Organizational Behaviour and Design			
Course Code	**MAD101**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Objectives: This course will enable the students

- To understand theories and models of Organizational Behaviour (OB) and organizational design.
- To analyze individual and group behaviour within organizations and their impact on effectiveness.
- To apply principles of leadership, power, and organizational design in practical scenarios.
- To familiarize students with contemporary challenges and strategies in organizational design.

Module-1 (8 Hours)

Introduction: Organizational Behaviour: Introduction to OB, Meaning and History of Organizational Behaviour, Organizational Effectiveness, Organizational Learning Process, Stakeholders, Contemporary Challenges for Organizations.

Module-2 (9 Hours)

Personality, Perception, and Motivation: Personality Types and Theories, Learning: Process, Types, Theories, Emotions: Types, Emotional Labor, Emotional Intelligence, Attitudes: Formation, Values, Perception: Factors, Process of Perception, Motivation: Definition, Theories of Motivation.

Module-3 (9 Hours)

Group Dynamics and Organizational Culture: Group Dynamics: Meaning, Concept, Informal Leaders and Norms, Group Decision Making Techniques, Communication in Groups, Culture: Meaning, Importance, Types of Cultures, Creating and Sustaining Culture.

Module-4 (9 Hours)

Leadership and Power: Leadership: Meaning, Importance, Styles, Theories of Leadership, Leaders vs. Managers, Power: Meaning, Sources of Power, Power Centres, Politics in Organizations, Leadership in Global Context.

Module-5 (9 Hours)

Organizational Design and Strategy: Organizational Design: Determinants, Types, Basic Challenges, Strategic Direction in Design, Selection of Strategy and Design, Differentiation and Integration, Centralization and Decentralization, Mutual Adjustment, Mechanistic and Organic Designs.

Module-6 (7 Hours)

Application and Case Studies: Case Studies on OB, Group Dynamics, Leadership, and Organizational Design, Success and Failures in Organizational Design, Revision and Integration of Key Concepts.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

1. Organizational Behaviour, Stephen P. Robbins, Pearson Education, 18th edition, 2021.
2. Understanding Organizational Behaviour, Udai Pareek.

Web links and Video Lectures (e-Resources):

- NPTEL Organizational Behaviour Course
- OpenStax Organizational Behaviour

Skill Development Activities Suggested

- Visit an organization and note the various functions discharged in a day.
- Conduct a professional event in the department and try to understand the various roles played by students in relation to team and organizational environment.
- Develop questions, interact with people in the organization, and try to observe personality traits.
- Meet any leader/HoD/Dean and observe the management of various departments and record the changes in administrative pattern.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Gain practical experience in the field of Management and OrganisationalBehaviour.	L1
CO2	Acquire conceptual knowledge of management, various functions of Management and theories in OB.	L2
CO3	Comprehend and apply management and behavioural models to relateattitude, perception and personality	L3

CO4	Analyse the recent trends in Management and OB models.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	

Managerial Economics and Indian Economic Policy			
Course Code	**MAD102**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- To understand the principles and applications of managerial economics in business decision-making.
- To analyze market structures, pricing strategies, and consumer behavior using economic theories.
- To gain insights into Indian economic policies and their impact on the business environment.
- To evaluate economic indicators and policies in the context of Indian economic development.

Module-1 (8 Hours)

Introduction to Managerial Economics: Basic Concepts and Principles of Managerial Economics, Demand and Supply Analysis, Elasticity of Demand and Supply, Consumer Behavior: Utility Analysis, Indifference Curve Approach, Production and Cost Analysis.

Module-2 (9 Hours)

Market Structures and Pricing Strategies: Perfect Competition: Characteristics, Pricing and Output Decisions, Monopoly: Pricing Strategies, Welfare Implications, Monopolistic Competition: Characteristics, Pricing and Non-Price Competition, Oligopoly: Models (Kinked Demand Curve, Cournot, Bertrand), Collusion, Pricing Strategies: Cost-Plus Pricing, Penetration Pricing, Skimming Pricing.

Module-3 (9 Hours)

Economic Policy Framework: Overview of Indian Economic Policy, Fiscal Policy: Objectives, Instruments, and Impact, Monetary Policy: Tools, Objectives, and Impact, Trade Policy: Import-Export Regulations, Trade Agreements, Industrial Policy: Licensing, Public Sector Reforms.

Module-4 (9 Hours)

Economic Development and Planning: Economic Development: Concepts, Indicators, Economic Planning: Objectives, Planning Models (Five-Year Plans), Recent Trends in Indian Economic Planning, Role of Government in Economic Development, Poverty and Inequality: Measurement and Policy Responses.

Module-5 (9 Hours)

Indian Economic Environment: Economic Reforms: Liberalization, Privatization, Globalization, Sectoral Analysis: Agriculture, Industry, Services, Investment Climate: Foreign Direct Investment, Public-Private Partnerships, Regional Disparities and Development Policies, Employment and Labor Market Policies.

Module-6 (7 Hours)

Case Studies on Managerial Economics Applications and Indian Economic Policies, Analysis of Current Economic Issues in India, Review of Economic Reforms: Impact on Different Sectors, Success and Failures in Policy Implementation, Revision and Integration of Key Concepts, Group Discussions on Real-Life Economic Challenges, Presentations on Economic Policy Proposals.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- *Managerial Economics*, William F. Samuelson & Stephen G. Marks, Wiley, 10th edition, 2020.
- *Indian Economy: Performance and Policies*, Uma Kapila, Academic Foundation, 2023.
- *Managerial Economics and Business Strategy*, Michael Baye, McGraw-Hill Education, 9th edition, 2022.
- *Economic Survey of India*, Ministry of Finance, Government of India, Latest Edition.

Web links and Video Lectures (e-Resources):

- NPTEL Managerial Economics
- Economic Survey of India
- Indian Economic Policy

Skill Development Activities Suggested

- Analyze real-world business scenarios using managerial economics concepts.
- Review and critique Indian economic policies and their impact on businesses.
- Conduct a detailed analysis of recent economic reforms and their implications for various sectors.
- Engage in discussions on current economic issues and propose policy recommendations.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Apply managerial economics principles to business decision-making and strategy.	L1
CO2	Analyze various market structures and pricing strategies in different business contexts.	L2
CO3	Understand and evaluate Indian economic policies and their effects on the business environment	L3
CO4	Assess economic development and planning models in the context of India's economic growth	L4

Mapping of COs and POs:

Sl. No.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4

CO1	2	1				3			
CO2		2	3				2		
CO3		1		3		2		3	
CO4	2		3		1		2		

Marketing Management			
Course Code	**MAD103**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Learning objectives:

· To make students understand the fundamental concepts of marketing and environment in which marketing system operates.

· To gain knowledge on consumer buying behaviour and influencing factors

· To describe major bases for segment marketing, target marketing, and market positioning.

· To develop a Conceptual framework, covering basic elements of the marketing mix.

· To understand fundamental premise underlying market driven strategies and hands on practical approach.

Module-1 (7 Hours)

Introduction to Marketing: Importance of marketing, Definitions of market and marketing, Types of Needs, Elements of Marketing Concept, Functions of Marketing, evolution of marketing, Marketing V/s Selling, Customer Value and Satisfaction, 4P's of Marketing, Marketing Environment, Techniques used in environment analysis, Characteristics (Micro and Macro), Marketing to the 21st century customer.

Module-2 (9 Hours)

Analysing Consumer Behaviour: Meaning and Characteristics, Importance of consumer behaviour, Factors influencing Consumer Behaviour, Consumer characteristics influencing buying behaviour personal factors and cultural factors. Consumer Buying Decision Process, Buying Roles, Buying Motives. The black box model of consumer behaviour. Psychological factors consumer.

Module-3 (9 Hours)

Product management and Pricing: Importance and primary objective of product management, product levels, product hierarchy, Classification of products, product mix, product mix strategies, Managing Product Life Cycle. New Product Development, packing as a marketing tool, Role of labeling in packing. Concept of Branding, Brand Equity, branding strategies, selecting logo, brand extension- effects. Introducing to pricing, Significance of pricing, factor influencing pricing (Internal factor and External factor), objectives, Pricing Strategies-Value based, Cost based, Market based, Competitor based, Pricing Procedure.

Module-4 (9 Hours)

Distribution and Promotion: Roles and purpose of Marketing Channels, Factors Affecting Channel Choice, Channel Design, Channel Management Decision, Channel Conflict, Designing a physical Distribution System. Promotions- Marketing communications- Integrated Marketing Communications (IMC)-communication objectives, steps in developing effective communication. Advertising: Advertising Objectives, Advertising Budget, Advertising Copy, AIDA model, Traditional Vs Modern Media- Online and Mobile Advertising, social media for Advertising. Push-pull strategies of promotion.

Module-5 (9 Hours)

Market segmentation, Targeting and Brand Positioning: Concept of Market Segmentation, Benefits, Requisites of Effective Segmentation, Bases for Segmenting Consumer Markets, Market Segmentation Strategies. Types of Segmentation. Targeting - Bases for identifying target Customer target Marketing strategies, Positioning - Meaning, Tasks involved in Positioning. Monitoring brands performance and positioning. Product Differentiation Strategies.

Module-6 (7 Hours)

Emerging Trends in Marketing: Marketing Planning. Concepts of B2B marketing, Service Marketing, Digital and social media Marketing, Green Marketing, Event Marketing, Marketing Audit,

Sponsorship, Cause Related Marketing, Marketing for Non-Profit Organizations, Relationship marketing, Marketing Strategies for Leaders, Challengers, Followers and Startups. Social Responsibility of marketing, Neuro Marketing, Sensory Marketing, societal marketing concept, premiumization.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

1. Marketing Management- Indian Context, Global Perspective by Ramaswamy &Namakumari by SAGE publication, 6th Edition.
2. Marketing Management: A South Asian Perspective by Kotler, Keller, Koshy & Jha by Pearson publication, Latest Edition.
3. New Product Management by Merle Crawford and Anthony Di Benedetto by McGraw-Hill, Latest Edition.
4. Advertisement Brands & Consumer Behaviour by Ramesh Kumar by Sage Publications, 2020.
5. Marketing in India: Text and Cases by Neelamegham S by Vikas publication, Latest edition.
6. Marketing by Lamb, Hair, Mc Danniel by Cengage Learning, Latest edition.
7. Fundamentals of Marketing Management, Etzel M J BJ Walker & William J Stanton by Tata Macgraw Hill, Latest edition.

Web links and Video Lectures (e-Resources):

· https://youtu.be/5fdx5Laavkc
· https://youtu.be/Ule8n6GgE1g
· https://youtu.be/ob5KWs3I3aY?t=131
· https://youtu.be/U1VWUHLhmdk
· https://youtu.be/iWuYUhSHXHg
· https://youtu.be/IErR_YYfP3Y
· https://youtu.be/mLV7MASrDlQ

Skill Development Activities Suggested

· Sensitise the students to the market dynamics by visiting super markets and regulatory markets like APMC, etc.
· Students to study the buying pattern based on demographics of consumers.
· Students to draft advertising copy.
· Students to take any FMCG product and study the PCL of that product.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Comprehend the concepts of Marketing Management.	L1
CO2	Gain knowledge on consumer behaviour and buying process	L2
CO3	Understand concept of Product and Brand Management, Branding and Pricing strategies	L3
CO4	Identify marketing channels and the concept of product distribution, techniques of sales promotion	L4
CO5	Simply ideas into a viable marketing plan for various modes of marketing	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2	1		2				2		
CO3				3				2	
CO4		2		2					3
CO5		2			2				

Financial Reporting, Statements and Analysis			
Course Code	**MAD104**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- To understand the principles and practices of financial reporting and statement preparation.
- Toanalyze financial statements using various techniques and frameworks.
- To evaluate the impact of financial reporting on decision-making and business performance.
- To apply accounting standards and regulations in the preparation and analysis of financial statements.

Module-1 (8 Hours)

Introduction to Financial Reporting:

Overview of Financial Reporting, Objectives and Importance of Financial Statements, Regulatory Framework and Accounting Standards, Components of Financial Statements: Income Statement, Balance Sheet, Cash Flow Statement, Statement of Changes in Equity.

Module-2 (9 Hours)

Income Recognition and Measurement:

Revenue Recognition Principles, Measurement of Revenue, Cost of Goods Sold, Gross Profit Calculation, Accounting for Sales and Revenue Recognition Issues, Related Party Transactions and Their Disclosure.

Module-3 (9 Hours)

Asset and Liability Accounting:

Classification and Valuation of Assets: Current and Non-Current Assets, Depreciation and Amortization, Impairment of Assets, Liabilities: Classification and Measurement, Provisions and Contingencies, Accounting for Leases and Contracts.

Module-4 (9 Hours)

Financial Statement Analysis:

Techniques of Financial Statement Analysis: Horizontal and Vertical Analysis, Ratio Analysis: Liquidity Ratios, Solvency Ratios, Profitability Ratios, Efficiency Ratios, DuPont Analysis, Common-Size Financial Statements.

Module-5 (9 Hours)

Advanced Topics in Financial Reporting:

Accounting for Income Taxes, Accounting for Employee Benefits, Accounting for Share-Based Payments, Earnings Per Share Calculation, Segment Reporting, Interim Financial Reporting.

Module-6 (7 Hours)

Application and Case Studies:

Case Studies on Financial Reporting and Analysis, Application of Financial Ratios in Business Decision-Making, Real-World Applications of Financial Statements for Investment Decisions, Evaluation of Financial Performance using Case Studies, Comparative Analysis of Financial Statements Across Industries, Interpretation of Financial Statements for Risk Assessment, Revision and Integration of Key Concepts, Group Presentations on Financial Analysis Projects and Reporting.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- *Financial Accounting: An International Introduction*, David Alexander & Anne Britton, Routledge, 6th edition, 2022.
- *Financial Statement Analysis*, K. R. Subramanyam & John J. Wild, McGraw-Hill Education, 12th edition, 2022.
- *Advanced Financial Accounting*, Joe Ben Hoyle, Thomas Schaefer, & Timothy Doupnik, McGraw-Hill Education, 12th edition, 2021.
- *Financial Reporting and Analysis*, Charles H. Gibson, Cengage Learning, 14th edition, 2022.

Web links and Video Lectures (e-Resources):

- Khan Academy Financial Accounting
- Coursera Financial Reporting Specialization
- MITOpenCourseWare Financial Accounting
- Investopedia Financial Analysis

Skill Development Activities Suggested

- Analyze financial statements of selected companies and present findings.
- Prepare a comprehensive report on financial performance using various analysis techniques.
- Conduct a case study on financial reporting issues faced by companies.
- Compare and contrast financial reporting practices across different industries.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Prepare and interpret financial statements in accordance with accounting standards.	L2
CO2	Analyze financial statements using various analytical techniques and frameworks	L4
CO3	Apply advanced concepts in financial reporting and understand their impact on business decisions.	L3
CO4	Evaluate real-world financial reporting scenarios and provide actionable insights.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2			3		3			
CO2		2	3	2			2		
CO3		3		3		2		3	
CO4	2		2	2	1		2		

Artificial Intelligence and Its Applications (Lab)			
Course Code	**MAD105**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Objectives: This course will enable the students

- To gain hands-on experience with AI tools and technologies.
- To develop and apply AI models to solve real-world problems.
- To understand and implement various AI algorithms and techniques.
- Toanalyze the effectiveness and efficiency of AI applications in different domains

Module-1 (8 Hours)

Introduction to AI Tools and Technologies:

Overview of AI Tools and Software, Setting Up Development Environments, Introduction to Programming Languages for AI (Python/R), Familiarization with AI Libraries and Frameworks (e.g., TensorFlow, PyTorch), Basic Data Handling and Preprocessing Techniques.

Module-2 (9 Hours)

Machine Learning Algorithms:

Implementation of Supervised Learning Algorithms (e.g., Linear Regression, Decision Trees), Implementation of Unsupervised Learning Algorithms (e.g., K-Means Clustering, PCA), Hands-On Exercises with Classification and Regression Models, Model Evaluation Metrics and Techniques.

Module-3 (9 Hours)

Deep Learning and Neural Networks:

Building and Training Neural Networks, Introduction to Convolutional Neural Networks (CNNs) for Image Processing, Implementation of Recurrent Neural Networks (RNNs) for Sequence Data, Hands-On Projects with Deep Learning Frameworks.

Module-4 (9 Hours)

Natural Language Processing (NLP):

Text Preprocessing Techniques, Implementation of NLP Algorithms (e.g., Sentiment Analysis, Named Entity Recognition), Working with NLP Libraries (e.g., NLTK, SpaCy), Building and Evaluating Language Models.

Module-5 (9 Hours)

AI in Real-World Applications:

Case Studies of AI Applications in Various Domains (e.g., Healthcare, Finance, Retail), Implementing AI Solutions

for Real-World Problems, Analysis of AI Model Performance in Different Scenarios, Group Projects on AI Applications.

Module-6 (7 Hours)

Project Work and Integration:
Completion of a Comprehensive AI Project, Presentation and Demonstration of AI Solutions, Review and Integration of AI Techniques and Tools Used, Discussion on Future Trends and Challenges in AI, Revision and Reflection on Key Learnings.

Assessment Details (both CIE and SEE)
The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:
There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.
CIE Marks shall be based on:
a) Lab Assignments and Practical Work (for 25 Marks)
b) Project Work, Presentations, and Class Participation (for 25 Marks)

Semester End Examination:
The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:
Books

- *Artificial Intelligence: A Modern Approach*, Stuart Russell & Peter Norvig, Pearson, 4th edition, 2023.
- *Deep Learning*, Ian Goodfellow, Yoshua Bengio, & Aaron Courville, MIT Press, 2016.
- *Python Machine Learning*, Sebastian Raschka & Vahid Mirjalili, Packt Publishing, 3rd edition, 2022.
- *Natural Language Processing with Python*, Steven Bird, Ewan Klein, & Edward Loper, O'Reilly Media, 1st edition, 2009.

Web links and Video Lectures (e-Resources):

Coursera: AI for Everyone
https://www.coursera.org/learn/ai-for-everyone

MIT OpenCourseWare: Introduction to Deep Learning
https://ocw.mit.edu/courses/media-arts-and-sciences/mas-s62-introduction-to-deep-learning-spring-2018/

Kaggle Learn
https://www.kaggle.com/learn

DataCamp: Introduction to Python for Data Science

https://www.datacamp.com/courses/intro-to-python-for-data-science

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Skill Development Activities Suggested

- Complete hands-on exercises using BI tools and data mining techniques.
- Develop and present a mini-project using business intelligence and data mining methods.
- Participate in group discussions and projects on real-world BI and data mining applications.
- Explore and analyze datasets to uncover insights and support business decisions.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Implement business intelligence tools for data extraction, transformation, and visualization.	L3
CO2	Apply data mining algorithms to analyze and interpret large datasets.	L4
CO3	Evaluate and present data-driven insights to support business decision-making.	L4
CO4	Demonstrate practical knowledge of BI and data mining through projects and case studies.	L5

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	

Business Intelligence and Data Mining (Lab)			
Course Code	**MAD106**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- To gain practical experience with business intelligence tools and data mining techniques.
- To develop skills in data extraction, transformation, and visualization.
- Toanalyze and interpret large datasets to support business decision-making.
- To apply data mining algorithms and techniques to uncover insights from data.

Module-1 (8 Hours)

Introduction to Business Intelligence Tools:
Overview of Business Intelligence (BI) Tools, Setting Up BI Environments, Introduction to BI Software (e.g., Power BI, Tableau), Data Integration Techniques, Basic Data Visualization Concepts and Techniques.

Module-2 (9 Hours)

Data Extraction and Transformation:
Data Extraction Techniques from Various Sources (e.g., Databases, APIs), Data Cleaning and Preprocessing, ETL (Extract, Transform, Load) Processes, Using Tools for Data Transformation (e.g., Alteryx), Handling Missing and Outlier Data.

Module-3 (9 Hours)

Data Visualization and Reporting:
Creating Interactive Dashboards, Visualizing Data Trends and Patterns, Using BI Tools for Reporting (e.g., Power BI, Tableau), Designing Effective Visualizations for Business Insights, Hands-On Practice with Dashboard Creation.

Module-4 (9 Hours)

Introduction to Data Mining Techniques:
Overview of Data Mining Concepts, Implementation of Classification Algorithms (e.g., Decision Trees, Naive Bayes), Implementation of Clustering Algorithms (e.g., K-Means, Hierarchical Clustering), Evaluating and Interpreting Data Mining Results.

Module-5 (9 Hours)

Advanced Data Mining and Analytics:
Association Rule Mining (e.g., Apriori Algorithm), Time Series Analysis, Text Mining and Sentiment Analysis, Advanced Data Mining Techniques (e.g., Neural Networks, SVM), Hands-On Exercises with Advanced Analytics.

Module-6 (7 Hours)

Application and Case Studies:
Case Studies on Business Intelligence Applications, Real-World Data Mining Projects, Comparative Analysis of BI Tools, Analysis of Data Mining Case Studies, Revision and Integration of Key Concepts, Group Presentations on BI and Data Mining Projects.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

1. *Business Intelligence: Data Mining and Optimization for Decision Making*, Carlo Vercellis, Wiley, 2nd edition, 2018.
2. *Data Mining: Practical Machine Learning Tools and Techniques*, Ian H. Witten, Eibe Frank, & Mark A. Hall, Morgan Kaufmann, 4th edition, 2016.
3. *Data Warehousing and Business Intelligence for e-Commerce*, Michael J. Shaffer, Wiley, 1st edition, 2012.
4. *Business Analytics: Data Analysis & Decision Making*, S. Christian Albright & Wayne L. Winston, Cengage Learning, 7th edition, 2022.

Web links and Video Lectures (e-Resources):

1. **Coursera: Business Intelligence and Data Mining**
   https://www.coursera.org/learn/business-intelligence
2. **Khan Academy: Data and Statistics**
   https://www.khanacademy.org/math/statistics-probability
3. **edX: Data Mining with Python**
   https://www.edx.org/course/data-mining-with-python
4. **Tableau Training Videos**
   https://www.tableau.com/learn/training
5. **Power BI Documentation**
   https://docs.microsoft.com/en-us/power-bi/

Skill Development Activities Suggested

- Complete hands-on exercises using BI tools and data mining techniques.
- Develop and present a mini-project using business intelligence and data mining methods.
- Participate in group discussions and projects on real-world BI and data mining applications.
- Explore and analyze datasets to uncover insights and support business decisions.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Implement business intelligence tools for data extraction, transformation, and visualization.	L3
CO2	Apply data mining algorithms to analyze and interpret large datasets	L4
CO3	Evaluate and present data-driven insights to support business decision-making	L4
CO4	Demonstrate practical knowledge of BI and data mining through projects and case studies	L5

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2			3		3			
CO2		2	3	2			2		
CO3		3		3		2		3	
CO4	2		2	2	1		2		

II SEMESTER

Human Resource Management			
Course Code	**MAD201**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- To understand the key functions and roles of Human Resources (HR) in organizations.
- To develop skills in HR planning, recruitment, and performance management.
- To analyze HR practices and their impact on organizational performance.
- To familiarize with contemporary HR issues and trends.

Module-1 (8 Hours)

Introduction to Human Resources Management:
Overview of Human Resources Management, Role of HR in Organizations, HR Planning and Strategy, HR Functions and Responsibilities, Evolution of HRM, HRM Models and Frameworks.

Module-2 (9 Hours)

Recruitment and Selection:
Recruitment Process: Planning and Job Analysis, Sourcing and Attracting Candidates, Selection Techniques and Tools, Interviewing and Assessment Methods, Legal and Ethical Considerations in Recruitment, Onboarding and Induction.

Module-3 (9 Hours)

Performance Management:
Performance Management Systems, Setting Performance Objectives and KPIs, Performance Appraisal Methods, Feedback and Coaching, Managing Underperformance, Linkage to Rewards and Recognition.

Module-4 (9 Hours)

Training and Development:
Training Needs Analysis, Designing Training Programs, Delivery Methods and Techniques, Evaluation of Training Effectiveness, Career Development and Succession Planning, Talent Management Strategies.

Module-5 (9 Hours)

Compensation and Benefits:
Compensation Structures and Pay Scales, Benefits and Perquisites, Performance-Based Pay, Employee Compensation Policies, Legal and Regulatory Aspects, Job Evaluation and Market Salary Analysis.

Module-6 (7 Hours)

Application and Case Studies:
Case Studies on HR Practices and Challenges, Real-World HR Issues and Solutions, Comparative Analysis of HRM Practices in Different Organizations, Revision and Integration of Key Concepts, Group Presentations on HR Projects.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

1. Human Resource Management, Gary Dessler, Pearson, 16th edition, 2020.
2. Fundamentals of Human Resource Management, Raymond A. Noe, et al., McGraw-Hill Education, 8th edition, 2021.
3. Human Resource Management: Theory and Practice, John Bratton & Jeffrey Gold, Palgrave, 5th edition, 2017.
4. Strategic Human Resource Management, Jeffrey A. Mello, Cengage Learning, 4th edition, 2022.

Web links and Video Lectures (e-Resources):

Coursera: Human Resource Management
https://www.coursera.org/learn/human-resource-management

Khan Academy: Human Resources
https://www.khanacademy.org/economics-finance-domain/enterprise-architecture

MITOpenCourseWare: Human Resource Management
https://ocw.mit.edu/courses/sloan-school-of-management/15-662-human-resource-management-spring-2010/

Harvard Business Review: HR Articles
https://hbr.org/topic/human-resources

LinkedIn Learning: HR Fundamentals
https://www.linkedin.com/learning/topics/human-resources

Skill Development Activities Suggested

- Conduct a mock recruitment process including job analysis, candidate sourcing, and interviews.
- Develop a performance appraisal system and conduct a simulated performance review.
- Design and deliver a training program on a relevant HR topic.
- Analyze compensation and benefits structures for different organizations and present findings.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Implement and manage HR functions and strategies effectively within organizations.	L3
CO2	Develop and execute recruitment and selection processes, including legal and ethical considerations.	L4
CO3	Design and manage performance management systems, including appraisal and feedback mechanisms	L4
CO4	Evaluate and apply training and development programs and compensation strategies to enhance organizational performance	L5

Mapping of COs and POs:

Sl. No.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	2	1		3		2			
CO2		2	3	2			2		
CO3			3	3		2		3	
CO4	2	2	2	2	1		2		

Research methods in Business			
Course Code	**MAD202**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Learning objectives:

- To understand the fundamental principles and methodologies of business research.
- To develop skills in designing and conducting research studies.
- Toanalyze and interpret research data effectively.
- To apply research findings to make informed business decisions.

Module-1 (7 Hours)

Introduction to Research Methods:

Overview of Business Research, Importance and Purpose of Research, Types of Research (Descriptive, Analytical, Applied, Fundamental), Research Process and Methodology, Research Ethics and Legal Considerations, Literature Review and Research Question Formulation.

Module-2 (9 Hours)

Research Design and Methodology:

Research Design: Types and Techniques, Sampling Methods and Techniques, Data Collection Methods: Qualitative and Quantitative, Designing Questionnaires and Surveys, Measurement and Scaling Techniques, Validity and Reliability of Research Instruments.

Module-3 (9 Hours)

Data Analysis and Interpretation:

Data Analysis Techniques: Descriptive and Inferential Statistics, Hypothesis Testing and Analysis, Regression Analysis and Correlation, Data Interpretation and Presentation, Use of Statistical Software (e.g., SPSS, R), Reporting Research Findings.

Module-4 (9 Hours)

Qualitative Research Methods:

Qualitative Research Techniques: Interviews, Focus Groups, Observations, Content Analysis, Case Study Method, Data Coding and Thematic Analysis, Validity and Reliability in Qualitative Research, Ethical Issues in Qualitative Research.

Module-5 (9 Hours)

Quantitative Research Methods:

Quantitative Research Techniques: Surveys, Experiments, Longitudinal Studies, Cross-Sectional Studies, Use of Statistical Methods for Analysis, Survey Design and Sampling, Data Management and Cleaning, Ethical Considerations in Quantitative Research.

Module-6 (7 Hours)

Case Studies on Business Research Projects, Application of Research Methods to Real-World Problems, Comparative Analysis of Research Findings, Revision and Integration of Key Concepts, Group Presentations on Research Projects, Development and Presentation of Research Proposals, Application of Statistical Software for Data Analysis, Interpretation of Results and Recommendations.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- Business Research Methods, Donald R. Cooper & Pamela S. Schindler, McGraw-Hill Education, 12th edition, 2018.
- Research Methods for Business Students, Mark Saunders, Philip Lewis, & Adrian Thornhill, Pearson, 8th edition, 2019.
- Applied Business Research: Qualitative and Quantitative Methods, Robert A. Schindler, Wiley, 4th edition, 2019.
- Business Research: A Practical Guide for Undergraduate and Postgraduate Students, Jill Collis & Roger Hussey, Palgrave, 4th edition, 2019.

Web links and Video Lectures (e-Resources):

- **Coursera: Introduction to Research for Essay Writing**
  https://www.coursera.org/learn/intro-research-essay-writing
- **MIT OpenCourseWare: Principles of Research Methods**
  https://ocw.mit.edu/courses/economics/14-32-introduction-to-econometrics-spring-2011/
- **Khan Academy: Statistics and Probability**
  https://www.khanacademy.org/math/statistics-probability
- **Harvard Business Review: Research Articles**
  https://hbr.org/topic/research
- **LinkedIn Learning: Research Methods**
  https://www.linkedin.com/learning/topics/research-methods

Skill Development Activities Suggested

- Design and conduct a small-scale research study on a business problem.
- Develop a research proposal including objectives, methodology, and data collection methods.
- Analyze and present research findings using statistical tools and software.
- Critically review and discuss research papers and case studies in class.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Design and conduct research studies using appropriate methodologies and techniques.	L1
CO2	Analyze and interpret data using statistical and qualitative methods	L2
CO3	Develop and present research proposals and findings effectively	L3
CO4	Apply research findings to solve business problems and make informed decisions.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	

Corporate Finance			
Course Code	**MAD203**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- To understand the fundamental concepts and principles of corporate finance.
- To analyze financial statements and make informed financial decisions.
- To apply financial theories and models in real-world business scenarios.
- To evaluate investment opportunities and financing options.

Module-1 (7 Hours)

Introduction to Corporate Finance:

Overview of Corporate Finance, Objectives of Financial Management, Time Value of Money, Risk and Return, Financial Statements and Ratio Analysis, Financial Planning and Forecasting.

Module-2 (9 Hours)

Capital Budgeting:

Capital Budgeting Process, Types of Investment Projects, Cash Flow Estimation, Discounted Cash Flow Techniques, Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period, Profitability Index, Capital Budgeting Decisions.

Module-3 (9 Hours)

Cost of Capital and Capital Structure:

Cost of Capital: Definition and Calculation, Weighted Average Cost of Capital (WACC), Cost of Debt, Cost of Equity, Capital Structure Theories, Optimal Capital Structure, Financial Leverage, Impact of Capital Structure on Firm Value.

Module-4 (9 Hours)

Dividend Policy and Valuation:

Dividend Policy Theories, Dividend Decisions, Types of Dividends, Dividend Policy and Stock Prices, Valuation of Securities, Stock Valuation Models, Bond Valuation, Equity Valuation, Dividend Discount Model (DDM), Free Cash

Flow Valuation.

Module-5 (9 Hours)

Working Capital Management:
Components of Working Capital, Management of Cash, Receivables, and Inventories, Working Capital Financing, Operating Cycle and Cash Conversion Cycle, Techniques for Managing Working Capital, Short-Term Financing Options.

Module-6 (7 Hours)

Application and Case Studies:
Case Studies on Corporate Finance Decisions, Application of Financial Models to Real-World Scenarios, Analysis of Financial Statements of Public Companies, Comparative Analysis of Financing Options, Revision and Integration of Key Concepts, Group Presentations on Financial Analysis Projects, Evaluation of Capital Budgeting Proposals.

Assessment Details (both CIE and SEE)
The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:
There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:
a) Tests (for 25Marks) and
b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:
The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:
Books

- Principles of Corporate Finance, Richard A. Brealey, Stewart C. Myers, Franklin Allen, McGraw-Hill Education, 13th edition, 2021.
- Corporate Finance, Jonathan Berk, Peter DeMarzo, Pearson, 5th edition, 2021.
- Fundamentals of Corporate Finance, Richard A. Brealey, Stewart C. Myers, Franklin Allen, McGraw-Hill Education, 11th edition, 2019.
- Corporate Finance: Theory and Practice, Aswath Damodaran, Wiley, 2nd edition, 2014.

Web links and Video Lectures (e-Resources):

- **Coursera: Financial Management**
  https://www.coursera.org/learn/financial-management
- **MIT OpenCourseWare: Corporate Finance**
  https://ocw.mit.edu/courses/sloan-school-of-management/15-401-introduction-to-financial-and-managerial-accounting-spring-2008/
- **Khan Academy: Finance and Capital Markets**
  https://www.khanacademy.org/economics-finance-domain/core-finance
- **Harvard Business Review: Finance Articles**
  https://hbr.org/topic/finance
- **LinkedIn Learning: Corporate Finance**

https://www.linkedin.com/learning/topics/corporate-finance

Skill Development Activities Suggested

- Analyze and present financial statements of a company.
- Develop and evaluate a capital budgeting proposal.
- Conduct a comparative analysis of different financing options for a business.
- Prepare and present a report on the impact of dividend policy on firm value.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Apply financial theories and models to make informed corporate finance decisions	L1
CO2	Analyze financial statements and evaluate investment opportunities.	L2
CO3	Develop and implement effective capital budgeting and financing strategies.	L3
CO4	Assess and apply dividend policies and valuation techniques to real-world scenarios.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2			2				2		
CO3				3				2	
CO4		2		2					3

Entrepreneurship Development & Legal Aspects			
Course Code	**MAD204**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Learning objectives:

- To understand the fundamentals of entrepreneurship and the entrepreneurial process.
- To analyze and evaluate business opportunities and legal considerations for startups.
- To apply principles of entrepreneurship in real-world scenarios.
- To comprehend the legal aspects affecting business operations and entrepreneurship.

Module-1 (8 Hours)

Introduction to Entrepreneurship:

Definition and Importance of Entrepreneurship, Types of Entrepreneurs, The Entrepreneurial Mindset, Entrepreneurial Characteristics, The Entrepreneurial Process, Identifying and Evaluating Business Opportunities, Role of Innovation in Entrepreneurship.

Module-2 (9 Hours)

Business Planning and Development:

Business Model Canvas, Business Plan Components, Market Research and Analysis, Feasibility Studies, SWOT Analysis, Business Strategy Formulation, Financing Options for Startups, Preparing and Presenting a Business Plan.

Module-3 (9 Hours)

Legal Aspects of Entrepreneurship:

Legal Forms of Business Organizations, Registration and Licensing Requirements, Intellectual Property Rights, Contracts and Agreements, Employment Laws and Regulations, Legal Compliance and Ethical Issues, Understanding Business Laws and Regulations.

Module-4 (9 Hours)

Finance and Accounting for Startups:
Financial Planning and Budgeting, Managing Startup Finances, Accounting Principles and Practices, Fundraising Strategies, Venture Capital and Angel Investors, Financial Statements and Reporting, Managing Cash Flow and Financial Risks.

Module-5 (9 Hours)

Growth and Scaling:
Strategies for Business Growth, Scaling Operations, Managing Expansion Challenges, Strategic Partnerships and Alliances, Market Penetration and Expansion, Innovation and Technology Integration, Case Studies on Successful Entrepreneurs and Enterprises.

Module-6 (7 Hours)

Application and Case Studies:
Case Studies on Entrepreneurship, Business Planning Exercises, Application of Legal Concepts in Startup Scenarios, Comparative Analysis of Legal Structures, Revision and Integration of Key Concepts, Group Presentations on Entrepreneurial Projects, Evaluation of Business Plans and Startup Proposals.

Assessment Details (both CIE and SEE)
The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:
There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:
a) Tests (for 25Marks) and
b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:
The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:
Books

•*Entrepreneurship: Theory, Process, and Practice*, Donald F. Kuratko, Cengage Learning, 11th edition, 2020.
•*The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Eric Ries, Crown Business, 2011.
•*Entrepreneurship and Small Business Management*, Steve Mariotti, Pearson, 6th edition, 2017.
•*Business Law and the Regulation of Business*, Richard A. Mann, Barry S. Roberts, Cengage Learning, 14th edition, 2021.

Web links and Video Lectures (e-Resources):

- **Coursera: Innovation and Entrepreneurship**
  https://www.coursera.org/learn/innovation-entrepreneurship
- **MIT OpenCourseWare: Entrepreneurial Management**

https://ocw.mit.edu/courses/sloan-school-of-management/15-390-entrepreneurial-management-fall-2004/

- **Khan Academy: Entrepreneurship**
  https://www.khanacademy.org/economics-finance-domain/entrepreneurship
- **Harvard Business Review: Entrepreneurship Articles**
  https://hbr.org/topic/entrepreneurship
- **LinkedIn Learning: Entrepreneurship**
  https://www.linkedin.com/learning/topics/entrepreneurship

Skill Development Activities Suggested

- Develop a comprehensive business plan for a startup idea.
- Analyze and present case studies of successful and failed startups.
- Create and simulate legal documents such as contracts and agreements for a new business.
- Conduct market research and feasibility analysis for a proposed business venture.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Identify and evaluate business opportunities and develop a business plan	L1
CO2	Understand and apply legal principles relevant to entrepreneurship	L2
CO3	Analyze financial and accounting issues related to startups.	L3
CO4	Evaluate strategies for business growth and scaling.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	

Big Data Management and Security(Lab)			
Course Code	**MAD205**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- To understand the fundamentals of big data and its management techniques.
- Toanalyze and implement big data technologies and tools.
- To apply security measures and practices in big data environments.
- To evaluate and address challenges related to big data management and security.

and industry.

Module-1 (7 Hours)

Introduction to Big Data:

Definition and Characteristics of Big Data, Big Data Technologies and Ecosystem, Data Sources and Types, Big Data Architecture, Overview of Big Data Processing Frameworks, Data Warehousing vs. Big Data, Challenges and Opportunities in Big Data.

Module-2 (9 Hours)

Big Data Management Tools and Techniques:

Hadoop Ecosystem: HDFS, MapReduce, YARN, Apache Hive, Apache HBase, Apache Spark, Data Integration and ETL Processes, Data Storage and Retrieval, Performance Optimization Techniques.

Module-3 (9 Hours)

Data Security and Privacy in Big Data:
Data Security Concepts and Principles, Encryption Techniques, Access Control Mechanisms, Data Masking and Anonymization, Privacy Laws and Regulations, Security Challenges in Big Data Environments, Case Studies on Data Breaches and Security Incidents.

Module-4 (9 Hours)

Big Data Analytics and Visualization:
Data Analytics Techniques: Descriptive, Predictive, Prescriptive Analytics, Tools for Big Data Analytics: Apache Pig, Apache Flink, Data Visualization Tools and Techniques, Creating Dashboards and Reports, Interpreting and Communicating Data Insights.

Module-5 (9 Hours)

Emerging Trends and Applications in Big Data:
Machine Learning and AI in Big Data, IoT and Big Data, Cloud-Based Big Data Solutions, Real-Time Data Processing, Big Data for Business Intelligence, Ethical Considerations in Big Data, Future Trends and Innovations.

Module-6 (7 Hours)

Application and Case Studies:
Case Studies on Big Data Management and Security, Application of Big Data Tools and Techniques, Comparative Analysis of Big Data Solutions, Revision and Integration of Key Concepts, Group Presentations on Big Data Projects, Evaluation of Big Data Implementations.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

1. Big Data: Principles and Paradigms, Rajkumar Buyya, et al., Wiley, 2016.
2. Data Management for Researchers: Organize, Analyze, and Share Your Data for Research Success, Kristin Briney, Pelagic Publishing, 2015.
3. Big Data Security Analytics: How Data Analytics and Machine Learning are Helping to Combat Cybercrime, David Linthicum, O'Reilly Media, 2019.
4. Big Data: A Revolution That Will Transform How We Live, Work, and Think, Viktor Mayer-Schönberger and Kenneth Cukier, Eamon Dolan/Houghton Mifflin Harcourt, 2013.

Web links and Video Lectures (e-Resources):

- Coursera: Big Data Specialization https://www.coursera.org/specializations/big-data
- MIT OpenCourseWare: Introduction to Big Data https://ocw.mit.edu/courses/media-arts-and-sciences/mas-s62-introduction-to-big-data-fall-2017/

- Khan Academy: Statistics and Probabilityhttps://www.khanacademy.org/math/statistics-probability
- Harvard Business Review: Big Data Articleshttps://hbr.org/topic/big-data
- LinkedIn Learning: Big Datahttps://www.linkedin.com/learning/topics/big-data

Skill Development Activities Suggested

- Implement a big data project using Hadoop or Spark.
- Analyze and visualize large datasets using relevant tools and techniques.
- Develop a data security strategy for a big data environment.
- Conduct a case study analysis on a recent big data breach.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Define and explain the fundamentals of big data management	L1
CO2	Apply big data tools and techniques for data processing and analysis	L2
CO3	Analyze data security challenges and implement measures in big data environments.	L3
CO4	Evaluate and address emerging trends and applications in big data.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3		1			3			
CO2	3	2		1			3		
CO3	2				1			1	
CO4	2		3		1				1

Introduction to Machine Learning (Lab)			
Course Code	**MAD206**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Learning objectives:

- To gain practical experience with machine learning algorithms and tools.
- To apply machine learning techniques to real-world datasets.
- To evaluate and fine-tune machine learning models.
- To understand the practical challenges in implementing machine learning solutions.

Module-1 (7 Hours)

Introduction to Machine Learning Tools and Environments:

Setting up Machine Learning Environment, Introduction to Python for Machine Learning, Overview of Key Libraries: NumPy, pandas, scikit-learn, TensorFlow, and Keras, Jupyter Notebooks for Data Analysis and Visualization.

Module-2 (9 Hours)

Data Preprocessing and Exploration:

Loading and Cleaning Datasets, Handling Missing Values and Outliers, Feature Scaling and Normalization, Exploratory Data Analysis (EDA), Visualizing Data Distributions and Relationships.

Module-3 (9 Hours)

Supervised Learning Algorithms:

Implementing Regression Models: Linear Regression, Polynomial Regression, Implementing Classification Models: Logistic Regression, k-Nearest Neighbors (k-NN), Decision Trees, and Random Forests, Model Evaluation Metrics: Accuracy, Precision, Recall, F1-Score.

Module-4 (9 Hours)

Unsupervised Learning Algorithms:
Implementing Clustering Models: k-Means Clustering, Hierarchical Clustering, Dimensionality Reduction Techniques: Principal Component Analysis (PCA), Anomaly Detection.

Module-5 (9 Hours)

Model Tuning and Validation:
Hyperparameter Tuning: Grid Search and Random Search, Cross-Validation Techniques, Model Selection and Evaluation, Addressing Overfitting and Underfitting, Performance Metrics and Model Improvement Strategies.

Module-6 (7 Hours)

Application and Case Studies:
Hands-On Projects: Building and Evaluating Machine Learning Models on Real Datasets, Case Studies on Machine Learning Applications, Presentation of Lab Projects and Findings, Revision and Integration of Key Concepts.

Assessment Details (both CIE and SEE)
The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:
There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:
a) Tests (for 25Marks) and
b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:
The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:
Books

- Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, Aurélien Géron, O'Reilly Media, 2022.
- Introduction to Machine Learning with Python: A Guide for Data Scientists, Andreas C. Müller & Sarah Guido, O'Reilly Media, 2016.
- Machine Learning Yearning, Andrew Ng, self-published, 2018.
- Pattern Recognition and Machine Learning, Christopher M. Bishop, Springer, 2006.

Web links and Video Lectures (e-Resources):

- Coursera: Machine Learning by Andrew Ng https://www.coursera.org/learn/machine-learning
- MIT OpenCourseWare: Introduction to Machine Learning https://ocw.mit.edu/courses/media-arts-and-sciences/mas-s62-introduction-to-machine-learning-fall-2017/
- Khan Academy: Machine Learning https://www.khanacademy.org/computing/computer-science/machine-learning
- Harvard Business Review: Machine Learning Articles https://hbr.org/topic/machine-learning
- LinkedIn Learning: Machine Learning https://www.linkedin.com/learning/topics/machine-learning

Skill Development Activities Suggested

- Implement a machine learning model using different algorithms on a given dataset.
- Perform data preprocessing and visualization tasks using Python libraries.
- Participate in a group project to solve a real-world problem with machine learning techniques.

- Analyze and present findings from a case study involving machine learning applications.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Set up and configure a machine learning environment and tools	L1
CO2	Apply data preprocessing and exploration techniques to prepare datasets for analysis.	L2
CO3	Implement and evaluate various machine learning algorithms and models.	L3
CO4	Analyze and present machine learning project results and solutions to real-world problems.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2			2				2		
CO3				3				2	
CO4		2		2					3

III SEMESTER

Analytics toolkit for Decision Sciences			
Course Code	**MAD301**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Learning objectives:

1. Understand the fundamental concepts and tools used in data analytics for decision making.
2. Analyze data using statistical and machine learning techniques to support business decisions.
3. Develop proficiency in using analytical software and tools.
4. Apply analytics to solve real-world business problems.

Module-1 (7 Hours)

Introduction to Analytics and Decision Sciences: Introduction to Data Analytics, Importance in Decision Sciences, Types of Analytics: Descriptive, Predictive, Prescriptive, Data-Driven Decision Making, Tools and Software for Analytics, Ethical Considerations in Analytics.

Module-2 (9 Hours)

Data Collection and Data Management: Data Collection Methods, Data Cleaning and Preparation, Data Warehousing, Data Integration, Handling Missing Data, Data Management Best Practices, Introduction to Big Data and Data Lakes.

Module-3 (9 Hours)

Descriptive Analytics: Descriptive Statistics, Data Visualization Techniques, Exploratory Data Analysis (EDA), Summarizing Data Distributions, Identifying Patterns and Trends, Introduction to Business Intelligence (BI) Tools, Reporting and Dashboards.

Module-4 (9 Hours)

Predictive Analytics: Introduction to Predictive Modeling, Regression Analysis, Time Series Analysis, Classification Techniques, Model Evaluation and Validation, Overfitting and Underfitting, Case Studies on Predictive Analytics Applications.

Module-5 (9 Hours)

Prescriptive Analytics and Optimization: Introduction to Prescriptive Analytics, Linear and Non-Linear Optimization, Decision Trees, Simulation, Risk Analysis, Optimization in Resource Allocation, Case Studies on Prescriptive Analytics Applications.

Module-6 (7 Hours)

Application and Case Studies: Case Studies on Data Analytics Projects, Application of Analytics to Real-World Business Problems, Comparative Analysis of Analytical Models, Revision and Integration of Key Concepts, Group Presentations on Analytical Projects.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

1. Data Science for Business, Foster Provost & Tom Fawcett, 1/e, O'Reilly Media, 2013.
2. Business Analytics: Data Analysis & Decision Making, S. Christian Albright & Wayne L. Winston, 5/e, Cengage Learning, 2014.
3. Data Mining for Business Intelligence, Galit Shmueli, Nitin R. Patel & Peter C. Bruce, 2/e, Wiley, 2010.
4. The Data Warehouse Toolkit, Ralph Kimball & Margy Ross, 3/e, Wiley, 2013.
5. Business Intelligence Guidebook: From Data Integration to Analytics, Rick Sherman, 1/e, Morgan Kaufmann, 2014.

Web links and Video Lectures (e-Resources):

- Coursera: Data Science Specialization https://www.coursera.org/specializations/jhu-data-science
- MITOpenCourseWare: The Analytics Edge https://ocw.mit.edu/courses/sloan-school-of-management/15-071-the-analytics-edge-spring-2017/
- Khan Academy: Statistics and Probability https://www.khanacademy.org/math/statistics-probability
- Harvard Business Review: Data Analytics Articles https://hbr.org/topic/data-analytics
- LinkedIn Learning: Business Analytics https://www.linkedin.com/learning/topics/business-analytics
- YouTube: Introduction to Data Analytics https://www.youtube.com/watch?v=5TgBd6r031M
- YouTube: Data Analytics Full Course https://www.youtube.com/watch?v=6oLtP3wUBeA

Skill Development Activities Suggested

- Analyze a dataset and present the findings using visualization tools.
- Develop a simple predictive model using regression analysis.
- Create a dashboard using BI tools to report key metrics of a given business scenario.
- Conduct a simulation study to optimize resource allocation for a business process.
- Prepare a group presentation on the application of analytics to a real-world business problem.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOM'S LEVEL
CO1	Understand fundamental concepts and tools used in data analytics for decision making.	L1
CO2	Analyze data using statistical and machine learning techniques to support business decisions.	L2
CO3	Develop proficiency in using analytical software and tools.	L3
CO4	Apply analytics to solve real-world business problems.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	

Deep Learning- I (Lab)			
Course Code	**MAD302**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Learning objectives:

- Understand the fundamental concepts of deep learning and its applications.
- Develop and implement deep learning models using popular frameworks.
- Evaluate the performance of deep learning models.
- Apply deep learning techniques to solve real-world problems

Module-1 (7 Hours)
Introduction to Deep Learning: Basics of Neural Networks, Activation Functions, Loss Functions, Introduction to Deep Learning Frameworks, Setting up the Environment for Deep Learning.
Module-2 (9 Hours)
Deep Learning Models and Architectures: Feedforward Neural Networks, Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Long Short-Term Memory (LSTM) Networks, Model Training and Optimization.
Module-3 (9 Hours)
Advanced Deep Learning Techniques: Transfer Learning, Generative Adversarial Networks (GANs), Autoencoders, Attention Mechanisms, Sequence-to-Sequence Models.
Module-4 (9 Hours)
Deep Learning Tools and Libraries: TensorFlow, Keras, PyTorch, Practical Implementation of Models, Hyperparameter Tuning, Model Evaluation and Validation.
Module-5 (9 Hours)
Applications of Deep Learning: Image Recognition, Natural Language Processing (NLP), Speech Recognition, Anomaly Detection, Case Studies on Real-World Applications of Deep Learning.
Module-6 (7 Hours)
Application and Case Studies: Case Studies on Deep Learning Projects, Application of Deep Learning to Real-World Problems, Comparative Analysis of Deep Learning Models, Revision and Integration of Key Concepts, Group Presentations on Deep Learning Projects.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- Deep Learning, Ian Goodfellow, Yoshua Bengio, Aaron Courville, MIT Press, 2016.
- Neural Networks and Deep Learning, Michael Nielsen, Determination Press, 2015.
- Deep Learning with Python, Francois Chollet, Manning Publications, 2017.
- Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, Aurélien Géron, O'Reilly Media, 2019.
- Pattern Recognition and Machine Learning, Christopher M. Bishop, Springer, 2006.

Web links and Video Lectures (e-Resources):

- Coursera: Deep Learning Specialization https://www.coursera.org/specializations/deep-learning
- MITOpenCourseWare: Deep Learning for Self-Driving Cars https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-985j-deep-learning-for-self-driving-cars-january-iap-2019/
- Khan Academy: Neural Networks and Deep Learning https://www.khanacademy.org/science/computer-science/neural-networks
- Harvard Business Review: Deep Learning Articles https://hbr.org/topic/deep-learning
- LinkedIn Learning: Deep Learning https://www.linkedin.com/learning/topics/deep-learning
- YouTube: Deep Learning Course - Full Tutorial https://www.youtube.com/watch?v=aircAruvnKk
- YouTube: Deep Learning in 5 Minutes https://www.youtube.com/watch?v=9dZh0T1xzt8

Skill Development Activities Suggested

- Develop a simple neural network to classify handwritten digits.
- Implement a convolutional neural network for image classification.
- Create a sequence-to-sequence model for text translation.
- Conduct a project on transfer learning using a pre-trained model.
- Prepare a group presentation on the application of deep learning to a real-world problem.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOM'S LEVEL
CO1	Understand fundamental concepts of deep learning and its applications.	L1
CO2	Develop and implement deep learning models using popular frameworks.	L2
CO3	Evaluate the performance of deep learning models.	L3
CO4	Apply deep learning techniques to solve real-world problems.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	

Natural Language Processing (NLP)			
Course Code	**MAD303**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Learning objectives:

- Understand the fundamental concepts and techniques in NLP.
- Implement text preprocessing and feature extraction methods.
- Build and evaluate machine learning models for various NLP tasks.
- Explore advanced topics in NLP, such as deep learning models and language generation.
- Apply NLP techniques to real-world problems in different domains.

Module-1 (7 Hours)

Introduction to NLP:

Definition, History, and Applications of NLPChallenges in NLP: Ambiguity, Context, and SemanticsNLP Pipeline: Tokenization, Stop Words Removal, Stemming, Lemmatization

Module-2 (9 Hours)

Text Representation and Feature Engineering:Bag-of-Words ModelTF-IDF (Term Frequency-Inverse Document Frequency)Word Embeddings: Word2Vec, GloVe

Module-3 (9 Hours)

NLP Techniques and Applications:Sentiment Analysis, Named Entity Recognition (NER), Text Classification and Topic Modeling

Module-4 (9 Hours)

Deep Learning for NLP:Recurrent Neural Networks (RNNs) and LSTM, Convolutional Neural Networks (CNNs) for Text, Transformer Models: BERT, GPT

Module-5 (9 Hours)

Advanced Topics in NLP:Sequence-to-Sequence Models, Language Generation: Neural Machine Translation, Text Summarization, Ethical and Social Implications of NLP

Module-6 (7 Hours)

Applications of NLP:NLP in Healthcare: Clinical Text Mining, Medical Diagnosis, NLP in Finance: Sentiment Analysis for Stock Market Prediction, NLP in Social Media and Customer Feedback Analysis

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- **Speech and Language Processing** by Daniel Jurafsky and James H. Martin
- **Natural Language Processing with Python** by Steven Bird, Ewan Klein, and Edward Loper
- **Deep Learning for Natural Language Processing** by Palash Goyal and Sumit Pandey
- **Foundations of Statistical Natural Language Processing** by Christopher D. Manning and Hinrich Schütze

Web links and Video Lectures (e-Resources):

- Coursera: Natural Language Processing Specialization
- Stanford CS224N: Natural Language Processing with Deep Learning Google Analytics Academy

Skill Development Activities Suggested

- Implement NLP algorithms and models using Python libraries such as NLTK, spaCy, and TensorFlow.
- Participate in Kaggle competitions focused on NLP tasks like sentiment analysis or text classification.
- Read and present research papers on recent advancements in NLP.

- Engage in group projects to apply NLP techniques to specific domains such as healthcare or finance.
- Debate and discuss ethical considerations in using NLP for automated decision-making.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Implement basic NLP techniques for text preprocessing and feature extraction.	L2
CO2	Build and evaluate machine learning models for various NLP tasks.	L3
CO3	Apply advanced NLP techniques, including deep learning models, to solve real-world problems.	L4
CO4	Evaluate ethical and social implications of NLP applications.	L5

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	
CO5					2				3

Data Visualization (Lab)			
Course Code	**MAD304**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Learning objectives:

- Understand the fundamental concepts of deep learning.
- Implement neural networks and deep learning algorithms.
- Explore different architectures of neural networks.
- Apply deep learning techniques to solve real-world problems.

Module-1 (7 Hours)

Module-1: Introduction to Deep Learning: Basics of Neural Networks, Activation Functions, Loss Functions, Gradient Descent, Backpropagation, Introduction to Deep Learning Frameworks (TensorFlow, PyTorch).

Module-2 (9 Hours)

Feedforward Neural Networks: Architecture, Training, Regularization Techniques, Hyperparameter Tuning, Performance Metrics, Case Studies and Applications.

Module-3 (9 Hours)

Convolutional Neural Networks: Convolution Operation, Pooling, CNN Architectures, Transfer Learning, Applications in Image Processing, Case Studies and Applications.

Module-4 (9 Hours)

Recurrent Neural Networks: Architecture, Backpropagation Through Time, Long Short-Term Memory (LSTM), Gated Recurrent Units (GRU), Applications in Sequence Data, Case Studies and Applications.

Module-5 (9 Hours)

Generative Adversarial Networks: Introduction to GANs, Architecture, Training GANs, Applications in Data Generation, Case Studies and Applications.

Module-6 (7 Hours)

Teachable Topics: Implementation of Deep Learning Models, Comparison of Different Architectures, Performance Optimization, Group Presentations on Deep Learning Projects

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- "Deep Learning," Ian Goodfellow, Yoshua Bengio, and Aaron Courville, MIT Press, 2016.
- "Neural Networks and Deep Learning," Michael Nielsen, Determination Press, 2015.
- "Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow," Aurélien Géron, O'Reilly Media, 2019.
- "Deep Learning with Python," François Chollet, Manning Publications, 2018.
- "Python Deep Learning," Ivan Vasilev, Packt Publishing, 2017.

Web links and Video Lectures (e-Resources):

- Coursera: Deep Learning Specialization https://www.coursera.org/specializations/deep-learning
- MITOpenCourseWare: Deep Learning for Self-Driving Cars https://ocw.mit.edu/courses/6-867-deep-learning-for-self-driving-cars-fall-2020/
- Khan Academy: Introduction to Deep Learning https://www.khanacademy.org/computing/computer-science/information-theory
- Harvard Business Review: Deep Learning Articles https://hbr.org/search?term=deep+learning
- YouTube: Introduction to Deep Learning https://www.youtube.com/watch?v=5TgBd6r031M
- YouTube: Deep Learning Full Course https://www.youtube.com/watch?v=6oLtP3wUBeA

Skill Development Activities Suggested

- Analyze a dataset and present the findings using visualization tools.

- Develop a simple predictive model using regression analysis.
- Create a dashboard using BI tools to report key metrics of a given business scenario.
- Conduct a simulation study to optimize resource allocation for a business process.
- Prepare a group presentation on the application of analytics to a real-world business problem.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Understand fundamental concepts and tools used in data analytics for decision making.	L1
CO2	Analyze data using statistical and machine learning techniques to support business decisions.	L2
CO3	Develop proficiency in using analytical software and tools.	L3
CO4	Apply analytics to solve real-world business problems.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1								
CO2		2	2						2
CO3				3			3		2
CO4		2		2					2

Evolutionary Algorithms			
Course Code	**MAD305**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Objectives:

1. Understand the fundamental concepts and principles of evolutionary algorithms.
2. Implement various evolutionary algorithms to solve optimization problems.
3. Analyze the performance of different evolutionary algorithms.
4. Apply evolutionary algorithms to real-world problems.

Module-1 (7 Hours)

Introduction to Evolutionary Algorithms: Overview of Evolutionary Algorithms, Biological Inspiration, Genetic Algorithms, Genetic Programming, Evolution Strategies, Differential Evolution.

Module-2 (9 Hours)

Genetic Algorithms: Representation, Selection, Crossover, Mutation, Fitness Evaluation, Niching and Speciation, Applications of Genetic Algorithms.

Module-3 (9 Hours)

Evolution Strategies and Differential Evolution: Representation, Selection, Recombination, Mutation, Self-Adaptation, Comparison of Evolution Strategies and Differential Evolution, Applications.

Module-4 (9 Hours)

Genetic Programming: Tree-Based Representation, Evolutionary Operators, Fitness Evaluation, Applications of Genetic Programming, Comparison with Other Evolutionary Algorithms.

Module-5 (9 Hours)

Advanced Topics in Evolutionary Algorithms: Multi-Objective Optimization, Constraint Handling, Co-Evolution, Hybrid Evolutionary Algorithms, Real-World Applications.

Module-6 (7 Hours)

Implementation of Evolutionary Algorithms, Analysis and Comparison of Algorithm Performance, Real-World Case Studies, Group Projects and Presentations.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- "Genetic Algorithms in Search, Optimization, and Machine Learning," David E. Goldberg, Addison-Wesley, 1989.
- "An Introduction to Genetic Algorithms," Melanie Mitchell, MIT Press, 1998.
- "Evolutionary Computation: Principles and Practice," Thomas Bäck, Addison-Wesley, 1996.
- "Genetic Programming: An Introduction," Wolfgang Banzhaf, Peter Nordin, Robert E. Keller, Frank D. Francone, Morgan Kaufmann, 1998.
- "Handbook of Evolutionary Computation," Thomas Bäck, David B. Fogel, Zbigniew Michalewicz, CRC Press, 1997.

Web links and Video Lectures (e-Resources):

- Coursera: Evolutionary Algorithms https://www.coursera.org/learn/evolutionary-algorithms
- MITOpenCourseWare: Genetic Algorithms and Evolutionary Computation https://ocw.mit.edu/courses/genetic-algorithms-and-evolutionary-computation
- Khan Academy: Probability and Statistics https://www.khanacademy.org/math/statistics-probability
- Harvard Business Review: Algorithm Articles https://hbr.org/search?term=algorithms
- LinkedIn Learning: Genetic Algorithms https://www.linkedin.com/learning/topics/genetic-algorithms
- YouTube: Evolutionary Algorithms Tutorial https://www.youtube.com/watch?v=TFe7kzQuSZs
- YouTube: Genetic Algorithms and Evolutionary Computation https://www.youtube.com/watch?v=uqXVAo3mmSE

Skill Development Activities Suggested

- Implement various evolutionary algorithms to solve optimization problems.
- Analyze the performance of different evolutionary algorithms on benchmark functions.
- Develop a hybrid evolutionary algorithm combining features from different algorithms.
- Apply evolutionary algorithms to real-world optimization problems.
- Conduct a comparative study on the efficiency of various evolutionary algorithms.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Understand fundamental concepts and principles of evolutionary algorithms.	L1
CO2	Implement and apply genetic algorithms, genetic programming, and other evolutionary strategies.	L2
CO3	Analyze the performance of evolutionary algorithms and compare their efficiencies.	L3
CO4	Apply evolutionary algorithms to solve real-world optimization problems.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1								
CO2		2	2						2
CO3				3			3		2
CO4		2		2					2

Professional Business Communication			
Course Code	**MAD306**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- To enable the students to become aware of their communication skills and sensitize them to their potential to become successful managers.
- To enable learners with the mechanics of writing and also help them to draft business letters in
- English precisely and effectively.
- To introduce the students to some of the practices in managerial communication those are in vogue.
- To prepare students to develop the art of business communication with emphasis on analysing business situations.
- To train Students towards drafting business proposals.

Module-1 (7 Hours)

Introduction: Meaning & Definition, Role, Classification, Purpose of communication, Communication Process, Characteristics of successful communication, Importance of communication in management, Communication structure in organization, Communication in conflict resolution, Communication in crisis. Communication and negotiation, Communication in a cross-cultural setting, Barriers to communication.

Module-2 (9 Hours)

Oral Communication: Meaning, Principles of successful oral communication, Barriers to oral communication, Conversation control, Reflection and Empathy: two sides of effective oral communication. Modes of Oral Communication, Effectiveness of oral communication.
Listening as a Communication Skill: Approaches to listening, how to be a better listener, Process of listening, Nonverbal communication: Meaning, classification.

Module-3 (9 Hours)

Written Communication: Purpose of writing, Clarity in writing, Principles of effective writing, Approaching the writing process systematically: The 3X3 writing process for business communication Pre writing, Writing, Revising. Audience analysis, Writing Positive, Neutral, Persuasive and Bad-news Messages.

Types of Written Communication In Business: Business Letters: Introduction To Business Letters, Types of Business Letters, Writing Routine And Persuasive Letters, Positive And Negative Messages Writing, Employee Reviews, Recommendation Letters, Thank You Letters.

Module-4 (9 Hours)

Business Reports: Purpose, Kinds and Objectives of reports , Organization & Preparing reports, short and long reports Writing Proposals: Structure &preparation , Writing memos, Media Management:The press release, Press conference, Media interviews.
Group Communication: Meetings, Planning meetings, objectives , participants , timing , venue ofmeetings.
Meeting Documentation: Notice, Agenda and Resolution & Minutes.

Module-5 (9 Hours)

Case method of learning: Understanding the case method of learning , different types of cases , overcoming the difficulties of the case method , reading a case properly , case analysis approaches , analyzing the case, dos and don'ts for case preparation.
Employment Communication: Introduction, Writing CVs, Group discussion, Interview skills.
Impact of Technological Advancement on Business Communication, Technology-enabled Communication-Communication networks, Intranet, Internet, E-Mails, SMS, teleconferencing,videoconferencing.

Module-6 (7 Hours)

Presentation and Negotiation skills: Presentation: What is a presentation, Elements of presentation, Designing & Delivering Business Presentations, Advanced Visual Support for managers.
Negotiation skills: Definition of negotiation, Nature and need for negotiation, Factors affecting negotiation, Stages of negotiation process, Negotiation strategies.
Etiquette Advantage in Managerial Communication: Meaning, types and advantages of Etiquette.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and
b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight iscompulsory.

Suggested Learning Resources:

Books

1. Business Communication: Concepts, Cases and Applications- Chaturvedi P. D, & Mukesh Chaturvedi, 4/e, Pearson Education, 2020.
2. Communicating in Business: Ober and Newman, Cengage learning, 8th Edition, 2018.
3. Business Communication: Process and Product, Mary Ellen Guffey, 3/e, Cengage Learning, 2002.
4. Business and Professional Communication: Kelly M, Quintanilla, Shawn T and Wahl, SAGE

South Asia Edition, 2017.
5. Business Communication: Lesikar, Flatley, Rentz & Pande, 12/e, TMH, 2014.
6. Communicating in Business: Williams, Krizan, Logan and Merrier, Cengage Learning, 8/e, 2017.
7. Contemporary Business Communication - Scot Ober-Biztanntra, 5/e, 2015.
8. Advanced Business Communication, Penrose, Rasberry, Myers, 5/e, Cengage Learning, 2004.

Web links and Video Lectures (e-Resources):

- https://www.youtube.com/watch?v=yml9dx9nUco
- https://www.edx.org/learn/business-communications
- https://onlinecourses.swayam2.ac.in/imb19_mg14/preview
- https://www.careers360.com/courses-certifications/swayam-communication-courses-brp-org
- https://dcomm.org/wp-content/uploads/2019/05/Business-Communication-PDFDrive.com-.pdf
- http://www.mim.ac.mw/books/Business%20Communication.pdf
- https://www.researchgate.net/publication/347508593_A_Practical_Book_of_Business_Communication_A_Practical_Book_of_Business_Communication_Published_by
- https://2012books.lardbucket.org/pdfs/communication-for-business-success-canadianedition.pdf
- https://sagepub.libguides.com/c.php?g=964634&p=6968892
- https://nptel.ac.in/courses/110105052
- https://www.caclubindia.com/coaching/cseet-business-communication-ca-agrika-khatrionline-classes-3476.asp

Skill Development Activities Suggested

- Students enact and analyze the non-verbal cues.
- Demonstrating using Communication Equipments like Fax, Telex, Intercoms, etc.
- Demonstrating Video conferencing & teleconferencing in the class.
- Conduct a mock meeting of students in the class identifying an issue of their concern. The students should prepare notice, agenda and minutes of the meeting.
- Each student to give presentation of 5 minutes (this can be spread throughout the semester) and to be evaluated by the faculty.
- Organize a mock press conference addressing to the launch of new product by an organization.
- Students should be given an assignment to draft a proposal to undertake research project

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Gain practical experience in financial accounting.	L1
CO2	Acquire conceptual knowledge of financial accounting principles and standards.	L2
CO3	Comprehend and apply accounting techniques to prepare and analyze financial statements.	L3
CO4	Analyze financial data and trends using various financial analysis tools.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2			2				2		
CO3				3				2	
CO4		2		2					3

INTERNSHIP

IV SEMESTER

Advanced Machine Learning(Lab)			
Course Code	**MAD401**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- To understand advanced machine learning algorithms and their applications.
- To implement machine learning models for complex data sets.
- To evaluate and optimize machine learning models.
- To apply machine learning techniques to real-world problems.

Module-1 (7 Hours)
Introduction to Advanced Machine Learning: Overview of Advanced Machine Learning, Supervised vs. Unsupervised Learning, Semi-Supervised and Reinforcement Learning, Evaluation Metrics for Machine Learning Models.
Module-2 (9 Hours)
Ensemble Methods: Bagging, Boosting, Random Forests, Gradient Boosting Machines, Stacking, Applications of Ensemble Methods.
Module-3 (9 Hours)
Deep Learning: Neural Networks, Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Long Short-Term Memory (LSTM), Autoencoders, Applications of Deep Learning.
Module-4 (9 Hours)
Natural Language Processing (NLP): Text Preprocessing, Word Embeddings, Sequence Models, Transformer Models, Applications of NLP in Sentiment Analysis, Text Classification, and Machine Translation.
Module-5 (9 Hours)
Advanced Topics in Machine Learning: Transfer Learning, Generative Adversarial Networks (GANs), Reinforcement Learning, Hyperparameter Tuning, Model Interpretability, Ethical Considerations in Machine Learning.
Module-6 (7 Hours)
Teachable Topics: Implementing and Fine-Tuning Advanced Machine Learning Models, Case Studies on Machine Learning Applications, Analysis and Optimization of Model Performance, Group Projects and Presentations.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- "Pattern Recognition and Machine Learning," Christopher M. Bishop, Springer, 2006.
- "Deep Learning," Ian Goodfellow, Yoshua Bengio, Aaron Courville, MIT Press, 2016.
- "Machine Learning: A Probabilistic Perspective," Kevin P. Murphy, MIT Press, 2012.
- "Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow," Aurélien Géron, O'Reilly Media, 2019.
- "Reinforcement Learning: An Introduction," Richard S. Sutton, Andrew G. Barto, MIT Press, 2018.

Web links and Video Lectures (e-Resources):

- Coursera: Machine Learning by Andrew Ng https://www.coursera.org/learn/machine-learning
- MITOpenCourseWare: Advanced Machine Learning https://ocw.mit.edu/courses/advanced-machine-learning
- Khan Academy: Advanced Machine Learning https://www.khanacademy.org/advanced-machine-learning
- Harvard Business Review: Machine Learning Articles https://hbr.org/search?term=machine%20learning
- LinkedIn Learning: Machine Learning https://www.linkedin.com/learning/topics/machine-learning
- YouTube: Advanced Machine Learning Tutorial https://www.youtube.com/watch?v=aircAruvnKk
- YouTube: Deep Learning with Python https://www.youtube.com/watch?v=PwAGxqrXSCs

Skill Development Activities Suggested

- Implement advanced machine learning algorithms on real-world datasets.
- Analyze and optimize the performance of machine learning models.
- Develop and fine-tune deep learning models for various applications.
- Apply natural language processing techniques to text data.
- Conduct a comparative study on different machine learning algorithms.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Understand advanced concepts and principles of machine learning.	L1
CO2	Implement and apply advanced machine learning algorithms and deep learning techniques.	L2
CO3	Analyze the performance of machine learning models and optimize their efficiencies.	L3

CO4	Apply machine learning techniques to solve real-world problems in various domains.	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	

Deep Learning – II (Lab)			
Course Code	**MAD402**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Learning objectives:

- Gain practical experience with deep learning techniques and frameworks.
- Implement advanced deep learning models for complex problems.
- Develop, evaluate, and fine-tune deep learning models using Python.
- Apply deep learning techniques to real-world datasets.
- Interpret results and present findings effectively.

Module-1 (7 Hours)

Introduction to Deep Learning Frameworks: Overview of TensorFlow and Keras, Setting up environments, Basic operations and functions, Model creation and training.

Module-2 (9 Hours)

Advanced Neural Networks: Deep Feedforward Networks, Regularization techniques (Dropout, L2 Regularization), Batch normalization, Model optimization techniques.

Module-3 (9 Hours)

Convolutional Neural Networks (CNNs): Architecture of CNNs, Implementing CNNs for image classification, Transfer learning with pre-trained models, Case studies.

Module-4 (9 Hours)

Recurrent Neural Networks (RNNs) and LSTMs: Architecture of RNNs, Long Short-Term Memory (LSTM) networks, Implementing RNNs for sequence prediction, Case studies.

Module-5 (9 Hours)

Generative Adversarial Networks (GANs): Introduction to GANs, Implementing GANs for image generation, Variational Autoencoders (VAEs), Case studies.

Module-6 (7 Hours)

CEthical Considerations and Best Practices: Bias in deep learning models, Privacy issues, Ethical considerations in model deployment, Responsible AI practices.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Suggested Learning Resources:

Books

- Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow by Aurélien Géron
- Deep Learning by Ian Goodfellow, Yoshua Bengio, and Aaron Courville
- Neural Networks and Deep Learning by Michael Nielsen (available for free online)

Web links and Video Lectures (e-Resources):

- Coursera: Deep Learning Specializationhttps://www.coursera.org/specializations/deep-learning
- edX: Deep Learning with Python and PyTorchhttps://www.edx.org/course/deep-learning-with-python-and-pytorch
- Fast.ai: Practical Deep Learning for Codershttps://course.fast.ai/

Skill Development Activities Suggested

- Implement advanced deep learning models from scratch using Python.
- Participate in deep learning competitions and challenges on platforms like Kaggle.
- Conduct independent research on recent advancements in deep learning techniques.
- Collaborate on a team project to develop a deep learning-powered application.
- Present and discuss deep learning models and results in class.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Implement advanced deep learning models using Python and frameworks	L1
CO2	Apply deep learning techniques to solve complex problems	L2
CO3	Evaluate and fine-tune deep learning models based on performance metrics	L3
CO4	Interpret and present deep learning model results effectively	L4

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2			2				2		

CO3				3				2	
CO4		2		2					3

Entrepreneurship and Venture Capital			
Course Code	**MAD403**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Learning objectives:

- Understand the key concepts and theories of entrepreneurship.
- Develop skills to create and manage a new venture.
- Learn the processes involved in venture capital financing.
- Analyze the role of venture capital in business growth.
- Address the challenges faced by entrepreneurs and venture capitalists.

Module-1 (7 Hours)

Introduction to Entrepreneurship: Definition, Importance of Entrepreneurship, Entrepreneurial Mindset, Types of Entrepreneurs, Theories of Entrepreneurship, Role of Entrepreneurship in Economic Development.

Module-2 (9 Hours)

Creating and Managing New Ventures: Identifying Opportunities, Market Research, Business Model Development, Business Plan Writing, Legal Aspects of New Ventures, Managing Growth, Challenges in Managing New Ventures.

Module-3 (9 Hours)

Venture Capital Financing: Introduction to Venture Capital, Venture Capital Ecosystem, Types of Venture Capital Firms, Venture Capital Process, Stages of Venture Capital Financing, Deal Structuring, Valuation of Startups, Exit Strategies.

Module-4 (9 Hours)

Financial and Strategic Planning for Startups: Financial Projections, Funding Sources (Angel Investors, Venture Capital, Crowdfunding), Strategic Planning, Scaling Up, Financial Management, Risk Management.

Module-5 (9 Hours)

Innovation and Technology in Entrepreneurship: Role of Innovation in Entrepreneurship, Technology Trends and Startups, Intellectual Property Rights, Protecting Innovations, Case Studies of Innovative Startups.

Module-6 (7 Hours)

Case Studies and Contemporary Issues: Real-World Case Studies of Successful and Unsuccessful Startups, Ethical and Legal Issues in Entrepreneurship, Social Entrepreneurship, Impact of Globalization on Startups, Future Trends in Venture Capital..

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- **Entrepreneurship: Theory, Process, and Practice** by Donald F. Kuratko
- **The Lean Startup** by Eric Ries
- **Venture Deals: Be Smarter Than Your Lawyer and Venture Capitalist** by Brad Feld and Jason Mendelson
- **Zero to One** by Peter Thiel and Blake Masters
- **The Innovator's Dilemma** by Clayton Christensen

Web links and Video Lectures (e-Resources):

- Coursera: Entrepreneurship Specialization
- edX: Becoming an Entrepreneur
- Harvard Online: Entrepreneurship Essentials
- Khan Academy: Entrepreneurship

Skill Development Activities Suggested

- Develop a business plan for a new venture.
- Conduct market research for identifying business opportunities.
- Create financial projections for a startup.
- Simulate venture capital deal structuring.
- Analyze case studies of startups and present findings.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Understand the key concepts and theories of entrepreneurship.	L1
CO2	Develop skills to create and manage a new venture.	L2
CO3	Learn the processes involved in venture capital financing.	L3
CO4	Analyze the role of venture capital in business growth.	L4
CO5	Address the challenges faced by entrepreneurs and venture capitalists.	L5

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	
CO5					2				3

Predictive Analytics (Lab)			
Course Code	**MAD404**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- Understand the fundamental concepts of predictive analytics.
- Develop skills in data preprocessing and exploratory data analysis.
- Learn various predictive modeling techniques.
- Evaluate model performance and interpret results.
- Apply predictive analytics to real-world scenarios.

Module-1 (7 Hours)

Introduction to Predictive Analytics: Definition, Importance of Predictive Analytics, Types of Predictive Models, Applications in Various Industries, Steps in Predictive Analytics Process.

Module-2 (9 Hours)

Data Preparation and Exploratory Data Analysis: Data Cleaning, Handling Missing Values, Data Transformation, Feature Selection, Data Visualization, Statistical Summary.

Module-3 (9 Hours)

Predictive Modeling Techniques: Linear Regression, Logistic Regression, Decision Trees, Random Forest, Support Vector Machines, k-Nearest Neighbors, Model Training and Testing.

Module-4 (9 Hours)

Model Evaluation and Interpretation: Metrics for Regression and Classification, Cross-Validation, ROC Curve, Confusion Matrix, Precision, Recall, F1 Score, Model Interpretation Techniques.

Module-5 (9 Hours)

Advanced Predictive Techniques: Ensemble Methods, Gradient Boosting, Neural Networks, Time Series Forecasting, Unsupervised Learning for Predictive Modeling, Anomaly Detection.

Module-6 (7 Hours)

Case Studies and Applications: Real-World Case Studies in Marketing, Finance, Healthcare, Manufacturing, Ethical Issues in Predictive Analytics, Future Trends in Predictive Analytics.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die by Eric Siegel
- Data Science for Business by Foster Provost and Tom Fawcett
- Applied Predictive Modeling by Max Kuhn and Kjell Johnson
- An Introduction to Statistical Learning by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani
- The Elements of Statistical Learning by Trevor Hastie, Robert Tibshirani, and Jerome Friedman

Web links and Video Lectures (e-Resources):

- Coursera: Machine Learning by Andrew Ng - https://www.coursera.org/learn/machine-learning
- edX: Principles of Machine Learning - https://www.edx.org/course/principles-of-machine-learning
- Harvard Online: Data Science: Machine Learning - https://online-learning.harvard.edu/course/data-science-machine-learning
- Khan Academy: Statistics and Probability - https://www.khanacademy.org/math/statistics-probability

Skill Development Activities Suggested

- Develop a predictive model for a given dataset.
- Conduct exploratory data analysis on real-world data.
- Create visualizations to represent data insights.
- Simulate various predictive modeling techniques.

- Analyze case studies of predictive analytics applications and present findings.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Understand the fundamental concepts of predictive analytics.	L1
CO2	Develop skills in data preprocessing and exploratory data analysis.	L2
CO3	Learn various predictive modeling techniques.	L3
CO4	Evaluate model performance and interpret results.	L4
CO5	Apply predictive analytics to real-world scenarios.	L5

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	

Data Analytics using R (Lab)			
Course Code	**MAD405**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**02:02:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**03**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- Understand the basics of R programming and its applications in data analytics.
- Develop skills to manipulate and visualize data using R.
- Learn statistical methods and machine learning algorithms in R.
- Apply R for data analysis, interpretation, and reporting.
- Gain practical experience through hands-on lab sessions.

Module-1 (7 Hours)

Introduction to R and RStudio: Basics of R Programming, Data Types, Variables, Operators, Basic Functions, Introduction to RStudio, R Packages and Libraries.

Module-2 (9 Hours)

Data Manipulation and Visualization: Importing Data, Data Cleaning, Data Transformation using dplyr, Data Visualization using ggplot2, Creating Reports with RMarkdown.

Module-3 (9 Hours)

Statistical Analysis with R: Descriptive Statistics, Inferential Statistics, Hypothesis Testing, ANOVA, Correlation and Regression Analysis.

Module-4 (9 Hours)

Predictive Modeling in R: Introduction to Predictive Modeling, Linear Regression, Logistic Regression, Decision Trees, Random Forest, Model Evaluation Techniques.

Module-5 (9 Hours)

Advanced Data Analytics Techniques: Clustering, Principal Component Analysis (PCA), Time Series Analysis, Text Mining, Sentiment Analysis.

Module-6 (7 Hours)

Case Studies and Applications: Real-World Case Studies in Business, Healthcare, Finance, Social Media Analytics, Ethical Issues in Data Analytics, Future Trends in Data Analytics using R

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

CIE Marks shall be based on:

a) Tests (for 25Marks) and

b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.

· Each full question is for 20 marks with 3 sub questions.

· Each full question will have sub question covering all the topics.

· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

Suggested Learning Resources:

Books

- R for Data Science by Hadley Wickham and Garrett Grolemund
- Hands-On Programming with R by Garrett Grolemund
- An Introduction to Statistical Learning by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani
- Advanced R by Hadley Wickham

The Art of R Programming by Norman Matloff

Web links and Video Lectures (e-Resources):

- Coursera: R Programming - https://www.coursera.org/learn/r-programming
- edX: Data Science: R Basics - https://www.edx.org/course/data-science-r-basics
- Harvard Online: Data Science: R Basics - https://online-learning.harvard.edu/course/data-science-r-basics
- Khan Academy: Statistics and Probability - https://www.khanacademy.org/math/statistics-probability

Skill Development Activities Suggested

- Develop R scripts for data manipulation and visualization.
- Conduct statistical analysis on real-world datasets using R.
- Create predictive models and evaluate their performance using R.
- Perform advanced analytics techniques such as clustering and PCA.
- Analyze case studies and present findings using R.

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Understand the basics of R programming and its applications in data analytics.	L1
CO2	Develop skills to manipulate and visualize data using R.	L2
CO3	Learn statistical methods and machine learning algorithms in R.	L3
CO4	Apply R for data analysis, interpretation, and reporting.	L4
CO5	Gain practical experience through hands-on lab sessions.	L5

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	
CO5				2					3

Production and Operations Management			
Course Code	**MAD406**	**CIE Marks**	**50**
Teaching Hours/Week (L:P:SDA)	**04:00:00**	**SEE Marks**	**50**
Total Hours of Pedagogy	**50**	**Total Marks**	**100**
Credits	**04**	**Exam Hours**	**03**

Course Objectives: This course will enable students to:

- To understand fundamental concepts of programming and problem-solving techniques.
- To classify and differentiate between various programming constructs.
- To compile and execute programs to solve real-world problems.
- To acquaint the students with industry-relevant programming skills and best practices.

Module-1 (8 Hours)

Introduction to Production and Operations Management: - Definition of Production and Operations Management, evolution of Production Management as Operations Management.- Role of Operations Management in total management System- Interface between the operation systems and systems of other functional areas.

Module-2 (9 Hours)

Production Planning and Control: Basic functions of Production Planning and Control, Production Cycle - characteristics of process technologies. Project, Job Shop, Assembly and Continuos - Inter Relationship between product life cycle and process life cycle. Scheduling and control of production operations-control procedures and devices. Product sequencing - Sequencing of products in multi- product multi-stage situations – Plant Capacity and Line Balancing - Plant layout - Different types of layouts. Location and the factors influencing location.

Module-3 (9 Hours)

Maintenance Management: Objectives – Failure Concept, Reliability, Preventive and Breakdown maintenance, Replacement policies and Quality control –standards and specifications, Quality Assurance and Quality Circles – Statistical Quality Control – Control Charts for average. Range fraction defective and number of defects - Total Quality Management. ISO certification improvement of productivity: Work Study, various techniques in the Methods Study for identifying the most appropriate method. Work measurement - its uses and different methods, computation of allowance and allowed time.

Module-4 (9 Hours)

Materials Management:- Need use and importance of Material management-Materials requirement planing-Materials Budgeting- Techniques for prioritization of materials-Sour of Supply of Materials -Selection ,evaluation and Performance of suppliers-make or buy decisions and its implications under various circumstances -Vendor rating - determinants of vendor rating

Module-5 (9 Hours)

Structures and Unions: Definition, Declaration, Accessing Structure Members, Nested Structures, Arrays of Structures, Structures and Functions, Unions, Difference between Structures and Unions. **File Handling**: Introduction, Types of Files, File Operations, File Handling Functions, Reading and Writing Files, Random Access to Files.

Module-6 (7 Hours)

Stores Management – Objectives of Stores Management – Requirements for efficient

Management of Stores - Safety stock - Inventory Control - Types of Inventory. Costs - Systems of inventory control – ABC, VED and FNSD analyses. Different Systems of Inventory Control - Value Analysis – Importance in cost reduction – concepts and procedures.

Assessment Details (both CIE and SEE)

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Continuous Internal Evaluation:

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CIE Marks shall be based on:

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Semester End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

· The question paper will have 8 full questions carrying equal marks.
· Each full question is for 20 marks with 3 sub questions.
· Each full question will have sub question covering all the topics.
· The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight iscompulsory.

Suggested Learning Resources:

Books

1. **Production and Operations Analysis** by Steven Nahmias
2. **Operations Management: Processes and Supply Chains** by Lee J. Krajewski, Manoj K. Malhotra, and Larry P. Ritzman
3. **Production and Operations Management** by S. Anil Kumar and N. Suresh
4. **Manufacturing Planning and Control for Supply Chain Management** by F. Robert Jacobs, William L. Berry, D. Clay Whybark, and Thomas E. Vollmann
5. **Operations Management for Competitive Advantage** by Richard B. Chase, F. Robert Jacobs, and Nicholas J. Aquilano
6. **Production and Operations Management: Concepts, Models, and Behavior** by Everett E. Adam Jr. and Ronald J. Ebert
7. **The Goal: A Process of Ongoing Improvement** by Eliyahu M. Goldratt and Jeff Cox

Web links and Video Lectures (e-Resources):

Coursera: Operations Managementhttps://www.coursera.org/learn/wharton-operations-management

edX: Introduction to Operations Managementhttps://www.edx.org/learn/operations-management/indian-institute-of-management-bangalore-operations-management

MIT OpenCourseWare: Operations Managementhttps://ocw.mit.edu/courses/15-760a-operations-management-spring-2002/

YouTube: Operations Management Videoshttps://www.youtube.com/watch?v=tdZOjBODtE4

NPTEL: Production and Operations Managementhttps://onlinecourses.nptel.ac.in/noc20_mg06/preview

Skill Development Activities Suggested

- Conduct a Market Basket Analysis
- Develop a Classification Model

- Perform Clustering Analysis
- Analyze Social Network Data
- Create a Report on Ethical and Privacy Issues

Course Outcome:

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

SL. NO.	DESCRIPTION	BLOOMS LEVEL
CO1	Gain practical experience in production and operations processes.	L1
CO2	Acquire conceptual knowledge of operations management techniques and their applications.	L2
CO3	Comprehend and apply operations management strategies to optimize business processes.	L3
CO4	Analyze and evaluate operational performance to improve efficiency and effectiveness.	L4
CO5	Address and resolve issues related to operations management, including supply chain and inventory management.	L5

Mapping of COs and POs:

SL. NO.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2		1		2	
CO5					2		3		