COEP Technological University (COEP TECH)

A Unitary Public University of Government of Maharashtra

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(Formerly College of Engineering Pune)

DEPARTMENT OF MANAGEMENT STUDIES

School of Multidisciplinary Sciences, Humanities and Management Studies

Curriculum Structure & Detailed Syllabus (MBA-BA)

(Effective from: A.Y. 2025-26)

Master of Business Administration (MBA) - Curriculum 2025 Pattern
2-year, 4 Semester Full time Program

1. **Preamble**: The MBA (BA) Curriculum 2025 elaborates a Credit System (CS), Grading System and Outcomes Based Education (OBE) program.
2. **Credit:** For a 15-week semester, credits are assigned as follows:
    a. **Lectures (L):** One-hour session per week equates to 1 credit per semester.
    b. **Tutorials (T):** A minimum of two hours per week equates to 1 credit per semester.
    c. **Practice (P):** A minimum of two hours per week equates to 1 credit per semester.

    Each credit comprises three components—Lecture (L), Tutorials (T), and Practice (Practical/Project Work/Self-Study) (P)—following the LTP pattern. The indicative LTP structure for each course is outlined in the syllabus

    The course instructor, with approval from the Head of the Department, or designated academic authority, may adjust the LTP structure based on course requirements, the nature of the subject, learner proficiency, and the proposed pedagogy and assessment methods.

3. **Program Educational Objectives:**
    a. **PEO1:** To enable individuals to model ethical and humane leadership, collaboratively building high-performing teams which are capable of achieving synergistic outcomes in diverse business environments.
    b. **PEO 2:** To create Managers with critical and analytical thinking ability to demonstrate creativity and innovation in the process of decision making.
    c. **PEO 3:** To build leaders with compelling written and spoken communication skills to effectively influence diverse stakeholders across various business context.
    d. **PEO 4:** To create leaders who are aware of their Social Responsibility and cultivate in them sustainable attitude.
    e. **PEO 5:** To develop professionals with a continuously learning and adapting mindset in a technological landscape.
    f. **PEO 6:** To foster a mindset of entrepreneurial opportunities by applying entrepreneurial skills to develop and implement sustainable and impactful business solutions.

4. **Program Outcomes:** At the end of the program, the graduates will be able to

    PO 1: Demonstrate ethical decision-making and integrity in leadership roles.
    PO 2: Apply humane values and principles in managing individuals and teams.
    PO 3: Collaborate effectively within diverse teams to achieve common goals.
    PO 4: Facilitate team synergy and high performance through effective interpersonal skills.
    PO 5: Generate creative and innovative solutions to address business challenges.
    PO 6: Adapt and employ effective communication strategies to influence stakeholders.

PO 7: Integrate principles of sustainability into business strategies and operations.

PO 8: Demonstrate a commitment to lifelong learning and professional development.

PO 9: Apply entrepreneurial skills such as opportunity recognition, resourcefulness, and risk management.

PO 10: Demonstrate the ability to implement and manage entrepreneurial projects.

Correlation between the PEOs and the POs

	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
PO1	√					
PO2	√			√		
PO3	√					
PO4	√					
PO5		√				
PO6			√			
PO7						√
PO8					√	
PO9						√
PO10						√

1. **<u>Course Types</u>:**
   a. **Program Core Course (PCC)** - Program Core Courses form the foundation of the MBA program, covering fundamental subjects essential for all students, irrespective of their specialization. These courses provide conceptual knowledge and skill development. They are mandatory and contribute to building a strong academic base.
   b. **Program Generic Course (PGC) -** Program Generic Courses are designed to offer broad-based knowledge applicable across multiple specializations. These courses focus on interdisciplinary learning, fostering managerial competencies, critical thinking, and problem-solving skills that enhance employability.
   c. **Program Specialization Course (PSC) -** Program Specialization Courses cater to students who wish to develop expertise in a specific domain within management. These courses provide in-depth knowledge and practical skills in specialized areas such as Finance, Marketing, Human Resource Management, Operations, or Entrepreneurship. PSCs allow students to tailor their learning experience based on their career aspirations.
   d. **Massive Open Online Courses (MOOCs) -** Massive Open Online Courses

(MOOCs) are online learning programs offered by reputed institutions and platforms such as Coursera, edX, NPTEL, or SWAYAM. These courses provide flexibility and accessibility to students, allowing them to enhance their knowledge beyond the standard curriculum. MOOCs can be taken for credit or enrichment, enabling students to learn from global experts and stay updated with emerging trends in business and management.

Abbreviation	Title	Sem I	Sem II	Sem III	Sem IV	Total
		Credits				
PCC	Program Core Course	21	18	18	12	69
PGC	Program Generic Course	4	3			7
PSC	Program Specialization Course		12	12	6	30
MOOCs	Massive Open Online Courses					
	Total Credits	25	33	30	18	**106**

Abbreviation	Title	Sem I	Sem II	Sem III	Sem IV	Total
		Subjects				
PCC	Program Core Course	7	6	5	4	22
PGC	Program Generic Course	4	3			7
PSC	Program Specialization Course		4	4	3	11
MOOCs	Massive Open Online Courses					
	Total Subjects	11	13	9	7	**40**

2. **<u>Specializations Offered</u>: NA**
3. **<u>Assessment</u>:**
    a. **Formative Assessment (FA) / Comprehensive Concurrent Evaluation (CCE) – 20 Marks:** Formative Assessment (FA) is an ongoing evaluation process used to monitor student learning and provide continuous feedback. It helps both instructors and students identify strengths, weaknesses, and areas for improvement during the learning process, rather than at the end of a course.
        i. Quizzes & Polls (quick knowledge checks)
        ii. Case Study Discussions (evaluating application of concepts)
        iii. Group Activities & Role Plays (peer learning & collaboration)
        iv. Reflective Journals or Blogs (self-assessment of learning progress)
        v. Classroom Presentations & Debates (verbal articulation of concepts)
        vi. Interactive Simulations & Gamified Learning Modules
    b. **Mid Semester Assessment – 30 Marks:** The Mid-Semester Examination (Mid-Sem Exam) is an interim assessment conducted halfway through the academic semester to evaluate students' understanding and progress in a course. It serves as a checkpoint to assess learning outcomes before the final semester-end examination.

i. **Summative in Nature:** It contributes to the overall course grading and evaluation.
ii. **Covers Half of the Syllabus:** Typically assesses concepts taught in the first half of the semester.
iii. **Structured & Time-Bound:** Conducted in a formal exam setting with specific time duration.
iv. **Performance Indicator:** Helps students and faculty gauge academic progress and preparedness for final exams.
v. **Feedback Mechanism:** Provides an opportunity for students to identify areas of improvement before the end-semester exam.

c. End Semester Examination – 50 Marks:

i. Summative in Nature: The End-Sem Exam is a high-stakes, final evaluation that contributes significantly to the final grade of a student in a course. It measures both conceptual clarity and practical application of subject knowledge.
ii. Comprehensive Coverage: Unlike Mid-Sem Exams, which typically assess half of the syllabus, the End-Sem Exam covers the entire syllabus taught over the semester, ensuring a holistic evaluation of student learning.
iii. Standardized and Time-Bound: The exam is conducted in a formal, invigilated setting according to the university/institute's academic regulations.
iv. Structured Question Paper Format: The End-Sem Exam usually includes a mix of question types to assess different levels of understanding, including:
    1. Objective Questions: Multiple-choice questions (MCQs), Fill-in-the-blanks, and True/False statements.
    2. Short-Answer Questions: Definitions, key concepts, and explanations of theories.
    3. Long-Answer/Analytical Questions: Application-based problems, case studies, essay-type responses, and scenario-based discussions.
    4. Numerical/Problem-Solving Questions: If applicable (for finance, operations, and quantitative subjects).
    5. Case Studies & Practical Applications: Industry-relevant case studies that test decision-making and critical thinking skills.

d. **Passing Standards -** The passing criteria for each course are determined based on a **relative grading system**, ensuring fairness and academic benchmarking across different student performances. The passing threshold is set at half of the median performance of the class for that particular course.

i. Relative Benchmarking:

1. The passing mark for each course is calculated as **Median Score / 2,** where the median is derived from the class performance distribution **subject to amin of 30 and max of 40 marks**.
2. This ensures that passing standards adjust based on the overall difficulty of the exam and student performance trends.

ii. Combined Passing:

1. Students must meet the minimum passing marks combined for Formative Assessment, Mid-Sem, and the End-Semester Examination.
2. Failing to score the passing marks will result in a repeat attempt of all the assessments.

e. Grading System

i. The Relative Grading System follows an Indirect and Absolute Grading approach, where students are initially assessed based on marks obtained in individual courses during examinations. These marks are then converted into grades using a predefined mechanism that takes into account the overall performance distribution of the class and the credit points assigned to each course.

ii. The final course evaluation is expressed in terms of grades, ensuring that a student's performance is measured in relation to their peers rather than through a fixed percentage cutoff. The system adheres to the 10-point standard grading scale as mandated by the University Grants Commission (UGC), providing a standardized and fair evaluation method that reflects both individual achievement and class-wide performance trends.

iii. The performance of a student will be evaluated in terms of two indices, viz.

1. Semester Grade Point Average (SGPA) which is the Grade Point Average for a semester.
2. Cumulative Grade Point Average (CGPA) which is the Grade Point Average for all the completed semesters at any point in time.

4. <u>Miscellaneous</u>:

a. **Degree Requirements:** The degree requirements for the MBA program are completion of minimum **106 credits**.

b. **Maximum Attempts per Course:** A student shall earn the credits for a given course in maximum **FOUR** attempts.

c. **Maximum Duration for completion of the Program:** The candidates shall complete the MBA Program within **4 years** from the date of admission.

d. **Attendance:** The student must meet the minimum requirement of **75% attendance** per semester per course for grant of the term.

e. **Medium of Instruction:** The medium of Instruction & Evaluation shall be **English**.

MBA in Business Analytics

SEMESTER I							
Program Core Courses-PCC Sem I							
Sr. No.	**Course Type**	**Course Code**	**Course Name**	**Teaching Scheme**			**Credits**
				L	T	P	
1	PCC-1		Marketing Management	2	1	0	3
2	PCC-2		Human Resource Management	2	1	0	3
3	PCC-3		Operations Management	2	1	0	3
4	PCC-4		Managerial Accounting	2	1	0	3
5	PCC-5		Introduction to Business Analytics	2	1	0	3
6	PCC-6		Financial Management	2	1	0	3
7	PCC-7		Business Statistics	2	1	0	3
Total Credits for PCC							**21**
Program Generic Courses Sem I							
Sr. No.	**Course Type**	**Course Code**	**Course Name**	**Teaching Scheme**			**Credits**
				L	T	P	
1	PGC-1		Company and Sectorial Analysis	1	0	0	1
2	PGC-2		Managerial Communication	1	0	0	1
3	PGC-3		Self-Awareness and Personality Development	1	0	0	1
4	PGC-4		Indian Ethos & Business Ethics	1	0	0	1
			Total Credits for PGC				**4**
Total Credits for Sem I							**25**
SEMESTER II							
Program Core Courses-PCC Sem II							
Sr. No.	**Course Type**	**Course Code**	**Course Name**	**Teaching Scheme**			**Credits**
				L	T	P	
1	PCC-1		Research Methodology	2	1	0	3
2	PCC-2		Business and Commercial Laws	2	1	0	3
3	PCC-3		Project Management	2	1	0	3
4	PCC-4		Management Information System	2	1	0	3
5	PCC-5		Managerial Economics	2	1	0	3
6	PCC-6		Operation Research	2	1	0	3
Total Credits for PCC							**18**

Program Generic Courses Sem II							
Sr. No.	**Course Type**	**Course Code**	**Course Name**	**Teaching Scheme**			**Credits**
				L	T	P	
1	PGC-1		Indian Business Models	1	1	0	1
2	PGC-2		Introduction to Artificial Intelligence	1	0	0	1
3	PGC-3		Power BI	0	0	2	1
			Total Credits for PGC				**3**

Program Specific Courses -Sem II							
Sr. No.	**Course Type**	**Course Code**	**Course Name**	**Teaching Scheme**			**Credits**
				L	T	P	
1	PSC-1		Data Insights and Visualizations	0	0	6	3
2	PSC-2		Digital Marketing & Web Analysis	2	0	2	3
3	PSC-3		Python Programming	0	0	6	3
4	PSC-4		Predictive Analytics	2	0	2	3
			Total Credits for PSC				**12**
			Total Semester II Credits	**33**			

Semester III

Program Core Courses-PCC -SEM III							
Sr. No.	**Course Type**	**Course Code**	**Course Name**	**Teaching Scheme**			**Credits**
				L	T	P	
1	PCC-1		Strategic Management	2	1	0	3
2	PCC-2		AI for Business Growth	2	1	0	3
3	PCC-3		Data Visualization with Python and GenAI	1	0	4	3
4	PCC-4		Business Forecasting	2	1	0	3
5	PCC-5		Internship Project	0	0	12	6
			Total Credits for PCC				**18**

Program Specific Courses -Sem III							
Sr. No.	**Course Type**	**Course Code**	**Course Name**	**Teaching Scheme**			**Credits**
				L	T	P	

1	PSC-1		Data Engineering & Knowledge Management	2	0	2	3
2	PSC-2		Big Data Analytics	2	0	2	3
3	PSC-3		Modern Data Management Systems	2	0	2	3
4	PSC-4		Data Science and Machine Learning	1	0	4	3
Total Credits for PSC							**12**
Total Credits for Sem III				**30**			

SEMESTER IV

Program Core Courses-PCC Sem IV

Sr. No.	**Course Type**	**Course Code**	**Course Name**	**Teaching Scheme**			**Credits**
				L	T	P	
1	PCC-1		Business Simulation	2	1	0	3
2	PCC-2		Data Security and Cyber Laws	2	1	0	3
3	PCC-3		Leadership and Strategic Thinking	2	1	0	3
4	PCC-4		Dissertation	0	0	6	3
			Total Credits for PCC				**12**

Program Specific Courses -Sem IV

Sr. No.	**Course Type**	**Course Code**	**Course Name**	**Teaching Scheme**			**Credits**
				L	T	P	
1	PSC-1		BA for Industry 4.0	1	1	0	2
2	PSC-2		AI & Deep Learning	1	0	2	2
3	PSC-3		Cloud Technology & Security	1	0	2	2
Total Credits for PSC							**6**
Total Credits for Sem IV				**18**			

Note :- MBA Business Analytics Total Credits For Batch 2025-27

Sem I + Sem II + Sem III + Sem IV → (25+33+30+18) = 106 Credits

Semester I

Program Core Courses-PCC Sem I

PCC-1 : MARKETING MANAGEMENT	**Semester I**
Credits:3	LTP:2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
		Student Will be able to
CO 1	REMEMBER	To study the concept of Marketing and 4 Ps of marketing & its application in the real world.
CO 2	UNDERSTAND	To demonstrate the relevance of marketing management concepts and frameworks and Assess the various marketing opportunities associated with emerging & developed markets, considering economic, political, and social-cultural factors.
CO 3	APPLY	To assess the interrelationships existing between segmentation, targeting and positioning, marketing environment, consumer buying behavior, marketing mix and Product Life Cycle with real world examples.
CO 4	ANALYZE	To familiarize with the basic concepts, and techniques of marketing management such as Product Levels, Marketing Research, STP, Marketing Mix and their adaptation to the contemporary marketing practices
CO 5	EVALUATE	To evaluate their role in sustainable marketing practices and the overall impact on the environment, companies and consumers
CO 6	CREATE	To create marketing plan for real world offerings.

UNITS & TOPICS **Hours**

Unit 1: Understanding Marketing Management 8

1.1 Marketing in the 21st Century

Evolution and Understanding the Core Concept

Objectives, Scope & Functions of Marketing

Core Evolving Concepts of Marketing – Customer Satisfaction, Relationship, Delight, Customer Loyalty & Customer Centricity

Concepts of Needs, Desires, Wants, Demand, Utility & Its Types

Marketing vs. Market & Its Types

UNITS & TOPICS	Hours
1.2 Marketing Management Philosophies	
The Production, Product, Selling, Marketing, Societal, and Holistic Marketing Concept	
The Role of Creativity, Innovation & Use of Design Thinking to Solve Marketing Challenges	
1.3 Segmentation, Target Marketing & Positioning (STM)	
Segmentation - Concept, Need & Benefits	
Geographic, Demographic, Psychographic, Behavioural Bases of Segmentation for Consumer Goods and Services	
Bases and Levels of Segmentation, Criteria for Effective Segmentation	
Target Market - Concept & Criteria for Selection	
Positioning - Concept of Differentiation & Positioning, Value Proposition & Unique Selling Proposition	
Forrester's Social Technographics Segmentation	
Unit 2: Marketing Plan, Analysis & Consumer Behaviour	8
2.1 Analysis of Marketing Environment	
Concept, Components, and Characteristics of Marketing Environment	
Needs & Trends & Major Forces Impacting the Macro &Micro Environment	
Need for Analysing the Marketing Environment	
Analysing the Political, Economic, Socio-cultural, Technical, and Legal Environment	
Demographics, Environmental, Social, and Governance (ESG) Factors, Technological Innovations, Regulatory Changes	
2.2 Concepts of Consumer Behaviour	
Unit 3: Marketing Mix	10
Marketing Mix	
Origin & Concept of Marketing Mix and Extended Marketing Mix (7P's)	
Services Marketing: Product, Price, Place, Promotion, People, Process, Physical Evidence	
Integrated Marketing Communication	
Product Life Cycle	
Concept, Characteristics, Relevance, Types, and Strategies Across Product Life Cycle (PLC)	
Digital Marketing Mix	
Service-Dominant Logic, Connected Marketing Mix - Four C's (Co-creation, Currency, Communal Activation, and Conversation)	
Forrester's Social Technographics	
Unit 4: Digital Transformation in Marketing	10
Digital Transformation in Marketing	

UNITS & TOPICS **Hours**

Modern Marketing Concepts of Adoption of Digital Marketing, AI, Big Data, and Machine Learning ,

Transforming Marketing Strategies

Customer Experience (CX, UI & UX)

8

Unit 5:

Sustainable Marketing

The Changing Role of the CMO in the Age of Customer Experience

Marketing Challenges into the Next Century

Socially Responsible Marketing and Marketing Ethics

Reference Books:

1. Marketing Management: A South Asian Perspective Kotler, Keller, Koshy & Jha, 14 th edition, Pearson Education, 2018.
2. Marketing Management, Rajan Saxena, TMGH, 6th Edition, 2019
3. Marketing, Lamb Hair Sharma, Mc Daniel, Cengage Learning, 1st Edition, 2016
4. Marketing Management – Ramaswamy V. S. & Namakumar S, 4/e, Macmillan Publishers, 2014.
5. Marketing Management -Arun Kumar& Meenakshi N, 2/e, Vikas publications, 2013
6. Marketing Management- Text and Cases, Tapan K Panda, Excel Books, 2008
7. Marketing 4.0: Moving from Traditional to Digital, Philip Kotler, Hermawan Kartajaya, Iwan Seiwan, 2017
8. Marketing 5.0: Technology for Humanity by Philip Kotler, Hermawan Kartajaya, Wiley .2021
9. Marketing 6.0: The Future Is Immersive: Philip Kotler, Hermawan Kartajaya, 2023

Online Resources:

1. https://www.pbme.in/papers/77.pdf
3. Selling of High Technology Products ttps://ijebmr.com/uploads/pdf/archivepdf/2023/IJEBMR_1150.pdf
4. https://hbr.org/2018/05/marketing-in-the-age-of-alexa
5. https://hbr.org/2017/03/what-creativity-in-marketing-looks-like-today
6. https://www.skyword.com/contentstandard/how-design-thinking-can-help-marketers-find-creativesolutions-from-customer-insights/
9. Generative AI: The Insights You Need from Harvard Business Review (HBR Insights Series), Harvard Business Review, Randye Kaye, et al., on 20th June 2024
8. https://revenueml.com/insights/articles/potential-generative-artificial-intelligence-pricing

Web Resources:

1. AFAQS - https://www.afaqs.com/

Brand Equity (ET) - https://www.brandequity.com/

PCC-2 HUMAN RESOURCE MANAGEMENT	**Semester I**
Credits:3	LTP:2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
		Student Will be able to
CO 1	REMEMBER	Know the key terms, upcoming trends in the subject
CO 2	UNDERSTAND	To understand of the basic concepts' functions and processes of human resource management
CO 3	APPLY	Application of the models learned contemporary practices in real business world.
CO 4	ANALYZE	Analyzing & constructive strategies for existing and new challenges in HRM
CO 5	EVALUATE	Evaluate the processes & policies in HRM
CO 6	CREATE	Creating &implementing best practices in real business scenario

UNITS & TOPICS **Hours**

Unit 1: Introduction to HRM and Strategic Perspectives - Introduction & evolution of HRM - Nature, scope, and functions of modern HRM - HRM in various sectors - HRM challenges and changing forces - Harvard Model of HRM - Strategic HRM: Factors influencing HR strategy - Strategic HRM models and functions - *Case Studies: Hassles at 24x7, Is it time to celebrate?* 5

Unit 2: HR Planning, Job Design & Talent Acquisition - Human Resource Planning (HRP): Drivers, process, forecasting methods, global trends - HRP models - *Case Study: A Challenge* - Job Analysis & Design: Competency modelling, job satisfaction - Recruitment & Selection: Sources, methods, AI in recruitment, evaluation - Resume building and terms of service 10

Unit 3: Performance & Compensation Management - Performance appraisal methods - Advantages and disadvantages of PA systems - Designing a performance management system - *Case Study: Is the Performance Appraisal System Robust?* - Compensation and Benefits: Contracts, salary components, incentives, trends - *Case Study: Compensation and Benefits* - Employee separation & grievance 10

UNITS & TOPICS	Hours
Unit 4: Training, Development & Talent Management - Training models and need analysis - Designing and implementing training - Contemporary training methods - Career and succession planning - Talent management strategies	10
Unit 5: Emerging HR Trends and Integration - Internal and external forces shaping HRM - Use of technology and AI in HR processes - Linking HRM with organizational goals - Integrated role of HR across employee lifecycle - Summary, reflection, case analysis review and wrap-up	10

Textbooks

1. Human Resource Management, C.B.Mamoria , Himalaya Publishing House
2. Human Resource Management: Text and Cases, K Aswathappa , Tata McGraw Hill Publishing Company.
3. Human Resource Management, Dr. S.S. Khanka, Sultan Chanda , Delhi
4. Human Resource Management, Deepak Bhattacharya, Sage Publishing Ltd.
5. Human Resource Management, Arun Monppa , Tata McGraw Hill Publishing Company

Reference Books:

1. Human Resource Management by Dessler &Varkkey (Twelfth Edition) Pearson
2. Human Resource Management by Decenzo and Robbins
3. Human Resource Planning by John Bramham

PCC-3: OPERATIONS MANAGEMENT	**Semester I**
Credits:3	LTP:2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO	**Cognitive Abilities**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Define key concepts, scope, and types of operations in manufacturing and service sectors.
CO2	UNDERSTAND	Explain the role of forecasting and production planning in effective operations management.
CO3	APPLY	Apply forecasting techniques and production scheduling methods to simple operational scenarios.
CO4	ANALYZE	Analyse resource utilization and inventory control techniques to enhance operational efficiency.
CO5	EVALUATE	Evaluate quality management and service delivery models in diverse industry contexts.
CO6	CREATE	Design strategic and sustainable operational solutions using lean, global, and green practices.

UNITS & TOPICS	**HOURS**
Unit 1: Introduction to Operations Management: Introduction to Operations and Business Processes, Types of Operations: Manufacturing vs. Services, Linkages with Other Functional Areas, Operations as a System.	9
Unit 2: Forecasting & Production Planning: Introduction to Forecasting (Role, Qualitative Methods Quantitative Forecasting Techniques), Production Planning & Control (Planning, Routing, Loading, Dispatching), Production Targets and their Management	9
Unit 3: Resource & Inventory Management: Overview of Resources (Material, Technology, Machinery), Basics of Inventory Management and Types, EOQ Model, Inventory Control Techniques & Turnover Ratio, Value Chain & Stores Management	9
Unit 4-: Quality & Service Operations: Concepts of Quality: Producer vs. Customer View- Deming's 14 Points, TQM, Six Sigma- Introduction to Service Operations: Role of HR, Service Encounters- Queuing Theory	9
Unit 5: Strategic & Sustainable Operations: Strategic Operations, Benchmarking, Lean Concepts & Productivity, International Operations: Outsourcing & Offshoring,	9

Basics of Green Operations, SCM Overview: Push-Pull, Warehousing, Reverse Logistics

Textbooks:

1. Heizer, J., Render, B., & Munson, C. (2020). *Operations management* (12th ed.). Pearson Education.

Reference Books:

1. Krajewski, L. J., Ritzman, L. P., & Malhotra, M. K. (2019). *Operations management: Processes and supply chains* (11th ed.). Pearson Education.
2. Chase, R. B., Jacobs, F. R., & Aquilano, N. J. (2020). *Operations and supply chain management* (15th ed.). McGraw-Hill Education.
3. Mahadevan, B. (2015). *Operations management: Theory and practice* (3rd ed.). Pearson Education India.
4. Slack, N., Brandon-Jones, A., & Johnston, R. (2019). *Operations management* (9th ed.). Pearson Education.

PCC-4: MANAGERIAL ACCOUNTING	**Semester I**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Remember meaning of various accounting terminology
CO2	UNDERSTAND	Understand theoretical concepts of Accounting
CO3	APPLY	Preparation of journal, ledger, Trial balance and financial statements
CO4	ANALYZE	Analysis of financial statements, Analysis of Cost records
CO5	EVALUATE	Evaluation of Cost related parameters
CO6	CREATE	Creation of financial records

UNITS & TOPICS	**Hours**
Unit 1: Basics of Accounting	5
Need for Accounting	
Branches of Accounting	
Capital vs Revenue	
Accounting Concepts & Conventions	
Terminology	
Accounting Standards, IFRS	
Unit 2: Accounting Process – I	10
Types of Accounts	
Golden Rules of Accounting	
Journal	
Ledger	
Trial Balance	
Unit 3: Accounting Process – II	10
Preparation and Analysis of Financial Statements	
Unit 4: Cost Accounting – I	10
Elements of Cost	
Types of Cost	
Classification and Analysis of Cost	

UNITS & TOPICS	Hours
Preparation of Cost Sheet	
Unit 5: Marginal Costing	10
Meaning & Importance of Marginal Costing	
Break-Even Analysis	
Cost-Volume-Profit (CVP) Analysis	
PV Ratio	

Textbooks:

1. Accounting for Management, S. N. Maheshwari
2. Cost and Management Accounting, M. N. Arora
3. Accounting – T S Grewal
4. Management Accounting, Ravi Kishore

Reference Books:

1. Financial Cost and Management Accounting, P. Periasamy
2. Financial Accounting for Management, ShankarnarayananRamanath, CENGAGE Learning
3. Management Accounting, MadhuVij
4. Fundamentals of Management Accounting, H. V. Jhamb

PCC-5 : INTRODUCTION TO BUSINESS ANALYTICS	**Semester I**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	List the fundamental concepts and definitions of business analytics.
CO2	UNDERSTAND	Explain the significance of business analytics in modern business decision-making.
CO3	APPLY	Explore industry applications of business analytics in various domains.
CO4	ANALYZE	Examine the Process of Knowledge Discovery and Mining of Data
CO5	EVALUATE	Determine ethical considerations and governance frameworks in business analytics.
CO6	CREATE	Compile challenges and opportunities associated with implementing business analytics in real-world scenarios.

UNITS & TOPICS	**Hours**
UNIT 1: Foundations of Business Analytics	10
Definition and Scope of Business Analytics	
Evolution and Significance of Business Analytics	
Business Analytics Lifecycle	
Key Terminologies in Business Analytics	
UNIT 2: Descriptive Analytics	10
Data Types and Sources	
Data Exploration Techniques	
Data Visualization for Business Insights	
UNIT 3: Data Modelling Techniques & Analytics	10
Knowledge Discovery Process	
Data Mining Models & Techniques	
Data Analytics Techniques (Descriptive, Prescriptive & Predictive)	
Current and Emerging Trends	
UNIT 4: Ethics & Governance in Business Analytics	10
Ethical Considerations in Data Analytics	
Data Governance Frameworks	

UNITS & TOPICS	Hours
Compliance and Privacy Issues	
UNIT 5: Applications and Case Studies	5
Application of Business Analytics to a Real-World Business Problem with respect to major domain viz. Marketing , Operations	

Reference Books:

1. "Business Analytics: The Science of Data-Driven Decision Making" by Thomas H. Davenport
2. "Data Science for Business" by Foster Provost and Tom Fawcett
3. "Business Analytics: A Practitioner's Guide" by S. N. Balakrishnan

Textbooks:

1. "Business Analytics: A Data-Driven Decision Making Approach" by Albright, Winston, and Zappe
2. "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications" by Bart Baesens
3. "Python for Data Analysis" by Wes McKinney

PCC-6 : FINANCIAL MANAGEMENT	**Semester I**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Describe the basic concepts related to financial management
CO2	UNDERSTAND	Compare various sources of capital required for finance.
CO3	APPLY	Apply concepts of financial management in profit and wealth maximization
CO4	ANALYZE	Analyze the sources of capital and workout the cost of capital
CO5	EVALUATE	Conclude the concepts of financial management in various decision making.
CO6	CREATE	Construct an optimum capital structure.

UNITS & TOPICS **Hours**

Unit 1: Introduction to Financial Functions 5

Scope of Financial Management

Objectives of Financial Management

Role of Finance Manager

Decision Making – Through the Lens of Financial Management

Financial Goal: Profit Maximization vs. Wealth Maximization

Unit 2: Introduction to Financial Statements 10

Introduction to Financial Accounting and Reporting

Purpose and Importance of Financial Statements

Types of Financial Statements: Balance Sheet, Income Statement, and Cash Flow Statement

Unit 3: Introduction to Corporate Events 10

Types of Shares: Preferred Stock and Common Stock, Long-Term Debt, Retained Earnings & Their Features

Corporate Events: Dividends, Splits Spinoffs, Secondary offerings, Share Buybacks

UNITS & TOPICS	Hours
Unit 4: Capital Structure	10
Choice for Sources of Funds	
Capital Structure Planning	
Cost of Equity	
Cost of Debt	
Computation and Composite Cost of Capital	
Unit 5: Capital Budgeting	10
Concepts and Steps in Capital Budgeting	
Average Rate of Return, Payback Period	
Present Value Method, Internal Rate of Return	

Textbooks:

1. Prasanna Chandra, Financial Management: Theory and Practice, McGraw Hill Education.
2. M. Y. Khan, P. K. Jain, Financial Management: Text, Problems, and Cases, McGraw Hill Education.

Reference Books:

1. Eugene F. Brigham, Joel F. Houston, Essentials of Financial Management, Cengage Learning India

PCC-7-Business Statistics	**Semester I**
Credits:3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	COGNITIVE ABILITIES	Course Outcome (Students will be able to)
CO 1	REMEMBER	STATE the need and aspects of basic statistics tools
CO 2	UNDERSTAND	ESTIMATE the various statistics tools and techniques available to an individual and to corporates
CO 3	APPLY	INTERPRET various real-life problems and measure to solve the same using statistical techniques and Excel
CO 4	ANALYZE	ANALYSE the ways of statistical techniques which can be used for the various situations .
CO 5	EVALUATE	EVALUTE various statistics-based methods available for various research.
CO 6	CREATE	SOLVE with a formula which can be base for research and data interpretations.

UNITS & TOPICS	**Hours**
Unit 1- Introduction to Statistics Arranging data to convey meaning - Tables, Various types of Graphs and Frequency Distribution with use of Spreadsheets /Excel.	9
Unit 2: Measures of Central Tendency Arithmetic Mean, Median, Mode. Measures of Dispersion – Range, Quartile, Variances, Standard Deviation, Coefficient of Variation, and use of Spreadsheets /Excel, interpretation of the outcomes with analysis.	9
Unit 3: Correlation and Regression Karl Pearson coefficient & Rank correlation. Simple Regression– Equation and prediction and use of Spreadsheets /Excel	9
Unit 4: Probability and Linear Programming	9

UNITS & TOPICS	Hours
Basic Concept, Bayes' theorem. Probability Distributions – Binomial, Poisson and Normal and use of Spreadsheets /Excel, Formulation of LPP, Graphical solution for the basic case lets	
Unit 5: Introduction to Sampling and Hypothesis Testing Methods of Selection of a Sample, Properties of Simple Random Sampling -Merits and Demerits of Simple Random Sampling - Sample Size for Specific Precision , Chi-Square Test and T-Test	9

Textbooks:

1.Quantitative Techniques - N.D. Vohra

Reference Books:

1. Statistical Methods - S.P. Gupta
2. Statistical and Quantitative Methods – By Ranjit Chitale

Program Generic Courses Sem I

PGC-1: Company and Sectorial Analysis	**Semester I**
Credits: 1	LTP: 1:0:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 1 Hrs /week	Internal Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Describe the fundamental structure and key sectors of the Indian economy.
CO2	UNDERSTAND	Interpret the contributions of various sectors like agriculture, industry, and services to India's GDP and economic growth.
CO3	APPLY	Apply sectoral analysis techniques to assess the performance and potential of different industries in India.
CO4	ANALYZE	Analyze the impact of government policies and macroeconomic indicators on sectoral growth and economic stability.
CO5	EVALUATE	Conclude the implications of sectoral trends and interlinkages on the broader economic outlook for India.
CO6	CREATE	Anticipate potential risks and opportunities in emerging sectors and their influence on the future of the Indian economy.

UNITS & TOPICS	**Hours**
Unit 1: Sectoral Analysis	5
1.1 Overview of the Indian Economy	
Structure of the Indian Economy	
Role and Structure of Agriculture, Industry, and Services	
Economic Reforms and Sectoral Growth	
1.2 Emerging Sectors	
E-commerce, Startups, and Digital Economy	
Biotechnology and Pharmaceuticals	
Artificial Intelligence	
Green Economy and Sustainability	
Sectoral Innovations and Disruptions	
Unit 2: Company Analysis	5
2.1 Understanding the Business Model	
Key Revenue Drivers and Cost Structures	
Business Lifecycle and Growth Strategies	
2.2 Industry & Competitive Analysis	
Porter’s Five Forces Framework	

UNITS & TOPICS	Hours
SWOT Analysis and Competitive Positioning	
2.3 Corporate Governance & Leadership Evaluation	
Board Structure and Decision-Making Processes	
Leadership Effectiveness and Management Strategy	
2.4 Sustainability & ESG Considerations	
Corporate Social Responsibility (CSR)	
Environmental and Ethical Impact of Business Decisions	
Unit 3: Business Health and Risk	5
3.1 Interpreting Key Financial Indicators	
Revenue, Profitability, and Growth Metrics	
Understanding Financial Health Without Deep Technical Analysis	
3.2 Risk Assessment & Business Resilience	
Identifying Operational, Reputational, and Strategic Risks	
Crisis Management and Adaptability Strategies	

Textbooks:

1. "Sectoral Analysis of the Indian Economy" – V. K. Agnihotri
2. “Indian Economy" – Ramesh Singh
3. "Structural Transformation of Indian Economy" – Sudip Chaudhuri
4. “Indian Economy: Performance and Policies" by Uma Kapila
5. India’s Economic Reforms and Development: Essays for Manmohan Singh" by Isher Judge Ahluwalia and IMD Little

Reference Books:

1. "Competitive Strategy: Techniques for Analyzing Industries and Competitors" – Michael E. Porter
2. Blue Ocean Strategy – W. Chan Kim & Renée Mauborgne
3. The McKinsey Way – Ethan M. Rasiel
4. India's Financial Markets: An Insider's Guide to How the Markets Work by Ajay Shah, Susan Thomas, and Michael Gorham
5. The Indian Economy: A Macro-Economic Perspective by K.R. Gupta

PGC-2: Managerial Communication	**Semester I**
Credits:1	LTP: 1:0:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 1 Hrs. /week	Internal Assessment: 50 Marks

CO#	COGNITIVE ABILITIES	Course Outcome (Students will be able to)
CO 1	REMEMBER	Know the key terms of communication
CO 2	UNDERSTAND	Understand and apply earning effectively in both spoken and written Managerial Communication skills
CO 3	APPLY	Applying the principles of effective communication skills
CO 4	ANALYZE	Analyze the models of communication skills
CO 5	EVALUATE	Evaluate work on feedback and perform managerial skills effectively
CO 6	CREATE	Creatively apply knowledge in the workplace keeping the organization active through managerial effectiveness

UNITS & TOPICS **Hours**

Unit 1: Fundamentals of Communication 5

- Introduction to managerial communication, Role in Business and Importance.
- Managerial Functions and Styles of Communication, Principles of Effective Communication
- Process of Communication, Forms of communication.
- Communication in Global Environment, Barriers to Communication and Methods of overcoming the barriers

Unit 2: Verbal communication 5

Verbal communication- Oral Presentation: Planning presentation, Technical & Non-technical presentations, Developing & displaying visual aids, Use of Charts, Diagrams & Tables, Handling questions from the audience, Face to Face Communication, Non-verbal communication – Personal Appearance, Gestures, Posture – Body Language

- Visual & Audio-Visual Aids for communication, Telephonic Conversation, Teleconferencing,

UNITS & TOPICS	Hours
Listening: Meaning, Importance, Types of listening, Tips for effective listening, Barriers for listening- Challenges and etiquette, Managerial speeches &principles of Effective Speech -**Written Communication** Resume writing, Planning a Targeted Resume, Preparing Resumes, Supplementing a Resume, Composing Application Messages - Conducting Meetings: Procedure- Preparing agenda, Minutes and Resolutions, Conducting Seminars & Conferences: Procedure of Regulating Speech Evaluating Oral Presentation–Drafting Speech – Negotiation Skills	
Unit 3: Communication in an organisation Group Discussions, Characteristics of Effective Communication. Group Decision Making and Cross-Cultural Dimensions, Purpose of Interviewing, Types of Interviews, Style of Interviewing, Correct Methods of Concluding and Judgment, Mock Interviews, Greetings and Art of Conversation, Dressing and Grooming, Norms of Business Dressing - Introduction to managerial writing- Business letters, Reports, emails; Mechanics of writing; Effective use of formal and in formal business expressions Effective E-mail, E-mail Etiquettes, Writing Business Reports and Proposals, Purpose of Business Reports, Parts of Report, Format of Business Proposals, Practice for Writing Business Reports- Correspondence- Norms for Business Letters, Letter for different kinds of situations	5

Textbooks:

1. Managerial Skills by Dr KAlex

Reference Books:

1.Lesikar, R.V.& Flatley, M.E.(2005).
2. Basic Business Communication Skills for Empowering the Internet Generation. TataMcGraw Hill Publishing Company Ltd. New Delhi.
3. Ludlow, R.& Panton, F. (1998). The Essence of Effective Communication. Prentice Hall of India Pvt. Ltd

PGC-3: Self-Awareness and Personality Development	**Semester I**
Credits:1	LTP: 1:0:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 1 Hrs. /week	Internal Assessment: 50 Marks

CO#	COGNITIVE ABILITIES	Course Outcome (Students will be able to)
CO 1	REMEMBER	Self-Awareness principles
CO 2	UNDERSTAND	Understand learning effectively in self-awareness
CO 3	APPLY	Applying the principles self-awareness
CO 4	ANALYZE	Analyze the principles of self-awareness
CO 5	EVALUATE	Evaluate through various methods effectively like SWOT
CO 6	CREATE	Creatively apply the self-awareness to attain highest potential

UNITS & TOPICS **Hours**

Unit 1: Introduction to Self-Awareness 5

Session 1.1: Understanding Self-Awareness

- Definition and importance of self-awareness
- The role of self-awareness in leadership and management
- Tools for self-assessment (SWOT Analysis, Johari Window)

Session 1.2: Exploring Personal Values and Beliefs (2 Hours)

- Identifying core values and beliefs
- How values influence decision-making and behavior
- Aligning personal values with professional goals

Unit 2: Personality Development 5

Session 2.1: Personality Theories and Self-Discovery

- Overview of major personality theories (Big Five, Myers-Briggs Type Indicator)
- Personality assessments and their applications
- Understanding your personality type and leveraging it in professional settings

Session 2.2: Building Emotional Intelligence (2 Hours)

- Introduction to emotional intelligence (EI)

UNITS & TOPICS **Hours**

- Components of EI: Self-awareness, self-regulation, motivation, empathy, social skills
- Developing EI for personal and professional success

Unit 3: Communication and Mind Mapping 5

Session 3.1: Fundamentals of Effective Communication

- Verbal, non-verbal, and written communication skills
- Active listening and empathy in communication
- Barriers to effective communication and overcoming them

Session 3.2: Introduction to Mind Mapping

- What is mind mapping? Understanding the concept
- Benefits of mind mapping for learning and personal development
- Tools and software for creating mind maps

Session 3.3: Applying Mind Mapping Techniques

- Practical exercises: Creating mind maps for problem-solving and decision-making
- Using mind mapping for goal setting and planning

Session 3.4: Strategies for Confidence Building

- Identifying self-limiting beliefs and overcoming them
- The power of positive self-talk and visualization
- Building self-esteem through personal achievements
- **Confidence Building and Personal Growth**

Session 3.5: Goal Setting and Personal Development Planning

- SMART goals for personal and professional growth
- Creating a personal development plan
- Tracking progress and staying motivated

Developing a Growth Mindset

- Understanding the growth vs. fixed mindset
- Techniques to cultivate a growth mindset
- Applying growth mindset principles to overcome challenges

Textbooks:

1. Managing Career By Discovering Your personality by S. Chand by S. Chand Publication

Reference Books:

1. Self-Awareness: The Hidden Driver of Success and Satisfaction by Travis Bradberry

PGC-4- Indian Ethos & Business Ethics	**Semester I**
Credits: 1	LTP:1:0:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 2Hrs /week	Internal Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO 1	REMEMBER	Explain business ethics in changing environment in the emerging companies
CO 2	UNDERSTAND	To understand the growing importance of Corporate Governance in Indian and Global Context.
CO 3	APPLY	To Identify the need for corporate governance and evaluate recommendations of committees in governance
CO 4	ANALYZE	To Critically analyze Professional ethical issues and challenges
CO 5	EVALUATE	CO3 Identify the need for corporate governance and evaluate recommendations of committees in governance
CO 6	CREATE	To create the Significance of Corporate social responsibility in companies through report comprehension

UNITS & TOPICS		**Hours**
1	Introduction to Indian Ethos: History & Relevance, Principles Practiced by Indian Companies, Role of Indian Ethos in Managerial Practices.	**5**
2	Understanding Values in Business: Kautilya‘s Arthashastra, Indian Heritage in Business, Management- Production and Consumption. Ethics v/s Ethos , Indian v/s Western Management, Work Ethos and Values for Indian Managers	**5**
3	Ethical Principles in Business; Ethical Culture in Organization, Developing codes of Ethics and conduct, Ethical and value based leadership.	**5**

References:

1. Chakraborty S.K., —Management Transformation by Valuesǁ, New Delhi, Sage Publication, 1990.
2. Chakraborty, S.K., Ethics in Management-Vedantic Approach, New Delhi, Oxford India Ltd. 1995.
3. Fernando A.C., Business Ethics: An Indian Perspective, Pearson, 2009.
4. Kautilya‘s Arthasastra, King, Governance, and Law in Ancient India, Oxford University Press, 2016.
5. Murthy, C.S.R. Business Ethics, Himalaya Publishing House, Mumbai, 2009.
6. Narayana G., —The Responsible Leader: A Journey through Gitaǁ, Ahmedabad, AMA 2000.

Semester II

Program Core Courses-PCC Sem II

PCC-1: Research Methodology	**Semester II**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Define and explain fundamental concepts, stages, and significance of business research in managerial decision-making.
CO2	UNDERSTAND	Describe various research designs, data collection techniques, and their applications in business research.
CO3	APPLY	Apply measurement scales, questionnaire design techniques, and data collection methods in research studies.
CO4	ANALYZE	Analyze sampling methods, hypothesis testing procedures, and data preparation techniques for research.
CO5	EVALUATE	Evaluate statistical methods such as T-test, ANOVA, correlation, and factor analysis to derive meaningful business insights.
CO6	CREATE	Design and present research reports with appropriate statistical interpretation while adhering to ethical research practices.

UNITS & TOPICS	**Hours**
Unit 1: Introduction to Business Research	5
Definition, Scope, and Importance of Business Research	
Stages in the Research Process	
Problem Definition & Research Objectives	
Types of Research: Exploratory, Descriptive, and Causal Research	
Role of Business Research in Managerial Decision-Making	
Unit 2: Research Designs & Data Collection Techniques	10
Classification of Research Designs	
Exploratory, Descriptive & Conclusive Research Designs	
Causal Research & Experimental Designs	
Secondary Data: Nature, Sources, and Advantages	

UNITS & TOPICS	Hours
Primary Data: Nature, Types, and Issues in Data Collection	
Unit 3: Measurement, Scaling & Questionnaire Design	10
Concept of Measurement & Its Challenges (Validity, Reliability)	
Types of Measurement Scales (Nominal, Ordinal, Interval, Ratio)	
Measurement of Attitudes & Scaling Procedures	
Questionnaire Design & Testing	
Unit 4: Sampling, Hypothesis Testing & Data Preparation	10
Sampling Theory & Sampling Designs	
Determining Sample Size & Central Limit Theorem	
Hypothesis Testing: Concept, Formulation, and Procedures	
Data Preparation Process (Editing, Coding, Classification, Tabulation)	
Unit 5: Statistical Analysis, Research Reporting & Ethical Issues	10
Introduction to SPSS & Data Analysis Tools	
Statistical Techniques: T-Test, ANOVA, Correlation & Factor Analysis	
Interpretation of Statistical Results	
Writing Research Reports for Academic & Business Purposes	
Ethical Considerations in Research: Plagiarism, Self-Plagiarism, and Publishing Ethics	

Textbooks:

1. **Zikmund, Babin, Carr, & Griffin** – *Business Research Methods*, Cengage Learning, 9th Edition, 2020. *(Covers business research concepts, research designs, and data collection techniques)*
2. **Donald R. Cooper & Pamela S. Schindler** – *Business Research Methods*, McGraw Hill, 12th Edition, 2021. *(Covers measurement, questionnaire design, hypothesis testing, and data analysis)*
3. **Uma Sekaran & Roger Bougie** – *Research Methods for Business: A Skill-Building Approach*, Wiley, 8th Edition, 2020. *(Covers sampling, statistical analysis, SPSS, and ethical issues in research)*

Reference Books:

1. **Kothari, C.R. & Gaurav Garg** – *Research Methodology: Methods and Techniques*, New Age International Publishers, 4th Edition, 2019. *(Covers hypothesis testing, sampling methods, and research reporting)*
2. **Malhotra, Naresh K. & Dash, Satya Bhushan** – *Marketing Research: An Applied Orientation*, Pearson, 7th Edition, 2020. *(Covers data collection, measurement scales, and research analysis techniques)*

3. **Andy Field** – *Discovering Statistics Using SPSS*, Sage Publications, 5th Edition, 2018. *(Covers statistical applications such as T-test, ANOVA, correlation, and factor analysis in SPSS*

PCC-2- Business and Commercial Laws	**Semester II**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Recall the basic principles of law, types of contracts, and relevant legal terms related to business.
CO2	UNDERSTAND	Understand the application of business laws, such as the Sale of Goods Act, Consumer Protection, and Company Law, in real-world scenarios.
CO3	APPLY	Apply legal concepts to solve business-related issues such as contract breaches, consumer disputes, and intellectual property concerns.
CO4	ANALYZE	Analyze business cases and legal precedents to assess the impact of laws on business operations and decision-making.
CO5	EVALUATE	Evaluate the effectiveness of legal frameworks, such as IPR, Cyber Law, and Consumer Protection, in promoting ethical business practices.
CO6	CREATE	Design impactful insights in cases identified for discussion

UNITS & TOPICS	**Hours**
Unit 1: Foundations of Law and Legal Environment – Meaning, Nature, and Classification of Law – Sources of Law: Constitution, Legislation, Precedents, Customs – Indian Court System – Fundamental Rights & Duties – Scope and Importance of Business Laws	9
Unit 2: Law of Contracts – Essentials of a Valid Contract – Types: Valid, Void, and Voidable – Performance and Discharge of Contracts – Breach and Remedies – Special Contracts: Indemnity, Guarantee, Bailment, Pledge, Agency	9
Unit 3: Sale of Goods and Consumer Protection – Sale of Goods Act, 1930: Contract of Sale, Conditions & Warranties, Risk Transfer, Classification of Goods, Caveat Emptor, Rights of Unpaid Seller, Auction Sales – Consumer Protection Act, 2019: Definitions, Rights, Redressal, Product Liability, E-Commerce Transactions	9
Unit 4: Company Law Essentials – Meaning & Features of Companies – Types of Companies and Incorporation – Share Capital, Memorandum & Articles of Association – Prospectus – Directors: Appointment & Responsibilities – Company Meetings	9
Unit 5: Contemporary Legal Aspects – IPR & Cyber Law – IPR in India: Patents,	9

UNITS & TOPICS	Hours
Trademarks, Copyrights, Designs, Trade Secrets – Registration, Protection & Infringement – Cyber Law in India: E-Governance, IT Act 2000, Cyber Offences, Data Privacy, Cyber Espionage	

Textbooks:

1. Kuchhal, M. C. – *Business Law* (Vikas Publishing House)
2. Kapoor, N. D. – *Elements of Mercantile Law* (Sultan Chand & Sons)

Reference Books:

1. Avtar Singh – *Company Law* (Eastern Book Company)
2. P. K. Goel – *Business Law for Managers* (Biztantra)
3. Bulchandani, K. R. – *Business Law* (Himalaya Publishing House)
4. Taxmann – *Bare Acts on Business and Corporate Laws*

PCC-3 : PROJECT MANAGEMENT	**SEMESTER II**
Credits:3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**Cognitive Abilities**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	List key concepts of project Management
CO2	UNDERSTAND	Understand the principles and processes of project management.
CO3	APPLY	Demonstrate effective communication and teamwork in project environments.
CO4	ANALYZE	Analyze risks and develop mitigation strategies for projects.
CO5	EVALUATE	Evaluate project performance using key performance indicators (KPIs) and earned value management (EVM).
CO6	CREATE	Create innovative projects for technology enabled businesses

Unit & Topics	**Hours**
Unit 1: Introduction to Project Management	9
Definition, Characteristics, and Objectives of a Project	
Philosophy, Principles, Need for and Knowledge Areas & Processes	
Project Life Cycle and Phases	
Role of a Project Manager and Stakeholders	
Project Management Processes and Its Impact	
Unit 2: Project Planning and Scheduling	9
Project Identification, Selection, and Planning	
Organizational Structure and Issues	
Gantt Charts, Critical Path Method (CPM), and PERT	
Resources and Considerations in Projects	
Work Breakdown Structure (WBS)	
Project Cost Estimation and Budgeting	
Unit 3: Risk Management	9
Risk Identification, Analysis, and Prioritization	
Project Risk Management	
Risk Mitigation Strategies	
Contingency Planning	
Quality Management and Value Engineering	

Unit & Topics	Hours
PMIS; MSP, Purchasing and Contracting for Projects	
Project Performance Measurement and Evaluation	
Unit 4: Project Execution and Monitoring	9
Project Execution	
Project Communication and Stakeholder Management	
Change Management	
Key Performance Indicators (KPIs)	
Earned Value Management (EVM)	
Unit 5: Project Closure	9
Project Evaluation and Performance Analysis	
Lessons Learned and Documentation	
Post-Project Review and Audit	

Textbooks and References:

Textbooks:

1. A Guide to the Project Management Body of Knowledge (PMBOK Guide), PMI
2. Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Harold Kerzner
3. Agile Project Management with Scrum, Ken Schwaber

References:

1. Project Management for Engineering, Business, and Technology, John M. Nicholas Scrum: The Art of Doing Twice the Work in Half the Time, Jeff Sutherland
2. Project Management for Humans: Helping People Get Things Done, Author: Brett Harned, Published date: 2017
3. Making Things Happen: Mastering Project Management, Author: Scott Berkun, Published date: 2008 (revised edition)
4. Project Management for the Unofficial Project Manager, Author: Kory Kogon

PCC-4: Management Information Systems	**Semester II**
Credits: 3	LTP:2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Define the concept of MIS, Its components and its types
CO2	UNDERSTAND	Understand principles and practices of MIS and its implication in the real world
CO3	APPLY	Interpreting the role & the interdisciplinary role of the Information Systems
CO4	ANALYZE	Analysing the impact of strategic decision making involved with MIS and implement effectively in businesses
CO5	EVALUATE	Integrate their learning from functional areas, decision making process in an organization and role of Information Systems to have a vintage point in this competitive world.
CO6	CREATE	Implementing the systems and creating a unique blend effectively in individual businesses

UNITS & TOPICS **Hours**

Unit 1: Basic Concepts of Management Information System 9

Basic Concepts of Management Information System

Role of Data and Information

Organization Structures & Systems Approach in Business Processes

Introduction & Categorization of Information Systems

Strategic Information System

Unit 2: Types of Information Systems 9

Meaning, Components, Functions, and Applications of MIS

Transaction Processing Systems

Management Information Systems

Decision Support Systems

Digital Dashboards,

UNITS & TOPICS	Hours
Unit 3: Applications of Information Systems	9
Meaning, Functions, and Applications of Functional Systems in Financial, Human Resource, Marketing, Production, and Operations, Enterprise Systems: Business Process Integration, ERP, Supply Chain Management Systems, ERP, Supply Chain Management Systems	
Unit 4: Ethical and Social Issues in Information Systems, Securing Information Systems, Data Protection and Privacy regulations, GDPR , DPDP Act 2023,	9
Unit 5: Digital Technology Trends Transforming Businesses Changing Environment and Its Impact on Information systems in Business Data Management & Analytics Business Intelligence	9

Text Books:

1. Arora, Management Information System, Excel Books, 2010, 4th Edition, New Delhi.
2. C.S.V. Murthy, Management Information System, Himalaya Publishing House, 2011, 11 Edition, Mumbai.
3. G. V. Satya Sekhar, Management Information

Reference Books:

1. Kenneth Laudon, Jane Laudon Essentials of Management Information Systems PHI 10th
2. Stephen Haag, Amy Philips Business Driven Technology McGraw Hill
3. W.S. Jawadekar Management Information systems TMH
4. Raymond McLeod and George P. Schell Management Information systems Pearson

PCC-5: MANAGERIAL ECONOMICS	**Semester I**
Credits:3	LTP:2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Understand and Define concepts of business economics
CO2	UNDERSTAND	Explain the concepts of economics in business context.
CO3	APPLY	Analyze the correlation between economic theory and business applications
CO4	ANALYZE	Apply business economics concepts in firm's decision-making process
CO5	EVALUATE	Discuss the effect of business economics theory on the working of business economics
CO6	CREATE	Develop real business economic model to judge whether it fits into economic theory

UNITS & TOPICS **Hours**

Unit 1: Introduction to Economics in Business 5

Process and its Significance

Definition, Nature, and Scope of Managerial Economics

Basic Concepts of Microeconomics and Macroeconomics

Managerial Economics and Decision-Making

Basic Concepts: Positive and Normative Approach, Optimization, Marginal Analysis, Opportunity Cost, Economic Model, Static and Dynamics

Concept of Value of Firm or Business

Unit 2: Demand Analysis 10

Theory of Consumer Behaviour

Elasticity of Demand and its Applications

Demand Estimation and Forecasting

The Supply Analysis: Determinants of Supply, Elasticity of Supply

Theory of Firms and Different Objectives of the Firm

Firm's Cost Analysis

Analysis of Costs in Business Context

UNITS & TOPICS	Hours
Significance of Opportunity Cost Concept	
Different Market Structures and Equilibrium (Short Term & Long Term)	
Real Business Life Analysis of Different Markets	
Unit 3: Theory of Production	10
Production Functions and Its Managerial Uses	
Cobb Douglas Production Function and Other Forms of Production Function	
Laws of Production and Analysis	
Empirical Estimates of Production and Cost	
Short-Run and Long-Run Average Cost Curves and Their Analysis	
Economies and Diseconomies of Scale	
Economics of Information, Market Failures	
Need for Government Intervention in Markets	
Price Controls, Support Price System of Dual Pricing	
Unit 4: Pricing Policies and Strategies	10
Practical Pricing Policies and Strategies	
Collusive and Non-Collusive Oligopoly and Pricing in Its Context	
Game Theoretic Approach to Pricing Strategies	
Unit 5: Introduction to Macroeconomics	10
Concepts of National Income, Aggregate Supply, and Aggregate Demand	
Macro Equilibrium	
Macro Concepts: Inflation, Deflation, Growth and Inflation Trade-Off	
Macro Policies: Monetary Policy, Fiscal Policy	
Foreign Trade and Balance of Payments	
Foreign Exchange Market and Related Concepts	
Trades in Foreign Markets	

Text Books

1. Salvatore, Dominick and Srivastava, Ravikesh (2012) Managerial Economics: Principles and Worldwide Applications, Oxford University Press, ISBN 13: 978-0-19-807534-9
2. Petersen, C.H., Lewis, W.C. and Jain, K.Sudhir (2017) Managerial Economics. Pearson, ISBN 978- 81-7758-386-1

Reference Books

1. Varshney and Maheshwari(2018) Managerial Economics, Sultan Chand and Sons, New Delhi.
2. SoumyenSikdar(2020) Principles of Macroeconomics ,Oxford University Press
3. Gregory, N. Mankiw & Mark P.Taylor(2017) Principles of Macroeconomics. Cengage.

Supplementary Reading:

2. **Weblinks:**

1. https://www.youtube.com/watch?v=kgD48XXVT1c
3. https://www.youtube.com/watch?v=ADLoWIxKsyQ
3. https://open.lib.umn.edu/principleseconomics/back-matter/appendix-a-1-how-toconstruct-and-interpret-graphs/

PCC-6 Operations Research	**Semester II**
Credits:3	LTP:2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	COGNITIVE ABILITIES	Course Outcome (Students will be able to)
CO 1	REMEMBER	Operations Research Phases
CO 2	UNDERSTAND	Understand assignment and transportation models
CO 3	APPLY	Apply decision analysis concepts for business decision making
CO 4	ANALYZE	Analyze time and cost using Quantitative project management
CO 5	EVALUATE	Evaluate simulation outputs for business decision making
CO 6	CREATE	Creating Linear programming and integer programming models

UNITS & TOPICS **Hours**

Unit 1: Linear Programming and Integer Programming 9

- OR Modelling phases
- Steps In OR Modelling
- Linear Programming Concepts
- Applications of LP in various functions and industries
- LP Formulation problems
- LP using Excel Solver and sensitivity analysis
- Integer programming concepts
- Applications of Integer Programming in various functions and industries
- Integer programming problem formulation

Unit 2: Transportation Models and Assignment Models 9

- Transportation Model Concepts
- Transportation Model problem formulation
- Initial Feasible solution using Northwest Corner method, Least Cost Method, Vogel Approximation method (VAM)
- Optimizing using UV method for Transportation problems
- Transportation Model using Excel solver
- Transshipment Model concepts
- Assignment Model Concepts
- Assignment Model problem formulation
- Hungarian Method for solving Assignment problems

UNITS & TOPICS **Hours**

- Assignment Model using Excel solver

Unit 3: Decision Analysis 9

- Decision Analysis Concepts
- Decision Analysis under risk
- Decision Analysis Under uncertainty
- Payoff matrix
- MaxMax, MaxMin, Laplace, Hurwicz alpha, Min Max regret Criteria
- EMV, Expected regret Criteria
- EVWPI and EVOPI computation and interpretation

Unit 4: Quantitative Project Management 9

- Critical Path Method CPM concepts
- Network diagrams and critical path
- EST, EFT, LFT, LST and various types of float computation
- Program Evaluation Review Technique PERT concepts
- Expected time , Standard deviation and Variance of project duration
- Crashing concepts
- Cost versus time trade off

Unit 5: Monte Carlo Simulation 9

- Monte Carlo Simulation Concepts
- Monte Carlo Simulation single variable problems
- Monte Carlo Simulation multivariable problems

Textbooks:

1.Textbooks: Render and Stair , Quantitative Analysis for Management, Prentice Hall publication 2024

Reference Books:

1.Hiller and Liberman , Operations Research, Tata Mcgrawhill publications 2002

Program Generic Courses -Sem II

PGC-1- Indian Business Models	**Semester II**
Credits: 1	LTP:1:0:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO 1	REMEMBER	To have clarity of prevailing dynamics of the Indian economy and its historical evolution.
CO 2	UNDERSTAND	To Understand topics such as marketing, finance, operations, and management is essential to comprehend the nuances of Indian business models.
CO 3	APPLY	To apply the understanding of Indian business models, covering traditional practices, emerging trends, government support, challenges, and future directions.
CO 4	ANALYZE	To analyze the historical, cultural, and economic factors that shape business practices in India, including the impact of globalization, government policies, and technological advancements.
CO 5	EVALUATE	To critically evaluate the challenges and opportunities faced by Indian businesses, including issues related to market dynamics, competition, innovation, sustainability, and ethical considerations.
CO 6	CREATE	To create cases of Indian business companies

UNITS & TOPICS	**Hours**
Overview of Indian Economy	**5**
Historical Perspective of Indian Business Socio-economic Factors influencing Indian Business Models Regulatory Framework: Laws and Policies affecting Indian Businesses Challenges and Opportunities in Indian Business Environment	
Overview of Traditional Indian Business Practices	**5**
Family Business Models Emerging Nomenclature of Indian Business Practises Case Studies of Successful Traditional Indian Businesses	
Emerging Business Models in India Startup	**5**
Ecosystem in India Digital Business Models: E-commerce, FinTech, EdTech, etc. Social Entrepreneurship Franchise and Multi-level Marketing (MLM) Models Case Studies of Innovative Indian Startups	

References:

Books Recommended: -

4. India Inside: The Emerging Innovation Challenge to the West" by Nirmalya Kumar and Phanish

Puranam, 2012, Boston, Mass: Harvard Business Review Press

2. Reimagining India: Unlocking the Potential of Asia's Next Superpower, 2013, New York : Simon & Schuster

3. The Indian Economy: Problems and Prospects" by Bimal Jalan, 1993, New Delhi : Penguin

PGC-2: Introduction to Artificial Intelligence	**Semester II**
Credits: 1	LTP: 1:0:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 1Hrs /week	Internal Assessment: 50 Marks

CO#	COGNITIVE ABILITIES	Course Outcome (Students will be able to)
CO1	REMEMBER	Understand the definition, scope, and historical development of Artificial Intelligence
CO2	UNDERSTAND	Differentiate Artificial Intelligence from human intelligence in terms of capabilities, structure, and execution
CO3	APPLY	Identify and explain key subfields of AI, including Machine Learning, Deep Learning, NLP, and Computer Vision.
CO4	ANALYZE	Describe the working principles of supervised, unsupervised, and reinforcement learning.
CO5	EVALUATE	Analyze real-world applications of AI in sectors such as healthcare, finance, transportation, and education.
CO6	CREATE	Evaluate the potential of AI to transform business models, improve decision-making, and enhance customer service.

UNITS & TOPICS	**Hours**
Unit 1: Introduction to Artificial Intelligence - Definition and scope of AI - Historical overview and key milestones - Differentiating AI from human intelligence	5
Unit 2: AI Subfields and Technologies - Machine Learning: Supervised, Unsupervised, Reinforcement learning - Deep Learning and Neural Networks - Natural Language Processing (NLP) and Computer Vision	5
Unit 3: Applications of AI - AI in Healthcare: Diagnosis, treatment, medical imaging - AI in Finance: Fraud detection, algorithmic trading, risk assessment - AI in Transportation: Autonomous vehicles, traffic optimization - AI in Customer Service: Chatbots and virtual agents - AI in Education: Personalized learning, intelligent tutoring systems	5

Reference Books:-

1. S. Russel and P. Norvig, “Artificial Intelligence – A Modern Approach”, Second Edition, Pearson Education

2. David Poole, Alan Mackworth, Randy Goebel, ”Computational Intelligence : a logical approach”, Oxford University Press.

3. G. Luger, “Artificial Intelligence: Structures and Strategies for complex problem solving”, Fourth Edition, Pearson Education.

4. J. Nilsson, “Artificial Intelligence: A new Synthesis”, Elsevier Publishers.

PGC-3 Power BI	**Semester II**
Credits:1	LTP:0:0:2
Teaching Learning Scheme	**Examination Scheme**
Lectures: 2Hrs /week	Internal Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO 1	REMEMBER	List different components of Power BI
CO 2	UNDERSTAND	Understand the basic components and workflow of Power BI.
CO 3	APPLY	Apply different techniques to Import, clean, and transform data using Power BI tools.
CO 4	ANALYZE	Analyse data using various charts and tools
CO 5	EVALUATE	Evaluate model build in power BI
CO 6	CREATE	Create interactive dashboards and visual reports.

UNITS & TOPICS	**Hours**
Unit 1: Introduction to Power BI – What is Power BI? Components and Ecosystem - Power BI vs Excel - Workflow: Get Data → Transform → Visualize → Share - Connecting to Data Sources - Power Query Editor Overview	5
Unit 2: Visualization and Dashboard Design – Types of Visuals (Bar, Line, Pie, Cards, Maps, etc.) - Slicers, Filters, Drill-through - Dashboard Interactivity - Best Design Practices - Publishing to Power BI Service	5
Unit 3: Data Modelling and Transformations – Data Types and Relationships - Cleaning Data: Remove Duplicates, Nulls - Power Query Transformations - Calculated Columns & Measures (Basic DAX) - Filtering and Sorting	5

Text Books

1. Microsoft Learn: Power BI Learning Path
2. Book: *"Introducing Microsoft Power BI"* by Alberto Ferrari & Marco Russo
3. YouTube channels: Guy in a Cube, Leila Gharani

Program Specific Courses -Sem II

PSC-1 Data Insights and Visualizations	**Semester II**
Credits:3	LTP:0:0:6
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	COGNITIVE ABILITIES	Course Outcome (Students will be able to)
CO 1	REMEMBER	Understand the role of data visualization in deriving insights and supporting business decision-making.
CO 2	UNDERSTAND	Identify, clean, and prepare data for visual analysis using appropriate tools and techniques.
CO 3	APPLY	Apply key principles of visual encoding (charts, colors, labels, axes) to create effective visualizations.
CO 4	ANALYZE	Use tools like Excel, Power BI, or Python to generate interactive dashboards and visual reports.
CO 5	EVALUATE	Analyse datasets to uncover trends, outliers, and patterns and communicate findings through storytelling.
CO 6	CREATE	Design and present data-driven insights tailored to specific business functions (marketing, finance, ops, etc.)

UNITS & TOPICS

Unit 1: Excel Fundamentals **9**

Session 1: Introduction to Excel Basics

- Fibonacci Sequence, Custom Lists
- Comments, Hide Columns or Rows
- Skip Blanks, AutoFit, Transpose

Session 2: Advanced Tools in Excel

- Union and Intersect
- Flash Fill

Session 3: Formulas and Functions

- Subtract, Square Root, Percent Change
- Names in Formulas
- Dynamic Named Range, Paste Options

Session 4: Formatting Cells

- Decimal Places, Currency vs Accounting
- Date and Time Formats, Fractions
- Text to Numbers, Numbers to Text

Session 5: Advanced Formatting

- Custom Number Format, Format Painter
- Cell Styles, Merge Cells, Strikethrough, Superscript/Subscript

Session 6: Find & Select and Printing Tools

- Find Features, Delete Blank Rows
- Row Differences, Copy Visible Cells Only
- Print Titles, Page Layout

Unit 2: Advance Excel Features **9**

Session 7: Sharing & Text Files

- Exporting to PDF
- Import/Export Text Files

Session 8: Count and Logical Functions

- Countif, Count Blank/Nonblank Cells
- Count Characters, Running Total, Sumif, Sumproduct
- Logical Functions: If, Ifs, Switch

Session 9: Cell References and Date/Time Functions

- Copy Exact Formula, 3D-reference, External References
- DateDif, Weekdays, Last Day of the Month

Session 10: Text Functions

- Separate Strings, Text to Columns
- Remove Spaces, Concatenate Strings

Session 11: Lookup & Reference Functions

- Vlookup, Index and Match, Indirect
- Tax Rates, Offset

Session 12: Data Analysis

- Sorting and Filtering
- Creating Charts: Column, Line, Pie, Bar
- Pivot Tables and Pivot Charts

Unit 3 : Theory of Data Visualization **9**

Session 13: Introduction to Data Visualization

- Definition and importance
- Real-world applications with examples

Session 14: Simple Statistics for Data Insights

- Quantitative relationships
- Summarizing data

Session 15: Differing Roles of Tables and Graphs

- Choosing the right medium for communication
- When to use tables vs. graphs

Session 16: Variations in Table Design

- Relationships in tables
- Best practices in table design

Unit 4 : Data Visualization and Design Principles **9**

Session 17: Visual Perception and Communication

- Pre-attentive processing
- Applying Gestalt principles

Session 18: Variations in Graph Design

- Encoding data in graphs
- Graph design solutions

Session 19: General Design Principles

- Highlighting and organizing data
- Integrating tables, graphs, and text

Unit 5 : Advance Design Principles **9**

Session 20: Advanced Table Design

- Structural components and best practices

Session 21: Graph Component-Level Design

- Primary and secondary data components
- Non-data component design

Session 22: Displaying Many Variables at Once

- Combining multiple units of measure
- Using small multiples

Session 23: Ineffective Graphs to Avoid

- Donut, radar, and funnel charts
- Why these graphs often mislead

Session 24: Telling Compelling Stories with Data

- Characteristics of statistical storytelling
- Crafting narratives with real-world cases

Textbooks:

1. Data Visualization in Excel: A Guide for Beginners, Intermediates, and Wonks (AK Peters Visualization Series)
2. High Impact Data Visualization in Excel with Power View, 3D Maps, Get & Transform and Power BI Paperback – 16 November 2016, by Adam Aspin (Author)

PSC-2: Digital Marketing and Web Analytics	**Semester II**
Credits:3	LTP:2:0:2
Teaching Learning Scheme	**Examination Scheme**
Lectures: 2Hrs /week	Internal Assessment: 20 Marks
Practical : 2 Hrs.	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Describe various digital Marketing Concepts in-line with business scenario
CO2	UNDERSTAND	Discuss various techniques of search engine marketing
CO3	APPLY	Explain various techniques to be identified for social media marketing
CO4	ANALYZE	Differentiate between web analytics techniques in given scenarios
CO5	EVALUATE	Justify selection of tools and techniques for digital marketing
CO6	CREATE	Plan for web analytics measure to be assessed

UNITS & TOPICS	**Hours**
Unit 1: Digital Marketing Planning and Website Structure - Inbound vs Outbound Marketing, Content Marketing - Understanding Traffic and Leads, Strategic Marketing Flow - WWW, Domain Purchase, Website Tech Stack - One-page website concept - Strategic page design: Home, Services, Pricing, Portfolio, Contact - Call to Action planning - SEO overview, Google Analytics code, Website Audit - Designing WordPress Website	5
Unit 2: Search Engine and Digital Advertising Techniques - SEO and SEM: Concepts and Processes - SEM Tools: PPC, Google AdWords, Google Trends, Adsense, Analytics - Digital Banners, Display Ads, Affiliate Marketing, Influencer Marketing - E-mail Marketing: Concepts and Execution - Mobile Marketing: Strategy and Implementation	10
Unit 3: Social Media and Emerging Trends in Digital Marketing - Introduction to Social Media and SMM - SMM Strategy and Platforms: Facebook, Instagram, LinkedIn, YouTube	10

UNITS & TOPICS	Hours
- Mobile and Web app-based SMM - S-Commerce Trends - Emerging Trends: AI in marketing, Voice Search, Virtual Reality, Hyper-Personalization	
Unit 4: Web Analytics Fundamentals - Introduction to Web Analytics and Web Analytics 2.0 - Key Elements: Clickstream, Outcomes, Experimentation, Voice of Customer, Competitive Intelligence - Choosing the Right Analytics Tool - Key Metrics: Visits, Time on Page/Site, Bounce, Exit, Conversion, Engagement - Great Metrics Attributes - Web Metrics Lifecycle Process	10
Unit 5: Web Analytics – Measuring Success and Dashboards - KPI Tracking: Task Completion, Share of Search, Loyalty, RSS Subscribers, Valuable Exits, Cart Abandonment, Purchase Path - Macro & Micro Conversions - Creating Actionable Dashboards - Consolidated Dashboards - Rules for High-Impact Reporting and Visualization	10

Reference Books:

1. Dave Chaffey,Fiona Ellis-Chadwick, Kevin Johnston, Richard Mayer, (2018), *Internet Marketing,* Pearson Education
2. Seema Gupta, (2020), *Digital Marketing,* McGraw Hill Publications, Second Edition.
3. Vandan Ahuja, (2015), *Digital Marketing,* Oxford University Press, Second Edition
4. Punit Bhatia, (2016), *Fundamentals of Digital Marketing,* Pearson Publications, Second Edition
5. Dave Chaffey, PR Smith, (2017), *Digital Marketing Excellence – Planning, Optimizing, Integrating Online Marketing,* Routledge (Taylor and Francis Group), Fifth Edition
6. Avinash Kaushik, (2009), W*eb Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity* (Sybex) 1st Edition
7. Brent Dykes (2011) *Web Analytics Action Hero: Using Analysis to Gain Insight and Optimize Your Business,* (Adobe)
8. Jason BurbyAct,(2007), *Actionable Web Analytics: Using Data to Make Smart Business Decisions* (Paperback), (Sybex)

PSC-3: Python Programming	**Semester II**
Credits: 3	LTP: 0:0:6
Teaching Learning Scheme	**Examination Scheme**
Lectures: 0Hrs /week	Internal Assessment: 20 Marks
Practical: 6hrs/Week	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	List Key Concepts in python
CO2	UNDERSTAND	Understand various Python libraries
CO3	APPLY	Apply python for statistical analysis
CO4	ANALYZE	Analyze data using Python
CO5	EVALUATE	Evaluate data analysis outputs using python
CO6	CREATE	Create Visuals to validate the analysis

UNITS & TOPICS	**Hours**
Unit 1: Python Fundamentals - Introduction to Python - Variables, Data Types, Operators - Input/Output - Conditional Statements and Loops	5
Unit 2: Working with Data - Lists, Tuples, Dictionaries - Functions and Modules - File Handling (CSV/Excel) - Exception Handling , Libraries in Python – NumPy, Libraries in Python – Pandas,	10
Unit 3: Business Data Analysis using Pandas and NumPy - DataFrames and Series - Reading business data from CSV/Excel - Filtering, Grouping, Aggregating, Basic Data Analysis Using Python.	10
Unit 4: Data Visualization for Business Insights - Using Matplotlib and Seaborn - Bar, Line, Pie, Histogram, Heatmaps - Dashboard-style plotting	10
Unit 5: Statistics for Machine Learning Using Python Statistics for Machine Learning, Probability Distributions Using Python, Inferential Statistics Concepts, Using SciPy Library for Statistics, One Sample t-test, Paired t-test, Independent Sample t-test, ANOVA	10

Textbooks:

1. Fundamentals Of Python: First Programs, 3rd Edition Paperback – 15 August 2024 by Kenneth A. Lambert

2. Introduction to Data Science: Practical Approach with R and Python Paperback – 1 October 2021by B. Uma Maheswari (Author), R. Sujatha (Author)

Reference Books:

1. An Introduction to Python (Also Includes What's New in Python Release - Version 3.11)By: Guido van Rossum | Publisher: Shroff Publishers & Distributors Pvt. Ltd.

PSC-4: Predictive Analytics	**Semester II**
Credits: 3	LTP: 2:0:2
Teaching Learning Scheme	**Examination Scheme**
Lectures: 2Hrs /week	Internal Assessment: 20 Marks
Practical: 2Hrs/Week	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Understand the role of data science and machine learning in business analytics. - Recognize the significance of leveraging data for making informed business decisions.
CO2	UNDERSTAND	Demonstrate proficiency in collecting and preparing data for business analytics. - Apply techniques for cleaning and transforming raw data for effective analysis.
CO3	APPLY	Understand predictive analytics and apply regression models for business prediction. - Implement classification techniques for making informed business decisions
CO4	ANALYZE	Understand prescriptive analytics and decision support systems
CO5	EVALUATE	Understand the impact of big data on business analytics. - Apply machine learning techniques to analyze and derive insights from big data.
CO6	CREATE	Explore industry applications of business analytics in various domains. - Analyze challenges and opportunities associated with implementing business analytics in real-world scenarios.

Objective:
This syllabus provides MBA students with a foundational understanding of data science and machine learning concepts, emphasizing their practical application in business analytics.

UNITS & TOPICS	**Hours**
Unit 1: Introduction to Predictive Analytics – Definition, need, and importance of predictive analytics. Predictive vs. descriptive vs. prescriptive analytics Predictive analytics lifecycle (CRISP-DM framework) Overview of tools and platforms (Python, R, RapidMiner, Power BI)	5
Unit 2: Data Collection and Preprocessing – Data collection, cleaning, and preprocessing Feature selection and engineering Handling missing values, outliers, and multicollinearity Exploratory data analysis (EDA) with visualization techniques	10
Unit 3: Evaluation Techniques Train/Test Split	10

UNITS & TOPICS	Hours
K-Fold Cross-Validation Stratified Cross-Validation Leave-One-Out Cross-Validation (LOOCV) Bootstrapping	
Unit 4: **Predictive Analytics for Business Decision-Making** – Linear Regression (simple & multiple) Assumptions, diagnostics, and model interpretation Applications: Sales forecasting, churn prediction, fraud detection **Evaluation Metrics for Regression** Mean Absolute Error (MAE) Mean Squared Error (MSE) Root Mean Squared Error (RMSE) Mean Absolute Percentage Error (MAPE) R-squared (Coefficient of Determination) Adjusted R-squared	10
Unit 5: **Evaluation Metrics for Classification** Logistic Regression (binary and multinomial) Accuracy Precision, Recall F1 Score Confusion Matrix ROC Curve and AUC (Area Under Curve) Precision-Recall Curve Bias, Variance, and Model Complexity, Bias-Variance Tradeoff. Overfitting - Underfitting	10

Reference Books:

1. "Data Science and Big Data Analytics: Making Data-Driven Decisions in Indian Business" by EMC Education Services
2. "Business Analytics: A Practitioner's Guide" by S. N. Balakrishnan
3. Data Science for Business" by Foster Provost and Tom Fawcett
4. "Business Analytics: Data Analysis & Decision Making" by S. Christian Albright and Wayne L. Winston
5. "Python for Data Analysis" by Wes McKinney

Textbooks:

1. "Hands-On Machine Learning with Scikit-Learn and TensorFlow" by AurélienGéron
2. "An Introduction to Statistical Learning" by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani
3. "Machine Learning Yearning" by Andrew Ng (Available online)
4. "Big Data: A Revolution That Will Transform How We Live, Work, and Think" by Viktor Mayer-Schönberger and Kenneth Cukier

Semester III

Program Core Courses-PCC -SEM III

PCC-1 STRATEGIC MANAGEMENT	**Semester III**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)** Students will be able to
CO1	REMEMBER	To define strategic management and its concept.
CO2	UNDERSTAND	Understand various aspects of Strategy, Framework of Strategy Formulation, Implementation, and Appraisal.
CO3	APPLY	integrate the aspects of strategy into functional areas and apply the tools of strategic formulation, Implementation, and control
CO4	ANALYZE	Analyze the challenges, and problems faced by the management team and the required approach for the appropriate functioning of the organization through strategic interventions.
CO5	EVALUATE	To evaluate different measures of strategic control at national and international level
CO6	CREATE	To create individual with strategic intend and purpose.

UNITS & TOPICS	**Hours**
Unit 1: Fundamentals of Strategy and Strategic Intent - Definition, scope, and levels of strategy (Corporate, Business, Functional) - Strategic management process: phases and characteristics - Stakeholders in business - Strategic intent: Vision, Mission, Objectives, Goals - Abell's Three Dimensions - CSF, KPI, KRA	9
Unit 2: Environmental and Industry Analysis - External Environment Scanning and Environmental Appraisal - Scenario Planning - Environmental Threat and Opportunity Profile (ETOP) - Industry Analysis: Porter's Five Forces - Internal Analysis: Resource-Based View, VRIO Framework, Core Competence, Distinctive Competitiveness	9
Unit 3: Strategy Formulation and Business Models - Strategic Advantage and Organizational Capability Profiles - Value Chain Analysis (Porter) - Business Portfolio Analysis: BCG Matrix, GE 9-cell Matrix - Competitive Strategies: Cost Leadership,	9

UNITS & TOPICS	Hours
Differentiation, Focus - Grand Strategies: Stability, Growth, Retrenchment - Mergers, Acquisitions, Strategic Alliances, Outsourcing	
Unit 4: Strategy Implementation and Control - Strategic Plan Components and Barriers - Mintzberg's 5 Ps, McKinsey 7S Framework - Strategy-Structure Fit: Functional, Divisional, SBU, Matrix, Network, Modular - Organizational Design: Stable vs Turbulent - Corporate Culture, Learning Organizations - Evaluation: Strategic and Operational Control, Balanced Scorecard	9
Unit 5: Blue Ocean, Digital Strategy, and Sustainability - Blue Ocean Strategy: Concepts, Value Innovation, Strategy Canvas, Four Actions Framework - Digital Transformation: Business models in the Internet Economy, E-Commerce Strategies - Sustainability in Strategy: SDGs, ESG Metrics, Environmental/Social Integration	9

Textbook:

1. Strategic Management, Richard Lynch, Pearson ISBN: 978-1-292-06466-6 (print).
2. 978-1-292-06468-0 (PDF) 978-0-292-06470-3 (eText).
3. Strategic Management and Business Policy by Ashar Kazmi.
4. Keneth Starkey Strategic Management- Issues and Cases.
5. Hitt, Ireland, Hoskisson, Manikutty Strategic Management- A South Indian Perspective.
6. Fred R. David Strategic Management.

Reference Books:

1. The Principles of Scientific Management, Taylor, F.W.
2. Strategy for a Networked WorldRamirez, R., &Mannervik.
3. The Social License: How to Keep Your Organization Legitimate,J. Morrison.
4. Strategy Without Design: The Silent Efficacy of Indirect Action, Chia, R.C.H.& Holt, R.

PCC-2 : AI for Business Growth	**Semester III**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	COGNITIVE ABILITIES	Course Outcome (Students will be able to) Students will be able to
CO1	REMEMBER	List Key concepts of AI
CO2	UNDERSTAND	Understand the fundamentals of Artificial Intelligence (AI) and its strategic role in business.
CO3	APPLY	Identify and describe AI applications in marketing, operations, finance, and customer experience.
CO4	ANALYZE	Explore and utilize AI-powered tools for business intelligence, analytics, and decision-making.
CO5	EVALUATE	Examine and critically analyze case studies of AI-driven business transformations across industries.
CO6	CREATE	Develop strategies for AI adoption in organizations, addressing implementation challenges and ethical considerations.

UNITS & TOPICS **Hours**

Unit 1: AI/ML for Strategic Business Growth Focus: Understanding AI's role in revenue, efficiency, and market expansion - AI vs ML vs Analytics - Mapping ML models to business KPIs - Types of ML models and business use 5

Application: Map ML techniques to growth outcomes (e.g., regression → revenue forecasting, clustering → market segmentation)

Unit 2: Customer Growth & Retention using ML Growth Focus: Increase customer base, reduce churn - Customer segmentation using K-Means - Churn prediction using logistic regression - Customer Lifetime Value (CLV) modelling 10

Application: Build a churn model and simulate retention ROI. Segment customers for personalized marketing.

UNITS & TOPICS	Hours
Unit 3: Revenue & Sales Growth through Prediction Models Growth Focus: Forecasting and cross-selling - Linear Regression for demand forecasting - Recommendation engines for cross-sell/upsell - Case study: Amazon/FMCG brand	10
Application: Create a sales forecast model for a retail product. Use basic recommender logic for product suggestions.	
Unit 4: Operational Efficiency & Cost Optimization Growth Focus: Reduce costs, increase productivity - Inventory optimization using time-series - Credit scoring and fraud detection - HR analytics: attrition prediction	10
Application: Build a demand forecast model. Classify credit risk and identify fraud indicators. Predict employee attrition.	
Unit 5: ROI, Ethics & AI Strategy for Growth Focus: Make AI investments viable & responsible - AI project lifecycle - ROI calculation for AI initiatives - Responsible AI governance & bias handling	10
Application: Create an AI strategy plan with projected growth metrics and ethical guardrails. Use ChatGPT to draft strategy notes.	

Text Books :

1. *Python for Data Analysis* – Wes McKinney
2. *You Look Like a Thing and I Love You* – Janelle Shane
3. *Storytelling with Data* – Cole Nussbaumer Knaflic
4. *Hands-On Machine Learning* – Aurélien Géron

PCC-3: Data Visualization with Python and GenAI	**Semester III**
Credits: 3	LTP: 1:0:4
Teaching Learning Scheme	**Examination Scheme**
Lectures: 5Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)** Students will be able to
CO1	REMEMBER	Understand the fundamentals of Generative AI and its ecosystem
CO2	UNDERSTAND	Learn to use GenAI tools for text, image, and code generation
CO3	APPLY	Use Python libraries to analyze and visualize data effectively
CO4	ANALYZE	Integrate AI-generated insights with data visualizations for storytelling
CO5	EVALUATE	Evaluate visualizations and insights.
CO6	CREATE	Design and present interactive business dashboards using GenAI and Python

UNITS & TOPICS **Hours**

Unit 1: Fundamentals of Generative AI - Introduction to AI, ML, and GenAI - Foundation models: Transformers, LLMs - Basics of Prompt Engineering - Ethics and Responsible AI - GenAI Use Cases in Business 9

Unit 2: GenAI Tools in Action - Using ChatGPT for content, coding, and analysis - DALL·E for image creation - GitHub Copilot for assisted programming - Canva AI and Notion AI for productivity 9

Unit 3: Python Programming Essentials - Python syntax and data structures - Using Jupyter Notebook and Google Colab - Data cleaning and manipulation with Pandas - Reading data from CSV, Excel, JSON files 9

Unit 4: Data Visualization with Python - Visualizations using Matplotlib and Seaborn - Creating bar, line, pie, scatter, and histogram charts - Plotly for interactive visualizations - Styling and formatting charts 9

Unit 5: Integration – GenAI + Visualization - Using GenAI to explain data trends and dashboards - Auto-generating insights from visual outputs - Business use cases in marketing, HR, and finance 9

UNITS & TOPICS **Hours**

Project & Assessment - Build a dashboard with Python + GenAI-generated insights - Presentation of analysis and prompt logic - Viva + peer evaluation

Text Books

1. *You Look Like a Thing and I Love You* – Janelle Shane
2. *Architects of Intelligence* – Martin Ford
3. *The Age of AI* – Henry A. Kissinger, Eric Schmidt, Daniel Huttenlocher
4. *Artificial Intelligence: A Guide for Thinking Humans* – Melanie Mitchell
5. *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow* – Aurélien Géron
6. *Python for Data Analysis* – Wes McKinney
7. *Python Data Science Handbook* – Jake VanderPlas
8. *Storytelling with Data* – Cole Nussbaumer Knaflic

PCC-4: Business Forecasting	**Semester III**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to) Students will be able to**
CO1	REMEMBER	Define key terms in forecasting.
CO2	UNDERSTAND	Understand the fundamental concepts and principles of business forecasting.
CO3	APPLY	Apply various forecasting techniques to real-world business scenarios.
CO4	ANALYZE	Utilize software tools for data analysis and forecasting.
CO5	EVALUATE	Evaluate and select appropriate forecasting methods based on data characteristics and business needs.
CO6	CREATE	Develop, implement, and monitor forecasting models in different business contexts, the cross-cultural and gender dimensions of negotiation

UNITS & TOPICS	**Hours**
Unit 1: Introduction to Business Forecasting - Introduction to Business Forecasting - Data Collection and Preparation - Exploratory Data Analysis (EDA) - Basics of Time Series Analysis	8
Unit 2: Forecasting Methods - Moving Average and Exponential Smoothing - ARIMA Modelling - Causal Models and Regression Analysis	10
Unit 3: Evaluating and Improving Forecasts - Qualitative Forecasting Methods - Forecast Accuracy and Model Evaluation - Software Tools for Forecasting (Excel, Python, R, etc.)	10
Unit 4: Practical Applications and Communication - Case Studies and Business Applications - Developing a Forecasting Strategy - Communicating Forecast Results Effectively	10

UNITS & TOPICS	Hours
Unit 5: Capstone Project and Review - Project-based forecasting using real or simulated business data - Model selection, implementation, and presentation - Final assessment and feedback	8

Textbooks:

1. Business Forecasting by John E. Hanke and Dean W. Wichern
2. Forecasting: Principles and Practice by Rob J. Hyndman and George Athanasopoulos
3. Applied Business Statistics: Making Better Business Decisions by Ken Black

Reference Journals:

1. International Journal of Forecasting, Elsevier
2. Journal of Business & Economic Statistics, American Statistical Association
3. Journal of Time Series Analysis, Wiley
4. Journal of Forecasting, Wiley
5. Technological Forecasting and Social Change, Elsevier

PCC-5 : Internship Project	**Semester III**
Credits: 6	LTP: 0:0:12
Teaching Learning Scheme	**Examination Scheme**
Lectures: 12Hrs /week	Internal Assessment: 50 Marks
	External Assessment: 50 Marks

CO#	COGNITIVE ABILITIES	Course Outcome (Students will be able to)
CO1	APPLY	Apply the theory concepts learned in practical ways in industry
CO2	ANALYSE	Analyze project allotted by the industry or write research based project report for the allotted subject
CO3	EVALUATE	Evaluate the practical environment & observations as per industry norms
CO4	CREATE	Compile a report, write, and solve organization challenges

Section	Details
Introduction	Every student enrolled is required to undertake an internship assignment within assigned companies for hands-on corporate experience and for integrating the knowledge and skills acquired through the coursework. SIP provides an opportunity to gain exposure to industry projects. It enables interactions with professionals and other summer interns, while also improving students' presentation, writing, and communication skills. Duration The Summer Internship takes place after the first year and before the beginning of the second year. It is conducted for a minimum duration of 60 days. Any extension of SIP duration is subject to the decision of the college. A faculty mentor will be allotted from college who will interact with industry mentor at regular interval for internship progress
Completion of Internship	Internship Upon completion of the internship, students should submit the completion certificate signed by the industry guide within the stipulated time as communicated by the college. The student intern shall submit the SIP Report (including completion certificate) to the Faculty Mentor. The student should have the SIP presentation ready soon after completing the SIP.
Project Report	The project report serves as a guideline for the work completed during the

Section	Details
	Section Details internship. Students must ensure they submit a complete and well-documented report to the college.
	SIP Total Marks: 100
Evaluation	Assessment of Report: 40 Marks Presentation of Project: 10 Marks External Viva: 50 Marks

Program Specific Courses -Sem III

PSC-1: Data Engineering & Knowledge Management	**Semester III**
Credits: 3	LTP: 2:0:2
Teaching Learning Scheme	**Examination Scheme**
Lectures: 4Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO #	**Cognitive**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Recall key concepts of Data Engineering, identify Knowledge Management tools, and recognize Data Governance principles.
CO2	UNDERSTAND	Explain Data Engineering's role in Business Intelligence, discuss Knowledge Management processes, and interpret Data Integration.
CO3	APPLY	Apply Data Processing techniques, utilize Knowledge Management Systems, and implement basic Data Governance practices.
CO4	ANALYZE	Analyse Data Engineering architectures, examine Knowledge Management processes, and differentiate Data Integration techniques.
CO5	EVALUATE	Evaluate Data Engineering solutions, assess Knowledge Management strategies, and consider ethical aspects.
CO6	CREATE	Design Data Engineering pipelines, develop Knowledge Management Systems, and formulate Data Governance frameworks.

UNITS & TOPICS	**Hours**
Unit 1: Introduction to Knowledge Management Types of knowledge: Tacit vs. Explicit Knowledge Management (KM) lifecycle: Creation, Storage, Sharing, Application KM frameworks: SECI Model, DIKW Pyramid Role of organizational culture in KM	9
Unit 2: Tools & Technologies in KM Knowledge repositories and enterprise wikis Content management systems (SharePoint, Confluence) Collaboration tools and intranets Use of NLP and AI in knowledge retrieval and classification	9
Unit 3: Foundations of Data Engineering: Data lifecycle: Collection, storage, processing, analysis ETL vs. ELT processes Structured vs. unstructured data. Roles and responsibilities of data engineers	9
Unit 4: Data Architecture & Tools Data lakes, data warehouses, data marts	9

UNITS & TOPICS	Hours
Batch vs. stream processing. Tools: Apache Hadoop, Spark, Kafka, Airflo Introduction to cloud platforms (AWS, Azure, GCP)	
Unit 5: Data Integration & Quality Management Data modelling and schema design Data wrangling, cleansing, and transformation Metadata management and data lineage Ensuring data quality: consistency, accuracy, and reliability	9

Textbooks:

1. "Database System Concepts" by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan
2. "Fundamentals of Data Engineering" by Joe Reis and Matt Housley
3. "Knowledge Management in Theory and Practice" by KimizDalkir
4. "Knowledge Management: An Integrated Approach" by Ashok Jashapara

Reference Books:

1. "Big Data: Principles and Best Practices of Scalable Real-time Data Systems" by Nathan Marz and James Warren
2. "Designing Data-Intensive Applications" by Martin Kleppmann
3. "Data Engineering with Python" by Paul Crickard
4. "Knowledge Management: Value Creation Through Organizational Learning" by Clyde Holsapple and Meir Russ
5. "Knowledge Management: Systems and Processes" by Irma Becerra-Fernandez, Rajiv Sabherwal
6. "Knowledge Management: Value Creation Through Organizational Learning" by Danny P. Wallace
7. "Knowledge Management: An Evolutionary View" by Sudhir Warier

PSC-2 : BIG Data Analytics	**Semester III**
Credits: 3	LTP: 2:0:2
Teaching Learning Scheme	**Examination Scheme**
Lectures: 2Hrs /week	Internal Assessment: 20 Marks
Practical: 2Hrs/Week	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO No.	**Cognitive Ability**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Recall key concepts of Big Data, identify technologies and tools, and recognize data processing techniques.
CO2	UNDERSTAND	Explain the Big Data Analytics lifecycle, discuss its role in business decision-making, and interpret analytics outputs.
CO3	APPLY	Apply data ingestion and processing techniques, utilize analytics tools, and implement data visualization techniques.
CO4	ANALYZE	Analyse Big Data architectures, examine processing techniques, and differentiate between analytics tools.
CO5	EVALUATE	Evaluate Big Data solutions, assess data-driven strategies, and consider ethical implications.
CO6	CREATE	Design analytics pipelines, develop predictive models, and formulate governance policies.

UNITS & TOPICS	**Hours**
Unit 1: Introduction to Big Data – Definition and Importance, Characteristics (5Vs), Big Data vs. Traditional Data, Business Applications (Finance, Marketing, Healthcare), Overview of Technologies and Tools	9
Unit 2: Big Data Infrastructure and Technologies – Big Data Ecosystem (Hadoop, Spark, and Beyond), Distributed Computing (MapReduce Framework), Storage Solutions (HDFS, NoSQL Databases like MongoDB), Cloud Computing (AWS, Azure, Google Cloud), Case Studies	9
Unit 3: Data Processing and Analysis – Data Ingestion Techniques, Data Cleaning and Preprocessing, Real-time vs. Batch Processing, Data Analysis with Apache Spark, Pig, Hive, Big Data Analytics Tools and Frameworks	9
Unit 4: Machine Learning and Predictive Analytics with Big Data – Introduction to AI and ML in Big Data, Supervised and Unsupervised Learning, Predictive Analytics (Regression, Classification), ML Tools (MLlib, TensorFlow), Business Case Studies	9
Unit 5: Big Data Governance, Security, and Ethics – Governance Policies and Standards, Data Privacy and Security (GDPR, CCPA), Ethical Considerations, Compliance, Security Measures for Big Data	9

Textbooks:

1. "Big Data: Principles and Best Practices of Scalable Real-Time Data Systems" by Nathan Marz and James Warren
2. "Big Data Analytics: Concepts, Tools, and Applications" by Dr. Anil Maheshwari
3. "Big Data: A Revolution That Will Transform How We Live, Work, and Think" by Viktor Mayer-Schönberger and Kenneth Cukier
4. "Big Data Analytics" by Seema Acharya and Subhashini Chellappan

Reference Books:

1. "Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data" by EMC Education Services
2. "Hadoop: The Definitive Guide" by Tom White
3. "Data Mining: Concepts and Techniques" by Jiawei Han, Micheline Kamber, and Jian Pei
4. "Mining of Massive Datasets" by Jure Leskovec, Anand Rajaraman, and Jeffrey Ullman
5. "Big Data for Dummies" by Judith Hurwitz, Alan Nugent, Dr. Fern Halper, and Marcia Kaufman

PSC-3: Modern Data Management	**Semester II**
Credits: 3	LTP: 2:0:2
Teaching Learning Scheme	**Examination Scheme**
Lectures: 2 Hrs. /week	Internal Assessment: 20 Marks
Practical : 2Hrs/ Week	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO #	**Cognitive Ability**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Describe the basic concepts and principles of data management, data modelling, data warehousing, data integration, data analytics, and cloud computing.
CO2	UNDERSTAND	Explain the significance of data management in today's digital world and describe the role of data modelling, data warehousing, data integration, data analytics, and cloud computing in managing data effectively.
CO3	APPLY	Apply the principles of data management to design effective data models, implement data warehouses, integrate data from various sources, perform data analytics, and utilize cloud computing services.
CO4	ANALYZ	Analyse the effectiveness of different data management strategies and techniques and identify areas for improvement.
CO5	EVALUATE	Evaluate the impact of data management on business performance and decision-making and assess the benefits and drawbacks of different data management technologies and approaches.
CO6	CREATE	Create a comprehensive data management plan that incorporates data modelling, data warehousing, data integration, data analytics, and cloud computing to address specific business needs or challenges.

UNITS & TOPICS **Hours**

Unit 1: Introduction to Data Management System – Understanding Data, Information, and Knowledge; Definition, Scope, and Importance of Data Management; Trends and Challenges in Data Management; Overview of Data Management Frameworks and Standards; RDBMS Concepts, ACID Properties, and Codd's Rules. 8

UNITS & TOPICS	Hours
Unit 2: Data Modelling and Relational Databases – Data Modelling Concepts and Techniques; Entity-Relationship (E-R) Model; Relational Database Principles; Understanding Normalization and Its Importance; Case Studies on Data Modelling and Database Design.	9
Unit 3: MySQL – Database Queries and Operations – Basic SQL Syntax and Query Writing; Database Operations: SELECT, INSERT, UPDATE, DELETE; Working with Database and Table Structures (CREATE, DROP, ALTER); Advanced SQL Queries: JOINS, UNION, GROUP BY; Handling NULL Values, Constraints, and Indexing; SQL Functions for String, Number, and Date Operations; Advanced SQL Features: Wildcards, Aliases, and Views.	12
Unit 4: Data Warehousing and Data Integration – Data Warehousing Concepts, Principles, and Architecture; Components of Data Warehousing; Data Warehousing Design and Implementation; Data Warehousing Operations and Maintenance; Introduction to Data Integration Concepts; Techniques and Methods of Data Integration; Challenges and Issues in Data Integration.	9
Unit 5: Cloud Computing in Data Management – Cloud Computing Concepts and Principles; Cloud Service Models (IaaS, PaaS, SaaS) and Deployment Models; Advantages and Disadvantages of Cloud Computing; Applications of Cloud Computing in Data Management; Case Studies on Cloud-Based Data Management.	8

Textbooks / Reference books:

1. Data Management and Analysis by Richard T. Watson.

2. Master Data Management and Data Governance by Alex Berson and Larry Dubov. DAMA-DMBoK, 2nd Edition, by DAMA International.

PSC-4: Data Science and Machine Learning	**Semester III**
Credits: 3	LTP: 1:0:4
Teaching Learning Scheme	**Examination Scheme**
Lectures: 1Hrs /week	Internal Assessment: 20 Marks
Practical : 4Hrs /Week	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Understand the fundamentals of predictive analytics,.
CO2	UNDERSTAND	Apply linear regression and classification methods to solve supervised learning problems in various business contexts.
CO3	APPLY	Implement predictive modeling techniques on real-world datasets and refine models for better accuracy and interpretability.
CO4	ANALYZE	Synthesise predictive analytics findings effectively through project presentations and support data-driven decision-making.
CO5	EVALUATE	Evaluate model performance using techniques such as cross-validation, bias-variance tradeoff, and error estimation metrics.
CO6	CREATE	Build and interpret additive models, decision trees, random forests, and unsupervised learning techniques like clustering and PCA.

UNITS & TOPICS	**Hours**
Unit 1: Supervised Learning (10 Hours)	
Linear Regression & Regularization	
Ridge and Lasso Multicollinearity, residual diagnostics	9
Gradient Decent	
Model performance metrics	
Unit 2: Classification Algorithms	
Decision Trees Random Forests Support Vector Machines (SVM), Kernel Trick	9
Model performance metrics: Accuracy, Precision, Recall, F1 Score, ROC-AUC	
Unit 3: Unsupervised Learning and Pattern Discovery	
Clustering Techniques	
K-Means DBSCAN Hierarchical Clustering	9
Dimensionality Reduction	
Principal Component Analysis (PCA)	
Unit 4: Association Rule Mining	
Apriori and FP-Growth Lift, Support, Confidence	9
Case Study: Market basket analysis or customer segmentation	
Unit 5: Ensemble Methods & Model Optimization (10 Hours)	9

Ensemble Learning
- Bagging: Random Forest
- Boosting: AdaBoost, XGBoost
- Stacking and Voting

Hyperparameter Tuning
- Grid Search, Random Search
- Cross-validation (k-Fold, Stratified)

Feature Engineering and Selection

Reference Books:

1. Applied Predictive Analytics: Principles and Techniques for the Professional Data Analyst by Dean Abbott, Wiley Publication
2. Modeling Techniques in Predictive Analytics with Python and R: A Guide to Data Science By Thomas W. Miller (FT Press Analytics) 1st Edition
3. Applied Predictive Modeling, by Max Kuhn, Kjell Johnson, 2016,Springer
4. Python Machine Learning - Second Edition, Sebastian Raschka , Packt Publishing, (2017)

SEMESTER IV

Program Core Courses-PCC Sem IV

PCC-1 Business Simulation	**Semester IV**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	Internal Assessment (20 Mks)
Lectures: 3 hrs. /week	Mid Sem Assessment: (30 Mks)
	End Semester Assessment: (50 Mks)

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
		Students will be able to
CO1	REMEMBER	List key concepts of Business Simulation
CO2	UNDERSTAND	Apply theoretical business concepts in simulated environments
CO3	APPLYING	Enhance team collaboration and communication
CO4	ANALYZE	Understand complex organizational interactions
CO5	EVALUATE	Develop strategic decision-making capabilities
CO6	CREATE	Build financial and operational management skills

UNITS & TOPICS	**Hours**
Unit 1: Foundational Knowledge 1.1 Business Fundamentals Introduction: Course overview, organizational structures, management principles, team formation, initial team-building exercise 1.2 Financial Management Basics: Accounting principles, financial statement analysis, financial metrics, cash flow fundamentals, interactive financial modeling workshop 1.3 Strategic Management Overview: Strategic planning, SWOT analysis, competitive landscape, strategic decision-making, case study introduction 1.4 Marketing Fundamentals: Market segmentation, consumer behavior, marketing mix, branding, marketing strategy exercise 1.6 International Business Context: Global markets, cross-cultural considerations, trade principles, economic environment, geopolitical impacts	5
Unit 2: Theoretical Preparation 2.1 Comprehensive Business Scenario Introduction: Simulation framework, company background, role assignments, market briefing, team brainstorming 2.2 Financial Modeling Workshop: Spreadsheet modelling, projections, budget development, investment analysis, risk assessment 2.3 Strategic Planning Deep	10

UNITS & TOPICS	Hours
Dive: Competitive analysis, scenario planning, strategic frameworks, team planning session	
Unit 3: Marketing Strategy Development 3.1 Marketing Strategy Development: Advanced market research, customer segmentation, positioning, marketing communication planning, team workshop 3.2 Operations & Supply Chain Management: Logistics optimization, cost management, efficiency improvement, operational strategy development 3.3 Integrated Simulation Preparation: Walkthrough, strategy alignment, risk management, rules briefing, final team prep	10
Unit 4: Simulation Execution – Immersive Business Experience 4.1 Simulation Rounds: Quarterly simulation cycles, real-time decision making, performance tracking, feedback sessions, adaptive complexity, challenge management	10
Unit 5: Reflection and Analysis – Learning Consolidation 5.1 Performance Review: Team/individual performance, decision impact assessment, lessons learned 5.2 Industry Expert Panel: Guest speakers, business insights, validation, Q&A, career guidance 5.3 Final Presentation Preparation: Narrative construction, visual analysis, team strategy justification 5.4 Final Simulation Showcase: Final presentations, reflection, awards, course conclusion	10

Text Books :

1. "Business Simulations: The Art and Science of Experiential Learning" – J. Scott Armstrong
2. "Strategic Management: Concepts and Cases – Competitiveness and Globalization" – Michael A. Hitt, R. Duane Ireland, Robert E. Hoskisson
3. "Financial Intelligence for Entrepreneurs" – Karen Berman & Joe Knight
4. "Operations Management" – William J. Stevenson
5. "Marketing Management" – Philip Kotler & Kevin Lane Keller
6. "Business Strategy: A Guide to Effective Decision-Making" – Jeremy Kourdi
7. "The Goal" – Eliyahu M. Goldratt
8. "Harvard Business School Case Studies" (select topics)

PCC-2 Data Security and Cyber Law	**Semester IV**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Develop a comprehensive understanding of cybersecurity terminologies, threats, and the significance of protecting end-user systems, critical IT infrastructure, and national security.
CO2	UNDERSTAND	Identify and evaluate various types of cybercrimes and cyberattacks, and apply appropriate measures for prevention, mitigation, and reporting through legal channels.
CO3	APPLY	Gain knowledge of the IT Act, 2000, and other global cyber laws to address cybercrimes and understand the legal and ethical implications of emerging technologies like AI, IoT, and blockchain.
CO4	ANALYZE	Analyze the principles of data privacy, security, and protection laws such as GDPR and India's Personal Data Protection Bill, and apply them in personal and organizational contexts.
CO5	EVALUATE	Evaluate cybersecurity plans, including policies, risk assessments, audits, and compliance strategies, to ensure effective governance and business continuity.
CO6	CREATE	Design cybersecurity plans, including policies, risk assessments to ensure effective governance.

UNITS & TOPICS **Hours**

Unit 1: Overview of Cyber Security 9

Cyber security threats & increasing threat landscape

Key cyber security terminologies

Protection of end-user machines & critical IT infrastructure

Cyber warfare & national security concerns

UNITS & TOPICS	Hours
Case Studies on cyber security breaches	
Unit 2: Cybercrimes & Threats	9
Cybercrimes targeting computer systems and mobile devices	
Online scams and frauds (email scams, phishing, credit/debit card fraud, cyberbullying)	
Cybercrime against individuals (cyber grooming, stalking, child pornography)	
Social engineering attacks & identity theft	
Cyber police stations, crime reporting procedures, Case Studies	
Unit 3: Cyber Law & Legal Framework	9
Cybercrime legal landscape around the world	
IT Act, 2000, and its amendments	
Cyber offences under IT Act, corporate governance, and legal challenges	
Laws related to AI, IoT, Blockchain, and Social Media	
Unit 4: Data Privacy & Data Security	9
Understanding data types: meta-data, big data, and non-personal data	
Data privacy vs. data security	
Personal Data Protection Bill & global data protection laws (GDPR, PIPEDA)	
Social media-related privacy concerns	
Unit 5: Cyber Security Management	9
Cyber security policies and planning	
Business continuity & cyber risk assessment	
National Cyber Security Strategy	

Textbooks:

1. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd.

Reference Books:

1. Information Warfare and Security by Dorothy F. Denning, Addison Wesley.
2. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform.
3. Data Privacy Principles and Practice by Natraj Venkataramanan and Ashwin Shriram, CRC Press.
4. Information Security Governance, Guidance for Information Security Managers by W. KragBrothy, 1st Edition, Wiley Publication.
5. Auditing IT Infrastructures for Compliance By Martin Weiss, Michael G. Solomon, 2nd Edition, Jones Bartlett Learning.

PCC-3 : Leadership and Strategic Thinking	**Semester IV**
Credits: 3	LTP: 2:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 3Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Recall fundamental concepts, terms, and frameworks related to strategic thinking.
CO2	UNDERSTAND	Explain the significance of strategic thinking in organizational contexts and differentiate it from strategic planning.
CO3	APPLY	Apply strategic frameworks and tools (e.g., SWOT, PESTLE, scenario planning) to real-world business scenarios.
CO4	ANALYZE	Analyze complex business challenges and identify the interdependencies within and between functional areas.
CO5	EVALUATE	Evaluate strategic alternatives and decision-making approaches for their effectiveness in various business environments.
CO6	CREATE	Develop innovative and actionable strategies to address dynamic business problems and align them with organizational goals.

UNITS & TOPICS	**Hours**
Unit 1: Foundations of Strategic Thinking - Definition and scope of strategic thinking - Strategic thinking vs. strategic planning - Characteristics of a strategic thinker - Levels of strategy: Corporate, Business, Functional - Strategic vs. operational thinking - Importance of vision, mission, goals - *Case studies: Strategic success and failure*	9
Unit 2: Strategic Analysis Tools and Frameworks - Internal & external environmental scanning - SWOT and PESTLE analysis - Porter's Five Forces, Value Chain Analysis - Scenario planning and forecasting - BCG Matrix, GE 9-cell Matrix, Blue Ocean Strategy - *Case studies: Tool-based analysis in real businesses*	9
Unit 3: Strategy Across Functions and Leadership Alignment - Strategic thinking in marketing, finance, HR, and operations - Linking functional and	9

UNITS & TOPICS	Hours
corporate strategies - Cross-functional collaboration - Role of leadership in strategy execution - Alignment and communication challenges - Balanced Scorecard, OKRs - *Case studies: Strategy execution*	
Unit 4: Strategic Decision-Making and Ethics - Strategic decisions under uncertainty - Decision-making frameworks: Rational, Incremental, Garbage Can Models - Ethics and social responsibility in strategy - *Case studies: Ethical dilemmas and real-world decisions*	9
Unit 5: Innovation, Adaptability, and Sustainability in Strategy - Role of innovation: Disruptive & business model innovation - Strategies for global expansion - Sustainable development goals (SDGs), ESG metrics - Integrating sustainability into strategic planning - *Case studies: Global and sustainable strategies*	9

Textbooks:

1. "Strategic Management: Concepts and Cases" Fred R. David, Forest R. David
2. "Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant" W. Chan Kim, Renée Mauborgne
3. "Competitive Strategy: Techniques for Analyzing Industries and Competitors" Michael E. Porter

Reference Books:

1. "Strategic Thinking for Leaders: A Systems Approach to Creating and Sustaining Value" J. William R. Barger, Brian G. Dive
2. Strategy Safari: A Guided Tour Through the Wilds of Strategic Management" Henry Mintzberg, Bruce Ahlstrand, Joseph Lampel

PCC-4: DISSERTATION	**Semester IV**
Credits: 3	LTP: 0:0:6
Teaching Learning Scheme	**Examination Scheme**
Lectures: 6Hrs /week	Internal Assessment: 50 Marks
	External Assessment: 50 Marks

CO#	COGNITIVE ABILITIES	Course Outcome (Students will be able to)
CO1	APPLYING	Apply the subject knowledge learned over two years
CO2	ANALYSING	Research must be carried out based on the selected topic, identifying problem statement, type of data analysis and tools, write research based paper for the selected subject
CO3	EVALUATING	Appropriate tools should be used for carrying out research
CO4	CREATING	Compile a report, write and solve organization challenges

Section	**Details**
Introduction	Dissertation is an academic writing based on research. A dissertation is a report of an extensive original research project completed as the final requirement for MBA Dissertations give students an opportunity to: · Explore their area of interest in depth. · Demonstrate accuracy and skills in investigating and discussing a problem. · Manage a critical project from the beginning to the end, most probably, for the first time. · Apply the skills they have learned in college in a more practical way. · Experience the process of producing knowledge. A dissertation is a substantial document that examines a subject and reviews different points of view (about the said subject) based on original research. It demonstrates the author's mastery of the subject, scholarly methods, the main facts, and unique points of view in it.
Duration:	Dissertation takes place in fourth semester. It is the culmination of the entire course studies undertaken during the two years.

Section	Details
Presentations:	A detailed individual presentation of the research will be scheduled based on selected topics.
Project Report:	Project report will be used as guideline for the work students have completed during the Dissertation. Students need to make sure that they submit a complete report to the college. Guidelines for project report shall be shared in the classroom.
Evaluation:	Total marks allotted: 100 External Viva will be conducted.

Program Specific Courses -Sem IV

PSC-1 BA for Industry 4.0	**Semester III**
Credits: 2	LTP: 1:1:0
Teaching Learning Scheme	**Examination Scheme**
Lectures: 2Hrs /week	Internal Assessment: 20 Marks
	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO #	**Cognitive Ability**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Understand the key concepts, technologies, and business implications of Industry 4.0 and the role of business analytics.
CO2	UNDERSTAND	Use business intelligence tools like Power BI and Tableau to develop insights from data and support digital transformation initiatives.
CO3	APPLY	Apply data analytics techniques in manufacturing, operations, and IoT-enabled environments for better decision-making and efficiency.
CO4	ANALYZE	Analyse the application of AI, ML, and real-time analytics for automation, forecasting, and strategic business decisions.
CO5	EVALUATE	Evaluate ethical, privacy, and workforce-related challenges in adopting emerging technologies in Industry 4.0 environments.
CO6	CREATE	Design integrated analytics-driven strategies for modern businesses adapting to technological disruption and global trends.

UNITS & TOPICS **Hours**

Unit 1: Introduction to Industry 4.0 and Business Analytics - Understanding Industry 4.0 - Key Technologies: IoT, AI, Big Data, Cloud Computing, Automation - Role of Business Analytics in modern industries - Impact on business models 6

Unit 2: Data Analytics in Manufacturing, Operations, and IoT - Data-Driven Decision Making Basics - Predictive Maintenance and Process Optimization - Introduction to IoT - Collecting and Processing IoT Data - Applications in Manufacturing, Services, Supply Chain, and Logistics 6

Unit 3: AI, ML, and Real-Time Analytics for Business Decisions - Basics of Artificial Intelligence and Machine Learning - Real-Time Analytics for Efficiency - Automation and 6

UNITS & TOPICS	Hours
Robotics in Industry 4.0 - Forecasting Trends using Predictive Analytics - Case Studies: Retail & Finance	
Unit 4: Business Intelligence and Digital Tools - Role of Business Intelligence in Industry 4.0 - Digital Transformation and Analytics Tools (Power BI, Tableau) - Data-Driven Decision Making Frameworks - Business Case Studies	6
Unit 5: Future Trends, Challenges, and Ethical Considerations - Cybersecurity and Data Privacy - Ethical Use of AI and Emerging Tech in Business - Impact of Industry 4.0 on Workforce and Jobs - Organizational Adaptability to Technological Change	6

Primary References:

1. **Andrew Burgess** – *The Executive Guide to Artificial Intelligence*
2. **Bernard Marr** – *Big Data in Practice: How 45 Successful Companies Used Big Data Analytics to Deliver Extraordinary Results*
3. **Frank T. Rothaermel** – *Digital Strategy: Theory and Cases*
4. **Michael Wade & Didier Bonnet** – *Digital Vortex: How Today's Market Leaders Can Beat Disruptive Competitors*

Additional References:

5. **U.D. Kumar** – *Big Data Analytics for Industry 4.0*
6. **Thomas H. Davenport** – *Competing on Analytics: The New Science of Winning*

Software & Tools Introduced:

1. **Microsoft Excel & Power BI** – Data Visualization & Business Intelligence
2. **Python (Basic Pandas & Scikit-learn)** – Simple Data Analytics
3. **Cloud-Based Business Tools (AWS, Google Cloud, Azure)** – Basics of Cloud Computing
4. **IoT Platforms** – Basic Overview of IoT in Business

PSC-2: AI & Deep Learning	**Semester IV**
Credits: 2	LTP: 1:0:2
Teaching Learning Scheme	**Examination Scheme**
Lectures: 1Hrs /week	Internal Assessment: 20 Marks
Practical: 2Hrs /Week	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO#	**COGNITIVE ABILITIES**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Understand and apply supervised learning techniques such as regression, regularization, SVM, and ensemble methods for classification tasks
CO2	UNDERSTAND	Explore unsupervised learning techniques including clustering, PCA, and dimensionality reduction with appropriate tuning of model parameters.
CO3	APPLY	Apply NLP techniques and tools for tasks such as sentiment analysis and text processing using Python-based libraries
CO4	ANALYZE	Analyse case studies to understand real-world applications and challenges in applying machine learning and deep learning models.
CO5	EVALUATE	Design, implement, and evaluate end-to-end ML/DL projects including data handling, model deployment, and ethical considerations.
CO6	CREATE	Develop deep learning models using neural networks with TensorFlow and Keras for complex business and real-world problems.

UNITS & TOPICS	**Hours**
Unit 1: Foundations of Deep Learning • Artificial Neural Networks (ANN) • Biological neuron vs. artificial neuron • Perceptron, Multi-layer Perceptron (MLP) • Activation functions (ReLU, Sigmoid, Tanh) • Forward pass, loss functions, and backpropagation	6
Unit 4: CNN and RNN Basics • Convolution operation and filters, Architecture: LeNet, AlexNet, VGG, ResNet • Applications: Image classification, object detection, face recognition • Sequential data handling, Simple RNN architecture • Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRU) • Applications: Time series forecasting, speech recognition, sentiment analysis	6
Unit 3: Introduction to NLP & Text Processing • NLP pipeline and applications • Tokenization, Lemmatization, Stemming	6

UNITS & TOPICS	Hours
• POS tagging, Named Entity Recognition (NER) • TF-IDF, Bag-of-Words, Word2Vec, GloVe • Text vectorization and embedding layers	
Unit 4: NLP with Deep Learning • Sentiment analysis with LSTM • Text classification using CNN + RNN • Sequence-to-sequence (Seq2Seq) modeling • Attention mechanism in NLP • Machine Translation: Encoder-Decoder architecture • Chatbots: Basics of intent classification and response generation	6
Unit 5: AI & Pre-trained Language Models • The Transformer architecture: Self-attention, Multi-head attention • BERT: Pre-training, fine-tuning, and applications (classification, Q&A) • GPT: Text generation and prompt engineering • Hugging Face Transformers library	6

Reference Books:

1. Applied Predictive Analytics: Principles and Techniques for the Professional Data Analyst by Dean Abbott, Wiley Publication
2. Modeling Techniques in Predictive Analytics with Python and R: A Guide to Data Science By Thomas W. Miller (FT Press Analytics) 1st Edition
3. Applied Predictive Modeling, by Max Kuhn, Kjell Johnson, 2016,Springer
4. Python Machine Learning - Second Edition, Sebastian Raschka ,Packt Publishing, (2017)
5. https://www.deeplearningbook.org/
6. Neuralnetworksanddeeplearning.com
7. Deep Learning from Scratch: Building with Python from First Principles (Greyscale Indian Edition), by Seth Weidman
8. Generative Deep Learning: Teaching Machines To Paint, Write, Compose, and Play, Second Edition (Grayscale Indian Edition)by David Foster and Karl Friston

PSC-3 : Cloud Technology & Security	**Semester IV**
Credits: 2	LTP: 1:0:2
Teaching Learning Scheme	**Examination Scheme**
Lectures: 1Hrs /week	Internal Assessment: 20 Marks
Practical: 2Hrs /Week	Mid Sem Assessment: 30 Marks
	External Assessment: 50 Marks

CO No.	**Cognitive Ability**	**Course Outcome (Students will be able to)**
CO1	REMEMBER	Understand the fundamental concepts, deployment models, and business benefits of cloud computing.
CO2	UNDERSTAND	Compare major cloud service providers and evaluate their applications across various industries.
CO3	APPLY	Recognize key security risks and strategies to protect data in the cloud.
CO4	ANALYZE	Analyse emerging trends in cloud computing such as AI integration, sustainability, and automation, and apply industry best practices.
CO5	EVALUATE	Interpret cloud-related legal frameworks and compliance standards
CO6	CREATE	Formulate a cloud adoption strategy, including budgeting, migration planning, and service selection aligned with business goals.

UNITS & TOPICS	**Hours**
Unit 1: Introduction to Cloud Computing - What is Cloud Computing? - Benefits for Businesses: Cost Savings, Flexibility, Scalability - Cloud Models: Public, Private, Hybrid - Real-World Examples of Cloud Adoption	6
Unit 2: Cloud Service Providers & Business Applications - Overview of Major Providers: AWS, Azure, Google Cloud - Use Cases in E-commerce, Healthcare, Banking, Startups - Criteria for Selecting a Cloud Service Provider	6
Unit 3: Cloud Security & Risk Management - Importance of Cloud Security - Common Risks: Data Breaches, Downtime, Hacking - Basic Security Measures: Passwords, Encryption, Backups - Case Studies: Major Incidents	6
Unit 4: Compliance and Legal Considerations - Data Privacy Laws: GDPR, HIPAA - Compliance Standards: ISO, NIST - How Companies Protect Data - Managing Business Risk in the Cloud	6
Unit 5: Cloud Strategy and Future Trends - Decision-Making: When & Why to Move to Cloud - Budgeting and Cost Control for Cloud Services - Smooth Migration Planning - AI in Cloud, Sustainability, and Cloud Automation - Best Practices and Lessons from Industry	6

Recommended Books (Simple & Practical)

1. "Cloud Computing for Business: The Open Group Guide" – The Open Group
2. "Cloud Computing Explained: Implementation Handbook for Business" – John Rhoton
3. "The Basics of Cloud Computing" – Derrick Rountree, Ileana Castrillo
4. "Cybersecurity for Beginners" – Raef Meeuwisse (for basic cloud security concepts)