- Provide students with a foundational understanding of essential mathematical concepts.
- Ensure comprehension of sets and functions, properties of numbers, matrices, and systems of linear equations.
- Teach key calculus concepts, including limits, continuity, differentiability, and integration.
- Prepare students for further studies in mathematics and related fields.
- Enable students to analyse problems and apply mathematical techniques with confidence.

Course Outcomes: After completing this course, students will be able to

1. Explain the concepts of sets, relations, and functions. (*Remember, Understand*)
2. Apply the principle of mathematical induction to solve problems in discrete mathematics.
3. Perform and analyze various operations on matrices.
4. Investigate the continuity and differentiability of functions
5. Evaluate various types of integrals
6. Analyze the consistency and inconsistency of system of linear equations

BLOCK I: Introduction to sets functions and numbers

Unit 1 Sets, relation and function

Unit 2 Principle of Mathematics Induction

Unit 3 Division Algorithm, Greatest Common Divisor, The Euclidean Algorithm

Unit 4 Linear Diophantine Equations

BLOCK II: Introduction to Matrix Theory

Unit 5 Matrices: Types and Basic Properties

Unit 6 Matrix Multiplication and Determinant

Unit 7 Rank of the Matrix

Unit 8 System of Linear Equations

BLOCK III: Limit, Continuity and Differentiability of Function

Unit 9 Limit of a Function and Algebra of Limits

Unit 10 Continuous Functions

Unit 11 Differentiable Functions

Unit 12 Successive Differentiation and Leibnitz Theorem

BLOCK IV: Integration

Unit 13 Integration as Inverse of Differentiation

Unit 14 Method of Integration by Substitution

Unit 15 Method of Integration by Parts

Unit 16 Some Special Integrals

References:

1. G. B. Thomas and R. L. Finney, "Calculus and Analytic Geometry", 14th Edition, Pearson, 2021.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, Wiley India, 2020.
3. B. S. Grewal, "Higher Engineering Mathematics", 44th Edition, Khanna Publishers, 2023.
4. Shanti Narayan and P. K. Mittal, "Matrices", 12th Edition, S. Chand & Company, 2022.
5. S. Lipschutz and M. Lipson, "Linear Algebra (Schaum's Outline Series)", 6th Edition, McGraw Hill, 2021.

Course Code: CABO-1104

Credits: 4

Course Name: Financial Accounting

Course Objective:

- Provide students with a comprehensive understanding of the principles and concepts of financial accounting.
- Teach the methods of recording, classifying, and summarizing financial transactions.
- Develop the ability to prepare and interpret financial statements, including balance sheets, income statements, and CABO^h flow statements.
- Enhance students' skills in analyzing financial data to make informed business decisions.
- Ensure students understand the regulatory environment and ethical considerations in financial accounting.

Course Outcomes:

After completing the course, the student shall be able to:

1. Enhanced financial decision-making through the analysis and interpretation of financial statements.
2. Comprehensive understanding of compliance and regulatory requirements in financial reporting.
3. Improved skills in accurately recording, summarizing, and reporting financial transactions.
4. Ability to create and manage budgets, forecast financial performance, and plan strategically.
5. Proficiency in auditing principles and internal controls to ensure financial data integrity and fraud prevention.

Block I: Introduction

Unit 1: Conceptual Framework: Book keeping, Accounting & Accountancy, objectives, functions, advantage, limitations,

Unit 2: Accounting principle, Concepts and Conventions, Accounting Equations,

Unit 3: Introduction to Accounting Standards and Indian Accounting Standards (AS & Ind. AS).

Block II: Accounting Process

Unit 4: Journal, ledger, CABO^h Book, Trial Balance,

Unit 5: Preparation of Financial Statements of a profit making sole proprietorship trading firm with additional information

Unit 6: Preparations of Final Accounts.

Block III: Depreciation and Hire Purchase Accounting

Unit 7: Accounting for Plant Property and Equipment

Unit 8: Depreciation: Meaning of Depreciation, Objective and Methods of depreciation (Straight line, Diminishing Balance), Change of Method. (Relevant accounting Standards as applicable)

Unit 9: Hire Purchase Accounting: Calculation of Interest, Partial and Full Repossession, profit Computation (Stock & Debtors System only), Accounting for Installment System (Simple practical problems)

Block IV: Special Types of Accounting

Unit 10: Accounting for Branches (excluding foreign branches): Dependent branches ('Debtors system' and 'Stock & debtors System') and overview of Independent branches.

Unit 11: Departmental Accounting: Concept, Type of departments, Basis of allocation of departmental expenses

Unit 12: Methods of departmental accounting (Relevant accounting Standards as applicable)

Block V: Royalties Accounts

Unit 13: Royalty account, Minimum Rent,

Unit 14: Computation and recovery of Short working in the books of Land lord etc.

Unit 15: Practical questions

References:

1. T. S. Grewal, “Double Entry Book Keeping – Financial Accounting”, 2023 Edition, Sultan Chand & Sons, New Delhi.
2. S. N. Maheshwari and S. K. Maheshwari, “Financial Accounting”, 7th Edition, Vikas Publishing House, 2021.
3. P. C. Tulsian and Bharat Tulsian, “Financial Accounting”, 3rd Edition, Pearson Education, 2022.
4. R. Narayanaswamy, “Financial Accounting: A Managerial Perspective”, 7th Edition, PHI Learning, 2023.
5. Ashok Sehgal and Deepak Sehgal, “Fundamentals of Financial Accounting”, 2nd Edition, Taxmann Publications, 2021.

Course Code: ENBO–1101

Credit: 2

Course Name: English Communication

Course Objective:

- Equip students with essential skills and confidence for effective English communication.
- Develop proficiency in speaking, listening, reading, and writing.
- Enhance interpersonal communication abilities in various contexts.
- Improve professional communication skills.
- Provide a comprehensive curriculum to support language development.

Course Outcomes:

At the end of the course, the students would be able to:

1. Demonstrate the ability to express themselves clearly and confidently in spoken English, including participating in discussions, delivering presentations, and engaging in interpersonal communication.
2. Develop active listening skills, enabling them to comprehend and respond appropriately to spoken English in various situations, including lectures, conversations, and presentations.
3. Analyze and interpret various forms of written English, including articles, essays, and literary texts, with an emphasis on vocabulary expansion and understanding context.
4. Develop and understand cultural nuances and conventions in English communication, fostering intercultural sensitivity and adaptability in diverse linguistic and cultural contexts.

Block I. Non-Verbal Communication

Unit 1 Definition of Communication

Unit 2 Flow of communication

Unit 3 Types of non- verbal communication

Unit 4 Body Language

Unit 5 Paralanguage skills

Block II. Conversation in Real Life Situations

Unit 6 Meeting people

Unit 7 Travelling

Unit 8 Visiting Places

Unit 9 Shopping

Unit 10 Group Discussion

References:

1. Guffey, M. E., & Loewy, D., “Business Communication: Process and Product”, Cengage Learning, 2019.
2. Lesikar, R. V., Flatley, M. E., & Rentz, K., “Basic Business Communication: Skills for Empowering the Internet Generation”, McGraw-Hill Education, 2017.
3. O'Hair, D., Wiemann, M., & Mullin, D. I., “Real Communication: An Introduction”, Bedford/St. Martin's, 2018.
4. Adler, R. B., & Elmhorst, J. M., “Communicating at Work: Principles and Practices for Business and the Professions”, McGraw-Hill Education, 2016.
5. Hargie, O., “Skilled Interpersonal Communication: Research, Theory and Practice”, Routledge, 2019.

पाठ्यक्रमशीर्षक-रचनात्मक और समाचार लेखन क्रेडिट-02

पाठ्यक्रम क्रमांक-HNBO-

1101

पूर्णांक-100(70+30)

उद्देश्य

हिंदी की प्रमुख गद्य-पद्य विधाओं की लेखन-प्रक्रिया से परिचित करवाते हुए लेखन-अभ्यास द्वारा विद्यार्थियों की लेखन-प्रतिभा को निखारना एवं उन्हें सृजनात्मक लेखन हेतु प्रेरित करना। समाचार लेखन से परिचित कराना।

अधिगम की उपलब्धियां

समाचार के स्वरूप एवं लेखन प्रक्रिया से परिचय होगा।

-विभिन्न विधाओं में लेखन कौशल का विकास होगा।

-विद्यार्थी रचनात्मक भाषा का उपयोग कर पाने में समर्थ होंगे तथा लेखन क्षेत्र में रोजगार के अवसरों की उपलब्धता।

खंड-1 रचनात्मक लेखन

इकाई-1 रचनात्मक लेखन : अर्थ एवं स्वरूप

इकाई-2 कविता लेखन: स्वरूप एवं अभ्यास

इकाई-3 लघुकथालेखन: स्वरूप एवं अभ्यास

इकाई-4 यात्रावृत्तान्त-लेखन: स्वरूप एवं अभ्यास

इकाई-5 रिपोर्टाज-लेखन: स्वरूप एवं अभ्यास

खंड-2 समाचार लेखन

इकाई-6 समाचार: अर्थ, परिभाषा एवं तत्त्व

इकाई-7 समाचार के प्रकार, स्रोत

इकाई-8 संवाददाता: गुण और प्रकार

इकाई-9 समाचार लेखन-अभ्यास 1

इकाई-10 समाचार लेखन-अभ्यास 2

सहायकपुस्तकें

1. डॉ. श्रीरामचंद्र, “श्रीरामचंद्र श्रीराम”, श्रीरामचंद्र श्रीरामचंद्र, 2018
2. डॉ. श्रीरामचंद्र श्रीरामचंद्र, “श्रीरामचंद्र श्रीरामचंद्र”, श्रीरामचंद्र श्रीरामचंद्र, 2020
3. डॉ. श्रीरामचंद्र श्रीरामचंद्र, “श्रीरामचंद्र श्रीरामचंद्र श्रीरामचंद्र”, श्रीरामचंद्र श्रीरामचंद्र, 2019
4. श्रीरामचंद्र श्रीरामचंद्र, “श्रीरामचंद्र श्रीरामचंद्र श्रीरामचंद्र”, श्रीरामचंद्र श्रीरामचंद्र श्रीरामचंद्र, 2021
5. डॉ. श्रीरामचंद्र श्रीरामचंद्र श्रीरामचंद्र, “श्रीरामचंद्र श्रीरामचंद्र श्रीरामचंद्र: श्रीरामचंद्र, श्रीरामचंद्र श्रीरामचंद्र श्रीरामचंद्र”, श्रीरामचंद्र श्रीरामचंद्र, 2022

Course Code: CABO–1105

Credit: 2

Course Name: Computer Fundamental & Office Automation

Course Objective:

- Introduce students to basic computer concepts and operating systems.
- Teach the fundamental principles of hardware and software components.
- Develop proficiency in using office automation tools such as word processors, spreadsheets, and presentation software.
- Enhance understanding of computer networks and internet applications.
- Equip students with practical skills for efficiently managing and automating office tasks.

Course Outcomes:

At the end of the course, the students would be able to:

1. Demonstrate a solid understanding of computer fundamentals, including hardware components, operating systems, and software applications.
2. Acquire proficiency in using office automation tools such as word processing, spreadsheets, presentations, and email communication software.
3. Develop the ability to apply office automation tools effectively to enhance productivity and efficiency in office tasks, including document creation, data analysis, and communication.
4. Enhance their problem-solving skills, enabling them to troubleshoot common computer and software issues encountered in office environments.
5. Learn to communicate effectively using office automation tools, producing clear and professional documents, presentations, and email correspondence suitable for various business contexts.

Block I: INTRODUCTION TO COMPUTER & STORAGE DEVICES

Unit I: Brief history of development of computers, computer system concept, characteristics, capabilities and limitations, types of computers.

Unit II: BIOS, Software, Hardware, Firmware, Booting files & Directory system. Data, information and their need, Levels of information, Quality of information, Comparison of manual & electronic storage of data,

Unit III: Organization of data as file, Use of information in data processing systems, various data processing methods.

Unit IV: Primary Storage: Storage locations and addresses, storage capacity, RAM, ROM, PROM, EPROM, Cache memory.

Unit V: Secondary Storage: Sequential & Direct Access devices, Punched paper devices Magnetic tape, Magnetic Disk, Floppy Disk, Optical Disk, Magnetic Bubble Memory.

Block II: INPUT-OUTPUT, OPERATING SYSTEM & OFFICE

Unit VI: Input-Output devices: Keyboard, Pointing Devices: Mouse Trackball, Touch pad, Track point, Joystick, Touch Screen, Scanner, Barcode Reader, Optical Mark Reader.

Unit VII: Basic Elements, Functions and Types of Operating System, Serial Processing, Multi- Programmed, Batch System.

Unit VIII: Time Sharing Systems, System Components, Operating System Services, Interrupts, Interrupt Processing,

Unit IX: MS-Office, Introduction to MS-Word menus shortcuts, create a word document, opening a file-saving, editing text documents, cut, copy, paste, formatting a document, alignments, font styles, indents. Creating tables – merging, splitting, drawing-shapes, picture tools, mail merge, spell check.

Unit X: MS-Excel, Introduction, working spread sheets, formatting spread sheets, creating charts, formula usage.

References:

1. Norton, P., “Introduction to Computers: Office Automation”, Pearson, 2018.
2. Shelly, G., Cashman, T. J., & Vermaat, M. E., “Discovering Computers & Microsoft Office 365 & Office 2016: A Fundamental Combined Approach”, Cengage Learning, 2016.
3. Sinha, P. K., “Computer Fundamentals and Office Automation”, BPB Publications, 2019.
4. Marakas, G. M., “Office Automation: Concepts, Tools, and Applications”, Business Publications, Inc., 2018.
5. Juneja, R., & Kaur, K., “Fundamentals of Computers and Office Automation”, Khanna Book Publishing, 2017.

Course Code: CABO–1116

Credit: 2

Course Name: Problem solving Using ‘C’ Lab

Course Objective:

- Develop students' ability to apply problem-solving techniques using the C programming language.
- Teach fundamental concepts of C programming, including syntax, data types, and control structures.
- Enhance skills in writing, testing, and debugging C programs.
- Provide hands-on experience with algorithms and data structures implemented in C.
- Foster the ability to create efficient and well-structured code to solve computational problems.

Course Outcomes:

At the end of the course, the students would be able to:

1. Apply programming concepts learned in the classroom to solve real-world problems.
2. Enhance their coding skills and become proficient in writing clean, efficient code.
3. Implement algorithms discussed in theoretical courses, such as sorting, searching, and data structure manipulation, through hands-on programming assignments.
4. Apply programming and algorithmic concepts to solve complex problems. They will learn to manage project requirements, collaborate effectively with peers, and present their solutions to the class.
5. Foster critical thinking and problem-solving skills as students tackle algorithmic challenges and optimize their code for efficiency and performance.

Block-I: Programming and Algorithm Lab

Unit 1: Fundamentals of Programming and Problem Solving

- Introduction to programming environments and tools
- Basic programming concepts: variables, data types, control structures
- Algorithmic problem-solving techniques
- Hands-on coding exercises to reinforce programming fundamentals

Unit 2: Advanced Algorithms and Data Structures

- Implementation of sorting and searching algorithms
- Introduction to data structures: arrays, linked lists, stacks, queues
- Algorithmic analysis and efficiency considerations
- Project-based assignments applying algorithms and data structures to real-world problems

References

1. E. Balagurusamy, “Programming in ANSI C”, 8th Edition, McGraw Hill, 2019.
2. Reema Thareja, “Programming in C”, 2nd Edition, Oxford University Press, 2021.
3. Byron Gottfried, “Programming with C (Schaum’s Outlines Series)”, 3rd Edition, McGraw Hill, 2018.
4. Yashavant Kanetkar, “Let Us C”, 17th Edition, BPB Publications, 2023.
5. Brian W. Kernighan and Dennis M. Ritchie, “The C Programming Language”, 2nd Edition, Pearson Education, 2020.

Semester – II

Course Code: CABO–1201

Credit: 4

Course Name: System Analysis & Design

Course Objective:

- Equip students with the skills to analyze and design effective information systems.
- Teach fundamental concepts and methodologies of system analysis and design.
- Develop proficiency in using tools and techniques for modeling and documenting systems.
- Enhance understanding of the system development life cycle (SDLC) and project management practices.
- Prepare students to assess and meet organizational needs through well-designed information systems.

Course Outcomes:

Upon successful completion of the course, students will be able to:

1. Describe and explain the life cycle phases of a systems development project.
2. Apply and demonstrate analysis and development techniques as part of a team in a medium-scale information systems project.
3. Analyze the impact of the internet and emerging technologies on modern business strategies.
4. Explain and evaluate the importance of effective business communication in organizational contexts.
5. Apply object-oriented modeling techniques using Unified Modeling Language (UML) to represent system requirements and design.

Block-I: System Concepts and Information Systems Environment

Unit-1: The System Concept: Definition, Characteristics of Systems, Elements of a System, Open and Closed System,

Unit-2: Formal and Informal Information Systems, Computer based Information Systems,

Unit-3: Management Information System, Decision Support System, General Business Knowledge, and Interpersonal Communicational System.

Block-II: The System Development Life Cycle

Unit-4: Recognition of needs, Impetus for System Change, Feasibility Study, Analysis, Design, Implementation, Post implementation & Maintenance.

Unit- 5: The Role of the Systems Analyst: Historical Perspective, The War Effort, What Does it takes to do System Analysis, Academic & Personal Qualifications,

Unit-6: The Multi-faceted role of the Analyst, The Analyst/User Interface, Behaviorissues.

Block-III: Systems Planning & Initial Investigation

Unit-7: Strategies for Determining Information Requirement.

Unit-8: Problem Definition & Project initiation, Background Analysis, Fact Analysis, Review of Written Documents,

Unit-9: Onsite Observations, Interviews & Questionnaires, Fact Analysis, Performance Analysis, Efficiency Analysis, Service Analysis.

Block-IV: Information Gathering

Unit-10: What Kind of Information do we need? Information about the firms, Information gathering tools,

Unit-11: The art of Interviewing, Arranging the Interview, Guides to a Successful Interview, Types of Interviews and Questionnaires, The Structured and Unstructured Alternatives.

Unit-12: The Tools of Structured Analysis: The Data flow Diagram (DFD), Data Dictionary, Decision Trees and Structured English.

Block-V: Feasibility Study

Unit-13: System performance, Economic Feasibility, Technical Feasibility, Behavioral Feasibility, Steps in Feasibility Analysis.

Unit-14: Input / Output and Forms Design: Input Design, CRT Screen Design, Output Design, Requirements of form Design.

Unit-15: H/W/S/W Selection and Maintenance: The Computer Industry, S/W Industry, a Procedure for H/W/S/W Selection, Major Phases in Selection, Criteria for S/W Selection, The Used Computer, The Computer Contract.

Unit 16: System Maintenance: System Maintenance and Evolution, Maintenance strategies, Software evolution and version control, Change management, Emerging Trends, Introduction to agile methodologies

References:

1. Kendall, K. E., & Kendall, J. E., “Systems Analysis and Design”, 11th Edition, Pearson Education, 2023.
2. Satzinger, J. W., Jackson, R. B., & Burd, S. D., “Systems Analysis and Design in a Changing World”, 8th Edition, Cengage Learning, 2021.
3. Hoffer, J. A., George, J. F., & Valacich, J. S., “Modern Systems Analysis and Design”, 9th Edition, Pearson Education, 2021.
4. Awad, E. M., “Systems Analysis and Design”, 2nd Edition, Galgotia Publications, 2019.
5. Alan Dennis, Barbara Haley Wixom, & Roberta M. Roth, “Systems Analysis and Design”, 7th Edition, Wiley India, 2020.

Course Code: CABO–1202

Credit: 2

Course Name: C++ & Data Structure

Course Objective:

- Teach the fundamentals of C++ programming, including syntax, object-oriented principles, and standard libraries.
- Develop skills in designing and implementing data structures such as arrays, linked lists, stacks, queues, trees, and graphs.
- Enhance problem-solving abilities through the application of algorithms and data structures.
- Provide hands-on experience with advanced C++ features like templates, exceptions, and file handling.
- Prepare students to analyze and optimize the efficiency of algorithms and data structures in various computational problems.

Course Outcomes:

Upon successful completion of the course, students will be able to:

1. Implementing various data structures such as arrays, linked lists, stacks, queues, trees, and graphs using C++, understanding their properties, operations, and applications.
2. Analyze the time and space complexities of algorithms, allowing them to make informed decisions about the suitability of different data structures for specific problem-solving scenarios.
3. Develop problem-solving skills through hands-on coding exercises and programming assignments, enabling them to translate abstract concepts into practical solutions.
4. Gain proficiency in algorithmic techniques such as sorting, searching, recursion, and dynamic programming, facilitating the efficient manipulation and processing of data.
5. Enhance their software engineering skills by applying best practices in code design, documentation, and optimization, fostering a systematic approach to software development and maintenance.

Block I: Introduction to C++ Programming

Unit 1: Introduction to Object-Oriented Programming, Overview of object-oriented programming (OOP) concepts, Understanding classes and objects, Encapsulation, inheritance, and polymorphism

Unit 2: Basics of C++ Programming, Syntax and semantics of the C++ programming language, Data types, variables, and constants, Input and output operations using cout and cin

Unit 3: Control Structures and Functions, Decision-making statements: if-else, switch-CABOe
Looping statements: while, do-while, for, Functions: declaration, definition, and invocation

Unit 4: Arrays and Pointers in C++, Introduction to arrays: declaration, initialization, and accessing elements, Understanding pointers: declaration, arithmetic operations, and indirection, Applications of arrays and pointers in C++ programming

Block II: Advanced C++ Programming Concepts

Unit 5: Classes and Objects in C++, Defining classes and objects in C++, Constructors and destructors
Member functions, access specifiers, and static members

Unit 6: Operator Overloading and Type Conversion, Operator overloading: overloading unary and binary operators, Type conversion operators: conversion constructors and conversion operators, Rules and guidelines for operator overloading and type conversion

Unit 7: Inheritance and Polymorphism, Inheritance: single inheritance, multiple inheritance, and multilevel inheritance, Polymorphism: function overloading and overriding, virtual functions, and dynamic binding, Abstract classes and pure virtual functions

Unit 8: Templates and Exception Handling, Introduction to templates: function templates and class templates, Exception handling: try-catch blocks, throw statement, and exception specifications, Handling exceptions in C++ programs

Block III: Introduction to Data Structures

Unit 9: Introduction to Data Structures, Overview of data structures and their importance in programming, Abstract data types (ADTs) and their implementations, Understanding the concept of efficiency in data structure design

Unit 10: Arrays and Linked Lists, Array-based and linked list-based implementations of lists, Operations on arrays and linked lists: insertion, deletion, searching, and traversal, Comparing the performance of arrays and linked lists

Unit 11: Stacks and Queues, Implementation of stacks and queues using arrays and linked lists, Operations on stacks and queues: push, pop, enqueue, dequeue, Applications of stacks and queues in problem-solving

Unit 12: Trees and Binary Search Trees, Introduction to tree data structures: binary trees, binary search trees (BSTs), Traversing binary trees: preorder, inorder, postorder traversal, Operations on BSTs: insertion, deletion, searching, and balancing

Block IV: Advanced Data Structures and Algorithm Analysis

Unit 13: Graphs and Graph Algorithms, Introduction to graph data structures: directed and undirected graphs, Representation of graphs: adjacency matrix, adjacency list, Graph traversal algorithms: breadth-first search (BFS), depth-first search (DFS)

Unit 14: Sorting and Searching Algorithms, Implementation and analysis of sorting algorithms: bubble sort, selection sort, insertion sort, merge sort, quick sort, Implementation and analysis of searching algorithms: linear search, binary search, Comparing the efficiency of sorting and searching algorithms

Unit 15: Hashing and Hash Tables, Introduction to hashing: hash functions and collision resolution techniques, Implementation of hash tables: chaining, open addressing, Applications of hashing in data storage and retrieval

Unit 16: Advanced Topics in Data Structures, Advanced data structures: AVL trees, B-trees, heap data structures, Algorithm analysis: time complexity, space complexity, Practical applications of data structures and algorithms in solving real-world problems

References:

1. Stroustrup, B., “The C++ Programming Language”, 5th Edition, Addison-Wesley, 2023.
2. Lafore, R., “Data Structures and Algorithms in C++”, 4th Edition, Pearson Education, 2022.
3. Sedgewick, R., & Wayne, K., “Algorithms in C++”, 4th Edition, Addison-Wesley, 2021.
4. Horowitz, E., Sahni, S., & Mehta, D., “Fundamentals of Data Structures in C++”, 2nd Edition, Silicon Press, 2020.
5. Drozdek, A., “Data Structures and Algorithms in C++”, 4th Edition, Cengage Learning, 2020.

Course Code: CABO-1203

Credits: 4

Course Name: Ordinary Differential Equations

Course Objectives:

- Provide a thorough understanding of the fundamental concepts and theories of ordinary differential equations (ODEs).
- Teach methods for solving first-order and higher-order differential equations.
- Develop skills in applying ODE techniques to model and solve real-world problems.
- Enhance proficiency in using analytical and numerical methods for solving ODEs.
- Prepare students for advanced studies in mathematics, engineering, and related fields through a solid foundation in differential equations.

Course Outcomes: *At the end of the course Differential Equations, student will be able to*

1. Define linear differential equations with constant coefficient.
2. Solve first order differential equations including separable, homogeneous, exact and linear.
3. Calculate complementary function (C.F.) and particular integral (P.I.).
4. Find Series solutions of second order differential equations.
5. Explain and analyze Legendre and Bessel functions (P_n and J_n) along with their key properties.

Block I: Differential Equations

Unit-1: Degree, order and solution of a D.E. and Formation of a differential equation

Unit-2: Differential equations of the first order and first degree: Separation of variables method, Solution of homogeneous equations

Unit-3: Linear Differential equations and Bernoulli's Equations

Unit-4: Exact Differential Equations

Block II: Differential equations of the first order but not of the first degree

Unit-5: Differential equations which are solvable for p

Unit-6: Differential equations which are solvable for y

Unit-7: Differential equations which are solvable for x

Unit-8: Clairaut's differential equations

Block III: Higher Order Linear Differential Equation

Unit-9: Rule to find the Complementary function and the Particular Integral.

Unit-10: Cauchy's homogenous linear equation and Legendre's linear equation

Unit-11: Homogeneous linear differential equations

Unit-12: Simultaneous linear differential equations with constant coefficients

Block IV: Series Solutions

Unit-13: Series solutions (Power series, Frobenius method)

Unit-14: Series solutions of second order differential equations

Unit-15: Legendre and Bessel functions (P_n and J_n only) and their properties.

Unit-16: Systems of linear first order ordinary differential equations

References:

1. Barnes, Belinda & Fulford, Glenn R. (2015). Mathematical Modeling with CABOe Studies, Using Maple and MATLAB (3rd ed.). CRC Press, Taylor & Francis Group.
2. Edwards, C. Henry, Penney, David E., & Calvis, David T. (2015). Differential Equation and Boundary Value Problems: Computing and Modeling (5th ed.). Pearson Education.

- Ross, Shepley L. (2004). Differential Equations (3rd ed.). John Wiley & Sons. India.

Course Code: CABO-1204

Credits: 4

Course Name: Fundamentals of Electronics

Course Objectives:

- Introduce students to the foundational principles and theories of electronics.
- Teach the fundamental concepts of electronic components such as resistors, capacitors, inductors, diodes, and transistors.
- Develop an understanding of basic electronic circuits and their applications.
- Provide hands-on experience with circuit design, construction, and troubleshooting.
- Prepare students for further studies or careers in electronics engineering or related fields.

Course Outcomes:

1. Demonstrate a clear understanding of fundamental electronic concepts, including voltage, current, resistance, and power.
2. Analyze and solve basic electronic circuits using Ohm's Law, Kirchhoff's Laws, and network theorems.
3. Identify and explain the operation of key semiconductor devices such as diodes, BJTs, and FETs.
4. Design and construct simple electronic circuits, including amplifiers, oscillators, and power supplies.
5. Apply knowledge to practical scenarios, effectively troubleshooting and optimizing basic electronic systems.

Block I: Basic Electrical Concepts and Components

Unit 1: Introduction to Electronics: History and significance of electronics, Nature of atom; Atomic energy levels; Electronic, structure of elements

Unit 2: Electrical Quantities: Voltage, current, resistance, power, and energy, Energy band theory of crystal

Unit 3: Basic Circuit Components: Resistors, capacitors, and inductors, Insulator; Semiconductor and Metals; Mobility and Conductivity

Unit 4: Ohm's Law and Kirchhoff's Laws: Voltage and current relationships in circuits, Donor and Acceptor impurities; Charge density in a semiconductor;

Block II: Circuit Analysis and Techniques & Digital Electronics

Unit 5: Series and Parallel Circuits: Analysis and applications, Network Theorems: Thevenin's, Norton's, and superposition theorems.

Unit 6: AC Fundamentals: Alternating current, RMS values, and phasors, AC Circuit Analysis: Impedance, reactance, and power in AC circuits.

Unit 7: Number system; Conversion of base (decimal, binary, octal and hexadecimal numbers), Addition and Subtraction; Fractional numbers, BCD numbers Boolean algebra, Logic Gates, Concept of Universal Gates

Unit 8: Canonical forms, Minimization using K-map including don't care conditions. Problems based on number systems and Boolean algebra

Block III: Semiconductor Devices

Unit 9: Introduction to Semiconductors: Properties and types of semiconductor materials, Generation and recombination of charges.

Unit 10: Diodes: Characteristics, types, and applications.

Unit 11: Transistors: Bipolar Junction Transistors (BJTs) and their operation.

Unit 12: Field-Effect Transistors (FETs): Types, characteristics, and applications.

Block IV: Basic Electronic Circuits and Applications

Unit 13: Amplifiers: Basic principles, types, and applications, Ideal operational amplifier; Op-Amp parameters and its ideal characteristics

Unit 14: Oscillators: Principles and types of oscillators.

Unit 15: Power Supplies: Rectifiers, filters, and voltage regulators.

Unit 16: Introduction to Digital Electronics: Logic gates, Boolean algebra, and simple digital circuits.

References:

1. Boylestad, R. L., & Nashelsky, L., “Electronic Devices and Circuit Theory”, 11th Edition, Pearson Education, 2009.
2. Horowitz, P., & Hill, W., “The Art of Electronics”, 3rd Edition, Cambridge University Press, 2015.
3. Scherz, P., & Monk, S., “Practical Electronics for Inventors”, 4th Edition, McGraw-Hill Education, 2016.
4. Alexander, C. K., & Sadiku, M. N. O., “Fundamentals of Electric Circuits”, 6th Edition, McGraw-Hill Education, 2016.
5. Floyd, T. L., “Electronic Devices (Electron Flow Version)”, 10th Edition, Pearson Education, 2017.

Course code: ENBO-1201

Credit: 2

Course Title: Creative Writing

Course Objectives:

- Develop students' creativity and imagination in writing.
- Improve students' writing skills and techniques.
- Help students express themselves effectively through different writing styles and genres.
- Introduce students to various forms of creative writing, such as poetry, short stories, and plays.
- Foster a supportive and collaborative environment for sharing and critiquing each other's work.

Course Outcomes:

1. Generate original ideas and develop them into well-crafted pieces of writing.
2. Demonstrate proficiency in different writing styles and techniques.
3. Communicate their thoughts and emotions through their writing.
4. Explain various forms of creative writing and their unique characteristics.
5. Provide constructive feedback on their own and others' work.

Block I: Introduction to Creative Writing

Unit 1: Understanding the Basics of Creative Writing

Unit 2: Exploring Different Genres of Writing

Unit 3: Developing a Writing Routine

Unit 4: Understanding the Importance of Feedback

Unit 5: Practicing Self-editing Techniques

Block II: Elements of Creative Writing

Unit 6: Character Development

Unit 7: Setting and Atmosphere

Unit 8: Plot Development

Unit 9: Dialogue and Voice

Unit 10: Theme and Symbolism

References:

1. Swain, D. V., "Creating Characters: How to Build Story People", 1st Edition, Writer's Digest Books, 2009.
2. Browne, R., & King, D., "Self-Editing for Fiction Writers: How to Edit Yourself into Print", 2nd Edition, HarperCollins, 2004.
3. Bell, J., & Magrs, P. (Eds.), "The Creative Writing Coursebook: Forty Authors Share Advice and Exercises for Fiction and Poetry", 1st Edition, Macmillan, 2001.
4. LaPlante, A., "The Making of a Story: A Norton Guide to Creative Writing", 1st Edition, W. W. Norton & Company, 2007.
5. Rasley, A., "The Power of Point of View: Make Your Story Come to Life", 1st Edition, Writer's Digest Books, 2005.

पाठ्यक्रमशीर्षक-फ़िल्मऔरमीडियालेखन क्रेडिट-02

पाठ्यक्रमक्रमांक-HNBO-1201

पूर्णांक-100(70+30)

उद्देश्य

फ़िल्मकेस्वरूप,प्रकारसेपरिचितकराना।

फ़िल्मकेतकनीकीपक्षकाज्ञानकराना।

मीडियालेखनकेस्वरूपसेपरिचितकराना।

मीडियालेखनकेविविधरूपोंकाज्ञानकराना।

अधिगमकीउपलब्धियां

विद्यार्थीफ़िल्मलेखनकेस्वरूप,फ़िल्मकेप्रकारऔरफ़िल्मकेतकनीकीपक्षसेपरिचितहोंगे।

मीडियालेखनकेस्वरूपऔरविविधरूपोंकाज्ञानप्राप्तकरसकेंगे।

खंड-1फ़िल्मलेखन

इकाई-1फ़िल्मलेखन:स्वरूपएवंमहत्त्व

इकाई-2फ़िल्मकेप्रकार

इकाई-3फ़िल्मकाकलापक्ष (पटकथा, संवाद, अभिनय, संगीत)

इकाई-4फ़िल्मकातकनीकीपक्ष (ध्वनि, प्रकाश, फिल्मांकन, संपादन)

इकाई-5फ़िल्म-समीक्षा:स्वरूपएवंमहत्त्व

खंड-2मीडियालेखन

इकाई-6मीडियालेखन:अर्थ, परिभाषाएवंअवधारणा

इकाई-7प्रिंटमीडियाकेविविधरूप (समाचार-पत्रपत्रिकाएँ, पोस्टर, विज्ञापन)

इकाई-8इलेक्ट्रॉनिकमीडियाकेविविधरूप (रेडियो, टेलीविजन, सोशलमीडिया)

इकाई-9मीडिया लेखन में हिंदी की भूमिका

इकाई-10मीडियालेखनकीसंभावनाएंएवंचुनौतियां

सहायकग्रन्थ

1. [REDACTED], [REDACTED], “[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]”, 1st [REDACTED], [REDACTED], 2012
2. [REDACTED], [REDACTED], [REDACTED], [REDACTED], “[REDACTED] [REDACTED]: [REDACTED] [REDACTED]”, 10th [REDACTED], [REDACTED]-[REDACTED] [REDACTED], 2018
3. [REDACTED], [REDACTED], “[REDACTED] [REDACTED] [REDACTED]: [REDACTED] [REDACTED] [REDACTED] [REDACTED]”, 2nd [REDACTED], [REDACTED]-[REDACTED] [REDACTED], 2004
4. [REDACTED], [REDACTED], “[REDACTED] [REDACTED]: [REDACTED] [REDACTED] [REDACTED]”, 2nd [REDACTED], [REDACTED] [REDACTED], 2017
5. [REDACTED], [REDACTED], “[REDACTED] [REDACTED]: [REDACTED], [REDACTED] [REDACTED] [REDACTED]”, 1st [REDACTED], [REDACTED] [REDACTED], 2019

Code: CABO–1205

Credit: 2

Course Name: Logical Reasoning

Course Objectives:

- Equip learners with the ability to critically analyze, interpret, and evaluate arguments and data, enabling them to solve complex problems with accuracy and efficiency.
- Foster the capacity to think clearly and rationally, understanding logical connections between ideas, challenging assumptions, and evaluating evidence.
- Provide learners with the tools to effectively analyze and interpret data presented in various formats, making accurate conclusions and decisions based on this analysis.
- Teach advanced problem-solving techniques, encouraging creative thinking and enabling learners to approach unfamiliar situations and novel problems with confidence.

Course Outcomes:

Upon completing the course, learners will be able to:

1. Apply Logical and Analytical Reasoning: Accurately solve a wide range of logical and analytical reasoning questions, using deductive and inductive reasoning skills effectively in both academic and real-world scenarios.
2. Demonstrate Enhanced Critical Thinking: Critically assess arguments, identify logical fallacies, make informed decisions, and construct coherent arguments of their own, applying these skills in diverse contexts.
3. Interpret and Analyze Data Competently: Read and interpret complex data from charts, graphs, and tables, and perform data sufficiency tasks with proficiency, essential for success in the quantitative sections of competitive exams.

Block 1: Foundational Reasoning Skills

Unit 1: Introduction to Logical Reasoning

Unit 2: Deductive Reasoning

Unit 3: Inductive Reasoning

Unit 4: Analogy based on kinds of relationships

Unit 5: Logical statements- Two premise argument, more than two premise argument using connectives.

Block 2: Application of Reasoning

Unit 6: Venn diagrams

Unit 7: Moods and figures

Unit 8: Problem on Cubes and Dices

Unit 9: Syllogism

Unit 10: Logical Fallacies

References:

1. **Morris, J.**, “A Modern Approach to Logical Reasoning”, 4th Edition, McGraw-Hill Education, 2018.

2. **Rao, S. S.**, “Logical and Analytical Reasoning”, 2nd Edition, Tata McGraw-Hill, 2017.
3. **Narayana, B.**, “Mastering Logical Reasoning”, 1st Edition, Pearson Education, 2020.
4. **Kaplan, M.**, “Logical Reasoning for Competitive Exams”, 1st Edition, Kaplan Publishing, 2021.
5. **Khan, M. A.**, “Critical Thinking and Logical Reasoning”, 3rd Edition, Wiley India, 2019.

Course Code: CABO–1216

Credit: 2

Course Name: C++ & Data Structure Lab

Course Objective:

- Provide practical experience in implementing data structures using C++ programming language.
- Enhance understanding of C++ syntax, object-oriented concepts, and standard libraries through hands-on exercises.
- Develop proficiency in designing, coding, testing, and debugging data structures and algorithms.
- Foster problem-solving skills by applying data structures to solve real-world computational problems.
- Prepare students for software development roles by equipping them with practical skills in C++ programming and data structure implementation.

Course Outcomes:

Upon successful completion of the 'C' Programming Lab, students will be able to:

1. Explain fundamental concepts of data structures and programming in Python and C, including operations like sorting, searching, insertion, and deletion.
2. Apply linear data structures such as arrays, stacks, and queues for organizing and processing ordered and unordered data.
3. Develop and debug structured programs in C using a systematic approach to coding, testing, and troubleshooting.
4. Implement linear and non-linear data structures (like linked lists, trees, and graphs) through efficient C programming techniques.
5. Solve computational problems by selecting and applying appropriate data structures and algorithms for sorting, searching, and data manipulation.

References

1. Schildt, H., “C++: The Complete Reference”, 5th Edition, McGraw-Hill Education, 2014.
2. Tanenbaum, A. S., & Augenstein, M. J., “Data Structures using C++”, 2nd Edition, Pearson Education, 2015.
3. Tanenbaum, A. S., “Data Structures: Algorithms and Applications in C++”, 2nd Edition, Pearson Education, 2017.
4. Balgurusamy, E., “Object-Oriented Programming with C++”, 7th Edition, McGraw-Hill Education, 2017.
5. Yedidyah, L., “Data Structures and Algorithm Analysis in C++”, 4th Edition, Pearson Education, 2018.

List of Experiments

Write Programing in C++for following:

- Lab 1.** Sorting programs: Bubble sort, Merge sort, Insertion sort, Selection sort, and Quick sort.
- Lab 2.** Searching programs: Linear Search, Binary Search.
- Lab 3.** Array implementation of Stack, Queue, Circular Queue, Linked List.
- Lab 4.** Implementation of Stack, Queue, Circular Queue, Linked List using dynamic memory allocation.
- Lab 5.** Implementation of Binary tree.
- Lab 6.** Program for Tree Traversals (preorder, in order, post order).
- Lab 7.** Program for graph traversal (BFS, DFS).
- Lab 8.** Program for minimum cost spanning tree, shortest path.

Semester - III

Course Code: CABO-1301

Credit: 4

Course Name: Computer Organization

Course Objective:

Computer Organization and Architecture is a comprehensive course designed to provide students with a deep understanding of the structure and functionality of computer systems. This course covers topics ranging from basic digital logic design to the architecture of modern computer systems. Through lectures, laboratory sessions, and practical assignments, students will gain insights into the organization of computer hardware, instruction set architecture, memory systems, and input/output mechanisms.

Course Outcomes:

At the end of the course, the students would be able to:

1. Demonstrate an understanding of basic computer architecture concepts, including components, organization, and operations of a computer system.
2. Develop proficiency in Assembly Language Programming
3. Comprehend Processor Design and Performance Evaluation.
4. Gain knowledge of Memory Systems and Storage Technologies.
5. Develop awareness of Parallel and Distributed Computing Concepts.

Block – I: Foundations of Computer Organization

Unit 1: Introduction to Computer Organization and Architecture, Basic concepts and components of computer systems, Historical perspective and evolution of computer architecture, Digital Logic and Circuits, Boolean algebra and logic gates

Unit 2: Digital Logic and Circuits (Continued)

Combinational and sequential circuits, Designing and analyzing digital circuits, Arithmetic circuits and ALU design, Simplification of Boolean functions, NAND or NOR implementation, Don't care condition, Tabulation method, Adder, subtractor, Code Conversion, Universal Gate

Unit 3: Sequential Logic:

Flip-flops, Triggering of Flip-flops, Analysis of clocked sequential, circuits, State reduction and Assignment, Flip-flop excitation

Unit 4: CPU Structure and Function

Instruction set architecture (ISA), CPU components: ALU, control unit, registers, Design of counters, Design with state equations, Register Transfer Language, Register transfer, Bus and Memory transfer

Block – II: Processor Architecture and Design

Unit 5: CPU Structure and Function (Continued), Microarchitecture and instruction execution, Performance metrics and benchmarks

Unit 6: Memory Systems, Memory hierarchy: cache, main memory, secondary storage, Memory technologies and organization

Unit 7: Memory Systems Cache memory: principles and optimization techniques, Virtual memory concepts and implementation.

Unit 8: Basic Computer Organization and Design, Instruction codes, Computer registers, Computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input-output and interrupt, Design of Basic computer, Design of Accumulator Unit

Unit 9: Input/Output Systems, I/O interface and devices, Polling, interrupts, and DMA, Programming Arithmetic and logic operations, Subroutines, I-O Programming

Block – III: Memory Systems and Interfacing

Unit 10: Input/Output Systems, Bus architectures and protocols, Storage devices and technologies

Unit 11: Pipelining, Basic concepts and principles of pipelining, Pipelined CPU design and optimization, Pipelining, Hazards and their resolution techniques, Advanced pipelining techniques

Unit 12: Heterogeneous Computing and Accelerators, GPU architectures and programming models, FPGA-based accelerators, Domain-specific accelerators (e.g., AI accelerators)

Unit 13: Parallel Processing, Concepts of parallel processing, Types of parallelism: SIMD, MIMD

Block – IV: Parallel and Distributed Computing

Unit 14: Parallel Processing, Multiprocessor systems and architectures, Cache coherence protocols

Unit 15: Advanced Topics in Computer Architecture, Multicore and manycore architectures, Energy-efficient computing techniques

Unit 16: Emerging Trends in Computer Architecture, Quantum computing, Neuromorphic computing, Energy-Efficient Architectures, Techniques for energy-efficient computing, Low-power processor and system design, Energy-aware programming models and optimizations

References

1. Morri, M. M., “Computer Organization and Architecture: Designing for Performance”, 10th Edition, Pearson Education, 2019.
2. Carl Hamacher, V., & Zaky, Z., “Computer Organization and Embedded Systems”, 6th Edition, McGraw-Hill Education, 2012.
3. Stallings, W., “Computer Organization and Architecture: Software Perspective”, 9th Edition, Pearson Education, 2015.
4. Hayes, J. P., “Computer Architecture and Organization”, 4th Edition, McGraw-Hill Education, 2012.
5. William, A., “Parallel Computing: Theory and Practice”, 2nd Edition, Pearson Education, 2014.
6. Dube, V. K., & Prabhu, M. M., “Introduction to Computer Architecture and Organization”, 1st Edition, Wiley, 2016.

Course Code: CABO–1302
Course Name: Operating System

Credit:2

Course Objective:

- Introduce students to the fundamental concepts and principles of operating systems.
- Teach the structure and components of modern operating systems, including process management, memory management, file systems, and device management.
- Develop an understanding of the role of operating systems in managing hardware resources and providing a platform for software applications.
- Explore advanced topics such as concurrency, synchronization, and deadlock handling.
- Provide hands-on experience with operating system concepts through practical exercises, simulations, and projects.

Course Outcomes:

At the end of the course, the students would be able to:

1. Explain the architecture and key components of operating systems, including the kernel, device drivers, and system libraries.
2. Analyze and compare different types of operating systems, such as batch processing systems, time-sharing systems, and real-time systems, based on their design and functionality.
3. Demonstrate proficiency in process management, including process creation, scheduling, synchronization, and inter-process communication.
4. Implement and manage memory management techniques, including memory allocation, segmentation, paging, and virtual memory, to optimize system performance and resource utilization.
5. Design and implement file systems, including file organization, directory structures, and file access methods, to manage storage resources efficiently.

Block I: Introduction to Operating Systems

Unit 1: Fundamentals of Operating Systems: Definition and objectives of operating systems, History and evolution of operating systems, Types of operating systems (e.g., batch processing, time-sharing, real-time), Operating system structures

Unit 2: Operating System Services: Process management, Memory management, File system management, Device management, System calls and APIs

Unit 3: Operating System Architecture: Kernel architecture, User mode and kernel mode, System components (e.g., scheduler, dispatcher, interrupt handler), Microkernel and monolithic kernel architectures

Unit 4: Operating System Interfaces: Command-line interfaces (CLI), Graphical user interfaces (GUI), Application programming interfaces (APIs), Shell scripting

Block II: Process Management

Unit 5: Introduction to Processes: Definition of a process, Process states and transitions, Process control block (PCB), Process creation and termination, Process hierarchy

Unit 6: Process Scheduling: Basics of process scheduling, CPU scheduling algorithms (e.g., FCFS, SJF, Round Robin, Priority Scheduling), Multilevel Queue Scheduling, Thread scheduling, Scheduling in multiprocessor systems

Unit 7: Process Synchronization: Basics of process synchronization, Critical section problem, Semaphores and mutex locks, Monitors, Deadlock prevention and avoidance

Unit 8: Inter-process Communication: Inter-process communication mechanisms (e.g., shared memory, message passing), Pipes and FIFOs, Socket programming, Remote procedure calls (RPC), C/ABO studies and applications of inter process communication

Block III: Memory Management

Unit 9: Introduction to Memory Management, Basic concepts of memory management, Memory hierarchy (registers, cache, main memory, secondary memory), Address spaces and memory allocation

Unit 10: Memory Allocation Techniques Fixed partitioning, Dynamic partitioning, Buddy system, Paging and segmentation, Virtual memory concepts

Unit 11: Memory Management Strategies, Swapping and swapping strategies, Page replacement algorithms (e.g., FIFO, LRU, Optimal), Segment replacement algorithms, Thrashing and its prevention

Unit 12: Advanced Memory Management Topics, Memory fragmentation, Memory compaction, Memory protection and access control, Shared memory and memory-mapped files

Block IV: File System and Input/Output Management

Unit 13: Introduction to File Systems, Basic concepts of file systems, File system objectives and functions, File system types (e.g., FAT, NTFS, ext4), File system architecture

Unit 14: File System Implementation, File organization and structures, Directory structures and operations, File system operations (e.g., create, delete, read, write), File system consistency and recovery

Unit 15: Input/Output Management, I/O devices and device controllers, I/O operations and techniques (e.g., polling, interrupts, DMA), Buffering and caching, Device drivers and I/O software layers

Unit 16: Advanced Topics in File Systems and I/O Management, File system security and access control, Disk scheduling algorithms, RAID (Redundant Array of Independent Disks), I/O performance optimization techniques

References:

1. Silberschatz, A., Galvin, P. B., & Gagne, G., “Operating System Concepts”, 10th Edition, Wiley, 2018.
2. Tanenbaum, A. S., & Bos, H., “Modern Operating Systems”, 4th Edition, Pearson Education, 2015.
3. Stallings, W., “Operating Systems: Internals and Design Principles”, 9th Edition, Pearson Education, 2017.
4. Pratt, M. S., & Zeldman, A. S., “Operating Systems: A Design-Oriented Approach”, 2nd Edition, McGraw-Hill Education, 2016.
5. Dhamdhare, D. M., “Operating Systems: A Concept-Based Approach”, 2nd Edition, Tata McGraw-Hill, 2015.
6. McHoes, A. D., & Irvine, J. E., “Operating Systems: Internals and Design Principles”, 8th Edition, Pearson Education, 2017.

Course Code: CABO-1303
Course Name: Integral Calculus

Credits:4

Course Objectives:

- Provide a comprehensive understanding of integral calculus concepts, including antiderivatives, definite integrals, and the fundamental theorem of calculus.
- Teach various integration techniques, such as substitution, integration by parts, and trigonometric substitution.
- Develop proficiency in calculating areas, volumes, and other geometric quantities using integration.
- Explore applications of integral calculus in physics, engineering, economics, and other disciplines.
- Prepare students for further studies in mathematics or related fields by mastering integral calculus techniques and applications.

Course Outcomes:

On successful completion of this course, students shall be able to

1. Explain the concept of a partition and Riemann integration.
2. Differentiate between Improper integrals.
3. Evaluate Reduction Formulae.
4. Apply integration techniques to find volume and surfaces.
5. Analyze and apply the concept of vector differentiation and integration.

Block I: Riemann Integration

Unit 1: Partition on an Interval, Riemann upper and lower sums

Unit 2: Criterion and properties of Riemann integration

Unit 3: Fundamental and mean value theorems of integral calculus

Unit 4: Integration as a limit of sum and Differentiation under the sign of Integration

Block II: Improper Integral

Unit 5: Improper integrals and their classification

Unit 6: Test for convergence-I

Unit 7: Test for convergence-II

Unit 8: Beta and Gamma functions

Block III: Rectification and Quadrature, Applications of Integration Unit 9: Reduction formulae

Unit 10: Rectification and Quadrature

Unit 11: Volumes and surfaces of solids of revolution

Unit 12: Double and triple integrals

Block IV: Vector Differentiation and Integration

Unit 13: Vector Differentiation: Gradient, Divergence and Curl

Unit 14: Normal on a surface, Directional Derivative

Unit 15: Vector Integration

Unit 16: Green, Gauss, Stokes Theorem and their applications

References:

1. Thomas, G. B., & Finney, R. L., “Calculus and Analytical Geometry”, 9th Edition, Pearson Education, 2015.
2. Stewart, J., “Calculus: Early Transcendentals”, 8th Edition, Cengage Learning, 2015.
3. Anton, H., Bivens, I., & Davis, S., “Calculus: Multivariable”, 10th Edition, Wiley, 2019.
4. Morris, S. A., & Lardner, J. W., “Calculus: An Introduction to the Theory of Functions of One and Several Variables”, 1st Edition, Springer, 2014.
5. Ross, S. L., “Elementary Analysis: The Theory of Calculus”, 2nd Edition, Springer, 2017.

Course code: ENBO-1301**Credit: 2****Course title: Personality Development****Course Objectives:**

- This course aims to provide participants with a comprehensive framework for personal growth and development. By the end of the course, participants will:
- Gain a deep understanding of the various components that make up an individual's personality, including temperament, character, and traits.
- Develop heightened self-awareness regarding one's strengths, weaknesses, emotions, thoughts, and values.
- Enhance verbal and non-verbal communication skills to interact more effectively with others in personal and professional settings.
- Improve emotional intelligence by learning to manage and express one's emotions constructively and understand the emotions of others.

Course Outcomes:*Upon successful completion of this course, participants will be able to:*

1. Demonstrate a deeper understanding of their personality, including strengths, limitations, and potential areas for growth.
2. Employ improved communication skills, adapting their approach to suit various audiences and contexts.
3. Apply emotional intelligence in personal and professional relationships to foster understanding and cooperation.
4. Navigate various situations confidently, making decisions assertively and presenting ideas persuasively.

Block I: Understanding Self and Interpersonal Skills

Unit 1: Introduction to Personality Development

Unit 2: Communication Skills

Unit 3: Emotional Intelligence

Unit 4: Time Management

Unit 5: Stress Management

Block II: Enhancing Personal Effectiveness and Building Relationships

Unit 6: Critical Thinking and Problem Solving

Unit 7: Leadership and Teamwork
Unit 8: Adaptability and Resilience
Unit 9: Personal Branding and Networking
Unit 10: Planning for the Future

References:

1. Covey, Stephen R., "The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change," Simon & Schuster, 1989.
2. DeVito, Joseph A., "The Interpersonal Communication Book," Pearson, 2015.
3. Goleman, Daniel, "Emotional Intelligence: Why It Can Matter More Than IQ," Bantam Books, 1995.
4. Kouzes, James M., & Posner, Barry Z., "The Leadership Challenge: How to Make Extraordinary Things Happen in Organizations," Jossey-Bass, 2017.

पाठ्यक्रमशीर्षक-पटकथालेखन

क्रेडिट-02

पाठ्यक्रमक्रमांक-HNBO-1301

पूर्णांक-100(70+30)

उद्देश्य

पटकथालेखनकापरिचयकराना।

विद्यार्थियोंकीलेखनक्षमताकाविकास

विद्यार्थियोंकोलेखनमेंरोज़गारसंबन्धीक्षेत्रोंकेलिएतैयारकरना।

अधिगमकीउपलब्धियां

पटकथा-लेखनकेस्वरूपऔरतकनीकीशब्दोंसेपरिचितहोंगे।

पटकथालेखनकीजानकारीमिलनेकेउपरांतविद्यार्थीरोज़गार-बाज़ारकेलिएतैयारहोंगे।

अभिव्यक्तिकौशलकाविकास।

भाषायीसंप्रेषणकेमहत्त्वसेअवगतहोंगे।

खंड-1पटकथालेखन

Course code: VACO-1301

Course Title: Environmental Education

Credit: 3

Course Objectives:

- Students will learn about the Earth's natural systems, including ecosystems, biodiversity, and the processes that support life. They will explore the interconnections between these systems and human societies.
- Students will be introduced to global, regional, and local environmental challenges, including pollution, resource depletion, and biodiversity loss, understanding their causes and effects.
- The course aims to equip students with the knowledge and skills to develop and evaluate sustainable solutions to environmental challenges, emphasizing the role of innovation and technology.
- Students will be encouraged to reflect on their roles and responsibilities in mitigating environmental issues, promoting a sense of stewardship towards the planet.

Course Outcomes:

Upon successful completion of this course, students will be able to:

1. Demonstrate a comprehensive understanding of environmental systems and the interdependencies between humans and the natural world.
2. Identify key environmental challenges and critically assess their causes, impacts, and the complexities involved in addressing them.
3. Apply knowledge of environmental science and sustainable practices to develop, propose, and evaluate solutions to environmental problems.
4. Exhibit a commitment to environmental responsibility in personal and professional contexts, including sustainable lifestyle choices and advocacy for environmental causes.

Block I: Understanding Natural Resources

Unit 1: Introduction to Natural Resources

Unit 2: Water Resources

Unit 3: Soil Resources

Unit 4: Forest Resources, Forest management and conservation

Unit 5: Mineral and Energy Resources

Block II: Ecosystems and Biodiversity

Unit 6: Basics of Ecology and Ecosystems

Unit 7: Terrestrial Ecosystems

Unit 8: Aquatic Ecosystems

Unit 9: Urban Ecosystems

Unit 10: Global Biodiversity Hotspots

Block III: Pollution and its prevention

Unit 11: Pollution: Meaning and types

Unit 12: Solid Waste Management

Unit 13: Sustainable Practices in Industries

Unit 14: Energy Conservation and Renewable Energies

Unit 15: Environmental Policies and Legislation

Reference:

1. Miller, G. Tyler, and Scott Spoolman. "Living in the Environment." Cengage Learning, 18th edition, 2015.
2. Chiras, Daniel D. "Environmental Science." Jones & Bartlett Learning, 9th edition, 2013.
3. Chapin III, F. Stuart, Pamela A. Matson, and Peter Vitousek. "Principles of Terrestrial Ecosystem Ecology." Springer, 2011.
4. Gaston, Kevin J., and John I. Spicer. "Biodiversity: An Introduction." Blackwell Science, 2nd edition, 2004.
5. Raven, Peter H., Linda R. Berg, and David M. Hassenzahl. "Environment." Wiley, 8th edition, 2011.
McKinney, Michael L., Robert M. Schoch, and Logan Yonavjak. "Environmental Science: Systems and Solutions." Jones & Bartlett Learning, 5th edition, 2012.

Course Code: CABO-1304

Credit: 3

Course Name: Computer Based Numerical Analysis

Course Objectives:

- Introduce students to numerical methods for solving mathematical problems using computers.
- Teach algorithms and techniques for numerical approximation, including interpolation, differentiation, and integration.
- Develop skills in error analysis and numerical stability to ensure accurate results.
- Explore applications of numerical analysis in solving problems from various fields such as engineering, physics, and finance.
- Provide hands-on experience with implementing numerical algorithms using computational software or programming languages.

Course Outcomes:

At the end of the course, student will be able to

1. Apply error analysis techniques to quantify and minimize accuracies in numerical computations.
2. Employ various methods for finding solutions to algebraic and transcendental equations.
3. Demonstrate proficiency in interpolating functions using different techniques and working with unequal intervals.
4. Utilize numerical differentiation & integration methods to approximate derivatives and integrals.

Block I: Error Analysis and Solution of Algebraic and Transcendental Equation

Unit 1: Accuracy of numbers and Error Analysis

Unit 2: Bisection Method, Iteration method

Unit 3: Method of false position,

Unit 4: Method of finding complex roots: Newton-Raphson method

Block II: Interpolation and Approximation

Unit 5: Finite Differences and Difference table

Unit 6: Newton's forward and backward formula

Unit 7: Gauss' forward and backward interpolation formula, Stirling's formula

Unit 8: Interpolation with Unequal Intervals

Block III: Differentiation and Integration

Unit 9: Numerical Differentiation

Unit 10: Newton Cote's Quadrature Formula and Trapezoidal rule

Unit 11: Simpson's 1/3 and 3/8 rule

Unit 12: Boole's rule and Waddle's rule.

Block IV: Numerical Solution of Linear Algebraic Equation and Ordinary Differential Equations

Unit 13: Gauss-Elimination Method, Gauss-Jordan Method

Unit 14: LU Decomposition Method

Unit 15: Jacobi's Method and Gauss-Seidel Method

Unit 16: Numerical Solution of Ordinary Differential Equations

Reference:

1. Ranganatham, S., Prasad, M. V. S. S. N., & Ramesh Babu, V., *Numerical Analysis*, S. Chand Publishing, 2010.
2. Jain, M. K., Iyengar, S. R. K., & Jain, R. K., *Numerical Methods*, New Age International, 2007.
3. Sastry, S. S., *Introductory Methods of Numerical Analysis*, PHI Learning Pvt. Ltd., 2012.
4. Hildebrand, F. B., *Introduction to Numerical Analysis*, McGraw-Hill Education, 2002.
5. Gupta, R. S., *Elements of Numerical Analysis: Algebra*, Cambridge University Press, 2004.
6. Conte, S., & Deboor, C., *Elementary Numerical Analysis*, McGraw-Hill Education, 2013.

Course Code: CABO-1315

Credit: 2

Course Name: Operating System Lab

Course Objective:

- Provide practical experience in working with operating system concepts and functionalities.
- Familiarize students with various operating system commands, utilities, and tools.
- Develop proficiency in system administration tasks such as user management, file system operations, and process management.
- Offer hands-on exercises to reinforce theoretical concepts learned in the operating systems course.
- Prepare students for troubleshooting common operating system issues and challenges.

Course Outcomes:

At the end of the course, the students would be able to:

1. Gain practical experience in implementing operating system concepts such as process scheduling, synchronization, and deadlock handling.
2. Develop skills in system call programming and process management techniques, including creation, termination, and communication between processes.
3. Explain memory management principles, including allocation, deallocation, and memory protection mechanisms, through hands-on exercises and simulations.
4. Master file system operations and disk management techniques, including file creation, deletion, and manipulation, enhancing proficiency in storage management within an operating system environment.

List of Experiments

Lab 1: Implement a program to create and terminate processes using system calls.

Lab 2: Implement inter-process communication mechanisms such as shared memory and message passing.

Lab 3: Implement CPU scheduling algorithms (e.g., FCFS, SJF, Round Robin) and analyze their performance using simulation.

Lab 4: Implement priority-based CPU scheduling and compare it with other scheduling algorithms.

Lab 5: Implement semaphores for process synchronization and solve synchronization problems like producer-consumer and reader-writer.

Lab 6: Implement mutexes and condition variables for synchronization and demonstrate their usage.

Lab 7: Implement deadlock detection algorithms such as Banker's algorithm and demonstrate their effectiveness.

Lab 8: Implement deadlock prevention techniques like resource allocation graphs and demonstrate their application.

Lab 9: Implement memory allocation algorithms (e.g., contiguous allocation, paging) and analyze their efficiency.

Lab 10: Simulate memory allocation and deallocation to analyze fragmentation issues and mitigation strategies.

Lab 11: Implement demand paging and page fault handling algorithms.

Lab 12: Implement page replacement algorithms (e.g., LRU, FIFO) and evaluate their performance through simulation.

Lab 13: Implement file creation, deletion, and manipulation operations using system calls.

Lab 14: Implement directory operations such as creation, listing, and deletion.

Lab 15: Implement disk scheduling algorithms (e.g., FCFS, SSTF, SCAN) and compare their performance.

Lab 16: Implement input/output operations and device management using system calls.

References:

1. Silberschatz, A., Galvin, P. B., & Gagne, G., *Operating System Concepts*, 10th Edition, Wiley, 2018.
2. Tanenbaum, A. S., & Bos, H., *Modern Operating Systems*, 5th Edition, Pearson Education, 2022.
3. Stallings, W., *Operating Systems: Internals and Design Principles*, 9th Edition, Pearson Education, 2018.
4. Nutt, G. J., *Operating Systems: A Modern Perspective*, 2nd Edition, Addison-Wesley, 2004.
5. Bovet, D. P., & Cesati, M., *Understanding the Linux Kernel*, 3rd Edition, O'Reilly Media, 2005.

Semester - IV

Course Code: CABO-1401

Credit: 4

Course Name: Analysis and Design of Algorithm

Course Objective:

- Introduce students to fundamental algorithms and algorithm design techniques.
- Teach methods for analyzing the efficiency and correctness of algorithms.
- Develop skills in designing and implementing efficient algorithms to solve computational problems.
- Explore advanced topics such as dynamic programming, greedy algorithms, and divide-and-conquer strategies.
- Provide practical experience through problem-solving exercises, algorithmic challenges, and programming assignments.

Course Outcomes:

At the end of the course, the students would be able to:

1. Develop the ability to formulate and solve algorithmic problems using various design paradigms, including divide and conquer, dynamic programming, and greedy algorithms.
2. Gain a deep understanding of algorithmic complexity analysis techniques, including time complexity, space complexity, and asymptotic notation, enabling them to evaluate the efficiency of algorithms rigorously.
3. Acquire proficiency in implementing algorithms in a programming language of their choice, translating theoretical concepts into practical code and gaining hands-on experience with algorithmic implementation.
4. Develop critical thinking and analytical skills, enabling them to approach complex problems systematically and devise efficient algorithmic solutions.

Block I: Introduction to Algorithms and Analysis

Unit 1: Introduction to Algorithms: Definition of algorithms, algorithmic problem-solving, and algorithm design paradigms, Overview of algorithm analysis techniques: time complexity, space complexity, and big-O notation.

Unit 2: Algorithm Analysis: Asymptotic analysis: big-O, big-Theta, and big-Omega notation, Worst-CABOe, average-CABOe, and best-CABOe analysis of algorithms.

Unit 3: Divide and Conquer: Divide and conquer paradigm: principles and applications, Examples of divide and conquer algorithms: merge sort, quicksort, binary search.

Unit 4: Advanced Data Structures: Priority queues and heaps, Disjoint-set data structures, Hash tables and hashing techniques

Block II: Advanced Algorithm Design Paradigms

Unit 5: Dynamic Programming: Principles of dynamic programming and memorization, Examples of dynamic programming algorithms: Fibonacci sequence, knapsack problem.

Unit 6: Greedy Algorithms: Greedy algorithm paradigm: characteristics and applications, Examples of greedy algorithms: minimum spanning tree, shortest path algorithms.

Unit 7: Backtracking: Backtracking paradigm: principles and techniques, Examples of backtracking algorithms: N-Queens problem, Sudoku solver.

Unit 8: Branch and Bound: General method, applications - travelling sales person problem, knapsack problem- LC branch and bound solution, FIFO branch and bound solution

Block III: Specialized Topics in Algorithm Design

Unit 9: Graph Algorithms: Graph representation and traversal techniques: DFS, BFS,

Unit 10: Path Algorithms: Shortest path algorithms (Dijkstra's, Bellman-Ford), minimum spanning tree algorithms (Prim's, Kruskal's).

Unit 11: Network Flow Algorithms Maximum flow and minimum cut problems, Network flow algorithms: Ford-Fulkerson algorithm, Edmonds-Karp algorithm.

Unit 12: String Matching Algorithms Brute-force and efficient string-matching algorithms. Examples: Knuth-Morris-Pratt (KMP) algorithm, Boyer-Moore algorithm.

Unit 13: Approximation Algorithms: Introduction to approximation algorithms and approximation ratio. Examples: vertex cover, traveling salesman problem.

Block IV: Randomization Algorithm and Advanced Algorithms

Unit 14: Randomized Algorithms: Randomized algorithm paradigm: principles and applications Examples: randomized quicksort, Monte Carlo algorithms.

Unit 15: Parallel and Distributed Algorithms: Parallel algorithm design techniques: parallel prefix, parallel sorting, Distributed algorithm paradigms: message-passing, shared memory.

Unit 16: Advanced Topics: NP-HARD AND NP-COMPLETE PROBLEMS: Basic concepts, non-deterministic algorithms, NP-hard and NP-complete classes, Cook's theorem.

References:

1. Cormen, Thomas H., Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein. *Introduction to Algorithms*. 4th ed., MIT Press, 2022.
2. Kleinberg, Jon, and Éva Tardos. *Algorithm Design*. 1st ed., Pearson, 2005.
3. Dasgupta, Sanjoy, Christos H. Papadimitriou, and Umesh Vazirani. *Algorithms*. 1st ed., McGraw-Hill Education, 2006.
4. Sedgewick, Robert, and Kevin Wayne. *Algorithms*. 4th ed., Addison-Wesley Professional, 2011.
5. Skiena, Steven S. *The Algorithm Design Manual*. 3rd ed., Springer, 2020.

Course Code: CABO-1402

Credit: 2

Course Name: Object Oriented Programming with JAVA

Course Objective:

- Introduce students to the principles and concepts of object-oriented programming (OOP) using the Java programming language.
- Teach the fundamentals of Java syntax, data types, control structures, and object-oriented principles such as encapsulation, inheritance, and polymorphism.
- Develop proficiency in designing, implementing, and testing Java programs using object-oriented design principles.
- Explore advanced Java features and libraries for building robust and scalable applications.
- Provide hands-on experience with real-world Java programming projects to reinforce learning objectives

Course Outcomes:

At the end of the course, the students would be able to:

1. Gain proficiency in writing Java code to implement object-oriented concepts, including classes, objects, methods, and constructors, to solve computational problems.
2. Understand and apply key object-oriented design principles such as encapsulation, inheritance, and polymorphism to design robust and flexible software solutions.
3. Develop software development skills, including modular design, code organization, and debugging techniques, enabling them to create well-structured and maintainable Java applications.
4. Design, develop, and deploy Java-based applications, including graphical user interfaces (GUIs), data processing applications, and web applications, demonstrating their ability to apply OOP concepts to real-world software development scenarios.

Block I: Introduction to Java Programming

Unit 1: Introduction to Object-Oriented Programming, Concepts of OOP: classes, objects, inheritance, polymorphism, encapsulation, Introduction to Java programming language: history, features, and syntax.

Unit 2: Java Basics, Data types, variables, and operators in Java, Control flow statements: if-else, switch, loops (while, do-while, for).

Unit 3: Classes and Objects, Declaring classes and creating objects, Class members: fields, methods, constructors.

Block II: Object-Oriented Programming Concepts

Unit 4: Inheritance and Polymorphism, Inheritance: extending classes, superclass-subclass relationship, Polymorphism: method overriding, dynamic method dispatch.

Unit 5: Abstraction and Encapsulation, Abstraction: abstract classes, interfaces, and abstract methods, Encapsulation: access modifiers, getter and setter methods.

Unit 6: Packages and Access Modifiers, Package concept in Java: organizing classes into packages, Access modifiers: public, private, protected, default.

Block III: Advanced Java Programming

Unit 7: Exception Handling, Handling exceptions in Java: try-catch, throw, throws, finally blocks, Exception hierarchy and checked vs. unchecked exceptions.

Unit 8: Generics, Introduction to generics: parameterized classes, methods, and interfaces, Type safety and generic collections (ArrayList, HashMap).

Unit 9: File Handling and I/O, File handling in Java: reading from and writing to files, Input/Output streams: byte stream and character stream classes.

Block IV: Event and GUI programming

Unit 10: GUI Programming Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout,

Unit 11: GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing

Unit 12: I/O programming: Text and Binary I/O, Binary I/O classes, Object I/O, Random, Access Files.

Unit 13: Multithreading: Introduction to multithreading: creating and managing threads, Synchronization: synchronized methods, blocks, and thread safety.

Block-IV: Java Servlets & Java Server Pages

Unit-14: Introduction, HTTP Servlet Basics, The Servlet Lifecycle, Retrieving Information, Sending HTML Information, Session Tracking, Database Connectivity

Unit-15: Introducing Java Server Pages, JSP Overview, Setting Up the JSP Environment

Unit-16: Generating Dynamic Content, Using Custom Tag Libraries and the JSP Standard Tag Library, Processing Input and Output.

References:

1. Deitel, Paul, and Harvey Deitel. *Java: How to Program, 11th Edition (Early Objects)*, Pearson, 2017.
2. Savitch, Walter, and Kenrick Mock. *Java: An Introduction to Problem Solving and Programming, 8th Edition*, Pearson, 2021.
3. Eckel, Bruce. *Thinking in Java, 4th Edition*, Prentice Hall, 2006.
4. Horstmann, Cay S. *Core Java Volume I—Fundamentals, 11th Edition*, Prentice Hall, 2018.
5. Bloch, Joshua. *Effective Java, 3rd Edition*, Addison-Wesley Professional, 2018.

Course Code: CABO-1403

Credits: 4

Course Name: Matrix Theory

Course Objectives:

- Provide a comprehensive understanding of the fundamental concepts and properties of matrices.
- Teach methods for performing matrix operations such as addition, multiplication, and inversion.
- Explore applications of matrices in various mathematical and scientific fields, including linear algebra, graph theory, and computer graphics.
- Develop proficiency in solving systems of linear equations using matrix techniques.
- Prepare students for advanced studies in mathematics, engineering, or other disciplines requiring matrix theory skills.

Course Outcomes:

At the end of the course, student will be able to

1. Explain the concept of a matrix.
2. Perform basic operation on matrices like addition and multiplication.
3. Calculate the determinant, rank of a matrix, echelon and normal form of a matrix.
4. Decide whether a system of linear equations is consistent or inconsistent.
5. Determine the eigenvalues and eigenvectors of a square matrix

Block I: Matrices and their basic properties

Unit 1: Matrices and their types, Related terms

Unit 2: Addition and Multiplication of Matrices

Unit 3: Determinant of a matrix,

Unit 4: Invertible Matrix and their applications.

Block II: Rank and system of linear equations

Unit 5: Rank of a Matrix, Elementary row transformation and echelon form.

Unit 6: Normal form of a matrix, Inverse of a matrix by elementary row transformations.

Unit 7: Consistent and Inconsistent System of linear equations

Unit 8: Cramer's rule

Block III: Eigenvalues and Eigenvectors

Unit 9: Eigen values and Eigenvectors of a square matrix

Unit 10: Basic Properties of Eigen values and Eigenvectors

Unit 11: Cayley's Hamilton Theorem and applications

Unit 12: Diagonalization of matrices

Block IV: Quadratic and Bilinear form

Unit 13: Introduction to Quadratic forms

Unit 14: Matrix representation of Quadratic forms

Unit 15: Diagonalization and Canonical forms

Unit 16: Bilinear forms

References:

1. Zhang, Fuzhen. *Matrix Theory: Basic Results and Techniques*, 2nd Edition, Springer, 2011.
2. Abadir, Karim M., and Jan R. Magnus. *Matrix Algebra*, 1st Edition, Cambridge University Press, 2005.
3. Narayan, Shanti, and P. K. Mittal. *A Textbook of Matrices*, Revised Edition, S. Chand Publishing, 2010.
4. Singh, Arindama. *Introduction to Matrix Theory*, Springer, 2021.
5. Datta, Kanti Bhushan. *Matrix and Linear Algebra Aided with MATLAB*, 2nd Edition, PHI Learning Pvt. Ltd., 2016.
6. Serre, Denis. *What Are Matrices?*, Springer, 2010

1.

Course Code: CABO-1404

Credit: 3

Course Name: Database Management System

Course Objective:

- Introduce students to the fundamental concepts and principles of database management systems (DBMS).
- Teach database design methodologies, including entity-relationship modeling and normalization.
- Develop proficiency in using SQL (Structured Query Language) for data definition, manipulation, and retrieval.
- Explore advanced topics such as transaction management, concurrency control, and database security.
- Provide hands-on experience with designing, implementing, and querying databases using a DBMS platform.

Course Outcomes:

At the end of the course, student will be able to

1. Explain the fundamental concepts and principles of Database Management Systems (DBMS).
2. Design and implement relational databases using appropriate data modeling techniques.
3. Utilize Structured Query Language (SQL) to create, retrieve, update, and delete data from databases.
4. Implement normalization techniques to ensure data integrity and minimize redundancy in database design.
5. Apply indexing and optimization techniques to enhance database performance and query efficiency.

Block -I: Overview of Database Management System

Unit-1: Introduction, Elements of Database System, DBMS and its architecture, Advantage of DBMS, Types of database users, Role of Database administrator, Need of DBMS.

Unit-2: Brief overview of Hierarchical Model, Network Model, Detailed study of Relational Model (Relations, Properties, Key & Integrity rules),

Unit-3: Comparison of Hierarchical, Network and Relational Model, Data Abstraction & data Independence, Primary Key, Foreign Key, all types of Keys

Unit-4: CODD's rules for Relational Model, E-R diagram, View, Structure.

Block- II: Normalization

Unit-5: Normalization concepts and update anomalies, Functional dependencies, Multi valued and join dependencies.

Unit-6: Normal Forms: (1 NF, 2 NF, 3NF, BCNF, 4NF, and 5NF)

Unit-7: ACID properties, Schedule, Conflict, Conflict Equivalent Schedules, Conflict Serializable Schedule, View Serializable Schedule, Concurrency Problems

Unit-8: Transactions Management & Concurrency Control, Transactions, Recoverable and Irrecoverable Schedule, CABOading and CABOcade less Schedule, Simple Lock based Protocol, Basic 2PL Locking Protocol, 2 PL, 2 PL categories

Block- III: SQL

Unit-9: SQL Constructs, Constraint, Types, Integrity

Unit-10: SQL Join: Multiple Table Queries, Alter v/s Update, Delete v/s Drop v/s Truncate, Constraints in SQL, Aggregate Function, "Group By" Clause, "Having" Clause, "Order By" Clause, Nested and Correlated Nested Query

Unit-11: Build-in functions, Views and their use, WITH Clause, ANY & ALL Operators, IN & NOT IN Operators, EXISTS and NOT EXIST Operators, Set Operations

Unit-12: Overviews of ORACLE: (Data definition and manipulation)

Block- IV: File Organization & Database Security

Unit-13: Security and Integrity threats, Defense mechanism, Integrity, Auditing and Control,

Unit-14: Recent trends in DBMS- Distributed and Deductive Database, Temporal, Geospatial Databases, Multimedia databases

Unit-15: File Organization, Indexing //Dense Index and Sparse Indexing, Primary Indexing, Clustering Indexing, Secondary Indexing over Key, Secondary Indexing over Non Key, Intro to B Tree.

Unit-16: Construction of B Tree, Order of B Tree, Intro to B+ Tree, Construction of B+ Tree, Order of B+ Tree, Min and Max Keys and Nodes in B/B+ Tree, Bulk Loading in B+ Tree, Join Algorithms.

References:

1. Silberschatz, A., Korth, H. F., & Sudarshan, S., *Database System Concepts* (7th ed.). McGraw-Hill Education, 2019
2. Elmasri, R., & Navathe, S. B., *Fundamentals of Database Systems* (7th ed.). Pearson Education, 2015
3. Coronel, C., & Morris, S., *Database Systems: Design, Implementation, & Management* (14th ed.). Cengage Learning, 2022
4. Gillenson, M. L., *Fundamentals of Database Management Systems* (3rd ed.). Wiley, 2023
5. Ramakrishnan, R., & Gehrke, J., *Database Management Systems* (3rd ed.). McGraw-Hill Education, 2003

Course code: ENBO-1401

Credit: 2

Course Title: Basic Knowledge of English Grammar

Course Objectives:

- To develop a fundamental understanding of English grammar rules and concepts.
- To improve students' ability to communicate effectively in both spoken and written English.
- To enhance students' confidence in using correct grammar in various contexts.
- To provide students with the necessary foundation for more advanced studies in English language and literature.

Course Outcomes:

At the end of the course, student will be able to

1. Identify and apply key grammar rules, such as subject-verb agreement, tense usage, and sentence structure.
2. Use and apply parts of speech, including nouns, pronouns, verbs, adjectives, and adverbs.
3. Recognize and correct common grammatical errors in their own writing.
4. Demonstrate improved proficiency in grammar through quizzes, exams, and class assignments.
5. Communicate clearly and confidently in both informal and formal settings using correct grammar.

Block I: Parts of Speech

Unit 1: Nouns

Unit 2: Pronouns

Unit 3: Verbs

Unit 4: Adjectives

Unit 5: Adverbs

Block II: Sentence Structure

Unit 6: Subject-Verb Agreement

Unit 7: Sentence Fragments

Unit 8: Run-on Sentences

Unit 9: Types of Sentences

Unit 10: Sentence Combining

References:

1. Murphy, Raymond. *English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Learners of English*. 5th Edition, Cambridge University Press, 2019.
2. Swan, Michael. *Practical English Usage*. 4th Edition, Oxford University Press, 2016.
3. Barrett, Grant. *Perfect English Grammar: The Indispensable Guide to Excellent Writing and Speaking*. Zephyros Press, 2016.
4. Thurman, Susan. *The Only Grammar Book You'll Ever Need: A One-Stop Source for Every Writing Assignment*. Adams Media, 2003.
5. Straus, Jane. *The Blue Book of Grammar and Punctuation: An Easy-to-Use Guide with Clear Rules, Real-World Examples, and Reproducible Quizzes*. 11th Edition, Jossey-Bass, 2014.

Course code: VACO-1401
Course Title: Understanding India

Credit: 3

Course Objectives:

- To provide students with a foundational understanding of the historical events and philosophies that influenced the formation of the Indian Constitution and shaped the nation's identity.
- To familiarize students with the structure, features, and key components of the Indian Constitution, including its unique blend of federalism, parliamentary governance, and judicial independence.
- To examine the fundamental rights and duties outlined in the Constitution, their implications for Indian citizens, and the balance between individual freedoms and social responsibilities.
- To delve into the intricacies of India's system of governance at both the Union and State levels, including the roles and functions of the executive, legislature, and judiciary.

Course Outcomes:

At the end of the course, student will be able to

1. Have a deep understanding of the Indian Constitution, its historical context, and its current application.
2. Describe the fundamental rights and duties of Indian citizens and their significance.
3. Explain the roles and functions of various pillars of Indian democracy, including the executive, legislature, and judiciary.
4. Demonstrate the socio-political challenges facing India and the measures being taken to address them.
5. Analyze contemporary issues in the Indian socio-political context and their constitutional implications.

Block I: The Indian Constitution

Unit 1: Historical Background of the Constitution

Unit 2: Basic structure of the Constitution

Unit 3: Salient Features of Indian Constitution

Unit 4: Union and its Territory, Citizenship

Unit 5: Fundamental Rights

Block II: System of Government

Unit 6: Fundamental Duties & Directive Principles of State Policy

Unit 7: Parliamentary System & Federal system

Unit 8: Parliament

Unit 9: Prime Minister & President

Unit 10: Chief Minister & Governor

Block III: Various Bodies

Unit 11: Panchayati Raj System

Unit 12: Supreme Court & High Court

Unit 13: Judicial Review, Judicial Activism, Public Interest Litigation

Unit 14: Constitutional Bodies

Unit 15: Non - Constitutional Bodies

SUGGESTED READINGS:

Here are some references for Indian polity:

1. Books:

- "Indian Polity" by M. Laxmikanth: A comprehensive guide to Indian constitutional and political systems.
- "Introduction to the Constitution of India" by Durga Das Basu: Provides a detailed analysis of the Indian Constitution and its provisions.
- "Our Constitution: An Introduction to India's Constitution and Constitutional Law" by Subhash C. Kashyap: Offers insights into the principles and functioning of India's constitutional framework.

2. Academic Journals:

- "Economic and Political Weekly": Covers articles and research on various aspects of Indian politics, governance, and public policy.
- "Journal of Indian Law and Society": Focuses on legal and constitutional issues in India, including debates on judicial activism, human rights, and legal reforms.

3. Websites and Online Resources:

- PRS Legislative Research (prsindia.org): Provides analysis, research, and data on Indian parliamentary proceedings, legislation, and policy matters.
- Election Commission of India (eci.gov.in): Offers information on elections, electoral processes, and political parties in India.
- IndiaStat (indiastat.com): Provides statistical data and reports on various aspects of Indian governance, including demographics, economy, and public administration.

4. Government Reports and Documents:

- Reports of the Law Commission of India: Includes recommendations and reports on legal and constitutional reforms in India.
- Annual Reports of the Ministry of Home Affairs and Ministry of Law and Justice: Provide insights into government policies, legislative developments, and law enforcement issues.

These references cover a wide range of topics related to Indian polity, including constitutional law, governance structures, political institutions, electoral processes, and legal frameworks.

Course Code: CABO-1415

Credit: 2

Course Name: Object Oriented Programming with Java Lab

Course Objective:

- Provide hands-on experience in applying object-oriented programming (OOP) concepts using Java.
- Familiarize students with Java development environments, tools, and libraries.
- Develop proficiency in designing and implementing Java programs using OOP principles such as classes, objects, inheritance, polymorphism, and encapsulation.
- Reinforce theoretical knowledge learned in the Object Oriented Programming with Java course through practical exercises and programming assignments.
- Prepare students to analyze, design, and develop software solutions using Java and OOP paradigms.

Course Outcomes:

At the end of the course, the students would be able to:

1. Demonstrate competence in Java programming, including syntax, data structures, control flow, and object-oriented concepts such as classes, objects, inheritance, polymorphism, and encapsulation.
2. Learn and apply object-oriented design principles such as abstraction, encapsulation, inheritance, and polymorphism to model and solve real-world problems effectively.
3. Gain experience in software development practices such as modular design, code organization, documentation, and testing, fostering habits of writing clean, maintainable, and well-documented code.
4. Develop problem-solving skills by working on a variety of programming assignments and projects, which require them to analyze requirements, design appropriate solutions, and implement them using object-oriented programming techniques.

Lab Experiments

Lab 1: Write basic Java programs to understand the syntax, data types, operators, and control flow statements in Java.

Lab2: Implement Java classes and objects to understand the concepts of abstraction, encapsulation, inheritance, and polymorphism.

Lab3: Develop graphical user interfaces (GUIs) using Java Swing or JavaFX to create interactive desktop applications.

Lab4: Implement exception handling mechanisms in Java to handle runtime errors and exceptions gracefully.

Lab5: Perform file input/output operations in Java to read from and write to text files, binary files, and streams.

Lab6: Implement multithreaded programs in Java to understand concurrency, synchronization, and thread communication.

Lab7: Connect Java applications to relational databases using JDBC (Java Database Connectivity) for data manipulation and retrieval.

Lab8: Develop networked applications using Java sockets for communication between clients and servers.

Lab9: Design and implement complete Java applications that incorporate multiple concepts learned throughout the course.

References:

1. Farrell, Joyce. *Java Programming*, 9th Edition, Cengage Learning, 2018.
2. Schildt, Herbert. *Java: The Complete Reference*, 11th Edition, McGraw-Hill Education, 2018.
3. Bloch, Joshua. *Effective Java*, 3rd Edition, Addison-Wesley Professional, 2018.
4. Horstmann, Cay S. *Core Java Volume I – Fundamentals*, 11th Edition, Pearson Education, 2018.
5. Deitel, Paul, and Harvey Deitel. *Java: How to Program*, 11th Edition, Pearson Education, 2017.

Semester – V

Course Code: CABO-1501

Credit: 4

Course Name: Software Engineering

Course Objective:

- Introduce students to the fundamental principles and concepts of software engineering.
- Teach software development methodologies, including requirements analysis, design, implementation, testing, and maintenance.
- Develop skills in software project management, including planning, scheduling, and tracking.
- Explore software quality assurance techniques, such as testing strategies, code reviews, and software metrics.
- Provide hands-on experience with software development tools and techniques through practical projects and CABOe studies.

Course Outcomes:

At the end of the course, the students would be able to:

1. Understand software development lifecycle (SDLC) and various software development methodologies, including waterfall, agile, and DevOps, enabling them to choose and apply appropriate methodologies based on project requirements.
2. Develop proficiency in gathering, analyzing, and documenting software requirements, translating user needs into functional specifications, and managing requirements throughout the software development process.
3. Design software architectures and components using appropriate design patterns, principles, and modeling techniques, and implement software solutions using programming languages and development tools.
4. Acquire project management skills, including planning, scheduling, budgeting, and risk management, and understand the importance of teamwork, communication, and collaboration in successful software development projects.

Block I: Introduction to Software Engineering

Unit 1: Introduction to Software Engineering: Definition and scope of software engineering, Evolution of software engineering methodologies, Importance of software engineering in modern software development.

Unit 2: Software Process Models: Waterfall model, iterative models, incremental model, Agile methodologies: Scrum, Kanban, Extreme Programming (XP), Introduction to DevOps practices and continuous integration/continuous deployment (CI/CD).

Unit 3: Requirements Engineering: Requirements elicitation, analysis, and specification, Functional and non-functional requirements, Use CABOe modeling, user stories, and requirement prioritization.

Block II: Software Design and Implementation

Unit 4: Software Design Principles: Software design process: design principles and patterns, Architectural styles: client-server, layered architecture, microservices,

Unit 5: UML diagrams: class diagrams, sequence diagrams, and state diagrams.

Unit 6: Object-Oriented Design: Object-oriented analysis and design (OOAD) concepts, Design patterns: creational, structural, and behavioral patterns, Application of design patterns in software development.

Unit 7: Implementation and Coding Standards: Coding standards and guidelines, Best practices in coding: modularity, readability, and maintainability, Introduction to version control systems (e.g., Git) and collaborative development.

Block III: Software Testing and Quality Assurance

Unit 8: Software Testing Fundamentals: Testing levels: unit testing, integration testing, system testing, Testing techniques: black-box testing, white-box testing, and grey-box testing, Test CABOe design, test coverage,

Unit 9: Test automation: Introduction to test automation tools (JUnit, Selenium), Test-driven development (TDD), Continuous integration and continuous testing

Unit 10: Software Quality Assurance: Quality assurance processes and techniques, Software metrics: measuring software quality and productivity, Quality standards and certifications: ISO 9001, CMMI, and IEEE standards.

Unit 11: Project Planning and Estimation: Project management processes: planning, scheduling, and resource allocation,

Block IV: Software Project Management

Unit 12: Project Estimation techniques: effort estimation, cost estimation, and time estimation, Project management tools and techniques: Gantt charts, PERT charts, and agile planning boards.

Unit 13: Risk Management: Risk identification, analysis, and mitigation strategies, Risk management in software projects: proactive and reactive approaches, Contingency planning and risk monitoring throughout the project lifecycle.

Unit 14: Agile Project Management: Agile project management principles and practices, Scrum framework: roles, ceremonies, and artifacts, Agile metrics and performance measurement in agile projects.

Unit 15: Software Maintenance and Evolution: Software maintenance activities: corrective, adaptive, and perfective maintenance, Software reengineering and refactoring techniques,

Unit 16: Software Evolution: Managing software evolution: versioning, release management, and software configuration management.

References:

1. Pressman, Roger S. "Software Engineering: A Practitioner's Approach." McGraw-Hill Education, 2024.
2. Sommerville, Ian. "Software Engineering." Pearson, 2015.
3. Sommerville, Ian. "Software Engineering: International Edition." Pearson, 2021.
4. Pfleeger, Shari Lawrence, and Joanne M. Atlee. "Software Engineering: Theory and Practice." Pearson, 2018.
5. Shari Lawrence Pfleeger and Joanne M. Atlee, *Software Engineering: Theory and Practice*, 4th ed., Pearson, 2010.
6. McConnell, Steve. "Code Complete: A Practical Handbook of Software Construction." Microsoft Press, 2004.

Course Code: CABO-1502

Credit: 4

Course Name: Computer Networks

Course Objective:

- Provide a comprehensive understanding of computer networks and their components.
- Teach networking concepts, protocols, and architectures, including OSI and TCP/IP models.
- Develop proficiency in configuring and troubleshooting network devices such as routers, switches, and firewalls.
- Explore advanced topics such as network security, wireless networking, and network management.
- Prepare students for industry certifications such as Cisco Certified Network Associate (CCNA) by covering relevant topics and skills.

Course Outcomes:

At the end of the course, student will be able to

1. Explain the fundamental concepts and principles of computer networks, including network architecture, network models, and network protocols.
2. Analyze and compare different types of network topologies, such as bus, star, ring, mesh, and hybrid topologies, based on their advantages and disadvantages.
3. Configure and troubleshoot network devices, such as routers, switches, hubs, and access points, to establish and maintain network connectivity.
4. Implement and analyze various network protocols, including TCP/IP, UDP, HTTP, FTP, SMTP, DHCP, DNS, and SNMP, to facilitate communication between network devices.
5. Design and implement secure networks using encryption, authentication, access control, and intrusion detection mechanisms to protect network resources and data.

Block 1: Fundamentals of Data Communication

Unit 1: Data Communication: Components of a Data Communication System, Simplex, Half- Duplex and Duplex Modes of Communication; Analog and Digital Signals; Noiseless and Noisy Channels; Bandwidth, Throughput and Latency;

Unit 2: Digital and Analog Transmission: Digital and Analog Transmission; Data Encoding and Modulation Techniques; Broadband and Baseband Transmission; Multiplexing, Transmission Media, Transmission Errors, Error Handling Mechanisms.

Unit 3: Computer Networks: Network Topologies, Local Area Networks, Metropolitan Area Networks, Wide Area Network, Wireless Networks, Internet.

Unit 4: Transmission Media, Guided & Unguided Transmission Media: Twisted pair, coaxial cable, fiber-optic cable, Characteristics, advantages, and disadvantages of each type of guided media, Wireless Transmission, Radio waves, microwaves, infrared, Wireless communication technologies: Wi-Fi, Bluetooth, cellular networks

Block – II: Computer Network and Reference Models

Unit 5: Network Models: Layered Architecture, OSI Reference Model and its Protocols; TCP/IP Protocol Suite, Physical, Logical, Port and Specific Addresses; Switching Techniques.

Unit 6: Functions of OSI and TCP/IP Layers: Use, Purpose, Origin, Functionality, Usability etc.

Unit 7: Framing, Error Detection and Correction; Flow and Error Control; Sliding Window Protocol, HDLC, Multiple Access – CSMA/CD, CSMA/CA, Reservation, Polling, Token Passing,

Unit 8: IPv4 Structure and Address: IPv4 Structure and Address Space; Classful and Classless Addressing; Datagram, Fragmentation and Checksum; IPv6 Packet Format, Mapping Logical to Physical Address (ARP), Direct and Indirect Network Layer Delivery;

Block – III: Network Protocols and Layers

Unit 9: Routing Algorithms & Protocols: TCP, UDP and SCTP Protocols; Flow Control, Error Control and Congestion Control in TCP and SCTP.

Unit 10: Data Link Layer Error Detection and Correction: Error detection methods: parity check, checksum, cyclic redundancy check (CRC), Error correction techniques: Hamming codes, Reed-Solomon codes

Unit 11: Medium Access Control (MAC): MAC protocols: CSMA/CD, CSMA/CA, token passing, Ethernet and IEEE 802 standards for LANs

Unit 12: Network Layer: Routing Algorithms - Shortest path algorithms: Dijkstra's algorithm, Bellman-Ford algorithm - Distance vector and link-state routing protocols

Block – IV: Advanced Network Concepts

Unit 13: IP Addressing and Subnetting: IPv4 and IPv6 addressing schemes, Subnetting and subnet mask calculation

Unit 14: Transport Layer: Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) - Characteristics and differences between TCP and UDP - Reliability, flow control, and congestion control in TCP, TCP/IP Applications, Common TCP/IP applications: HTTP, FTP, SMTP, DNS, Overview of application layer protocols and their functions

Unit 15: World Wide Web (WWW): Uniform Resource Locator (URL), Domain Name Service (DNS), Resolution - Mapping Names to Addresses and Addresses to Names; Electronic Mail Architecture, SMTP, POP and IMAP; TELNET and FTP.

Unit 16: Network Security: Malwares, Cryptography and Steganography; Secret-Key Algorithms, Public-Key Algorithms, Digital Signature, Virtual Private Networks, Firewalls.

References:

1. Behrouz A Forouzan, Data Communication and Computer networks, 4th ed, McGraw Hill. (2022)
2. A.S. Tanenbaum, "Computer Networks", 4th Edition, Prentice Hall India, (2022)
3. S. Keshav, "An Engineering Approach on Computer Networking", Addison Wesley, 2012
4. W. Stallings, "Data and Computer Communication", Macmillan Press, 2021.
5. James F. Kurose and Keith W. Ross, *Computer Networking: A Top-Down Approach*, 8th ed., Pearson, 2020

Course Code: CABO-1503

Credit: 4

Course Name: Theory of Computation

Course Objective:

- Introduce students to the theoretical foundations of computation and formal languages.
- Teach key concepts such as automata theory, formal grammars, and Turing machines.
- Develop proficiency in analyzing the computational power and limitations of different models of computation.
- Explore topics such as regular languages, context-free languages, and computability theory.
- Provide insight into the relationships between theoretical models of computation and practical applications in computer science.

Course Outcomes:

At the end of the course, student will be able to

1. Explain the theoretical foundations of computer science, including automata theory, formal languages, and computational complexity.
2. Analyze and design finite automata, regular expressions, and context-free grammars for solving language-related problems.
3. Develop computational processes using Turing machines and understand their computational power and limitations.
4. Analyze the time and space complexity of algorithms, classify problems into complexity classes, and recognize NP-complete problems.
5. Apply theoretical concepts learned in the course, such as finite state machines and formal languages, to solve practical problems in software development and formal language processing.

Block I: Introduction to Automata Theory

Unit 1: Introduction to Theory of Computation, Overview of computational models and their applications, Introduction to automata theory and its importance in computer science

Unit 2: Finite Automata and Regular Languages, Definition and properties of finite automata, Regular languages and regular expressions, Finite automata and regular expression equivalence

Unit 3: REGULAR GRAMMARS: Definition, regular grammars and FA, FA for regular grammar, Regular grammar for FA.

Unit 4: Pumping Lemma & Closure Properties: Proving languages to be non-regular -Pumping lemma, applications, Closureproperties of regular languages

Unit 5: Context-Free Grammars and Languages, Context-free grammars and their derivations, Context-free languages and their properties, Parsing techniques: top-down and bottom-up parsing

Unit 6: PUSHDOWN AUTOMATA: Definition, Model, Acceptance of CFL, Acceptance by Final State and Acceptance by Empty stack and its Equivalence, Equivalence of CFG and PDA.

Block II: Turing Machines and Computability

Unit 7: Turing Machines, Definition and components of Turing machines, Turing machine variants: multi-tape, non-deterministic, Universal Turing machine and its significance

Unit 8: Computability and Undecidability, Church-Turing thesis and computability, Halting problem and its undecidability,

Unit 9: Introduction to recursive and recursively enumerable languages, Context sensitive language and linear bounded automata (LBA),

Unit 10: Undecidable problems about TMs. Chomsky hierarchy, Decidability, Post's correspondence problem (PCP), undecidability of PCP.

Block III: Complexity Theory

Unit 11: Formal Language Processing, Introduction to formal language processing,

Unit 12: Regular expressions and their applications, Applications of context-free grammars in parsing

Unit 13: Finite State Machines in Software Development, State machines in software modeling,

Unit 14: Using finite state machines for program logic, Finite state machine-based design patterns

Block IV: Finite State Machines in Software Development

Unit 15: Finite State Machines, State machines in software modeling, Using finite state machines for program logic, Finite state machine-based design patterns

Unit 16: Formal Language Processing, Introduction to formal language processing, Regular expressions and their applications, Applications of context-free grammars in parsing

References:

1. "Introduction to Automata Theory, Languages, and Computation" by John E. Hopcroft, Rajeev Motwani, and Jeffrey D. Ullman (2006)
2. K. L. P Mishra, N. Chandra shekaran (2003), Theory of Computer Science-Automata Languages and Computation, 2nd edition, Prentice Hall of India, India.(2019)
3. Automata and Computability"Dexter C. Kozen (2022)
4. "Elements of the Theory of Computation"Harry R. Lewis, Christos H. Papadimitriou (1997, Pearson)
5. "Introduction to the Theory of Computation"Michael Sipser 3rd Edition (2012, Cengage Learning)

Course Code: CABO – 1504

Credit: 3

Course Name: Perspectives in Physics

Course Objective

- Introduce students to the foundational principles and theories of physics.
- Explore the historical development of physics and its role in understanding the natural world.
- Provide an overview of key concepts in classical mechanics, electromagnetism, thermodynamics, and modern physics.
- Foster critical thinking skills by examining the philosophical implications and interdisciplinary connections of physics.
- Cultivate an appreciation for the beauty and complexity of the physical universe through engaging discussions and experiments.

Course Outcomes:

At the end of the course, student will be able to

1. Understand the concepts of Atoms, Nucleus and Nuclear Energy, Relativity, elementary particles and cosmology.
2. Solve problems based on the fundamental concepts.
3. Explain quarks and another elementary particles.

Block-I: The Atom and particle waves

Unit-1: The structure of the atom, The existence of atoms: Evidence from chemistry,

Unit-2: Cathode rays, Electrons, and X rays, Atomic spectra and the Bohr model of the atom,

Unit-3: Particle waves and Quantum Mechanics.

Block-II: The Nucleus and Nuclear Energy

Unit-4: Radioactivity and the discovery of the nucleus, The structure of the nucleus, Radioactive decay,

Unit-5: Nuclear reactions and nuclear fission, nuclear reactors,

Unit-6: Nuclear weapons and nuclear fusion

Block-III: Special Relativity and Beyond

Unit-7: Relative motion in classical physics. The speed of light and Einstein's postulates.

Unit-8: Time dilation and length contraction.

Unit-9: Newton's laws and mass-energy equivalence. General relativity (Idea).

Block-IV: Idea of Elementary Particles, Cosmology

Unit-10: Quarks and other elementary particles.

Unit-11: Cosmology and the beginning of time

References:

1. The Physics of Everyday Phenomena: A Conceptual Introduction ToPhysics, Sixth Edition W. Thomas Griffith & Juliet W. BrossingMcgraw-Hill,(2024)
2. IntroductionToPhysicsJohnDCutnell.K.W.Johnson,DYoung,SSadlerWileyIndiaEdition, (2022)
3. Fundamentals Of Physics D Halliday,R Resnick, J Walker John Wiley And Sons,(2021)
4. For The Love Of Physics Walter Levin Free Press,(2011)

5. Concepts Of Modern Physics A Beiser, S Mahajan, Mc Graw Hill,(2023).

Course Code: CABO-1505

Credit: 3

Course Name: Basic Abstract & Linear Algebra

Course Objectives:

- Provide a foundational understanding of abstract algebraic structures such as groups, rings, and fields.
- Introduce students to linear algebra concepts including vector spaces, matrices, and linear transformations.
- Teach fundamental operations and properties of algebraic structures and matrices.
- Develop proficiency in solving linear systems of equations and performing matrix operations.
- Explore applications of abstract and linear algebra in various fields such as physics, engineering, and computer science.

Course Outcomes:

At the end of the course, student will be able to

1. Explain the basic concepts of groups and their applications.
2. Explain the significance of the notions of Cosets and Lagrange's Theorem.
3. Compute the expression of permutation groups by using permutation Group.
4. Recall and apply definitions of vector spaces, subspaces, linear transformations, etc.
5. Identify and recognize common vector operations and their properties.

Block I: Basic Abstract Algebra

Unit 1: Group & Sub Groups

Unit 2: Cyclic Group & Permutation Group

Unit 3: Isomorphic, Coset & Lagrange's Theorem

Unit 4: Ring & Field

Block II: Theory of Vector Spaces

Unit 5: Vector spaces: Definition and Examples

Unit 6: Linear combination, linear span, linear independence and dependence

Unit 7: Basis and Dimension of a vector space

Unit 8: Quotient space and Direct sum of vector spaces

Block III: Theory of Linear Transformation and Linear Operators

Unit 9: Linear Transformations

Unit 10: Space of Linear Transformation

Unit 11: Invertible Linear Transformation

Unit 12: Matrix representation of Linear Transformation

References:

1. Gallian, Joseph. A. (2021). Contemporary Abstract Algebra (8th ed.).
2. Cengage Learning India Private Limited, Delhi. Fourth impression, 2015.
3. Cheney, Ward, and David Kincaid. "Linear algebra: Theory and applications." *The Australian Mathematical Society* 110 (2009): 544-550.
4. Axler, Sheldon. *Linear algebra done right*. Springer Nature, 2024.
5. Spence, Lawrence E., Arnold J. Insel, and Stephen H. Friedberg. *Elementary linear algebra*. 2000.

6. Khan, Mohd. *Lectures on linear algebra*. Anamaya Publishers(2008).

Course Code: CABO-1516

Credit: 2

Course Name: Software Engineering Lab

Course Objective:

- Offer practical experience in applying software engineering principles and methodologies to real-world projects.
- Familiarize students with software development tools, techniques, and best practices.
- Provide hands-on experience in requirements gathering, software design, implementation, testing, and maintenance.
- Foster teamwork and collaboration skills through group projects and team-based activities.
- Prepare students for the challenges and responsibilities of software engineering roles in industry by simulating real-world project scenarios and environments.

Course Outcomes:

At the end of the course, student will be able to

1. Explain the fundamental principles and concepts of software engineering, including requirements engineering, design, testing, and maintenance.
2. Apply software engineering methodologies such as Agile, Waterfall, and DevOps to develop and manage software projects efficiently.
3. Demonstrate proficiency in using various software engineering tools and technologies for version control, testing, and project management.
4. Develop critical thinking and problem-solving skills through hands-on experience with real-world software engineering scenarios and CABOe studies.
5. Collaborate effectively in teams to design, implement, and deliver software solutions, demonstrating professionalism and adherence to best practices in software engineering.

Lab Experiment Questions

Lab 1. What is the primary purpose of the SRS document?

Lab 2. How do you distinguish between functional and non-functional requirements in your project?

Lab 3. What is the significance of class diagrams in system design?

Lab 4. Create a sequence diagram for a key use CABOe in your project. How does it help in understanding the system's workflow?

Lab 5. What are the primary advantages of using version control systems like Git in software development?

Lab 6. Demonstrate how to create and switch between branches in Git. Why is branching important?

Lab 7. Explain the process of committing changes to a Git repository. How do commit messages improve collaboration?

Lab 8. How do you estimate effort using story points during sprint planning? Provide an example.

Lab 9. Describe the format and significance of a daily stand-up meeting.

Lab 10. What are the key components of a test CABOe?

Lab 11. Write test CABOes for a specific functionality in your project, including input, execution conditions, and expected results.

Lab 12. How do you use a testing framework (e.g., JUnit, pytest) to automate test execution? Provide an example.

Lab 13. Choose a design pattern (e.g., Singleton, Factory, Observer) and explain its purpose.

Lab 14. Implement the chosen design pattern in your project and demonstrate its working with sample scenarios.

Lab 15. What are the benefits and potential drawbacks of using this design pattern?

Lab 16. What are the key aspects to look for during a code review?

References:

1. Sommerville, Ian. (2022). Software Engineering (10th ed.). Pearson
2. Pressman, Roger S. (2020). Software Engineering: A Practitioner's Approach (8th ed.). McGraw-Hill Education.
3. Martin, Robert C. (2020). Clean Code: A Handbook of Agile Software Craftsmanship. Prentice Hall.
4. Beck, Kent. (2018). Extreme Programming Explained: Embrace Change (2nd ed.). Addison-Wesley.
5. Fowler, Martin. (2021). Patterns of Enterprise Application Architecture. Addison-Wesley.

Semester – VI

Course Code: CABO–1601

Credit: 4

Course Name: IoT & Cloud Computing

Course Objective:

- Introduce students to the concepts and technologies of the Internet of Things (IoT) and cloud computing.
- Teach the architecture and components of IoT systems and cloud platforms.
- Explore protocols, standards, and communication technologies used in IoT and cloud environments.
- Provide hands-on experience in developing and deploying IoT applications on cloud platforms.
- Investigate security, privacy, and scalability challenges in IoT and cloud computing, along with strategies for addressing them.

Course Outcomes:

At the end of the course, student will be able to

1. Understand and explain how IoT devices integrate with cloud computing platforms, including the architecture, communication protocols, and cloud-based services used in IoT applications.
2. Develop practical skills in designing, implementing, and managing IoT applications deployed on cloud platforms, including data collection, processing, and visualization.
3. Identify and address security and privacy challenges in IoT systems, implementing best practices for securing IoT devices and data transmitted to and from cloud platforms.
4. Utilize cloud computing services such as storage, databases, serverless computing, and machine learning to enhance the functionality and scalability of IoT applications.
5. Analyze emerging trends in IoT and cloud computing, such as edge computing, blockchain integration, and ethical considerations, and evaluate their potential impact on future IoT deployments and applications.

Block I: Introduction to IoT and Cloud Computing

Unit 1: Introduction to IoT: Definition and concepts of IoT, Evolution and significance of IoT, IoT architecture and components

Unit 2: Introduction to Cloud Computing: Definition and characteristics of cloud computing, Cloud service models: IaaS, PaaS, SaaS, Cloud deployment models: Public, private, hybrid, community clouds

Unit 3: Convergence of IoT and Cloud Computing: Role of cloud computing in IoT ecosystem, Benefits and challenges of integrating IoT with cloud computing, CABOe studies showCABOing IoT and cloud computing synergy

Unit 4: IoT Protocols and Standards: Communication protocols: MQTT, CoAP, HTTP, etc., IoT standards: IEEE 802.15.4, Zigbee, LoRaWAN, etc., Security considerations in IoT protocols

Block II: IoT Device Development

Unit 5: IoT Hardware Platforms: Overview of popular IoT hardware platforms, Selection criteria for IoT hardware, Hands-on exercises with IoT development boards

Unit 6: IoT Device Programming: Introduction to IoT programming languages: Python, C, JavaScript, Basics of sensor interfacing and data acquisition, Hands-on IoT programming exercises

Unit 7: IoT Device Communication: Wireless communication technologies for IoT devices: Wi-Fi, Bluetooth, RFID, etc., Setting up communication between IoT devices and cloud servers, Data transmission protocols and techniques

Unit 8: IoT Device Security: Security challenges in IoT devices, Secure coding practices for IoT devices, Encryption and authentication mechanisms for IoT communication

Block III: Cloud Infrastructure and Services

Unit 9: Cloud Infrastructure Basics, Virtualization technology and concepts, Cloud storage solutions: Object storage, block storage, file storage, Introduction to cloud computing platforms: AWS, Azure, Google Cloud, etc.

Unit 10: Cloud Service Deployment: Deploying applications and services on cloud platforms Containerization technologies: Docker, Kubernetes, Hands-on exercises on deploying IoT applications on the cloud

Unit 11: Scalability and Elasticity in Cloud Computing: Horizontal and vertical scaling Auto-scaling and load balancing techniques, Ensuring scalability for IoT applications on the cloud

Unit 12: Cloud Security: Cloud security challenges and threats, Identity and access management (IAM), Encryption and data protection in the cloud

Block IV: IoT Data Management and Analytics

Unit 13: Data Collection and Storage for IoT: Data ingestion mechanisms for IoT applications Time-series databases for IoT data storage, Data retention and archival strategies

Unit 14: IoT Data Processing and Analysis: Real-time data processing techniques: Stream processing, Complex event processing (CEP), Data analytics frameworks for IoT: Apache Kafka, Apache Spark, etc., Extracting insights from IoT data

Unit 15: IoT Data Visualization: Data visualization techniques for IoT data, Dashboard design and development for IoT applications, Tools and libraries for IoT data visualization

Unit 16: IoT Data Security and Privacy: Securing IoT data at rest and in transit, Privacy concerns in IoT data collection and processing, Compliance with data protection regulations (e.g., GDPR)

References:

1. "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things" by David Hanes, Gonzalo Salgueiro, Patrick Grossetete(2024)
2. "Edge Computing: A Primer" by AgustinusBorgyWaluyo (2021)
3. "Fog and Edge Computing: Principles and Paradigms" edited by Rajkumar Buyya, Satish Narayana Srirama, and Shadi Ibrahim (2019)
4. "Edge Computing: From Hype to Reality" Fawzi Behmann, Kwok Wust Edition (2023, Wiley)
5. "Building the Internet of Things with IPv6 and MQTT" Chandrasekar Vuppapapati 1st Edition (2023, Apress)

Course Code: CABO–1602

Credit: 4

Course Name: Machine Learning using Python

Course Objectives:

- Introduce students to the fundamental concepts and algorithms of machine learning.
- Teach the Python programming language and its libraries for machine learning such as NumPy, Pandas, and Scikit-learn.
- Explore supervised and unsupervised learning techniques including regression, classification, clustering, and dimensionality reduction.
- Provide hands-on experience in implementing machine learning algorithms and models using Python.
- Foster critical thinking and problem-solving skills through practical exercises and real-world applications of machine learning.

Course Outcomes:

1. Gain a solid understanding of the core principles and techniques of machine learning.
2. Develop practical skills in implementing and evaluating machine learning algorithms using Python libraries.
3. Apply machine learning algorithms to analyze and solve real-world problems in various domains.
4. Interpret and communicate the results of machine learning models effectively.
5. Prepare for further studies or professional roles in machine learning and data science.

Block I: Introduction to Machine Learning and Python Basics

Unit 1: Introduction to Machine Learning: Overview of machine learning concepts, types, and applications, Understanding supervised, unsupervised, and reinforcement learning, Introduction to the Python ecosystem for machine learning: NumPy, Pandas, Matplotlib, and Scikit-learn

Unit 2: Python Basics for Machine Learning: Introduction to Python programming language: syntax, data types, variables, Control structures: loops and conditional statements, Functions and modules: defining functions, importing modules

Unit 3: Data Preprocessing in Python: Data cleaning and preprocessing techniques: handling missing values, outliers, and duplicates, Data exploration and visualization using Matplotlib and Seaborn, Feature scaling and normalization for improving model performance

Unit 4: Introduction to Supervised Learning: Overview of supervised learning: classification and regression tasks, Understanding the concepts of features, labels, and training data, Introduction to popular supervised learning algorithms: Linear Regression, Logistic Regression

Block II: Supervised Learning Algorithms

Unit 5: Linear Regression: Understanding linear regression: assumptions, cost function, gradient descent, Implementing linear regression in Python using Scikit-learn, Evaluating model performance: metrics like mean squared error, R-squared

Unit 6: Logistic Regression: Introduction to logistic regression for binary classification, Logistic regression cost function, sigmoid function, and decision boundary, Implementing logistic regression in Python and evaluating model performance

Unit 7: Decision Trees and Random Forests: Introduction to decision trees: construction, splitting criteria, pruning, Ensemble learning with Random Forests: bagging and boosting, Implementation and evaluation of decision trees and random forests in Python

Unit 8: Support Vector Machines (SVM): Understanding Support Vector Machines: margin, kernels, hyperplanes, Implementing SVM for classification tasks using Scikit-learn, Tuning SVM hyperparameters and evaluating model performance

Block III: Unsupervised Learning and Dimensionality Reduction

Unit 9: Introduction to Unsupervised Learning: Overview of unsupervised learning: clustering and dimensionality reduction, Introduction to K-means clustering algorithm and its implementation in Python, Evaluating clustering performance using metrics like silhouette score

Unit 10: Hierarchical Clustering and Density-Based Clustering: Introduction to hierarchical clustering: agglomerative and divisive clustering, Density-based clustering with DBSCAN algorithm, Comparing different clustering algorithms and selecting appropriate ones for different datasets

Unit 11: Principal Component Analysis (PCA): Understanding dimensionality reduction with PCA: covariance matrix, eigenvectors, eigenvalues, Implementing PCA for feature extraction and visualization in Python, Interpreting PCA results and selecting the number of principal components

Unit 12: t-Distributed Stochastic Neighbor Embedding (t-SNE), Introduction to t-SNE for visualization of high-dimensional data, Implementing t-SNE in Python and visualizing high-dimensional datasets, Understanding the limitations and considerations when using t-SNE

Block IV: Advanced Topics in Machine Learning

Unit 13: Introduction to Neural Networks: Overview of artificial neural networks (ANNs) and deep learning,

Unit 14: Basics of feedforward neural networks: layers, activation functions, forward propagation, Implementing a simple neural network for classification tasks in Python using TensorFlow/Keras

Unit 15: Convolutional Neural Networks (CNNs): Introduction to CNNs, convolutional layers, pooling layers, fully connected layers, Implementing CNNs for image classification tasks using TensorFlow/Keras,

Unit 16: Transfer learning with pre-trained CNN models like VGG, ResNet, Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM): Introduction to RNNs and LSTM networks for sequential data processing, Implementing RNNs and LSTM networks for sequence prediction tasks in Python, Applications of RNNs and LSTM in natural language processing (NLP) and time series analysis

References:

1. "Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow" by Aurélien Géron (2022)
2. "Python Machine Learning" by Sebastian Raschka and Vahid Mirjalili (2019)
3. "Introduction to Machine Learning with Python: A Guide for Data Scientists" by Andreas C. Müller and Sarah Guido (2016)
4. "Deep Learning with Python" by François Chollet (2021)
5. "Pattern Recognition and Machine Learning" by Christopher M. Bishop (2006)

Course Code: CABO–1603

Credit: 4

Course Name: Discrete Mathematics

Course Objective:

- Provide a foundational understanding of key concepts in discrete mathematics, including sets, functions, relations, and logic.
- Introduce students to fundamental topics such as combinatorics, graph theory, and discrete probability.
- Teach methods for analyzing and solving problems using discrete mathematical techniques.
- Explore applications of discrete mathematics in computer science, cryptography, and other fields.
- Develop critical thinking and problem-solving skills through rigorous mathematical reasoning and proof techniques.

Course Outcomes:

At the end of the course, the students would be able to:

1. Explain and apply fundamental concepts of logic, including propositional and predicate logic, to analyze and construct logical arguments and expressions.
2. Utilize set theory concepts, such as set operations, relations, functions, and cardinality, to model and solve problems in computer science and information technology.
3. Apply combinatorial techniques, including permutations, combinations, and counting principles, to analyze and solve problems related to data structures, algorithms, and cryptography.
4. Analyze and solve graph theory problems, including graph representation, connectivity, shortest path algorithms, and graph traversal techniques, to model and solve real-world problems.
5. Demonstrate proficiency in algebraic structures, including groups, rings, and fields, and apply algebraic properties to analyze and solve problems in cryptography, coding theory, and computer security.

Block I: Foundations of Discrete Mathematics

Unit 1: Introduction to Discrete Mathematics, Basic terminologies and concepts

Unit 2: Set Theory and Operations: Sets, operations on sets, Venn diagrams, set identities

Unit 3: Propositional Logic and Truth Tables: Propositions, truth tables, logical connectives, logical equivalence, laws of logic.

Unit 4: Predicate Logic and Quantifiers: Predicates, quantifiers, logical inference, universal and existential quantification.

Block II: Combinatorics and Counting Techniques

Unit 5: Permutations and Combinations: Fundamental principles, permutations with repetitions, combinations with repetitions.

Unit 6: Binomial Theorem and Applications: Binomial coefficients, Pascal's triangle, binomial theorem.

Unit 7: Principle of Inclusion-Exclusion: Counting techniques for overlapping sets.

Unit 8: Pigeonhole Principle and Applications: Applications of the pigeonhole principle in combinatorial problems.

Block III: Graph Theory and Discrete Structures

Unit 9: Introduction to Discrete Structures: Relations and Partial Orders: Relations, equivalence relations, partial orders, lattices.

Unit 10: Boolean Algebra

Unit 11: Introduction to Graph Theory: Basic definitions, types of graphs, graph representations.

Unit 12: Graph Traversals and Algorithms: Depth-first search (DFS) and Breadth-first search (BFS).

Block III: Discrete Probability and Number Theory

Unit 13: Basics of Discrete Probability: Sample spaces, events, probability axioms, conditional probability.

Unit 14: Random Variables and Distributions: Discrete random variables, probability mass functions, expectation and variance.

Unit 15: Introduction to Number Theory: Divisibility, prime numbers, modular arithmetic.

Unit 16: Cryptography and Applications: Basics of cryptography, encryption algorithms based on number theory principles.

References:

1. Discrete Mathematical Structures, Kolman, Busby & Ross: PHI, 6th Edition, 2009.
2. Elements of Discrete Maths, C.L. Liu : Tata McGraw Hill, 2nd edition, 2001.
3. Discrete Mathematics and Its Applications: By Kenneth H Rosen, McGraw Hill, 8th edition 2019.
4. J. P. Tremblay, R. Manohar: Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill Pub, 1975.

Course code: CABO-1604

Credit: 3

Course Name: Concepts of Physics

Course Objectives:

- Introduce students to the fundamental principles and laws of physics.
- Teach key concepts such as motion, forces, energy, and momentum.
- Develop an understanding of classical mechanics and its applications in describing the motion of objects.
- Explore basic principles of electricity and magnetism.
- Foster critical thinking skills through problem-solving exercises and hands-on experiments to illustrate physics concepts.

Course Outcomes:

At the end of the course, student will be able to

1. Comprehend the scope of physics, the role of measurement and mathematics in physics.
2. Infer the concepts of mechanics, electricity and magnetism, optics, and waves.
3. Explain and analyze behavior of fluid and heat.

Block-I: Physics, the Fundamental Science, and Motion

Unit-1: The scope of Physics, The role of measurement and mathematics in Physics, Physics and everyday phenomena and home experiments and observations.

Unit-2: Describing motion, falling objects and projectile motion, Newton's laws: Explaining motion, Circular motion, the planets, and gravity,

Unit-3: Energy and oscillations, Momentum and impulse, Rotational motion of solid objects.

Block-II: Electricity and Magnetism

Unit-4: Electrostatic phenomena: The electrostatic force: Coulomb's law, The electric field and electric potential, Conductors and insulators, Electric circuits

Unit-5: Magneto-statics: Magnets, magnetic force and magnetic effects of electric currents,

Unit-6: Faraday's law: Electromagnetic induction.

Block-III: Wave Motion and Optics

Unit-7: Waves: Wave pulses and periodic wave, Interference and standing waves, Sound waves and the physics of music.

Unit-8: Light waves and colour: Electromagnetic waves, wavelength and colour, Interference of light waves,

Unit-9: Diffraction, gratings, polarized light, Light and image formation, Eyeglasses, Microscopes, Telescopes.

Block-IV: Fluids and Heat

Unit-10: The behavior of fluids, Pressure and Pascal's principle, Archimedes' principle, Fluids in motion,

Unit-11: Bernoulli's principle, Temperature, and heat,

Unit-12: Heat engines and the law of thermodynamics. Concept of entropy.

References:

1. The Physics Of Everyday Phenomena: A Conceptual Introduction To Physics, Sixth Edition W. Thomas Griffith, Juliet W. Brosing McGraw-Hill, 9th edition (2019)

2. Introduction to Physics John D Cutnell, K. W. Johnson, D Young, S Stadler Wiley India Edition, (2022)
3. Fundamentals of Physics D Halliday, R Resnick, J Walker John Wiley And Sons, 5th edition (2021)
4. For the Love of Physics Walter Levin Free Press (2011) The Feynman
5. Lectures On Physics Vol. I R Feynman, Leighton, Sands Narosa Publishing House, (2008)

Course Code: CABO–1615

Credit: 4

Course Name: Machine Learning Using Python Lab

Course Objective:

- Provide practical experience in implementing machine learning algorithms and techniques using Python.
- Familiarize students with popular machine learning libraries and frameworks such as Scikit-learn, TensorFlow, and Keras.
- Offer hands-on exercises and projects to reinforce theoretical concepts learned in machine learning courses.
- Develop skills in data preprocessing, model training, evaluation, and deployment in Python.
- Prepare students to apply machine learning methods to real-world datasets and problems through guided lab sessions and projects.

Course Outcomes:

At the end of the course, student will be able to

1. Understand fundamental machine learning concepts, including supervised and unsupervised learning, feature engineering, model evaluation, and deployment.
2. Develop practical skills in using Python libraries such as NumPy, Pandas, Matplotlib, and Scikit-learn for data manipulation, visualization, and building machine learning models.
3. Implement a variety of machine learning algorithms, including linear regression, logistic regression, decision trees, support vector machines, clustering algorithms, and neural networks.
4. Evaluate the performance of machine learning models using appropriate metrics and techniques and interpret the results to make informed decisions.
5. Apply machine learning techniques to solve real-world problems in various domains such as finance, healthcare, marketing, and natural language processing, gaining practical experience in developing machine learning solutions.

Lab Experiment

- Lab-1. Load a dataset using Pandas and display the first few rows to understand its structure.
- Lab-2. Explore basic statistics such as mean, median, and standard deviation for numerical columns.
- Lab-3. Visualize data distributions using histograms and box plots.
- Lab-4. Handle missing values in the dataset using methods like mean imputation or dropping rows/columns.
- Lab-5. Encode categorical variables using techniques like one-hot encoding or label encoding.
- Lab-6. Scale numerical features using techniques like Min-Max scaling or standardization.
- Lab-7. Implement logistic regression to classify data into two classes based on input features.
- Lab-8. Build a decision tree classifier to predict the class labels of samples based on input features.
- Lab-9. Visualize the decision tree structure and interpret the decision rules.
- Lab-10. Determine the optimal number of clusters using the elbow method or silhouette score.
- Lab-11. Understand the explained variance ratio of principal components.

- Lab-12. Build a simple feedforward neural network using the Keras library to classify images from the MNIST dataset.
- Lab-13. Preprocess text data by tokenizing, stemming, and vectorizing text documents.
- Lab-14. Build a text classification model using techniques such as bag-of-words (BoW), term frequency-inverse document frequency (TF-IDF), and word embeddings.
- Lab-15. Evaluate the performance of the text classification model using metrics like accuracy, precision, and recall.

References:

1. Géron, Aurélien. "Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow." O'Reilly Media, 2019.
2. Raschka, Sebastian, and Mirjalili, Vahid. "Python Machine Learning." Packt Publishing, 2017.
3. Müller, Andreas C., and Guido, Sarah. "Introduction to Machine Learning with Python: A Guide for Data Scientists." O'Reilly Media, 2016.
4. Chollet, François. "Deep Learning with Python." Manning Publications, 2018.
5. "Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow" Géron, Aurélien. 3rd Edition (2022)

Course Code: CABO–1691

Credit: 3

Course Name: Internship

Course Objectives:

- Provide students with practical exposure to the industry and real-world work environments.
- Allow students to apply theoretical knowledge gained during their BCA program to practical projects and tasks.
- Develop professional skills such as teamwork, communication, problem-solving, and time management.
- Enable students to gain hands-on experience in specific areas of interest within the field of computer science, such as software development, web development, database management, networking, or cybersecurity.
- Facilitate networking opportunities and professional connections that can potentially lead to job placements or future career opportunities after completing the internship.

Course Outcomes:

At the end of the course, student will be able to

1. Demonstrate the ability to apply theoretical concepts and principles learned in their BCA coursework to real-world projects and tasks, effectively bridging the gap between academic learning and practical application.
2. Acquire hands-on experience in various aspects of computer applications, including software development, system administration, database management, cybersecurity, and IT support, enhancing their technical skills and proficiency in industry-standard tools and technologies.

3. Cultivate essential workplace skills such as teamwork, communication, problem-solving, adaptability, and time management through active participation in internship projects and interactions with colleagues and supervisors.
4. Establish meaningful connections with industry professionals, mentors, and peers, expanding their professional network and gaining insights into industry trends, emerging technologies, and career opportunities within the IT sector.
5. Reflect on their internship experiences, assess their strengths, weaknesses, and areas for improvement, and develop a personalized career development plan that aligns with their interests, goals, and aspirations in computer applications or related fields.

Semester – VII

Course Code: CABO–1701

Credit: 4

Course Name: Soft Computing

Course Objectives:

- Introduce students to the principles and techniques of soft computing, which encompasses fuzzy logic, neural networks, evolutionary algorithms, and probabilistic reasoning.
- Teach methods for modeling and simulating complex systems that are tolerant to imprecision, uncertainty, and partial truth.
- Explore applications of soft computing in various domains such as pattern recognition, optimization, control systems, and decision-making.
- Provide hands-on experience with soft computing tools and algorithms through practical exercises and projects.
- Foster critical thinking and problem-solving skills by analyzing and designing soft computing solutions for real-world problems.

Course Outcomes:

At the end of the course, student will be able to

1. Demonstrate Soft Computing principles, paradigms, and techniques, including fuzzy logic, neural networks, evolutionary algorithms, and swarm intelligence.
2. Apply Soft Computing techniques to solve a wide range of real-world problems, including pattern recognition, optimization, decision making, and data analysis, by selecting appropriate algorithms and methodologies.
3. Analyze and evaluate the performance and suitability of different Soft Computing techniques for specific tasks, considering factors such as computational complexity, robustness, and interpretability.
4. Gain practical experience in implementing Soft Computing algorithms and systems using programming languages and software tools commonly used in the field, enabling them to translate theoretical concepts into working solutions.
5. Recognize and explore the interdisciplinary applications of Soft Computing in diverse domains such as image processing, robotics, finance, bioinformatics, and quantum computing, fostering creativity and innovation in problem-solving approaches.

Block I: Introduction to Soft Computing

Unit 1: Introduction to Soft Computing: Definition and scope of Soft Computing, Characteristics of Soft Computing techniques, Applications and advantages of Soft Computing

Unit 2: Fuzzy Logic: Introduction to fuzzy sets and fuzzy logic, Fuzzy set operations, Fuzzy inference systems, Applications of fuzzy logic in control systems and decision making

Unit 3: Neural Networks: Introduction to artificial neural networks (ANNs), Single-layer and multi-layer perceptrons, Training algorithms: Backpropagation, Gradient Descent, Applications of neural networks in pattern recognition and classification

Unit 4: Evolutionary Computing: Introduction to evolutionary algorithms (Genetic Algorithms, Genetic Programming, Evolutionary Strategies), Principles of evolution and natural selection, Genetic operators: selection, crossover, mutation, Applications of evolutionary computing in optimization and machine learning

Block II: Advanced Soft Computing Techniques

Unit 5: Hybrid Soft Computing Systems: Integration of fuzzy logic, neural networks, and evolutionary computing, Neuro-fuzzy systems, Genetic fuzzy systems, Applications and advantages of hybrid systems

Unit 6: Swarm Intelligence: Introduction to swarm intelligence, Ant Colony Optimization (ACO), Particle Swarm Optimization (PSO), Applications of swarm intelligence in optimization problems

Unit 7: Rough Sets: Introduction to rough sets theory, Rough set operations, Rough set-based feature selection, Applications of rough sets in data analysis and decision support systems

Unit 8: Probabilistic Reasoning: Introduction to Bayesian networks, Probabilistic inference, Learning Bayesian networks from data, Applications of probabilistic reasoning in uncertainty modeling

Block III: Applications of Soft Computing

Unit 9: Soft Computing in Image Processing: Fuzzy image processing techniques, Neural networks for image classification and recognition, Evolutionary algorithms for image enhancement, Applications in medical imaging, remote sensing, and computer vision

Unit 10: Soft Computing in Robotics: Fuzzy logic-based control systems for robots, Neural network-based robot learning and control, Evolutionary robotics, Applications in industrial automation, autonomous vehicles, and human-robot interaction

Unit 11: Soft Computing in Finance: Fuzzy logic-based financial modeling and forecasting, Neural networks for stock market prediction, Evolutionary algorithms for portfolio optimization, Applications in risk management, trading strategies, and investment decision making

Unit 12: Soft Computing in Bioinformatics: Fuzzy clustering for gene expression analysis, Neural networks for protein structure prediction, Evolutionary algorithms for sequence alignment, Applications in genomics, proteomics, and drug discovery

Block IV: Emerging Trends in Soft Computing

Unit 13: Deep Learning: Introduction to deep neural networks (DNNs), Convolutional Neural Networks (CNNs) for image recognition, Recurrent Neural Networks (RNNs) for sequential data, Applications and recent advances in deep learning

Unit 14: Explainable AI (XAI): Importance of interpretability in AI systems, Techniques for explaining decisions made by AI models, Interpretable models: decision trees, rule-based systems, Applications in healthcare, finance, and law

Unit 15: Quantum Computing and Soft Computing: Introduction to quantum computing, Quantum-inspired algorithms for optimization, Hybrid quantum-classical approaches in soft computing, Potential applications and future prospects

Unit 16: Ethics and Social Implications of Soft Computing: Ethical considerations in AI and soft computing, Bias and fairness in AI systems, Privacy concerns and data protection, Societal impact and responsible AI development

References:

1. "Soft Computing: Techniques and its Applications in Electrical Engineering" by D.K. Chaturvedi, S.P. Singh, and V.K. Sharma (2008)
2. "Soft Computing and Intelligent Systems: Theory and Applications" by Madan M. Gupta and Narsingh Deo (2000)
3. "Introduction to Soft Computing" by Eva Volná, JánŠtěpán, and Vladik Kreinovich (2012)
4. "Soft Computing: Techniques and Applications" edited by K. Vijayakumar, V. Manickavasagam, and M. Marikkannu(2012)
5. "Handbook of Soft Computing for Engineers and Scientists" edited by F. CABOtillo, P. Melin, and O. Montiel (2013)

Course Code: CABO–1702

Credit: 4

Course Name: R programming

Course Objective:

- Introduce students to the R programming language and its applications in statistical computing and data analysis.
- Teach fundamental concepts such as data types, functions, loops, and conditional statements in R.
- Explore advanced topics including data manipulation, visualization, and statistical modeling using R packages such as dplyr, ggplot2, and lm.
- Provide hands-on experience with real-world datasets through practical exercises and projects.
- Prepare students to perform data analysis and statistical inference tasks using R, and to communicate results effectively through visualizations and reports.

Course Outcomes:

At the end of the course, student will be able to

1. Demonstrate proficiency in R programming, including data manipulation, visualization, statistical analysis, and reporting, through practical assignments and projects.
2. Manipulate and transform data efficiently using R, including tasks such as cleaning, reshaping, merging, and summarizing datasets for analysis.
3. Develop the ability to create insightful visualizations using R, including exploratory plots, statistical graphics, and interactive visualizations, to communicate patterns and insights in data effectively.
4. Acquire the skills to perform basic statistical analysis in R, including hypothesis testing, regression modeling, and descriptive statistics, to derive meaningful insights from data and make informed decisions.
5. Learn and apply principles of reproducible research, including documenting and organizing code, generating dynamic reports with R Markdown, and creating reproducible workflows, to ensure transparency and replicability in data analysis and reporting.

Block I: Introduction to R Programming

Unit 1: Introduction to R: Overview of R programming language, Installation and setup of R and RStudio, Basic syntax, data types, and variables,

Unit 2: Data Structures in R: Vectors, matrices, arrays, and data frames, Creating and manipulating data structures, Indexing and subsetting data objects,

Unit 3: Introduction to R Studio: R studio, Installation, set up directory, Function of R studio, Advantages and disadvantages

Unit 4: Control Structures: Conditional statements (if-else), Loops (for, while), Functions and user-defined functions

Unit 5: Data Import and Export: Reading and writing data from/to external files (CSV, Excel, text), Using built-in functions and packages for data manipulation, Handling missing data and data cleaning techniques

Block II: Data Visualization with R

Unit 6: Introduction to Data Visualization: Importance of data visualization, Overview of plotting systems in R (base R, ggplot2)

Unit 7: Basic Plots in R: Creating scatter plots, line plots, and bar plots, Customizing plot aesthetics (colors, labels, legends), Adding titles, axes labels, and annotations to plots

Unit 8: Advanced Plots in R: Creating histograms, box plots, and density plots, Plotting multiple graphs on the same canvas, Using faceting and grouping for complex visualizations

Unit 9: Interactive Visualizations: Introduction to interactive plotting libraries (plotly, ggplotly), Creating interactive plots with tooltips, zooming, and brushing, Exporting interactive plots for web applications and presentations

Block III: Data Manipulation and Analysis

Unit 10: Data Manipulation with dplyr: Introduction to the dplyr package, Filtering, sorting, and summarizing data, Group-wise operations and aggregations

Unit 11: Data Transformation with tidyr: Reshaping data with tidyr functions (gather, spread), Handling missing values and data imputation, Combining and merging datasets

Unit 12: Descriptive Statistics: Calculating summary statistics (mean, median, variance), Computing correlations and covariance, Generating frequency tables and cross-tabulations

Block IV: Advanced R Programming Techniques

Unit 13: Statistical Modeling Basics: Introduction to statistical modeling concepts, Linear regression analysis, Hypothesis testing and p-values

Unit 14: Introduction to R Packages: Overview of R package structure and development, Installing and loading R packages, Using popular packages for specific tasks (e.g., data manipulation, visualization)

Unit 15: Error Handling and Debugging, Identifying and troubleshooting common errors in R code, Using debugging tools (debug, browser), Implementing error handling techniques (tryCatch, stop)

Unit 16: Functional Programming in R: Understanding functional programming concepts, Using apply functions (apply, lapply, sapply), Writing and applying custom functions

References:

1. "R for Data Science" by Hadley Wickham and Garrett Grolemund(2017)

2. "Advanced R" by Hadley Wickham (2019)
3. "The Art of R Programming: A Tour of Statistical Software Design" by Norman Matloff (2011)
4. "R Cookbook: Proven Recipes for Data Analysis, Statistics, and Graphics" by Paul Teetor (2011)
5. "Introduction to Statistical Learning with Applications in R" by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani(2021)
6. "ggplot2: Elegant Graphics for Data Analysis" by Hadley Wickham (2023)

Course Code: CABO–1703

Credit: 4

Course Name: Network Security & Cryptography

Course Objective:

- Introduce students to the principles and concepts of network security, including threats, vulnerabilities, and countermeasures.
- Teach cryptographic techniques such as encryption, decryption, digital signatures, and hash functions.
- Explore protocols and algorithms used in secure communication, such as SSL/TLS, IPsec, and SSH.
- Provide hands-on experience with network security tools and techniques for intrusion detection, firewall configuration, and secure network design.
- Foster critical thinking and problem-solving skills by analyzing security threats and designing secure systems and protocols.

Course Outcomes:

At the end of the course, student will be able to

1. Demonstrate fundamental network security concepts, including threat analysis, risk assessment, access control mechanisms, and security policies, enabling them to identify and address security vulnerabilities in network infrastructures.
2. Acquire proficiency in cryptographic techniques, including symmetric and asymmetric encryption, hash functions, digital signatures, and cryptographic protocols, allowing them to secure data communication and ensure the confidentiality, integrity, and authenticity of information exchanged over networks.
3. Develop the ability to implement and configure security mechanisms, such as firewalls, intrusion detection systems (IDS), virtual private networks (VPNs), and secure authentication protocols, to protect network resources and mitigate security risks effectively.
4. Gain skills in security management practices, including risk assessment, security policy development, security awareness training, and incident response planning, enabling them to proactively manage security risks and respond effectively to security incidents and breaches.
5. Demonstrate awareness of legal and ethical considerations in network security practices, including compliance with relevant laws and regulations, protection of user privacy rights, and adherence to ethical standards of conduct, ensuring responsible and ethical behavior in security-related activities.

Block I: Introduction to Network Security

Unit 1: Introduction to Network Security: Overview of network security concepts and principles, Importance of network security in modern computing environments, Goals of network security: confidentiality, integrity, availability (CIA triad)

Unit 2: Threats and Attacks: Common network threats and vulnerabilities, Types of network attacks: eavesdropping, interception, spoofing, denial of service (DoS), distributed denial of service (DDoS), etc., CABOe studies of notable network security breaches and incidents

Unit 3: Security Policies and Mechanisms: Role of security policies in enforcing security requirements, Access control mechanisms: authentication, authorization, and accounting (AAA), Cryptography as a fundamental mechanism for ensuring data confidentiality and integrity

Unit 4: Cryptography Basics: Introduction to cryptography and its role in network security, Basic concepts: encryption, decryption, plaintext, ciphertext, keys, Types of cryptographic algorithms: symmetric encryption, asymmetric encryption, hashing,

Block II: Cryptographic Protocols and Algorithms

Unit 5: Symmetric Encryption: Principles of symmetric encryption algorithms (e.g., DES, AES), Modes of operation: ECB, CBC, CFB, OFB, Key management and distribution in symmetric encryption,

Unit 6: Asymmetric Encryption: Principles of asymmetric encryption algorithms (e.g., RSA, ElGamal), Key exchange protocols: Diffie-Hellman key exchange, Digital signatures and public key infrastructure (PKI)

Unit 7: Hash Functions and Message Authentication Codes (MACs): Overview of hash functions and their properties, Applications of hash functions: data integrity, password hashing, Message Authentication Codes (MACs) for data authentication and integrity verification

Unit 8: Cryptographic Protocols: Secure communication protocols: SSL/TLS, IPSec, Cryptographic protocols for key exchange, authentication, and secure messaging, CABOe studies of protocol vulnerabilities and attacks

Block III: Network Security Mechanisms

Unit 9: Access Control and Authentication Mechanisms: Role-based access control (RBAC) and access control lists (ACLs), Authentication mechanisms: passwords, biometrics, multifactor authentication, Single sign-on (SSO) solutions and federated identity management

Unit 10: Firewalls and Intrusion Detection Systems (IDS): Overview of firewalls: packet filtering, stateful inspection, application-layer filtering, Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS), Deployment strategies and best practices for firewalls and IDS/IPS

Unit 11: Virtual Private Networks (VPNs) and Secure Remote Access: Introduction to VPN technologies: IPSec VPNs, SSL VPNs, Secure remote access solutions: VPN clients, remote desktop protocols, Considerations for implementing secure remote access for organizations

Unit 12: Wireless Network Security: Common security threats and vulnerabilities in wireless networks, Security mechanisms for Wi-Fi networks: WPA2, WPA3, Best practices for securing wireless LANs and mobile devices

Block IV: Security Management and Incident Response

Unit 13: Security Management Practices: Risk management and threat assessment methodologies, Security policies, standards, and procedures, Security awareness training and employee education programs

Unit 14: Incident Response and Disaster Recovery: Incident response planning and preparedness, Incident detection, analysis, and containment procedures, Business continuity planning and disaster recovery strategies

Unit 15: Legal and Ethical Aspects of Network Security: Legal frameworks and regulations governing network security (e.g., GDPR, HIPAA), Ethical considerations in network security practices, CABOe studies of legal and ethical issues in network security

Unit 16: Emerging Trends and Future Directions: Current trends in network security: cloud security, IoT security, AI-driven security, Research challenges and opportunities in network security, Strategies for staying updated and adapting to evolving threats in network security

References:

1. "Computer Security: Principles and Practice" by William Stallings and Lawrie Brown (2018)

2. "Cryptography and Network Security: Principles and Practice" by William Stallings (2018)
3. "Network Security Essentials: Applications and Standards" by William Stallings (2021)
4. "Introduction to Cryptography with Coding Theory" by Wade Trappe and Lawrence C. Washington (2020)
5. "Principles of Computer Security: CompTIA Security+ and Beyond" by Wm. Arthur Conklin, Greg White, Chuck Cothren, Roger L. Davis, and Dwayne Williams (2022)

Course Code: CABO-1704
Course Name: Parallel Computing

Credit: 4

Course Objectives:

- Introduce students to the principles and techniques of parallel computing, which involve executing multiple computations simultaneously.
- Teach parallel programming models, including shared memory, distributed memory, and hybrid models.
- Explore parallel algorithms and data structures optimized for parallel execution, such as parallel sorting, matrix multiplication, and graph algorithms.
- Provide hands-on experience with parallel computing frameworks and libraries, such as OpenMP, MPI, CUDA, and Hadoop.
- Foster critical thinking and problem-solving skills by analyzing scalability, load balancing, and synchronization issues in parallel computing systems.

Outcomes:

At the end of the course, student will be able to

1. Explain parallel computing concepts, including architectures, programming models, and performance metrics.
2. Develop proficiency in parallel programming paradigms, such as shared memory, distributed memory, and GPU computing.
3. Design, analyze, and optimize parallel algorithms for various computational problems.
4. Demonstrate effective problem-solving skills in parallel computing through practical assignments and projects.
5. Prepare for advanced studies and research in parallel computing, with a solid foundation in theory and practical experience.

Block I: Introduction to Parallel Computing

Unit 1: Overview of Parallel Computing: Definition and significance of parallel computing, Historical development and evolution of parallel computing, Motivation for parallelism: Performance enhancement, scalability, and solving larger problems

Unit 2: Parallel Computing Architectures: Classification of parallel computing architectures: Shared memory, distributed memory, hybrid architectures, SIMD vs. MIMD architectures, Characteristics, advantages, and limitations of each architecture type

Unit 3: Parallel Programming Paradigms: Introduction to parallel programming models: Message Passing Interface (MPI), OpenMP, CUDA, OpenCL, Overview of data parallelism, task parallelism, and hybrid parallelism, Comparison of different parallel programming paradigms

Unit 4: Parallel Computing Platforms and Tools: Overview of parallel computing platforms: Multi-core processors, GPUs, clusters, supercomputers, Introduction to parallel computing tools and libraries: MPI libraries, CUDA toolkit, OpenMP directives, Setting up development environments for parallel programming

Block II: Parallel Algorithms and Techniques

Unit 5: Parallel Algorithm Design: Principles of parallel algorithm design: Decomposition, mapping, and scheduling, Strategies for identifying parallelism in algorithms: Task parallelism, data parallelism, pipelining, Analysis of parallel algorithm efficiency: Speedup, efficiency, scalability

Unit 6: Parallel Matrix and Vector Operations: Parallel algorithms for basic linear algebra operations: Matrix multiplication, vector addition, Parallelization techniques for matrix and vector computations, Performance optimization strategies for parallel matrix and vector operations

Unit 7: Parallel Sorting and Searching Algorithms: Parallel sorting algorithms: Bitonic sort, parallel merge sort, parallel quicksort, Parallel searching algorithms: Binary search, parallel search on trees and graphs, Analysis of parallel sorting and searching algorithms

Unit 8: Parallelization of Numerical Methods: Parallelization of numerical methods: Finite difference methods, finite element methods, Monte Carlo methods, Parallel algorithms for solving linear and nonlinear equations, numerical integration, and differential equations, Challenges and considerations in parallelizing numerical methods

Block III: Parallel Programming Models and Languages

Unit 9: Introduction to MPI Programming: Basics of message passing programming model, MPI concepts: Communicators, ranks, point-to-point communication, collective communication, Writing and executing MPI programs

Unit 10: Introduction to OpenMP Programming: Basics of shared memory programming model, OpenMP directives and constructs for parallelism: Parallel regions, work-sharing constructs, synchronization, Writing and executing OpenMP programs

Unit 11: GPU Programming with CUDA: Introduction to GPU architecture and CUDA programming model, CUDA programming basics: Kernel execution, memory management, thread synchronization, Writing and executing CUDA programs

Unit 12: Hybrid Programming with MPI and OpenMP: Combining message passing and shared memory parallelism, Strategies for hybrid parallel programming: Task distribution, load balancing, data partitioning, Writing and executing hybrid MPI+OpenMP programs

Block IV: Performance Optimization and Advanced Topics

Unit 13: Performance Analysis and Profiling: Techniques for performance measurement and analysis: Execution time, speedup, scalability, Profiling tools for identifying performance bottlenecks: gprof, Valgrind, NVIDIA Visual Profiler, Optimization strategies based on performance analysis

Unit 14: Parallel I/O and Storage: Parallel I/O concepts and challenges, Techniques for parallelizing I/O operations: Parallel file systems, I/O buffering, data striping, Strategies for efficient storage and retrieval of data in parallel computing environments

Unit 15: Parallelization of Machine Learning Algorithms: Parallel machine learning algorithms: Parallelization of training and inference processes, Parallel computing frameworks for machine learning: TensorFlow, PyTorch, Apache Spark MLlib, CABOe studies of parallel machine learning applications

Unit 16: Emerging Trends in Parallel Computing: Overview of emerging technologies and trends in parallel computing: Quantum computing, neuromorphic computing, edge computing, Challenges and opportunities in future parallel computing research and development, Discussion on the impact of parallel computing on various domains: Scientific computing, data analytics, artificial intelligence

References:

1. "Introduction to Parallel Computing" by Ananth Grama, Anshul Gupta, George Karypis, and Vipin Kumar (2021)

2. "Parallel Programming: Concepts and Practice" by Barry Wilkinson and Michael Allen (2018)
3. "Parallel Computing: Principles and Practice" by Rob H. Bisseling(2004)
4. "Parallel Programming in C with MPI and OpenMP" by Michael J. Quinn(2004)
5. "CUDA by Example: An Introduction to General-Purpose GPU Programming" by Jason Sanders and Edward Kandrot (2010)

Course Code: CABO-1705

Credits:4

Course Name: Linear Programming

Course Objectives:

- Introduce students to the theory and applications of linear programming, which involves optimizing a linear objective function subject to linear constraints.
- Teach the formulation of mathematical models as linear programming problems, including decision variables, objective functions, and constraints.
- Explore methods for solving linear programming problems, such as the simplex method, interior point methods, and graphical methods.
- Provide hands-on experience with linear programming software packages such as Excel Solver, GNU Linear Programming Kit (GLPK), and MATLAB Optimization Toolbox.
- Foster critical thinking skills by applying linear programming techniques to real-world optimization problems in various domains such as operations research, economics, engineering, and logistics.

Course Outcomes:

At the end of the course, student will be able to

1. Analyze and solve linear programming problem with graphical method.
2. Discuss simplex algorithm to solve linear programming problems.
3. Determine the concept of duality in linear programming problems to get its solution using dual simplex method.
4. Utilize Hungarian method to solve assignment problems.
5. Apply basic feasible solution techniques to solve transportation problem and get its optimal solution using modified method.

Block I: Linear Programming Problems

Unit 1: Linear programming problem and its formulation

Unit 2: Geometric interpretation, Convex set, Convex Hull and related results

Unit 3: Extreme points and Basic feasible solutions

Unit 4: Graphical Method to solve LPP

Block II: The Simplex Algorithm

Unit 5: Simplex Method

Unit 6: Big-M Method

Unit 7: Two-Phase Method

Unit 8: Special CABOs in Simplex Method

Block III: Duality Theory and Assignment Problem

Unit 9: Duality in LPP

Unit 10: Dual-Simplex Method

Unit 11: Mathematical formulation of assignment problem

Unit 12: Hungarian Method

Block IV: Transportation Problem

Unit 13: Mathematical formulation of transportation problem

Unit 14: Solution of transportation problem

Unit 15: MODI Method

Unit 16: Degeneracy in transportation problems

References:

1. "Operations Research", S. D. Sharma, Kedarnath Ramnath & Company. (2010)
2. "Linear Programming", G. Hadley, Oxford, IBH publishing Co. (2024)
3. "Operations Research", P.K. Gupta, S. Chand & Company Ltd. (2015)
4. "Elements of Operations Research" by Dr. P.K. Gupta, published by Sultan Chand & Sons in (2022).
5. "Problems in Operations Research" by Dr. P.K. Gupta and Man Mohan, also published by Sultan Chand & Sons in (2014).

Semester – VIII

Course Code: CABO–1801

Credit: 4

Course Name: Natural Language Processing

Course Objectives

- Introduce students to the field of natural language processing, which involves the interaction between computers and human languages.
- Teach fundamental concepts such as tokenization, stemming, lemmatization, part-of-speech tagging, and syntactic parsing.
- Explore techniques for text classification, sentiment analysis, named entity recognition, and machine translation.
- Provide hands-on experience with NLP libraries and tools such as NLTK (Natural Language Toolkit), spaCy, and TensorFlow.
- Foster critical thinking and problem-solving skills by applying NLP techniques to real-world applications such as chatbots, information retrieval, and text summarization.

Course Outcomes

By the end of this course, students will be able to:

1. Effectively normalize and tokenize text, handle various linguistic nuances, and utilize regular expressions for text matching.
2. Apply key NLP algorithms such as Bag-of-Words, TF-IDF, word embeddings, and text classification methods, and evaluate their performance using appropriate metrics.
3. Gain hands-on experience in building and fine-tuning advanced models, including RNNs, LSTMs, Transformers, and pre-trained language models like BERT and GPT.
4. Leverage NLP techniques for practical applications, such as sentiment analysis, named entity recognition, machine translation, and dialogue systems, demonstrating the ability to address and solve complex language-related challenges.
5. Evaluate ethical considerations, such as bias and fairness in NLP models, and stay informed about recent advancements and future directions in the field, ensuring they are prepared to contribute responsibly to the evolving landscape of NLP.

Block I: Introduction to Natural Language Processing

Unit 1: Overview of NLP: Definition and history of NLP, Applications of NLP, Basic concepts and terminology

Unit 2: Text Processing and Tokenization: Text normalization (lowercasing, stemming, lemmatization), Tokenization techniques, Handling punctuation, numbers, and special characters,

Unit 3: Linguistic Fundamentals for NLP: Syntax and semantics, Parts of speech (POS) tagging, Parsing (dependency and constituency parsing)

Unit 4: Regular Expressions and Text Matching: Introduction to regular expressions, Common text matching patterns, Use of regex in text processing

Block II: Core NLP Techniques and Algorithms

Unit 5: Bag-of-Words and TF-IDF, Concept of Bag-of-Words (BoW), Term Frequency-Inverse Document Frequency (TF-IDF), Feature extraction from text

Unit 6: Word Embeddings and Vector Space Models: Introduction to word embeddings, Word2Vec, GloVe, FastText, Contextual embeddings (ELMo, BERT)

Unit 7: Named Entity Recognition (NER): Concept of named entities, NER algorithms and models, Evaluation metrics for NER

Unit 8: Text Classification: Supervised learning for text classification, Common algorithms (Naive Bayes, SVM, Logistic Regression), Evaluation metrics (accuracy, precision, recall, F1-score)

Block III: Advanced NLP Techniques

Unit 9: Sentiment Analysis: Introduction to sentiment analysis, Rule-based vs. machine learning approaches, Applications in social media and customer feedback

Unit 10: Topic Modeling: Latent Dirichlet Allocation (LDA), Non-negative Matrix Factorization (NMF), Applications and visualization of topics

Unit 11: Sequence Models and Language Models: Recurrent Neural Networks (RNNs), Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRU), Transformer models and attention mechanisms

Unit 12: Machine Translation: History and evolution of machine translation, Statistical vs. neural machine translation, Evaluation of translation quality (BLEU score)

Block IV: Practical Applications and Emerging Trends

Unit 13: Speech Recognition and Processing: Basics of speech recognition, Acoustic models, language models, and pronunciation models, Current technologies and applications

Unit 14: Dialogue Systems and Chatbots: Structure of dialogue systems, Intent recognition and slot filling, Designing and building chatbots

Unit 15: Ethical Considerations in NLP: Bias and fairness in NLP models, Privacy concerns and data protection, Ethical AI and responsible use of NLP technologies

Unit 16: Recent Trends and Future Directions: Advances in pre-trained language models (e.g., GPT-3, T5), Zero-shot and few-shot learning, Future research directions and open challenges in NLP, Supplementary Materials

References:

1. "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition" by Daniel Jurafsky and James H. Martin (2025)
2. "Natural Language Processing in Action" by Lane, H., Howard, H., and Hapke, H. (2019)
3. "Speech and Language Processing: Algorithms and Systems" by Mohamed Zakaria Kurdi and Khalid Shaalan(2021)
4. "Deep Learning for Natural Language Processing" by Palash Goyal, Sumit Pandey, Karan Jain, and Karan Kumar (2018)
5. "Applied Natural Language Processing: Identification, Investigation, and Resolution" by John P. McCrae and Sergio Roa(2022)

Course Code: CABO–1802
Course Name: Web Designing

Credit: 4

Course Objectives

- Introduce students to the principles and techniques of web design, including layout, typography, color theory, and user experience (UX) design.
- Teach HTML (Hypertext Markup Language) and CSS (CABOCading Style Sheets) for creating and styling web pages.
- Explore responsive web design principles for creating websites that adapt to different screen sizes and devices.
- Provide hands-on experience with web design tools and frameworks such as Adobe Dreamweaver, Bootstrap, and WordPress.
- Foster creativity and critical thinking skills by designing and implementing web projects that meet user requirements and usability standards.

Course Outcomes

By the end of this course, students will be able to:

1. Effectively use HTML for structuring web content, CSS for styling, and JavaScript for interactive functionalities, mastering the core technologies of web development.
2. Design websites that adapt seamlessly to various devices and screen sizes, ensuring accessibility for all users by following best practices and standards.
3. Gain hands-on experience with design tools (e.g., Adobe XD, Figma), front-end frameworks (e.g., Bootstrap, React), and CSS preprocessors (e.g., Sass), enhancing their design workflow and productivity.
4. Apply techniques to improve website loading speed, performance, and search engine ranking, using tools and methodologies to test and enhance web performance.
5. Explain and implement cutting-edge web technologies and trends, such as Progressive Web Apps (PWAs), Single Page Applications (SPAs), and WebAssembly, ensuring they remain competitive in the dynamic field of web design.

Block I: Foundations of Web Design

Unit 1: Introduction to Web Design: History and evolution of the web, Understanding the role of a web designer, Overview of web technologies (HTML, CSS, JavaScript)

Unit 2: HTML Basics: Structure of an HTML document, Common HTML tags (headings, paragraphs, links, images, lists), Semantic HTML and accessibility considerations, Forms and input elements

Unit 3: CSS Fundamentals: CSS syntax and selectors, Styling text and fonts, Box model: margins, padding, borders, Layout techniques: float, flexbox, grid

Unit 4: Introduction to JavaScript: Basics of JavaScript: syntax, variables, data types, DOM manipulation, Event handling, Introduction to ES6 features (let, const, arrow functions)

Block II: Advanced HTML, CSS, and JavaScript

Unit 5: Advanced HTML Techniques: HTML5 elements (video, audio, canvas), Data attributes and microdata, Responsive design principles, Introduction to frameworks (Bootstrap)

Unit 6: Advanced CSS Techniques: Advanced selectors and combinators, CSS animations and transitions, Preprocessors (Sass, LESS), CSS methodologies (BEM, OOCSS)

Unit 7: Advanced JavaScript and ES6+: Advanced JavaScript concepts (closures, promises, async/await), JavaScript frameworks and libraries overview (React, Vue, Angular), AJAX and Fetch API, Local storage and session storage

Unit 8: Responsive Web Design: Principles of responsive design, Media queries, Mobile-first design, Testing and debugging responsive layouts

Block III: Tools and Frameworks for Web Design

Unit 9: Web Design Tools and Workflow: Design tools (Adobe XD, Sketch, Figma), Prototyping and wireframing, Version control with Git, Command-line basics and task runners (Gulp, Grunt)

Unit 10: Front-End Frameworks and Libraries: Introduction to Bootstrap, Material Design principles and implementation, Foundation framework, Utilizing icon libraries (Font Awesome, Material Icons)

Unit 11: CSS Frameworks and Preprocessors: Benefits of using CSS frameworks, Sass: syntax, variables, nesting, mixins, functions, LESS: syntax and features, Best practices for using preprocessors

Unit 12: JavaScript Frameworks and Libraries: Introduction to React: components, state, props, Vue.js: reactivity system, directives, components, Angular: modules, components, services, Comparing and choosing the right framework

Block III: Practical Applications and Emerging Trends

Unit 13: Web Performance Optimization: Importance of web performance, Techniques for optimizing images and media, Minimizing and bundling resources (minification, concatenation), Tools for performance testing (Lighthouse, WebPageTest)

Unit 14: Web Accessibility: Principles of web accessibility (WCAG guidelines), ARIA (Accessible Rich Internet Applications), Tools for testing accessibility, Implementing accessible forms and navigation

Unit 15: SEO and Web Analytics: Basics of SEO (Search Engine Optimization), On-page and off-page SEO techniques, Introduction to web analytics, Using Google Analytics for tracking and reporting

Unit 16: Emerging Trends and Future Directions: Progressive Web Apps (PWAs), Single Page Applications (SPAs), WebAssembly, Future of web design and development

References:

1. Robbins, J. (2018). *Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics* (5th ed.). O'Reilly Media. ISBN: 978-1491960202.
2. Meyer, E. A., & Weyl, E. (2017). *CSS: The Definitive Guide* (4th ed.). O'Reilly Media. ISBN: 978-1449393199.
3. Duckett, J. (2014). *JavaScript and JQuery: Interactive Front-End Web Development*. Wiley. ISBN: 978-1118531648.
4. Duckett, J. (2011). *HTML and CSS: Design and Build Websites*. Wiley. ISBN: 978-1118008188.
5. Crockford, D. (2008). *JavaScript: The Good Parts*. O'Reilly Media. ISBN: 978-0596517748.

Course Code: CABO–1803

Credit: 4

Course Name: Data Warehousing and Data Mining

Course Objectives

- Introduce students to the concepts and technologies of data warehousing, which involves the collection, storage, and management of large volumes of data from various sources.
- Teach data mining techniques for extracting valuable insights and patterns from data stored in data warehouses.
- Explore data preprocessing methods such as data cleaning, transformation, and integration to prepare data for analysis.
- Provide hands-on experience with data mining algorithms and tools such as association rule mining, classification, clustering, and anomaly detection.
- Foster critical thinking skills by applying data warehousing and data mining techniques to real-world datasets and business problems.

Course Outcomes

By the end of this course, students will be able to:

1. Develop and implement efficient data warehousing solutions, including schema design, ETL processes, and data integration.
2. Apply various data mining algorithms for classification, clustering, association, and other data mining tasks to discover patterns and insights from large datasets.
3. Explain the synergies between data warehousing and data mining, and utilize data warehouses as a source for data mining processes.
4. Identify and address ethical, privacy, and security issues related to data warehousing and mining, ensuring compliance with relevant laws and regulations.
5. Use data warehousing and data mining techniques to solve real-world problems in various domains such as marketing, finance, healthcare, and telecommunications.

Block I: Introduction to Data Warehousing

Unit 1: Fundamentals of Data Warehousing: Definition and Importance, Evolution and History, Data Warehousing Concepts, Difference between Database and Data Warehouse

Unit 2: Data Warehousing Architecture: Basic Architecture of Data Warehousing, Data Warehouse Models (Enterprise Warehouse, Data Mart, Virtual Warehouse), ETL (Extract, Transform, Load) Processes, Data Integration and Data Loading Techniques

Unit 3: Data Warehouse Design and Implementation: Designing a Data Warehouse: Methodologies and Approaches, Data Warehouse Schema: Star, Snowflake, and Galaxy, Data Partitioning Strategies, Indexing and Query Optimization

Unit 4: Data Warehouse Tools and Technologies: Overview of Data Warehousing Tools, OLAP (Online Analytical Processing) Systems, MOLAP, ROLAP, and HOLAP, CABOe Studies of Data Warehousing Tools (e.g., Microsoft SQL Server, Oracle)

Block II: Introduction to Data Mining

Unit 5: Fundamentals of Data Mining: Definition and Importance, Knowledge Discovery in Databases (KDD) Process, Data Mining vs. Query Tools, Data Mining Tasks: Descriptive and Predictive

Unit 6: Data Preprocessing: Data Cleaning, Data Integration, Data Reduction, Data Transformation and Discretization

Unit 7: Data Mining Techniques I: Classification: Decision Trees, Naive Bayes, k-Nearest Neighbors, Regression Analysis, Evaluation of Classifiers: Accuracy, Precision, Recall, F-measure

Unit 8: Data Mining Techniques II: Clustering: k-Means, Hierarchical Clustering, DBSCAN, Association Rule Mining: Apriori Algorithm, FP-Growth, Sequence and Time Series Mining

Block III: Advanced Data Mining and Applications

Unit 9: Advanced Topics in Data Mining: Text Mining and Web Mining, Spatial and Temporal Data Mining, Graph and Network Mining, Big Data Mining

Unit 10: Data Mining Tools and Technologies: Overview of Data Mining Tools (e.g., WEKA, RapidMiner, KNIME), Open Source Data Mining Software, Implementing Data Mining Algorithms in R and Python

Unit 11: Data Mining Applications I: Market Basket Analysis, Fraud Detection, Customer Relationship Management (CRM), Healthcare and Bioinformatics

Unit 12: Data Mining Applications II: Social Media and Sentiment Analysis, Recommender Systems, Financial Data Analysis, Telecommunications and Network Security

Block IV: Integration and Future Trends

Unit 13: Deep Learning for Data Mining: Privacy-preserving techniques in deep learning: federated learning, secure model aggregation, Secure deployment of deep learning models in production environments, Adversarial robustness in deep learning models for protecting against attacks

Unit 14: Integration of Data Warehousing and Data Mining: Synergies between Data Warehousing and Data Mining, Real-time Data Warehousing and Mining, Data Warehouse as a Data Source for Data Mining, CABOe Studies and Examples

Unit 15: Ethical and Privacy Issues: Data Privacy and Security Concerns, Ethical Implications of Data Mining, Data Anonymization Techniques, Legal Aspects and Regulations (e.g., GDPR)

Unit 16: Emerging Trends in Data Warehousing and Data Mining: Cloud Data Warehousing and Mining, Real-time Analytics, AI and Machine Learning Integration, Future Directions and Innovations

References:

1. "Security in Computing" by Charles P. Pfleeger and Shari Lawrence Pfleeger(2015)
2. "Building a Data Warehouse: With Examples in SQL Server" by Vincent Rainardi (2014)
3. "Data Mining: Concepts and Techniques" by Jiawei Han, Micheline Kamber, and Jian Pei (2011)
4. "Data Warehousing For Dummies" by Thomas C. Hammergren and Alan R. Simon (2009)
5. "Privacy-Preserving Data Mining: Models and Algorithms" by Charu C. Aggarwal and Philip S. Yu(2008)

Course Code: CABO–1804
Course Name: Digital Forensics

Credit: 4

Course Objective:

- Introduce students to the principles and techniques of digital forensics, which involves the investigation and analysis of digital evidence for legal purposes.
- Teach methods for acquiring, preserving, and analyzing digital evidence from various sources such as computers, mobile devices, and networks.
- Explore forensic techniques for recovering deleted files, examining file metadata, and identifying traces of malicious activities.
- Provide hands-on experience with forensic tools and software used in digital investigations, such as EnCABOe, FTK (Forensic Toolkit), and Autopsy.
- Foster critical thinking and problem-solving skills by applying digital forensic techniques to real-world scenarios and CABOe studies involving cybercrime, data breaches, and intellectual property theft.

Course Outcomes:

By the end of this course, students will be able to:

1. Demonstrate proficiency in using a variety of digital forensics tools and techniques for acquiring, analyzing, and interpreting digital evidence from diverse sources such as storage devices, networks, and memory dumps.
2. Develop an understanding of the legal and ethical considerations that govern digital forensics investigations, including the admissibility of digital evidence in court, privacy rights, and chain of custody requirements.
3. Acquire skills in incident response and handling, including identifying security incidents, containing threats, eradicating malware, and restoring systems to a secure state to minimize damage and data loss.
4. Enhance critical thinking and problem-solving abilities by analyzing complex digital evidence, identifying patterns and anomalies, and drawing conclusions to support investigative findings and decision-making.
5. Communicate effectively and report skills to convey forensic findings, methodologies, and conclusions clearly and concisely to technical and non-technical stakeholders, including law enforcement agencies, legal professionals, and organizational management.

Block I: Introduction to Digital Forensics

Unit 1: Introduction to Digital Forensics: Definition and scope of digital forensics, Importance of digital evidence in investigations, Roles of Forensics Investigator, Forensics Readiness, Steps for Forensics Legal and ethical considerations in digital forensics

Unit 2: Computer Forensics Investigation Process: Digital Forensics Investigation Process, Digital Forensics Investigation Process-Assessment Phase, Acquire the Data, Analyze the Data, Report the Investigation

Unit 3: Digital Evidence Acquisition: Principles of digital evidence collection and preservation, Forensic imaging techniques for storage devices, Chain of custody and documentation procedures

Unit 4: Understanding Storage Media and File System: The Booting Process, LINUX Boot Process, Mac OS Boot Sequence, Windows 10 Booting Sequence, File System, Type of File Systems

Unit 5: File Systems and Data Recovery: Overview of file systems (FAT, NTFS, ext), Data recovery methods and tools, Carving techniques for extracting deleted files and fragments

Block II: Windows, Network Forensics and Incident Response

Unit 6: Windows Forensics: Introduction to Windows Forensics, Windows Forensics Volatile Information, Windows Forensics Non- Volatile Information, Recovering deleted files and partitions, Windows Forensics Summary,

Unit 7: Digital Forensics Road map: Static Data Acquisition from windows using FTK Imager, Live Data Acquisition using FTK Imager, FTK Imager, Installation of KALI Linux, RAM Dump Analysis using Volatility, Static Data Acquisition from Linux OS

Unit 8: Recovering Deleted Files and Partitions, Digital Forensics Tools, Overview of EnCABOe Forensics, Deep Information Gathering Tool: Dmitry Page, Use of Autopsy and FTK Imager

Unit 9: Introduction to Network Forensics: Basics of network protocols (TCP/IP, DNS, HTTP), Capturing and analyzing network traffic, Identifying and investigating network-based attacks

Block III: Forensic Investigation Techniques

Unit 10: Intrusion Detection and Prevention: Overview of intrusion detection systems (IDS) and intrusion prevention systems (IPS), Signature-based vs. anomaly-based detection techniques, Analyzing IDS/IPS logs for detecting and responding to security incidents

Unit 11: Malware Analysis: Types of malware (viruses, worms, Trojans, ransomware), Techniques for analyzing and reverse-engineering malware, Developing and applying signatures for malware detection

Unit 12: Incident Response and Handling: Incident response process and procedures, Establishing an incident response team (IRT), Incident containment, eradication, and recovery strategies

Block IV: Advanced Topics in Digital Forensics

Unit 13: Mobile Forensics: Introduction to mobile device forensics (smartphones, tablets), Extracting and analyzing data from mobile devices, Challenges and considerations in mobile forensics

Unit 14: Memory Forensics: Understanding volatile memory (RAM) and its forensic implications, Memory acquisition techniques and tools, Analyzing memory dumps for evidence extraction

Unit 15: Anti-Forensics Techniques; Common anti-forensics tactics used by attackers, Detecting and countering anti-forensics measures, Best practices for preserving digital evidence integrity

Unit 16: Legal Aspects of Digital Forensics: Digital evidence admissibility in court, Expert witness testimony and courtroom procedures, CABOe studies and landmark legal decisions in digital forensics

References:

1. "Guide to Computer Forensics and Investigations" by Bill Nelson, Amelia Phillips, and Christopher Steuart (2020)
2. "Computer Forensics and Cyber Crime: An Introduction" by Marjie T. Britz (2013)
3. "Digital Evidence and Computer Crime: Forensic Science, Computers and the Internet" by Eoghan CABOey (2011)
4. "Handbook of Digital Forensics and Investigation" edited by Eoghan CABOey (2009)
5. "File System Forensic Analysis" by Brian Carrier (2005)

Course Code: CABO–1805

Credit: 4

Course Name: Bioinformatics Using AI

Course Objective:

- Introduce students to the interdisciplinary field of bioinformatics, which involves the application of computational techniques to analyze biological data.
- Teach fundamental concepts in biology, genetics, and genomics relevant to bioinformatics analysis.
- Explore artificial intelligence (AI) techniques such as machine learning, deep learning, and natural language processing for analyzing biological data.
- Provide hands-on experience with AI tools and frameworks used in bioinformatics, such as TensorFlow, Keras, and scikit-learn.
- Foster critical thinking skills by applying AI techniques to analyze genomic sequences, predict protein structures, and discover biomarkers for disease diagnosis and treatment.

Course Outcomes:

At the end of the course, student will be able to

1. Gain a thorough understanding of the principles and applications of Bioinformatics and AI in computational research, enabling effective utilization of AI techniques for biological data analysis.
2. Develop proficiency in data preprocessing techniques, feature engineering, and dimensionality reduction methods tailored for computational data in bioinformatics.
3. Master various supervised and unsupervised machine learning algorithms, including ensemble methods and deep learning architectures, for classification, regression, clustering, and pattern discovery in biological datasets.
4. Acquire skills in structural bioinformatics, research data analysis, and interpretation using AI techniques, empowering students to contribute to cutting-edge research in the field.
5. Demonstrate the integration of diverse biological datasets, formulate system models, and apply AI approaches to address complex biological questions, fostering interdisciplinary collaboration and innovation in bioinformatics research.

Block I: Introduction to Bioinformatics and AI

Unit 1: Overview of Bioinformatics and its applications in computational research, Bioinformatics data.

Unit2: Introduction to Artificial Intelligence (AI) fundamentals and applications, Fundamentals of AI and machine learning, Weka and machine learning algorithms.

Unit 3: Basics of computers for bioinformatics.

Unit 4: Fundamentals of machine learning and deep learning for data analysis.

Block II: Data Preprocessing and Feature Engineering

Unit 5: Data preprocessing techniques for computational data.

Unit 6: Feature extraction and selection methods in bioinformatics.

Unit 7: Dimensionality reduction techniques for high-dimensional data.

Unit 8: Handling missing data and noise in mathematical datasets.

Block III: Machine Learning Models in Bioinformatics

Unit 9: Supervised learning algorithms for bioinformatics (classification& regression).

Unit 10: Unsupervised learning techniques for clustering and pattern discovery in datasets.

Unit 11: Ensemble learning methods and their applications in bioinformatics.

Unit 12: Deep learning architectures for data modalities.

Block IV: Applications of AI in Bioinformatics

Unit 13: Structural bioinformatics and prediction methods with AI

Unit 14: Analysis of research data using AI techniques.

Unit 15: Data analysis and interpretation using machine learning and deep learning.

Unit 16: Integration of data and system modeling with AI approaches.

References:

1. Russell, S., &Norvig, P. (2021). Artificial intelligence: A modern approach. Pearson.
2. Géron, A. (2019). Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow. O'Reilly Media.
3. James, G., Witten, D., Hastie, T., &Tibshirani, R. (2013). Introduction to statistical learning: With applications in R. Springer.
4. Bishop, C. M. (2006). Pattern recognition and machine learning. Springer.
5. Mount, D. W. (2004). Bioinformatics: Sequence and genome analysis. Cold Spring Harbor Laboratory Press.

MOOCs

The University shall give flexibility in opting for MOOC (Massive Online Open Courses)/SWAYAM by the students pertaining to the prescribed curriculum and also the credits earned in the MOOC courses may be dealt as part of the evaluation scheme as per UGC (Online Learning Programme) Regulations, 2020.

Syllabi and Course Materials

The Syllabi, PPR and Self-Learning Materials (SLMs) are developed mostly by experienced faculty members of Usha Martin University in consultation with content experts and the same will be forwarded to CIQA and BOS/Academic Council/ Executive Council for further suggestions and approval.

Faculty Members

The University has identified the dedicated requisite faculty and support staff as mandated by the UGC and they are allocated the positions exclusively for OL mode. The course material prepared by the CDOE faculty is at par with the regulations 2020.

List of Faculty associated with BCA programme is as follows:

| S.No. | Name of Faculty | Designation | Nature of Appointment | Qualification | Subject |
|-------|-----------------------|---------------------|-----------------------|---------------|------------------|
| 1. | Dr. Vinay Singh | Associate Professor | Full-Time | Ph.D. | Computer Science |
| 2. | Dr. Ritushree Narayan | Assistant Professor | Full-Time | Ph.D. | Computer Science |

Delivery Mechanism

The OL of UMU follows a modern ICT (Information & Communication Technology) enabled approach for instruction. The methodology of instruction in OL of UMU is different from that of the conventional/regular programs. Our OL system is more learner-oriented and the learner is an active participant in the teaching-learning process. OL of UMU academic delivery system comprises:

A. Print Material

The printed material of the programme supplied to the students will be unit wise for every course.

B. Counselling Sessions

Normally, counselling sessions are held as per a schedule drawn beforehand by the Subject Coordinator. There will be 6 counselling/ contact classes for 4 credit courses will be held on the campus on Saturday and on Sunday of 2 hours duration for each course in face to face mode (In case of 2 credit course contact hours are required 6 hours and in case of 6 credit course contact hours required 18 hours). Contact classes will be held in the campus on Saturdays and on Sundays.

Attendance is mandatory for lab counseling sessions to ensure students gain the necessary practical skills. Students are required to attend at least 75% of lab sessions to be eligible for practical exams and assessments.

C. Medium of Instruction

Medium of Course Instruction: English

Medium of Examination: English

D. Student Support Systems

Universities Study Centers or Learner Support Centre shall be headed by a coordinator, not below the rank of Assistant professor and shall be augmented with academic and non-academic staff depending on the learner.

The university has made appropriate arrangements for various support services including counselling schedule and resource-oriented services evaluation methods and dates both online and offline modes for easy and smooth services to the students in online mode.

At present the university have only one study center on the campus. The institution is not promoting any study centers outside the campus. All student support services will be provided to the student through a single window method/mode onsite and online.

E. Procedure for Admissions, Curriculum, Transaction and Evaluation Admission Process

Admission to the BCA Programme will be done on the basis of screening of candidate's eligibility on first come first serve basis. The University will follow the reservation policy as per norms of the Government. Admission shall not be a right to the students and UMU, DDOE shall retain the right to cancel any admission at any point of time if any irregularity is found in the admission process, eligibility etc.

Maximum Duration

- A. The maximum duration of the BCA Programme is Eight years. Thereafter, students seeking completion of the left-over course(s) will be required to seek fresh admission.
- B. The student can complete his programme within a period of 8 years failing which he/she shall seek fresh admission to complete the programme.

Eligibility

10+2 from any recognized board.

Fee Structure

| Name of the Program | Degree | Duration | Year | Tuition Fee/Year | Exam Fee/Year | Total (in Rs.) |
|------------------------------|--------|--------------|--------------|------------------|---------------|----------------|
| Bachelor of Computer Science | UG | 4 to 8 Years | 1 | 13500 | 2000 | 15500 |
| | | | 2 | 12000 | 2000 | 14000 |
| | | | 3 | 12000 | 2000 | 14000 |
| | | | 4 | 12000 | 2000 | 14000 |
| | | | Total | | | |

Activity Schedule

| S.No. | Name of the Activity | Tentative months schedule (specify months) during year | | | |
|-------|---|--|------------|-------------|------------|
| | | From(Month) | To (Month) | From(Month) | To (Month) |
| 1 | Admission | Jul | Sep | Jan | Mar |
| 2 | Assignment submission (if any) | Sep | Oct | Mar | Apr |
| 3 | Evaluation of assignment | Oct | Nov | Apr | May |
| 4 | Examination | Dec | Dec | Jun | Jun |
| 5 | Declaration of result | Jan | Jan | Jul | Jul |
| 6 | Re-registration | Jul | Jul | Jan | Jan |
| 7 | Distribution of SLM | Jul | Sep | Jan | Mar |
| 8 | Contact programmes (counselling, practical, etc.) | Sep | Nov | Mar | May |

Credit System

UMU, CDOE proposes to follow the 'Credit System' for most of its programs. Each credit amounts to 30 hours of study comprising all learning activities. Thus, a 8 credit course requires 240 hours, 6 credit course requires 180 hours , 4 credit course requires 120 hours and 2 credit course requires 60 hours of study. This helps the student to understand the academic effort to complete a course. Completion of an academic programme requires successful clearing of both, the assignments and the term-end examination of each course in a programme.

| Duration of the Programme | Credits | Name of the Programme | Level of the Programme |
|---------------------------|---------|-----------------------|------------------------|
|---------------------------|---------|-----------------------|------------------------|

| | | | |
|--------------|-----|-----|-------------------|
| 4 to 8 Years | 160 | BCA | Bachelor's Degree |
|--------------|-----|-----|-------------------|

Assignments

In order to ascertain the writing skill and level of comprehension of the learner, assignment work is compulsory for all learners. Each assignment shall consist of a number of questions, case studies and practical related tasks. The assignment question papers will be uploaded to the website within a scheduled time and the learners shall be required to respond them within a specified period of time. The response of the learner is examined by a faculty member.

Evaluation

The evaluation system of the programme is based on two components:

- A. Continuous evaluation in the form of assignments (weightage 30%):** This Component carries a weightage of 30%. There will be at least one graded assignment and test per course. These assignments are to be submitted to the Co-Ordinator of the programme to which the student is assigned or attached with.
- B. Term-end examination (weightage 70%):** This will be held twice every year in the months of June and December. The students are at liberty to appear in any of the examinations conducted by the University during the year. A student will be allowed to appear in the Term-End Examination only after she/he has registered for that course and submitted the assignment. For appearing in the Examination, every student has to submit an Examination form through online (<https://www.umu.ac.in/>) / or offline before the due dates as given in the schedule of operations. If a student misses any term-end examination of a course for any reason, s/he may appear for any of them or all the courses subject to the maximum of 8 courses in the subsequent term-end examinations. This facility will be available until a student secures the minimum pass grade in the courses but up to a maximum period of four semesters, since the date of registration of the course is valid for four semesters. Beyond this period s/he may continue for another four semesters by getting Re-registration by paying fee again. In that case, the score of qualified assignments and/or term-end examination will be retained and the student will be required to complete the left out requirements of such re-registered courses. Minimum requirement for passing a course will be 40% marks.

G. Laboratory Support and Library Resources

The library of Usha Martin University aims to empower the teaching mission and intellectual culture of the community through availability through an organized collection of information as well as instruction in its access, relevance and evaluation.

The University Library enriches advance learning and discovery by providing access to a broad array of resources for education, research and creative work to ensure the rich interchange of ideas in the pursuit of knowledge.

The Usha Martin University has initiated the process of setting up a dedicated Library for OL program and acquiring printed books and e-books for this purpose. The required International and National subject journals are also provided. We already have annual journal subscriptions and the capacity can be enlarged at later stages as the University lines up with more online journals.

The collection of the Library is rich and diverse especially in terms of the breadth and depth of coverage. Collection encompasses subjects in Management, Commerce, Information Technology, Computer Applications, and other allied areas. This collection further includes Books, Research Journals, Project Reports/Dissertations and online Journals.

The University has well equipped Computer Laboratories, Lecture Capturing Systems, Audio Video facilities, ICT enabled class rooms, Wi-Fi facilities and Learning Management Systems etc.

H. Cost Estimate of the programme and the provisions

Initial expenses have been done by the University in terms of provision of infrastructure, manpower, printing of Self Study Material etc. The University intends to allocate expenses out of the total fee collection as per following details:

| | | |
|---|---|-----|
| a) SLM Development and Distribution | : | 20% |
| b) Postal and ICT Expenses | : | 10% |
| c) Salary and other Administrative expenses | : | 60% |
| d) Future Research development reserve | : | 10% |
| e) Lab Instruments | : | 10% |

Once programmes are operational, the programme budget from fee receipts will be planned as per the guidelines of University Grants Commission.

I. Quality Assurance

The University has established the Centre for Internal Quality Assurance (CIQA) in the University campus. The CIQA will monitor and maintain the quality of the OL programmes. It has the following objectives in making the compliances of quality implementations.

Objectives

The objective of Centre for Internal Quality Assurance is to develop and put in place a comprehensive and dynamic internal quality assurance system to ensure that programmes of higher education in the Online Learning mode being implemented by the Higher Educational Institution are of acceptable quality and further improved on continuous basis.

Functions of CIQA

The functions of Centre for Internal Quality Assurance would be following:

1. To maintain quality in the services provided to the learners.
2. To undertake self-evaluative and reflective exercises for continual quality improvement in all the systems and processes of the Higher Educational Institution.
3. To contribute in the identification of the key areas in which Higher Educational Institution should maintain quality.
4. To devise mechanism to ensure that the quality of Open and Distance Learning programme and Online programme matches with the quality of relevant programme in conventional mode.
5. To devise mechanisms for interaction with and obtaining feedback from all stakeholders namely, learners, teachers, staff, parents, society, employers, and Government for quality improvement.
6. To suggest measures to the authorities of Higher Educational Institution for qualitative improvement.
7. To facilitate the implementation of its recommendations through periodic reviews.
8. To organize workshops/seminars/symposium on quality related themes, ensure participation of all stakeholders, and disseminate the reports of such activities among all the stakeholders in Higher Educational Institution.
9. To develop and collate best practices in all areas leading to quality enhancement in services to the learners and disseminate the same all concerned in Higher Educational Institution.
10. To collect, collate and disseminate accurate, complete and reliable statistics about the quality of the programme(s).
11. To ensure that Programme Project Report for each programme is according to the norms and guidelines prescribed by the Commission and wherever necessary by the appropriate regulatory authority having control over the programme;

12. To put in place a mechanism to ensure the proper implementation of Programme Project Reports.
13. To maintain a record of Annual Plans and Annual Reports of Higher Educational Institution, review them periodically and generate actionable reports.
14. To provide inputs to the Higher Educational Institution for restructuring of programmes in order to make them relevant to the job market.
15. To facilitate system-based research on ways of creating learner centric environment and to bring about qualitative change in the entire system.
16. To act as a nodal coordinating unit for seeking assessment and accreditation from a designated body for accreditation such as NAAC etc.
17. To adopt measures to ensure internalization and institutionalization of quality enhancement practices through periodic accreditation and audit.
18. To coordinate between Higher Educational Institution and the Commission for various qualities related initiatives or guidelines.
19. To obtain information from other Higher Educational Institutions on various quality benchmarks or parameters and best practices.
20. To record activities undertaken on quality assurance in the form of an annual report of Centre for Internal Quality Assurance.
21. It will be mandatory for Centre for Internal Quality Assurance to submit Annual Reports to the Statutory Authorities or Bodies of the Higher Educational Institution about its activities at the end of each academic session. A copy of report in the format specified by the Commission, duly approved by the statutory authorities of the Higher Educational Institution shall be submitted annually to the Commission.

On enrolling in the BCA Programme at Usha Martin University in Online Learning (OL) mode, students embark on a transformative educational journey that emphasizes critical thinking, effective communication, and advanced problem-solving skills as emphasized in NEP-2020. Through a flexible and learner-centric approach, the programme nurtures a scientific temperament, empowering students to approach challenges with analytical precision and innovative solutions. The curriculum has been designed to instill a strong sense of ethics and responsibility, fostering a mindset that prioritizes sustainability and environmental consciousness. Students are encouraged to engage with

real-world problems and develop solutions that contribute positively to society and the global ecosystem.

As they progress, learners gain proficiency in foundational and advanced aspects of computer applications, software development, and emerging technologies. The programme equips them with practical knowledge and skills that align with current industry standards, preparing them for the rapidly evolving landscape of technology. Once the students graduate, he/she will possess the confidence and capability to participate in multiple functional areas of science and technology. They will be well-prepared for dynamic careers in software development, IT services, database management, and more recent developments. Additionally, the programme lays a robust foundation for those aspiring to pursue advanced education or competitive examinations in the public and private sectors.

The BCA Programme at Usha Martin University not only prepares students for professional success but also inspires them to become ethical, innovative, and socially responsible contributors to the global technological community. Through this comprehensive approach, graduates emerge as skilled professionals and leaders ready to shape the future of the digital world.



Registrar
कुल सचिव
Usha Martin University
उषा मार्टिन विश्वविद्यालय
Ranchi-835103/रांची-835103