Pimpri Chinchwad Education Trust's

Pimpri Chinchwad University

Sate, Pune - 412106

PCET's Pimpri Chinchwad University

Learn | Grow | Achieve

Curriculum Structure

Master of Business Administration (MBA)

(BUSINESS ANALYTICS AND ARTIFICIAL INTELLIGENCE)

(Pattern 2025)

School of Management

Effective from Academic Year 2026-27

Preamble:

The business world has changed significantly in the past few decades. The pace at which technology has evolved is unheard and unseen. The fourth industrial revolution is bringing advanced robotics and autonomous transport, artificial intelligence (AI) and machine learning, advanced materials and biotechnology. For instance, AI will almost certainly automate some jobs, particularly those that rely on assembly lines or data collection. The mobile internet and cloud technology are already impacting the business world to a larger extent. What is certain is that the future managers will need to align their skillset to keep pace in this VUCA world. It is therefore imperative for management education to meet the challenges of rapid changing times and technologies.

In this fast disruptive digital economy and VUCA world, high-quality management education is essential for India. Use of technology is one of the powerful ways to enhance the students' ability to meet the ever- changing requirements of the corporate world and society. MBA students be equipped to work across time zones, languages, and cultures. Employability, innovation, theory to practice connectedness are the central focus of MBA curriculum design and development. The core curriculum is designed to give students an in-depth mastery of the academic disciplines and applied functional areas necessary to every non-business and business leader's success.

Vision and Mission of Programme:

Vision - Nurture Leaders and Responsible Corporate Citizens for an era of Digital Business and Transformations.

Mission

- M1: Evolve the curriculum in tune with emerging technology trends and industry needs.
- M2: Develop skills and competencies in the business domains and leading-edge technology.
- M3: Nurture agile leader with ability to drive change, innovation, and transformation.
- M4: To make the students pleasantly employable.

Program Educational Objectives (PEOs):

Post-Graduates from the MBA program are expected to attain or achieve the following.

Program Educational Objectives:

- Comprehensive knowledge of technical concepts, technology platforms, and solutions.
- Exhibit good business functional knowledge and skills.
- Inculcate key attributes of visualization of technology, innovation, critical and integrative thinking enable to solve business problems.

Program Outcomes (POs)

- ***PO1:*** **Leadership**: Students will proactively demonstrate the ability to take initiative. They will be able to generate agreement, fairly and objectively, by working through different, even conflicting, points of view. They will be result oriented and have the ability to take calculated risks.
- ***PO2:*** **Innovation**: Students will demonstrate the ability to visualize innovative solutions and gather user needs holistically.
- ***PO3:*** **Critical & Analytical Thinking:** Students will be able to analyse a situation to its root cause, using tangible and intangible information.
- ***PO4:*** **Communication:** Students will be able to make a good personal impact, and articulate good written and spoken skills.
- ***PO5:*** **Global Perspective**: Students will be aware of contemporary globally accepted practices, tools, and techniques. They will demonstrate ability to view problems and solutions from a global perspective organizational, locational, and cultural.
- ***PO6:*** **Role of Self in the organization & in the society**: Students will demonstrate clarity on their personal goals, while being aware of the social context. They will be sensitive to ethical issues and believe in working out solutions based on sustainability principles.
- ***PO7:*** Techno-Proponent (PO): Apply the knowledge and passion for technology to solve business problems in an effective manner

- ***PO8:*** **Entrepreneurial Mindset**: Graduates will exhibit an entrepreneurial mindset, demonstrating creativity, innovation, and an ability to identify and pursue business opportunities.
- ***PO9:*** **Business Acumen:** Graduates will have an in-depth comprehension of various business functions, encompassing finance, marketing, operations, and human resources, and will be capable of applying this knowledge to address real-world business challenges.
- ***PO10:*** **Decision-Making**: Students will exhibit an awareness of ethical considerations in business and possess the capacity to make informed and responsible decisions that are in accordance with ethical principles and social responsibility.

Program Specific Outcomes (PSo)

1. **PSO1: Data-Driven Decision Making:** Demonstrate the ability to collect, clean, analyze, and interpret large volumes of structured and unstructured data using advanced analytical tools and techniques to support strategic and operational decision-making in a business context.
2. **PSO2: Proficiency in AI & ML Applications:** Apply Artificial Intelligence and Machine Learning models to solve complex business problems across various domains such as marketing, finance, supply chain, and human resources, while ensuring scalability and ethical usage.
3. **PSO3: Business Intelligence & Visualization:** Leverage Business Intelligence platforms and data visualization tools to create actionable insights, communicate data stories effectively, and enable real-time business performance tracking and optimization.
4. **PSO4: Integration of Technology with Business Strategy:** Strategically integrate digital technologies, analytics solutions, and AI systems with business models to drive innovation, enhance customer experience, and gain competitive advantage.
5. **PSO5: Ethical and Responsible Use of Data and AI:** Demonstrate awareness and application of data privacy laws, ethical AI principles, and responsible governance frameworks while handling data and deploying intelligent systems in business environments.

Curriculum Framework for MBA

Sr. No.	Type of course	Abbreviations
1.	Major Management Subjects	**MAJM**
2.	Professional Elective	**ELECTIVE**
3.	Major Specialization (MAJE)	**MAJE**
4.	Field Project	**FP**
5.	Research Methodology	**RM**
6.	Value Added Courses	**VAC**
7.	Ability Enhancement Courses	**AEC**

MBA (BA & AI) Curriculum Structure

School of Management

Program Structure of Masters of Business Administration 2025-27 MBA Business Analytics & Artificial Intelligence

WEF: A.Y. 2025-26 (Pattern 2025)

Semester I

Course Code	Course Name	Course Type	Teaching Scheme					Assessment Scheme		
			Th	Prac	Tut	Credit	Hrs	CIA	ESA	Total
PMB101	Principles and Practices of Management & OB	MAJM	3	0	0	3	3	40	60	100
PMB102	Economics & Finance for Decision Making	MAJM	3	0	0	3	3	40	60	100
PMB103	Statistics for Data Science	MAJM	3	0	0	3	3	40	60	100
PMB104	Business Analytics & Artificial Intelligence Applications in Management	MAJM	3	0	0	3	3	40	60	100
PMB121	Professional Elective 1	Elective	3	0	0	3	3	40	60	100
PMB106	Advance Excel for Data Analytics	VAC	0	1	0	1	2	50	-	50
PMB107	Python for Data Science	AEC	0	2	0	2	4	50	-	50
PMB125	Business Fundamentals in Contemporary world	MOOC	4	0	0	4	4	40	60	100
	Total		19	3	0	22	25	340	360	700
	Professional Electives 1									
PMB121A	Marketing & Supply Chain Management	Elective	3	0	0	3	3	40	60	100
PMB121B	Human Resource Management	Elective	3	0	0	3	3	40	60	100

Semester II

Course Code	Course Name	Course Type	Teaching Scheme					Assessment Scheme		
			Th	Prac	Tut	Credit	Hrs	CIA	ESA	Total
PMB109	Machine Learning & Predictive Analytics	MAJM	3	0	0	3	3	40	60	100
PMB110	Statistical Analysis using R Programming	MAJM	2	1	0	3	4	40	60	100
PMB111	Time Series Forecasting	MAJM	3	0	0	3	3	40	60	100
PMB112	Research Methodology & Intellectual Property Rights	MAJM	3	0	0	3	3	40	60	100
PMB122	Professional Elective 2	Elective	3	0	0	3	3	40	60	100
PMB113	Structured Query Language	AEC	1	1	0	2	3	50	0	50
PFL101	Foreign Language - I	AEC	2	0	0	0	2	50	0	50
PMB114	Strategic Corporate Communication	AEC	2	0	0	2	2	50	0	50
PMB120	Minor Project (Start-up)	FP	1	1	0	2	3	50	0	50
	Total		20	3	0	21	26	400	300	700

	Professional Electives 2									
PMB122A	**Threat Intelligence & Cyber Defense**	**Elective**	**3**	**0**	**0**	**3**	**3**	**40**	**60**	**100**
PMB122B	**Cyber Security**	**Elective**	**3**	**0**	**0**	**3**	**3**	**40**	**60**	**100**
	Foreign Language I									
PFL101A	**Foreign Language I: GERMAN**	**AEC**	**2**	**0**	**0**	**0**	**2**	**50**	**0**	**50**
PFL101B	**Foreign Language I: JAPANESE**	**AEC**	**2**	**0**	**0**	**0**	**2**	**50**	**0**	**50**

Exit Policy - PG Diploma in MBA: Students who opt to exit after completion of the first year and have scored required credits offered by the school in the program structure will be awarded a PG diploma in MBA, provided they must earn additional credits during the summer vacation of the first year.

First Year

Course Code	**Course Name**	**Course Type**	**Teaching Scheme**							
			Th	**Prac**	**Tut**	**Credit**	**Hrs**	**CIA**	**ESA**	**Total**
UDIEXPG 202	**Project/ Internship**	**VSC**	**0**	**4**	**0**	**4**	**8**	**50**	**100**	**150**

Semester III

Course Code	**Course Name**	**Course Type**	**Teaching Scheme**					**Assessment Scheme**		
			Th	**Prac**	**Tut**	**Credit**	**Hrs**	**CIA**	**ESA**	**Total**
PMB201	**Deep Learning**	**MAJM**	**3**	**0**	**0**	**3**	**3**	**40**	**60**	**100**
PMB202	**AI Ethics and Governance**	**MAJM**	**3**	**0**	**0**	**3**	**3**	**40**	**60**	**100**
PMB203	**Data Visualization and Storytelling**	**MAJM**	**3**	**0**	**0**	**3**	**3**	**40**	**40**	**60**
PMB204	**Professional Electives 3**	**Elective**	**3**	**0**	**0**	**3**	**3**	**40**	**60**	**100**
PMB205	**Block Chain and Crypto Currency**	**VAC**	**2**	**0**	**0**	**2**	**2**	**50**	**-**	**50**
PMB207	**Strategic Management and Business Analytics**	**MAJM**	**3**	**0**	**0**	**3**	**3**	**40**	**40**	**60**
PMB206	**Summer Internship Program**	**INTR**	**0**	**4**	**0**	**4**	**8**	**50**	**100**	**150**
PFL201	**Foreign Language-II**	**AEC**	**2**	**0**	**0**	**0**	**2**	**50**	**-**	**50**
	Total		**19**	**4**	**0**	**21**	**27**	**350**	**360**	**670**
	Professional Electives 3									
PMB204A	**Big Data Analytics and Cloud Computing**	**MAJM**	**3**	**0**	**0**	**3**	**3**	**40**	**60**	**100**
PMB204B	**E-Commerce Analytics**	**MAJM**	**3**	**0**	**0**	**3**	**3**	**40**	**60**	**100**
	Foreign Language II									
PFL201A	**Foreign Language II: GERMAN**	**AEC**	**2**	**0**	**0**	**0**	**2**	**50**	**0**	**50**
PFL201B	**Foreign Language II: JAPANESE**	**AEC**	**2**	**0**	**0**	**0**	**2**	**50**	**0**	**50**

Semester IV										
Course Code	Course Name	Course Type	Teaching Scheme					Assessment Scheme		
			Th	Prac	Tut	Credit	Hrs	CIA	ESA	Total
PMB208	Advanced Machine Learning and Artificial Intelligence Applications	MAJM	3	0	0	3	3	40	60	100
PMB209	Digital Payments and Financial Innovations	MAJM	3	0	0	3	3	40	60	100
PMB210	Capstone Project	MAJM	3	0	0	3	3	40	60	100
PMB214	Advanced Statistical Methods	MAJM	3	0	0	3	3	40	60	100
PMB211	Professional Electives 4	Elective	3	0	0	3	3	40	60	100
PMB212	Entrepreneurship Development	VAC	2	0	0	2	2	50	-	50
PMB213	Research Field Project	FP	0	4	0	4	8	50	100	150
	Total		17	4	0	21	25	300	400	700
	Professional Electives 4									
PMB211A	Customer Analytics and engagement strategy	Elective	3	0	0	3	3	40	60	100
PMB211B	Data Driven Decision Making in Marketing	Elective	3	0	0	2	2	40	60	100

SEMESTER I

COURSE CURRICULUM

Name of the Program:	MBA (BA & AI)	**Semester:** I	**Level:** PG
Course Name	Principles and Practices of Management & Organizational Behavior	**Course Code/ Course Type**	PMB 101/MAJM
Course Pattern	2025	**Version**	1.0

Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	-	-	3	3	40	60	-

Pre-Requisite: Bachelor's Degree

Course Objectives (CO):	The objectives of PPOM & OB course are: 1. Recall the basic concepts and principles of management. 2. Recognize the ability to apply the multifunctional approach to organizational objectives. 3. Apply professional mastery; managers, both present and prospective, are required to be fully equipped with principles of management and how these principles can be put into practice in an organization. 4. Evaluate and have better control over resources for effective management. 5. Design and create an evaluation system where principles of management will enhance decision-making abilities and sharpen tools for the purpose.
Course Learning Outcomes (CLO):	Students would be able to: 1. Identify cases as real time experience in the field of Management and Organizational Behavior. 2. Explain conceptual knowledge of management, various functions of Management and theories in OB. 3. Comprehend and apply management and behavioral models to relate attitude, perception and personality. 4. Analyze the recent trends in Management and models in organizational behavior for better control. 5. Decide/evaluate ongoing business situations through the application of the management principles.

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
Introduction: Meaning, Objectives, Differences between Administration and Management, Levels of Management, Kinds of Managers, Managerial roles, History of Management, Recent trends in Management	**CLO 1**	**9**
UNIT II		
Planning: Importance, Process, Benefits of Planning, Types of Plans, Planning tools and techniques; **Organising:** Meaning, Types of Organisation structures, Traditional structures, Directions in organisation structures; **Leading:** Meaning, Nature, Traits and Behaviour, Contingency approaches to Leadership, Transformational leadership;	**CLO 2**	**9**

Controlling: Meaning, Importance, Steps in the control process, Types of Control		
UNIT III		
Organisational Behaviour: Introduction, Meaning, History of Organisational Behaviour, Organisational effectiveness, Organisational learning process, Stakeholders, Contemporary challenges for Organisations	**CLO 3**	**9**
UNIT IV		
Behavioural Dynamics: MARS Model of individual behaviour and performance, Types of Individual behaviour, Personality in Organization, Values in the workplace, Types of values; **Perception:** Meaning, Model of Perceptual process. Emotions in workplace, Types of emotions, Circumplex Model of Emotion, Attitudes and Behaviour, Work-related stress and its management; **Motivation:** Meaning, Maslow's Hierarchy of Needs, Four Drive Theory of Motivation	**CLO 4**	**9**
UNIT V		
Teams & Culture: Teams: Advantages of Teams, Model of Team Effectiveness, Stages of Team Development, Power, Meaning, Sources, and Contingencies of Power, Consequences of Power; **Culture:** Meaning, Elements of Organizational Culture, Importance of Organisational Culture. Organisational Change, Meaning, Resistance to change, Approaches to Organisational Culture, Action Research Approach, Appreciative Inquiry Approach, Large Group Intervention Approach, Parallel Learning Structure Approach, and Ethical issues of Organisational Behaviour	**CLO 5**	**9**
Total Hours		**45**

Textbooks:

1. Organizational Behavior, Steven L. McShane & Mary Ann Von Glinow, 6/e, McGraw Hill Education, 2015
2. Essentials of Management, Koontz, McGraw Hill, 8/e, 2014
3. Management, John R. Schermerhorn, Jr., 8/e, Wiley India, 2010. 01.02.2023 12.01.2023

Reference Books:

1. Gupta, R.S., Sharma, B.D., & Bhalla. N.S. (2011). Principles & Practices of Management (11th edition). New Delhi: Kalyani Publishers
2. Williams. Management, (International edition) South-western Cengage Learning.
3. L M Prasad, (2007). Principles and Practices of Management, Himalaya Publishing House

Online Resources/E-Learning Resources:

1. Principles of Management (https://www.coursera.org/learn/principlesofmanagement)
2. Certification in Principles and Practices of Management (https://www.udemy.com/course/certification-in-principles-and-practices-of-management/?couponCode=ST8MT40924)
3. Principles of Management (https://open.lib.umn.edu/principlesmanagement/)

COURSE CURRICULUM

Name of the Program:		**MBA (BA & AI)**		**Semester: I**		**Level: PG**	
Course Name		**Economics & Finance for Decision Making**		**Course Code/ Course Type**		PMB 102 / MAJM	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA**	**Practical/Oral**
3	-	-	3	3	40	60	-
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):				The objectives of the course are: 1. Understand core concepts of microeconomics and macroeconomics relevant to managerial decision-making. 2. Apply financial principles for evaluating business performance and investment opportunities. 3. Use data analytics to interpret economic and financial data for strategic business decisions. 4. Build economic and financial models using analytical tools and software. 5. Interpret financial statements and understand financial markets and instruments.			
Course Learning Outcomes (CLO):				Students would be able to: 1. CLO1: Analyze market dynamics and business decisions using economic frameworks. 2. CLO2: Evaluate firm behavior, cost structures, and pricing strategies. 3. CLO3: Assess macroeconomic indicators and their impact on businesses. 4. CLO4: Interpret financial statements using ratio analysis and other techniques. 5. CLO5: Apply capital budgeting and risk analysis in investment decisions.			

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
Unit 1: Introduction to Managerial Economics		
Nature and Scope of Economics in Business Analytics. Demand and Supply Analysis. Elasticity of Demand and its Business Applications. Demand Forecasting Techniques using Analytics. Production and Cost Analysis. **Practical Component:** Demand forecasting using regression in Excel/R. Case study on pricing strategy using elasticity	**CLO 1**	**9**
Unit 2: Market Structures and Pricing		
Perfect Competition, Monopoly, Monopolistic Competition, and Oligopoly. Pricing Strategies in Different Market Structures. Game Theory and Strategic Behavior. Big Data and Pricing Optimization. **Practical Component:** Game theory simulations using Python. Analysis of real market pricing strategies with data	**CLO 2**	**9**
Unit 3: Macroeconomic Environment		
GDP, Inflation, Unemployment, and Business Cycles. Monetary and Fiscal Policies.	**CLO 3**	**9**

.Balance of Payments and Exchange Rate Mechanism. Global Economic Trends and their Business Impact. **Practical Component:** Analysis of macroeconomic indicators using public datasets (World Bank, IMF)		
Unit 4: Financial Statement Analysis		
Introduction to Financial Statements: Balance Sheet, Income Statement, Cash Flow. Financial Ratios and Interpretation. Common Size Analysis and Trend Analysis. Basics of Financial Modeling. **Practical Component:** Financial statement analysis in Excel	**CLO 4**	**9**
Unit 5: Corporate Finance and Valuation		
Time Value of Money and Discounted Cash Flow (DCF). Capital Budgeting: NPV, IRR, Payback Period, Profitability Index. Risk and Return, CAPM Model. Cost of Capital and Capital Structure. Stocks, Bonds, Mutual Funds, Derivatives. Fintech and Algorithmic Trading. Cryptocurrencies and Blockchain Basics.	**CLO 5**	**9**
Total Hours		**45**

Text Books:

- Managerial Economics – Mark Hirschey
- Principles of Corporate Finance – Brealey, Myers & Allen
- Financial Management – I.M. Pandey
- Macroeconomics – N. Gregory Mankiw
- Python for Finance – Yves Hilpisch (for practicals)

E – Resources :

1. Jacob Clifford – Microeconomics Series
2. Aswath Damodaran (NYU) – Corporate Finance & Valuation Lectures
3. Khan Academy – Finance and Capital Markets

Free PDFs & Readings:

1. Managerial Economics Textbook – MIT OCW
2. Financial Accounting Lecture Notes – MIT OCW
3. Investopedia – Reading Financial Statements

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester : I**		**Level: PG**	
Course Name		**Statistics for Data Science**		**Course Code/ Course Type**		**PMB 103/MAJM**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
1	1	-	2	3	50	0	0
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives of Statistics for Data Science are: 1. Recall key concepts in Statistics. 2. Recognise emerging trends and practices in data science and recognize their impact on organizational and employee management. 3. Apply methods for statistics and it's impact on data science in the organisation. 4. Evaluate statistical calculation and inferences for organisation benefit.					
Course Learning Outcomes (CLO):		Students would be able to: 1. Apply knowledge of fundamental principles of statistics. 2. Explain statistics processes for the betterment of the organisation. 3. Assess various formulas and inferences of statistical methods and theories for data science. 4. Analyze statistical inferences influencing various data science procedures. 5. Create data science models based on the statistical inferences.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Measures of Central Tendency: Mean, Median, Mode (Case Study: Customer spending behavior in digital banking) 1.2 Measures of Dispersion: Variance, Standard Deviation, Range 1.3 Data Distribution: Normal Distribution, Skewness, and Kurtosis (Example: Stock return distributions) 1.4 Visualizing Data: Histograms, Box Plots, Scatter Plots 1.5 Real-world Application: Risk analysis in Fintech firms using statistical graphs	**CLO 1**	**9**
UNIT II		
2.1 Probability Theory: Classical, Frequentist, and Bayesian Approaches 2.2 Discrete vs. Continuous Random Variables (Example: Credit risk modeling in lending platforms) 2.3 Probability Distributions: Binomial, Poisson, Normal (Case Study: Fraud detection in digital transactions)	**CLO 2**	**9**

2.4 Central Limit Theorem and its Importance in Fintech Data Analysis 2.5 Application in Risk Management: Understanding the likelihood of default		
UNIT III		
3.1 Sampling Methods: Simple, Stratified, Cluster (Example: Customer segmentation in Fintech firms) 3.2 Confidence Intervals and Margin of Error 3.3 Hypothesis Testing: t-Test, Chi-Square, ANOVA (Case Study: Evaluating the impact of UPI on traditional banking) 3.4 p-Values and Statistical Significance in Decision-Making 3.5 Application: A/B Testing in Fintech product development	**CLO 3**	**9**
UNIT IV		
4.1 Correlation vs. Causation (Example: Relationship between interest rates and loan default rates) 4.2 Simple and Multiple Linear Regression 4.3 Multicollinearity, Heteroscedasticity, and Residual Analysis 4.4 Logistic Regression for Binary Outcomes (Case Study: Predicting loan defaults) 4.5 Model Evaluation: R-Squared, Adjusted R-Squared, RMSE	**CLO 4**	**9**
UNIT V		
5.1 Components of Time Series: Trend, Seasonality, Cyclic, Irregular 5.2 Moving Averages, Exponential Smoothing 5.3 ARIMA and its Applications in Fintech (Case Study: Forecasting stock prices) 5.4 Volatility Modeling: GARCH Models in Financial Risk Assessment 5.5 **Real-world Application:** Predicting customer spending patterns in digital banking.	**CLO 5**	**9**
Total Hours		**45**

Textbooks:

1. Practical Statistics for Data Scientists. by Peter Bruce, Andrew Bruce. May 2017, O'Reilly Media, Inc.
2. Statistics for Data Science by James D. Miller November 2017, Packt Publishing
3. Statistics for Data Science and Analytics by Peter C. Bruce, Peter Gedeck, and Janet Dobbins, Wiley (sept 2024)
4. Armstrong's Essential HTime Series Analysis and Its Applications: With R Examples by Shumway and Stoffer, edition 5, Jan 2025, Springer Cham

Reference Books:

1. Statistics for Data Scientists by Maurits Kaptein and Edwin van den Heuvel, Edition1, Springer Cham, Feb 2022
2. The Elements of Statistical Learning: Data Mining, Inference, and Prediction**,** Trevor Hastie, Robert Tibshirani, Jerome Friedman, Springer, 2nd Edition, 1 January 2009
3. Bayesian Data Analysis**,** Andrew Gelman, John B. Carlin, Hal S. Stern, David Dunson, Aki Vehtari, Donald B. Rubin, CRC Press, 3rd Edition, 1 January 2013

Online Resources/E-Learning Resources

1. https://simplystatistics.org/
2. https://arxiv.org/archive/cs
3. https://www.tandfonline.com/toc/uasa20/current
4. https://isi-web.org/

COURSE CURRICULUM

Name of the Program:	**MBA (BA&AI)**			**Semester :II**		**Level: PG**
Course Name	**Business Analytics & Artificial Intelligence Applications in Management**			**Course Code/ Course Type**		**PMB104/MAJM**
Course Pattern	**2025**		**Version**		**1.0**	
Teaching Scheme				**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	-	**0**	3	3	40	60	NA
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):	The objectives of Business Analytics & Artificial Intelligence Applications in Management are: 1. To introduce the concepts of business analytics and artificial intelligence in the context of management. 2. To explain the role of AI and analytics in functional areas such as marketing, HR, finance, and operations. 3. To demonstrate the use of AI-driven tools for effective managerial decision-making. 4. To analyze real-life business scenarios using data analytics and machine learning techniques. 5. To evaluate the impact of AI applications on business performance and strategic planning.						
Course Learning Outcomes (CLO):	Students would be able to: 1. Describe the scope and significance of business analytics and artificial intelligence in management. 2. Interpret how AI and analytics can enhance decision-making in different management functions. 3. Apply analytical tools and AI models to solve basic business problems. 4. Analyze case studies to derive insights using AI-based approaches. 5. Develop strategic recommendations using AI applications for improved business outcomes.						

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Evolution of Business Analytics & AI in Decision-Making 1.2 Role of Data-Driven Decision-Making in Management (Case Study: Google's data-driven HR policies) 1.3 Business Intelligence vs. Business Analytics vs. AI 1.4 **Hands-on:** Using Excel & Power BI for Basic Business Analytics	**CLO 1**	**9**
UNIT II		
2.1 Identifying Key Performance Indicators (KPIs) in Business Analytics 2.2 Data Collection & Cleaning for Business Insights (Case Study: How Amazon	**CLO 2**	**9**

optimizes supply chain analytics) 2.3 Statistical Techniques for Business Decision-Making (Regression, Correlation, Hypothesis Testing) 2.4 Data Visualization & Reporting: Tableau 2.5 **Hands-on:** Analyzing a business dataset for strategic decision-making		
UNIT III		
3.1 Role of AI & ML in Business Strategy (Example: AI-driven product recommendations at Netflix) 3.2 Predictive Analytics in Sales & Marketing (Churn Prediction, Customer Segmentation) 3.3 NLP (Natural Language Processing) for Business Applications (Chatbots, Sentiment Analysis) 3.4 AI in HR & Recruitment (Example: Resume screening using AI at Unilever) 3.5 Hands-on: Building a simple predictive model for customer retention	**CLO 3**	**9**
UNIT IV		
4.1 RPA (Robotic Process Automation) in Business Operations 4.2 AI in Supply Chain Management (Example: AI-driven inventory forecasting at Walmart) 4.3 AI in Financial Risk Management (Fraud Detection & Credit Scoring) 4.4 AI Ethics & Governance: Challenges in AI Implementation 4.5 Hands-on: Automating a business workflow using RPA tools	**CLO 4**	**9**
UNIT V		
5.1 The Future of AI in Business: Trends & Innovations 5.2 AI-Driven Digital Transformation in Industries 5.3 AI & Business Model Innovation (Case Study: OpenAI's impact on enterprise productivity) 5.4 Challenges & Risks in AI Deployment in Business 5.5 Hands-on: Developing a business case for AI adoption	**CLO 5**	**9**
Total Hours		**45 Hours**

Textbooks:

1. Competing on Analytics: The New Science of Winning (Revised Edition). Boston: Harvard Business Review Press. Davenport, T. H., & Harris, J. G. (2017).
2. Data Mining for Business Analytics: Concepts, Techniques, and Applications in R. Hoboken, NJ: Wiley.Shmueli, G., Patel, N. R., & Bruce, P. C. (2016).
3. Weber, F. (2023). Artificial Intelligence for Business Analytics: Algorithms, Platforms, and Application Scenarios. Wiesbaden: Springer Vieweg.
4. Rose, D. (2020). Artificial Intelligence for Business. Boston: Pearson**.**

Reference Books:

1. Ganesan, K. (2022). The Business Case for AI: A Leader's Guide to AI Strategies, Best Practices & Real-World Applications. United States: Opinosis Analytics Publishing.
2. Wodecki, A. (2022). Artificial Intelligence in Management. Cheltenham: Edward Elgar Publishing.
3. Chaudhary, S., & Alam, M. (2023). AI-Based Data Analytics: Applications for Business Management. Boca Raton, FL: CRC Press.
4. Jain, Piyanka; Sharma, Puneet (November 2014). Behind Every Good Decision: How Anyone Can Use Business Analytics to Turn Data Into Profitable Insight. American Management Association

Online Resources/E-Learning Resources

1. https://www.scirp.org/reference/referencespapers?referenceid=3166319
2. https://business.fiu.edu/academics/graduate/insights/posts/competitive-advantage-of-using-ai-in-business.html?utm_source=chatgpt.com
3. https://www.tuw.edu/business/business-analytics-trends-ai-machine-learning/?utm_source=chatgpt.com
4. https://online.hbs.edu/blog/post/ai-in-business?utm_source=chatgpt.com
5. https://www.researchgate.net/publication/384729583_AI-driven_business_analytics_and_decision_making

PROFESSIONAL ELECTIVE 1

COURSE CURRICULUM

Name of the Program:		**MBA (BA & AI)**		**Semester: I**		**Level: PG**	
Course Name		**Marketing and Supply Chain Management**		**Course Code/ Course Type**		PMB121A/Elective	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	-	-	3	3	40	60	-
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives of the course are: 1. To prepare students understand online consumer mindset 2. To develop Strategic Marketing Skills to enhance customer experiences 3. To foster Innovation through Design Thinking 4. To excel into various evolving technology roles relevant to marketing and Supply Chain 5. To leverage Advanced Technologies					
Course Learning Outcomes (CLO):		**Students would be able to:** 1. Understand the link between marketing and supply chains. 2. Apply marketing strategies in SCM-driven sectors. 3. Use analytics for supply chain decision-making. 4. Optimize SCM operations using prescriptive tools. 5. Integrate marketing and SCM for business value.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
Unit I: Fundamentals of Marketing in the Supply Chain Contex - Covers the basics of marketing and its role in supply chains. Topics include marketing mix alignment, customer focus, demand forecasting, consumer behavior, B2B/B2C segmentation, product lifecycle, digital transformation, and promotional strategies in SCM.	**CLO 1**	**09**
UNIT II		
Unit II: Marketing Strategies in Supply Chain-Driven Industry - Focuses on marketing strategies in supply chain-heavy industries. Includes demand generation, inventory and production planning, customer education, CRM use, relationship marketing, sustainability, green marketing, and real-world case studies.	**CLO 2**	**09**
UNIT III		
Unit III: Introduction to Supply Chain Management and Analytics -Introduces supply chain structures and analytics. Covers key flows (material, info, finance), supply chain analytics (SCA), decision-making, types of analytics, demand sensing, Indian case applications, and basic analytical tools.	**CLO 3**	**09**
UNIT IV		
Unit IV: Business and Prescriptive Analytics in SCM - Focuses on data-driven decisions using analytics. Covers modeling, optimization, simulation, transport and distribution analytics, 3PL/4PL models, logistics design, GATI case study, and strategic use of prescriptive analytics.	**CLO 4**	**09**

UNIT V		
Unit V: Integrated Marketing and Supply Chain Strategies - Explores how marketing and SCM work together to drive business success. Topics include end-to-end value creation, aligning brand promise with delivery, omni-channel strategies, integrated planning, cross-functional collaboration, customer experience, performance metrics, innovation, and future trends in marketing-SCM integration.	**CLO 5**	**09**
Total Hours		**45**

Learning resources

1. Supply chain management strategy, planning, and operation
2. Supply chain management source and competitive advantage book
3. Supply chain management for competitive advantage | narayan rangraj, g. raghuram, mandyam m. srinivasan | mcgraw hill

Textbooks:

1. Supply Chain Management - Edited by Pengzhong Li
2. Textbook of Logistics and Supply Chain Management - By D K Agrawal
3. Big Data Analytics in Supply Chain Management - Theory and Applications

Reference Books:

1. SUPPLY CHAIN MANAGEMENT - https://mu.ac.in/wp-content/uploads/2021/02/Logistics-and-Supply-Chain Management-Sunil-Chopra-1.pdf
2. https://books.google.co.in/books?id=R8ycDwAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
3. https://books.google.co.in/books?id=XWBWeXDYED0C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
4. https://industri.fatek.unpatti.ac.id/wp-content/uploads/2019/03/254-Essentials-of-supply-chain-management-Michael-Hugos-Edisi-3-2011.pdf
5. https://thuvienxuatnhapkhau.com/wp-content/uploads/2021/08/BCT-0020-1.pdf
6. https://old.mu.ac.in/wp-content/uploads/2021/02/Logistics-and-Supply-Chain-Management-Martin-Christopher.pdf

COURSE CURRICULUM

Name of the Program:		**MBA (BA & AI)**		**Semester : I**		**Level: PG**	
Course Name		**Human Resource Management**		**Course Code/ Course Type**		PMB121B/Elective	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	0	0	3	3	40	60	NA
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives of Human Resource Management are: 1. Recall key concepts in Human Resource Management (HRM). 2. Recognise emerging trends and practices in HRM, recognizing their impact on organizational and employee management. 3. Apply methods for Human Resource Acquisition and Retention, covering HR planning, job analysis, recruitment, selection, and career planning. 4. Evaluate and interpret contemporary job descriptions and specifications, demonstrating proficiency in the job analysis process. 5. Design and create comprehensive training and development program to enhance employee skills and competencies aligned with organizational objectives					
Course Learning Outcomes (CLO):		Students would be able to: **1.** Apply knowledge of fundamental principles of Human Resource Management (HRM). **2.** Analyze HR planning and acquisition processes. **3.** Evaluate performance appraisal and training effectiveness using the Kirkpatrick Model. **4.** Assess various forms, components, and theories of compensation management, and analyze factors influencing remuneration decisions. **5.** Create HRD strategies integrating technology and learning initiatives.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
Unit 1		
Introduction to Human Resource Management: Understanding HRM: Definition, Objectives, and Scope. Structure of HR Department. Analyzing the Core Functions & Challenges in HRM. Understanding Personnel Management (PM): Definition, Difference between HRM and PM. Introduction to Strategic Human Resource Management (SHRM): Definition and Significance of SHRM. Nature of SHRM. Understanding the Harvard Model in HRM. Exploring the SHRM Matching Model	**CLO 1**	**9**
Unit 2		

HR Acquisition & Retention: Definition of HRP. Identifying Needs, Significance and Benefits of HRP. Exploring the Steps and Process of HRP. Techniques of HR Demand Forecasting. Methods of HR Supply Forecasting. Challenges in HRP. Process of Job Analysis. Defining & distinguishing between Job Description and Job Specification. Defining Job Design (JD). Process of JD. Understanding Job Enrichment. Understanding Recruitment. Exploring Various Sources & Methods of Recruitment. Differentiating Between Recruitment and Selection. Process of Selection. Understanding Career, Career stages and Career Anchors. Objective & Process of Career Planning. Analyzing the Steps in Career Planning. Roles of employer and employee in Career Management. Understanding the Succession Planning Objective & Process.	**CLO 2**	**9**
Unit 3		
Managing Employee Performance and Training: Definition, Objectives, Process & Methods of Performance Appraisal. Concept, Purpose & Techniques of Potential Appraisal. Definition, Need, Process of Training. Methods of Training. Concept & Need of Development. Difference between Training and Development. Defining Competency mapping and understanding its benefits. Developing competency model. Understanding Assessment centers. Measure of Tools. Evaluation of Training Effectiveness via Kirkpatrick Model.	**CLO3**	**9**
Unit 4		
Compensation Management: Concept, Different forms, Significances, Components, Theories of Compensation Management. Compensation Administration Process. Key factors influencing Remuneration. Wage/ Salary Differentials and Components of Salary. Overview of Fringe Benefits & Fringe Benefits Tax (FBT). Concept of Incentive and Bonus. Employee Stock Options (ESOPS). Retirement, Termination, VRS (Voluntary Retirement Scheme), Golden Handshake. Suspension: Concepts and Methods. Grievance Procedure in Indian Industry	**CLO4**	**9**
Unit 5		
Human Resource Development (HRD): Meaning of HRD. Need, Objectives & Scope of HRD. Functions and Process of HRD. Integration of technology in HRD processes. E-learning and virtual training platforms. Challenges and opportunities posed by digital transformation. Reskilling and upskilling initiatives for employees in response to technological advancements. Leveraging digital tools for personalized learning and development opportunities	**CLO5**	**9**
Total Hours		**45 hours**

Learning resources

Textbooks:

1. Human Resource Management, by Gary Dessler, Biju Varkkey, Pearson Education, 17ed, 22 June 2023
2. Human Resource Management: Text and Cases, by K Aswathappa, Sadhna Dash, McGraw Hill, 10th Edition – 29 May 2023
3. Routledge Handbook of Human Resource Management in Asia by Fang Lee Cooke and Sunghoon Kim, Routledge; 1st edition (30 June 2020)

Reference Books:

1. Human Resource Management in Organizations, Izabela Robinson, Chartered Institute of Personnel & Development, 1st edition (30 May 2006).
2. Armstrong's Essential Human Resource Management Practice - A guide to people management, by Michael Armstrong, Stephen Taylor, Kogan Page; 15th edition (3 January 2020).
3. Applied Psychology in Human Resource Management, Cascio & Aguins, Pearson; 7th edition (26 January 2010).

Online Resources/E-Learning Resources

1. Online Book: Human Resources Management (https://open.umn.edu/opentextbooks/textbooks/71)
2. MOOC Course: Human Resources Management (https://www.mygreatlearning.com/academy/learn-for-free/courses/human-resource-management)
3. MOOC Course: Human Resources Management by Oxford Home Study (https://www.oxfordhomestudy.com/courses/hr-courses-online/human-resources-certification-online-free)

COURSE CURRICULUM -

Name of the Program:		**MBA (BA & AI)**		**Semester : I**		**Level: PG**	
Course Name		**Advance Excel for Data Analytics**		**Course Code/ Course Type**		**PMB106 / VAC**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA**	**Practical/Oral**
0	**1**	**0**	**1**	**2**	**50**	**0**	**0**
Pre-Requisite:							
Course Objectives (CO):		The objectives of Operations and Supply Chain Management are: 1. Recall advanced MS Excel features for data analysis, automation, and visualization in Digital Marketing. 2. Recognize and apply advanced Excel techniques for solving complex business problems in Digital Marketing. 3. Apply Excel functions like PivotTables and Power Query for analyzing business data in Digital Marketing. 4. Analyze business scenarios using Excel's "What-If" analysis and goal-seeking features for data-driven decisions in Digital Marketing. 5. Evaluate the effectiveness of Excel dashboards for communicating data insights in Digital Marketing.					
Course Learning Outcomes (CLO):		Students would be able to: 1. Identify advanced Excel features and data management techniques. 2. Explain advanced Excel functions and formulas. 3. Apply knowledge of data analysis and visualization tools in Excel. 4. Analyze Macros and VBA features for automation in Excel. 5. Evaluate advanced data analysis techniques and tools in Excel.					

Course Contents/Syllabus:
Practical Plan

Practical/ Activity Number	**Title**	**Week Number/ Turn**	**Details**	**CLO**	**Hours**
1	**Practical 1: Introduction to Microsoft Excel**	**Week 1**	Open Excel and navigate through the workbook window, ribbons, and toolbars. File Management. Create a new workbook, save it in different formats, and close the workbook.	**CLO1**	**2**
		Week 2	Practice selecting cells and perform basic functions like SUM, AVERAGE, and COUNT. Use AutoSum to calculate totals and AutoFill to extend patterns in data		**2**
		Week 3	Format cells with different font styles, alignments, and number formats. Create formulas using cell references (absolute and relative) for simple calculations like SUM, SUBTRACT.		**2**
2.	**Practical 2: Introduction to Excel features**	**Week 4**	Create Excel workbook, define names, sort data, format table, submit.	**CLO 2**	**2**
		Week 5	Make various charts, customize, use basic functions, submit.		**2**

		Week 6	Use advanced functions, date functions, create complex formulas, submit.		**2**
3.	**Practical 3: Understanding Excel Features and Advanced Data Manipulation-**	**Week 7**	Excel Basics & Functions - Learn cell formatting, basic functions (SUM, AVERAGE), and data entry techniques.	**CLO 3**	**2**
		Week 8	Data Analysis & Visualization - Explore Pivot tables, charts, and filtering options for data analysis and presentation.		**2**
		Week 9	Advanced Functions & Automation - Use VLOOKUP, IF statements, and macros for advanced data processing and automation tasks		**2**
4.	**Practical 4: Excel Strategies for Advanced Business Analysis and Management**	**Week 10**	Create Pivot tables, Slicers, and Report Filters for advanced data analysis and analytics.	**CLO 4**	**2**
		Week 11	Create Excel databases for managing customer, vendor, and employee information.		**2**
		Week 12	Create sales reports, invoices, and perform account aging assessments using Excel.		**2**
5.	**Practical 5: Financial Management and Analysis Using Excel**	**Week 13**	Create a budget tracker using Excel, including managing income and expenses, tracking loans, and using financial formulas for calculations.	**CLO 5**	**2**
		Week 14	Analyze investment opportunities by creating spreadsheets to calculate returns, depreciation schedules, and perform business analysis.		**2**
		Week 15	Prepare financial reports such as cash flow statements, analyze business ratios for performance evaluation, and conduct comprehensive financial analysis using Excel tools.		**2**
Total Hours					**30**

Learning resources

Textbooks:

1. Excel 2016 Bible, John Walkenbach, John Wiley & Sons
2. Excel: Formulas & Functions, Robert Dinwiddie
3. Excel 2007 for Dummies by Greg Harvey

Excel 2016 Bible, John Walkenbach, John Wiley & Sons

· Excel: Formulas & Functions, Robert Dinwiddie

Reference Books:

1. New Perspectives on Microsoft Office Excel 2007
2. Microsoft Excel 2016 Step by Step, Curtis Frye

Online Resources/E-Learning Resources:

1. Advanced Instructional Methods - National Institute of Technical Teachers' Training and Research, Bhopal
   Link - https://onlinecourses.swayam2.ac.in/ntr23_ed29/preview
2. HR Analytics Using Excel -
   Link - https://onlinecourses.swayam2.ac.in/imb24_mg56/preview
3. Excel 2007 for Dummies by Greg Harvey
4. New Perspectives on Microsoft Office Excel 2007

COURSE CURRICULUM -

Name of the Program:		**MBA (BA&AI)**		**Semester : I**		**Level: PG**	
Course Name		**Python for Data Science**		**Course Code/ Course Type**		**PMB107 / AEC**	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
0	**2**	**0**	2	4	40	60	0
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives of Python for Data Science are: 1. Introduce the fundamentals of Python programming and its applications in data-driven decision-making. 2. Enable students to handle, clean, and manipulate large financial datasets using Pandas. 3. Familiarize students with data visualization techniques using Matplotlib and Seaborn for financial data storytelling. 4. Develop students' skills in numerical computing, statistical analysis, and hypothesis testing using NumPy and SciPy. 5. Equip students with practical skills in web scraping, automation, and real-time data extraction using APIs and libraries.					
Course Learning Outcomes (CLO):		**Students would be able to:** 1. Write Python scripts using variables, control flow, functions, and modules to solve basic business and financial problems. 2. Analyze, clean, and transform real-world datasets using Pandas to prepare them for business analytics. 3. Create meaningful visualizations and interactive dashboards using Matplotlib and Seaborn to communicate financial insights. 4. Perform statistical and hypothesis testing using Python libraries to derive actionable conclusions from financial data. 5. Design and implement web scraping and automation scripts to extract and analyze real-time financial data from the web.					

Course Contents/Syllabus:

Practical Plan

Practical/ Activity Number	**Title**	**Week Number/ Turn**	**Details**	**CLO**	**Hours**
1	Practical 1: Python Basics & Control Structures	Week 1	Introduction to Python, IDE setup (Jupyter, VS Code), Variables, Data Types, Operators	CLO1	2
		Week 2	If-Else, Loops, Functions and Modules		2
		Week 3	Writing Python scripts for basic business and financial calculations		2

2	Practical 2: Data Handling with Pandas	Week 4	Introduction to Pandas, Series, DataFrames, reading/writing CSV files	CLO2	2
		Week 5	Data cleaning – handling missing values, duplicates, and outliers (financial datasets)		2
		Week 6	Filtering, sorting, grouping, and aggregation		2
3	Practical 3: Data Visualization with Python	Week 7	Introduction to Matplotlib & Seaborn – Line, Bar, Histogram charts (credit transaction trends)	CLO3	2
		Week 8	Advanced visualizations: Heatmaps, Pair Plots, Violin Plots		2
		Week 9	Dashboard creation using multiple charts and layout customization		2
4	Practical 4: Statistical Analysis & Time Series	Week 10	NumPy for numerical arrays, statistical measures (mean, median, std. dev., correlation)	CLO4	2
		Week 11	Hypothesis testing with SciPy – t-test, chi-square, ANOVA		2
		Week 12	Time series data handling using Pandas (Example: stock forecasting)		2
5	Practical 5: Web Scraping and Automation	Week 13	Web scraping using BeautifulSoup and Selenium – Extracting stock data	CLO5	2
		Week 14	Automating repetitive financial tasks (e.g., monthly report generator)		2
		Week 15	Working with APIs – Fetching real-time data (forex, crypto, news, etc.)		2
Total					30

Learning resources

Textbooks:

1. *Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython (2nd edition).* Sebastopol: O'Reilly Media.
2. Python for Finance. Berlin: Springer Vieweg. Hilpisch, Y. (2018). McKinney, W. (2018).
3. *Hands-On Data Analysis with Pandas: Efficiently perform data collection, wrangling, analysis, and visualization using Python.* Birmingham: Packt Publishing. Molin, S. (2020).
4. *Python Data Science Handbook: Essential Tools for Working with Data.* Sebastopol: O'Reilly Media. VanderPlas, J. (2016).
5. *Data Science from Scratch: First Principles with Python.* Sebastopol: O'Reilly Media.Grus, J. (2019).

Reference Books:

1. McKinney, W. (2022). *Python for Data Analysis.* Sebastopol: O'Reilly Media.
2. Mather, B. (2023). *Financial Data Analytics Using Python (3 Book Series).* Kindle Edition.
3. Hilpisch, Y. J. (2023). *Reinforcement Learning for Finance: A Python-Based Introduction.*
4. *Hilpisch, Y. J. (2021). Python for Algorithmic Trading: From Idea to Cloud Deployment.*

Online Resources/E-Learning Resources

1. https://wesmckinney.com/book/
2. https://www.researchgate.net/publication/364576263_Role_and_Application_of_Artificial_Intelligence_in_Business_Analytics_A_Critical_Evaluation
3. https://wesmckinney.com/book/

COURSE CURRICULUM

Name of the Program:	**MBA (BA&AI)**	**Semester : I**	**Level: PG**
Course Name	**Business Fundamentals in Contemporary world**	**Course Code/ Course Type**	**PMB 125/ MOOC**
Course Pattern	**2025**	**Version**	**1.0**

Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA**	**Practical/Oral**
4	-	-	4	4	40	60	-

Pre-Requisite: Bachelor's Degree

Course Objectives (CO):	The objectives of course - 1. **Understand Core Business Principles:** Gain foundational knowledge of key business functions such as marketing, finance, operations, and management. 2. **Analyze Global Business Dynamics:** Explore how globalization, economic trends, and cultural factors influence business strategies in a contemporary context. 3. **Embrace Ethical and Sustainable Practices:** Recognize the importance of ethics, sustainability, and corporate social responsibility in modern business decision-making. 4. **Leverage Technology and Innovation:** Understand the impact of digital transformation, big data, and emerging technologies on business operations and competitive advantage. 5. **Develop Strategic Thinking Skills:** Enhance problem-solving and decision-making abilities to address complex challenges in today's dynamic business environment.
Course Learning Outcomes (CLO):	Students would be able to: 1. Recall fundamental business concepts and terminology across key domains such as marketing, finance, and management. 2. Explain how global economic, social, and technological trends influence contemporary business practices. 3. Apply business theories and tools to solve real-world case studies and develop actionable strategies. 4. Analyze complex business scenarios to identify challenges, assess risks, and evaluate opportunities. 5. Critically evaluate the ethical and sustainability implications of business decisions in diverse contexts.

Course Contents/Syllabus:

Descriptors/Topics	**Level**	**Hours**
Module I		
***Power BI Fundamentals* Offered by Corporate Finance Institute by Coursera**	**Beginner**	**9**
Module II		
Foundation of Project Management Offered by Google on Coursera	**Beginner**	**18**
Module III		
Entrepreneurial Mindset Offered by Tecnológico de Monterrey on Coursera	**Beginner**	**16**
Module IV		
Launch Your Online Business Offered by The State University of New York	**Beginner**	**17**
Total Hours		**60 Hours**

SEMESTER II

COURSE CURRICULUM

Name of the Program:	MBA (BA & AI)	**Semester:** II	**Level:** PG
Course Name	Machine Learning & Predictive Analytics	**Course Code/ Course Type**	PMB 109/MAJM
Course Pattern	2025	**Version**	1.0

Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	**0**	**0**	3	3	40	60	0

Pre-Requisite: Bachelor's Degree

Course Objectives (CO):	The objectives of Machine Learning & Predictive Analytics are: 1. To introduce fundamental concepts and algorithms in machine learning. 2. To explain the role of predictive analytics in decision-making processes. 3. To demonstrate the use of machine learning tools for data-driven insights. 4. To analyze datasets and identify appropriate predictive models. 5. To evaluate and optimize machine learning models for accuracy and performance.
Course Learning Outcomes (CLO):	Students would be able to: 1. Recall and explain key machine learning concepts, algorithms, and terminologies. 2. Differentiate between supervised, unsupervised, and reinforcement learning techniques 3. Apply machine learning models like regression, classification, and clustering using Python/R. 4. Analyze large datasets to uncover trends and predictive patterns. 5. Build and evaluate predictive models for business and real world scenarios.

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Understanding ML and Predictive Analytics in Business & Finance 1.2 Types of ML: Supervised, Unsupervised, and Reinforcement Learning (Case Study: Predicting loan defaults) 1.3 Model Evaluation Metrics: Accuracy, Precision, Recall, F1 Score, ROC-AUC 1.4 Data Preprocessing for ML: Normalization, Feature Scaling, Encoding Categorical Data 1.5 Hands-on: Implementing a basic regression model in Python for financial forecasting	**CLO 1**	**9**

UNIT II		
2.1 Linear and Logistic Regression (Case Study: Predicting stock market trends) 2.2 Decision Trees & Random Forests (Case Study: Credit risk assessment in lending) 2.3 Support Vector Machines (SVM) for Classification Problems 2.4 Evaluating ML Models using Cross-Validation 2.5 Hands-on: Building a credit risk prediction model using logistic regression	**CLO 2**	**9**
UNIT III		
3.1 K-Means Clustering for Customer Segmentation 3.2 Hierarchical Clustering & DBSCAN 3.3 Principal Component Analysis (PCA) for Dimensionality Reduction (Example: Analyzing large-scale transaction data) 3.4 Anomaly Detection for Fraud Detection (Case Study: Identifying fraudulent transactions in digital payments) 3.5 **Hands-on:** Clustering customers based on spending behaviors	**CLO 3**	**9**
UNIT IV		
4.1 Understanding Time Series Data in Finance 4.2 Moving Averages & Exponential Smoothing (Example: Forecasting financial KPIs) 4.3 ARIMA & SARIMA for Stock Price Prediction 4.4 Prophet Model for Forecasting in Business Analytics 4.5 Hands-on: Forecasting revenue trends using time series models	**CLO 4**	**9**
UNIT V		
5.1 Deploying ML Models using Flask & Streamlit 5.2 Model Explainability: SHAP, LIME (Case Study: Making AI-driven credit scoring transparent) 5.3 Bias & Fairness in Financial Predictive Models 5.4 Regulatory Guidelines for ML in Finance (Example: RBI's stance on AI-driven lending) 5.5 Hands-on: Deploying a machine learning model as a web app	**CLO 5**	**9**
Total Hours		**45**

Textbooks:

1. *Machine Learning and Data Science Blueprints for Finance.* Birmingham: Packt Publishing.Chauhan, S., & Kumar, A. (2021).
2. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, 2nd Edition. by Aurélien Géron. Released September 2019. Publisher(s): O'Reilly Media, Inc.
3. Python Machine Learning. Birmingham: Packt Publishing.Raschka, S., & Mirjalili, V. (2017).
4. *Pattern Recognition and Machine Learning. New York: Springer. Bishop, C. M. (2006).*
5. *The Elements of Statistical Learning: Data Mining, Inference, and Prediction.* New York: Springer.Hastie, T., Tibshirani, R., & Friedman, J. (2009).

Reference Books:

1. López de Prado, M. (2018). *Advances in Financial Machine Learning.* Hoboken, NJ: Wiley.
2. Jansen, J. (2020). *Machine Learning for Algorithmic Trading: Predictive Models in Python.* Birmingham: Packt Publishing.

Online Resources/E-Learning Resources:

1. https://www.researchgate.net/publication/379685217_Credit_Risk_Assessment_and_Fraud_Detection_in_Financ ial_Transactions_Using_Machine_Learning
2. https://www.mdpi.com/2306-5729/8/11/169
3. https://www.researchgate.net/publication/383699937_Financial_fraud_detection_through_the_application_of_ma chine_learning_techniques_a_literature_review
4. https://www.sciencedirect.com/science/article/abs/pii/S1568494620303240

COURSE CURRICULUM

Name of the Program:		MBA (BA & AI)		**Semester : II**		**Level: PG**	
Course Name		**Statistical Analysis using R- Programming**		**Course Code/ Course Type**		**PMB 110 /MAJM**	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
2	1	0	3	4	40	60	-
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives course are: 1. To build foundational competence in R programming for data analysis, business decision-making, and AI applications. 2. To prepare learners to handle structured and unstructured business datasets through advanced data wrangling, cleaning, and transformation techniques. 3. To empower learners to create impactful business dashboards using **ggplot2, Shiny, Plotly, and R Markdown**. 4. To apply statistical, econometric, and machine-learning models using R to solve **real-world business, fintech, and operational problems**. To develop end-to-end analytical project skills including **APIs, automation, reporting, forecasting, and predictive analytics**.					
Course Learning Outcomes (CLO):		Students would be able to: 1. Write modular, efficient R code to handle analytical workflows. 2. Clean, preprocess, validate, and transform large business datasets using industry-standard R tools. 3. Develop compelling static and interactive dashboards for business insights, financial analytics, and operations visualization. 4. Build and evaluate statistical & ML models to support decisions in **marketing, HR, operations, supply chain, fintech, BFSI**. 5. Execute full-cycle R-based analytics projects using APIs, automation, scraping, forecasting, and reproducible documentation.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I Introduction to R for Business Analytics		
1.1 Why R? Role in Data Science, AI & Business Analytics 1.2 Installing & Setting Up R, RStudio & Packages 1.3 R Syntax: Variables, Data Types, Operations 1.4 Control Structures & Writing Scripts 1.5 Functions, Loops, and Modular Code	**CLO 1**	**6**
UNIT II Data Structures, Importing & Cleaning Large Business Datasets		
2.1 Data Structures: Vectors, Lists, Matrices, Data Frames, Factors 2.2 Importing Data from CSV, Excel, Databases, API endpoints 2.3 Cleaning & Transformation using dplyr, tidyr, janitor	**CLO 2**	**6**

2.4 Handling Missing Values, Outliers, Duplicates 2.5 Feature Engineering Basics		
UNIT III Data Visualization using ggplot2, Shiny & Plotly		
3.1 Introduction to ggplot2 Fundamentals & Grammar of Graphics 3.2 Creating Line Charts, Bar Graphs, and Histograms 3.3 Customizing Plots: Themes, Labels, Legends 3.4 Interactive Visualization using Shiny (Real-World Example: Fintech Dashboard) 3.5 Hands-on: Building a Data Visualization Dashboard. Dashboarding Techniques for Decision Support	**CLO 3**	**6**
UNIT IV Statistical Techniques & Machine Learning for Business		
4.1 Descriptive & Inferential Statistics using R 4.2 Regression Models: Linear, Logistic, Ridge, Lasso 4.3 Classification Algorithms: Decision Tree, Random Forest, XGBoost 4.4 Model Validation: Confusion Matrix, ROC, Precision-Recall 4.5 Time Series Basics.	**CLO 4**	**6**
UNIT V Advanced Applications & End-to-End Business Analytics in R		
5.1 Writing Functions, Loops & Automation **5.2 Web Scraping using rvest** **5.3 Integrating APIs for live business data** **5.4 Automating Business Reports using R Markdown** **5.5 Full-Cycle Business Analytics Project**	**CLO 5**	**6**
Total Hours :		**30**

Practical Session

Practical / Activity Number	Title	Week Number/ Turn	Details	CLO	Hours
1	Practical 1: Introduction to R & Basic Programming	Week 1	• Installing R, RStudio, interface navigation • Writing basic R commands, variables, data types, operators	CLO1	2
		Week 2	• Control structures – if, else, loops • Writing and running scripts		2
		Week 3	• Creating modular code: functions, loops, apply family • Hands-on: Basic business calculations using R		2
2	Practical 2: Data Import & Data Cleaning in R	Week 4	• Importing CSV, Excel, Databases, APIs • Understanding data structures: vectors, lists, matrices, data frames, factors	CLO2	2
		Week 5	• Data cleaning using dplyr, tidyr, janitor • Handling missing values, duplicates, inconsistencies • Case: Banking transaction dataset)		2
		Week 6	• Feature engineering basics • Data transformation: mutate, filter, group_by, summarise		2

3	Practical 3: Data Visualization with ggplot2, Shiny & Plotly	Week 7	• Introduction to ggplot2 and Grammar of Graphics • Creating line charts, bar graphs, histograms	CLO3	2
		Week 8	• Customizing plots: themes, labels, legends • Multi-layered visualizations		2
		Week 9	• Introduction to Shiny & Plotly • Hands-on: Building an interactive Fintech Dashboard		2
4	Practical 4: Statistical & Machine Learning Models in R	Week 10	• Descriptive and inferential statistics • Correlation, hypothesis testing	CLO4	2
		Week 11	• Regression models: linear, logistic, ridge, lasso • Model evaluation metrics: RMSE, R^2		2
		Week 12	• Classification models: Decision Tree, Random Forest, XGBoost • Case: Credit risk prediction (BFSI dataset)		2
5	Practical 5: Advanced Applications – APIs, Automation & End-to-End Project	Week 13	• Web scraping using rvest • Extracting ecommerce/finance data	CLO5	2
		Week 14	• Integrating APIs (crypto, stock market, news) • Automating reports using R Markdown		2
		Week 15	• Full-cycle business analytics project • Data import → cleaning → visualization → modelling → report automation		2
Total					30

Learning resources

Textbooks:

1. *R for Data Science (2nd edition).* Wickham, H., & Grolemund, G. (2023).
2. *Data Science for Business with R.* Thousand Oaks, CA: SAGE Publications. Saltz, J. S., & Stanton, J. M. (2021).
3. *The Art of R Programming: A Tour of Statistical Software Design.* San Francisco, CA: No Starch Press. Matloff, N. (2011).

Reference Books:

1. Matloff, N. (2011). The art of R programming: A tour of statistical software design. No Starch Press
2. James, G., Witten, D., Hastie, T., & Tibshirani, R. (2021). An introduction to statistical learning: With applications in R (2nd ed.). Springer.
3. Kuhn, M., & Johnson, K. (2019). Feature engineering and selection: A practical approach for predictive models. CRC Press.
4. Lander, J. P. (2017). R for everyone: Advanced analytics and graphics (2nd ed.). Addison-Wesley.
5. Wickham, H. (2015). R packages: Organize, test, document, and share your code. O'Reilly Media.

Online Resources/E-Learning Resources

1.Wickham, H., Çetinkaya-Rundel, M., & Grolemund, G. (2023). R for data science (2nd ed.). https://r4ds.hadley.nz/
2. R Core Team. (2024). The R project for statistical computing. https://www.r-project.org/
3. Coursera. (2023). Data science specialization using R. Johns Hopkins University. https://www.coursera.org/
4. Kaggle. (2024). R notebooks and datasets for business analytics. https://www.kaggle.com/
5. edX. (2023). Data analysis and statistical modeling using R. https://www.edx.org/

COURSE CURRICULUM

Name of the Program:		**MBA (BA & AI)**		**Semester :II**		**Level: PG**	
Course Name		**Time Series Forecasting**		**Course Code/ Course Type**		PMB111/MAJM	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	0	0	3	3	40	60	NA
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):	The objectives of Time Series Forecasting are: 1. To understand the fundamentals and components of time series data relevant to financial domains. 2. To apply classical statistical models such as ARIMA and exponential smoothing for financial forecasting. 3. To explore volatility and multivariate forecasting models including GARCH and VAR. 4. To integrate machine learning and deep learning techniques like Random Forest and LSTM for time series forecasting. 5. To evaluate and deploy time series models for real- world fintech applications with performance metrics.						
Course Learning Outcomes (CLO):	Students would be able to: 1. Identify and interpret the components and patterns in financial time series data. (Bloom: Understand, Apply) 2. Develop ARIMA/SARIMA-based forecasting models for univariate financial data. (Apply, Analyze) 3. Implement volatility and multivariate models (e.g., GARCH, VAR) and evaluate their predictive performance. (Analyze, Evaluate) 4. Design and build deep learning models like LSTM for complex time series forecasting problems. (Create, Analyze) 5. Assess model performance using appropriate metrics and deploy forecasting models using modern tools. (Evaluate, Create)						

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Basics of Time Series Data & its Importance in Finance 1.2 Components of Time Series: Trend, Seasonality, Cyclicality, and Irregularity (Case Study: Stock price movements) 1.3 Time Series Data Visualization using Python (Matplotlib, Seaborn) 1.4 Handling Missing Data, Outliers & Noise in Financial Time Series 1.5 Hands-on: Exploring and visualizing financial time series data	**CLO 1**	**9**
UNIT II		
2.1 Moving Averages & Exponential Smoothing (Case Study: Forecasting revenue trends) 2.2 Autoregressive (AR), Moving Average (MA), and ARMA Models 2.3 ARIMA (AutoRegressive Integrated Moving Average) for Financial Forecasting 2.4 SARIMA (Seasonal ARIMA) for Seasonality-Based Forecasting	**CLO 2**	**9**

(Example: Predicting holiday spending trends)		
UNIT III		
3.1 Introduction to State Space Models & Kalman Filters 3.2 GARCH (Generalized Autoregressive Conditional Heteroskedasticity) for Volatility Modeling 3.3 VAR (Vector AutoRegression) for Multi-Variable Forecasting (Example: Predicting interest rates & inflation) 3.4 Prophet Model for Business Forecasting (Case Study: Financial KPI predictions)	**CLO3**	**9**
UNIT IV		
4.1 Feature Engineering for Time Series (Lag Variables, Rolling Statistics) 4.2 Decision Trees & Random Forest for Forecasting (Example: Predicting loan defaults) 4.3 LSTMs (Long Short-Term Memory) & RNNs for Deep Learning-Based Time Series Forecasting 4.4 Hybrid Models: Combining Statistical & ML Approaches	**CLO4**	**9**
UNIT V		
5.1 Real-World Use Cases of Time Series Forecasting in Fintech (Algorithmic Trading, Credit Risk, Economic Indicators) 5.2 Model Evaluation: RMSE, MAPE, MAE (Case Study: Evaluating forecasting models for banking data) 5.3 Bias & Interpretability in Forecasting Models (Example: Regulatory concerns in banking) 5.4 Deployment of Forecasting Models using Stream lit & Flask	**CLO5**	**9**
Total Hours		**45 hours**

Learning resources

Textbooks:

- "Time Series Analysis: Forecasting and Control" by George E.P. Box, Gwilym M. Jenkins, Gregory C. Reinsel, and Greta M. Ljung: Wiley, 5th Edition, 2015.
- "Practical Time Series Forecasting with R: A Hands-On Guide" by Galit Shmueli and Kenneth C. Lichtendahl Jr.: Axelrod Schnall Publishers, 3rd Edition, 2017.
- "Introductory Time Series with R" by Paul S.P. Cowpertwait and Andrew V. Metcalfe: Springer, 1st Edition, 2019.
- "Applied Time Series Analysis" by Terence C. Mills and Raphael N. Markellos: Academic Press, 2nd Edition, 2018.
- "Applied Time Series Analysis and Forecasting with Python" by Changquan Huang: Springer, 1st Edition, 2021.

Reference Books:

- "Financial Time Series" by Ruey S. Tsay: Wiley, 4th Edition, 2010.
- "Machine Learning for Time Series Forecasting with Python" by Francesca Lazzeri: Wiley, 1st Edition, 2020.
- "Hands-On Time Series Analysis with R" by Rami Krispin: Packt Publishing, 1st Edition, 2019.
- "Python for Finance: Analyze Big Financial Data" by Yves Hilpisch: O'Reilly Media, 2nd Edition, 2018.
- "Applied Econometrics: A Modern Approach Using EViews and Microfit" by Dimitrios Asteriou and S.G. Hall (Indian Edition): Palgrave Macmillan, 3rd Edition, 2015.

COURSE CURRICULUM

Name of the Program:	**MBA**			**Semester : IV**		**Level: UG**
Course Name	**Research Methodology & Intellectual Property Rights**			**Course Code/ Course Type**		PMB112/MAJM
Course Pattern	**2025**	**Version**		1.0		
Teaching Scheme				**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	-	-	3	3	40	60	-
Pre-Requisite:							
Course Objectives (CO):	CO1. To Understand the knowledge on basics of research and its types. CO2. To Learn the concept of Literature Review, Technical Reading, Attributions and Citations. CO3. To learn Ethics in Engineering Research. CO4. To Discuss the concepts of Intellectual Property Rights in engineering. CO5. Define and develop a possible research interest area to be taken ahead in their business research projects later to conduct an independent publishable research project						
Course Learning Outcomes (CLO):	CLO1: Understand advanced design, methodologies and analysis in business research methods CLO2: Generate ideas and identify core business problem and distil into a research problem & relate to constructs CLO3: Analyze past literature for in-depth understanding on how the identified problem could be addressed CLO4: Evident, analyze, and support the association of variables attributed in the conceptual model with theory CLO5: Evaluate outcomes of the relevant						

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
UNIT I – Foundations of Business Research Introduction to Business Research, Nature and Scope of Business Research, Types of Business Research used in management studies, Scientific Investigation in Business, Concepts and Constructs, Definitions and Variables, Propositions and Hypotheses, Theory Building and Models, Information Needs of Managers, Technology Applications in Business Research including Internet, E-mail, Browsers and Websites, Role of Research in Managerial Decision-Making, Ethical Issues in Business Research.	**1**	**9**
UNIT II		
UNIT II – Research Design and Research Approach Meaning and Purpose of a Research Design, Elements of a Research Design,	**2**	**9**

Types of Research Designs commonly used in universities (Exploratory, Descriptive, Causal), Formulation of the Research Problem, Developing the Problem Statement, Hypothesis Formulation and Characteristics of a Good Hypothesis, Testing of Hypothesis (basic framework), Selection of Appropriate Research Approach, Importance of Research Design in Business Studies.		
UNIT III		
UNIT III – Sampling Design, Measurement and Scaling Concept of Sampling and Sample Design, Probability and Non-Probability Sampling Methods, Determination of Sample Size, Concept of Measurement in Business Research, Levels of Measurement (Nominal, Ordinal, Interval, Ratio), Thurstone Scale, Likert Scale, Guttmann Scale and Semantic Differential Scale, Reliability of Measurement, Validity of Measurement**.**	**3**	**9**
UNIT IV		
UNIT IV – Data Collection Methods and Instruments Sources of Data (Primary and Secondary), Methods of Primary Data Collection used in academic research such as Interviews, Surveys, Observations and Experiments, Structured and Unstructured Interviews, Face-to-Face and Telephone Interviews, Observation Methods, Design and Construction of Questionnaires, Principles of Question Wording, Question Sequencing, Structured and Unstructured Questionnaires, Guidelines for Developing Valid and Reliable Questionnaires. **Research Report Writing and Presentation** Meaning, purpose, and importance of research reports, types of research reports; components of a standard report, and basic formatting guidelines. Oral presentation of research: designing presentation content, use of visual aids, role of the presenter, effective delivery, and handling audience questions.	**4**	**9**
UNIT V		
UNIT V – IPR Intellectual Property Rights (IPR), Trade Secrets: Confidential business information; no registration. Utility Models, IPR & Biodiversity, Right of Property , IPR Agreements & Global Institutions, Trademark, Role of WIPO, Role of WTO, Role of WIPO, Patents, Patent Filing & Examination Process.	**5**	**9**
Total Hours:		**45**

Learning resources

Textbooks:

1. Research Methodology, CR Kothari & Gaurav Garg (Methods & Techniques), New Age International Publishers
2. Schindler, Business Research Methods, McGraw Hill Education, 13th Edition
3. Research Methods for Business: A Skill Building Approach, 7th Edition, Uma Sekaran, Roger Bougie
4. Research Methodology, Methods & Techniques, CR Kothari, Gaurav Garg
5. Business Research Methods International Edition-2020, Bill Harley Emma Bell, Alan Bryman
6. **Law Relating to Intellectual Property Rights (IPR)** – *M.K. Bhandari*
7. **Text Book of Intellectual Property Rights** – *N.K. Acharya*

Reference Books:

1. Zikmund, W. G., Carr, J. C., & Griffin, M. (2013). Business Research Methods. Cengage Learning
2. Bryman, Alan & Bell, Emma (2015). Business Research Methods (Fourth Edition), Oxford University
3. Press
4. G.C. Beri, Marketing Research, Tata McGraw- Hill Publishers
5. Tull Donald and Hawkins De, Marketing Research, PHI
6. Green and Tull, Research Markets Decisions, PHI

7. **Intellectual Property Rights Manual** – *Sumeet Malik* (

Online Resources/E-Learning Resources

1. https://www.youtube.com/watch?v=5pPsU7ZIUks&utm_source=
2. https://www.youtube.com/watch?v=eDw-Xhnx6tU
3. https://www.youtube.com/watch?v=iSHcC-QNCP4
4. https://swayam.gov.in/?utm_source=
5. https://nptel.ac.in/?utm_source=
6. **Patent It Yourself** – *David Pressman* (practical patent guide)
7. **Terrell on the Law of Patents** – UK classic on patent law principles

Professional Electives 2

COURSE CURRICULUM

Name of the Program:	**MBA (BA & AI)**	**Semester : II**	**Level: PG**
Course Name	Cyber Security	**Course Code/ Course Type**	PMB112B / Elective
Course Pattern	**2025**	**Version**	1.0

Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	0	0	3	3	40	60	0

Pre-Requisite: Bachelor's Degree	
Course Objectives (CO):	The objectives of Cyber Security course are: 1. **Recall** the fundamental concepts of cybersecurity, privacy, and digital risk. 2. **Recognize** the importance of governance, risk management, and compliance in digital security. 3. **Apply** cybersecurity principles, policies, and protection models in organizational settings. 4. **Evaluate** cyber threats, vulnerabilities, attacks, and real-world case studies across sectors. 5. **Design** basic cybersecurity strategies, policies, and control frameworks for digital safety
Course Learning Outcomes (CLO):	Students would be able to: 1. **Identify** key cybersecurity threats, privacy risks, and real-world cyberattack cases. 2. **Explain** core concepts of security, governance, risk management, compliance, and privacy laws. 3. **Comprehend and apply** cybersecurity models, frameworks, and control mechanisms. 4. **Analyse** cybersecurity failures, digital risks, and management challenges in organizations. 5. **Decide/Evaluate** suitable cybersecurity strategies, policies, and response plans for digital businesses.

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
An Introduction to Cybersecurity & Privacy, Exploring the Dark Side of the Digital World, Governance Risk management Compliance Privacy laws (GDPR, DPDP), Cybersecurity Challenges Across Sectors: Individuals, Organizations & Nations , Saudi Aramco Refinery Cyberattack (Saudi Arabia, 2019), Smart / Digital Cars Cybersecurity Concern, Cybersecurity Threat Landscape: Phishing, Social Engineering, and Ransomware, Data, Vulnerabilities & Unauthorized Access, case study Kaseya Ransomware Attack (2021), Chennai Corporation Ransomware Attack (2019), AIIMS New Delhi Cyberattack (2022)	**CLO 1**	**9**
UNIT II		
Security & Cybersecurity: Meaning of Security, Cyber vs Information Security, Asset Protection, Authorized Access, Cybernetics Origin, Users as Targets, CIA Model, Tech vs Management Role, Zero-Trust, GRC Framework, GDPR & DPDP,	**CLO 2**	**9**

Cybersecurity as an Administrative (Management) Issue: Governance, Risk Management, Compliance, Policy Frameworks, Organizational Security Planning, Human Resource Roles, Technology as Threat–Asset–Defense, Information Security Management, Cybersecurity Standards & Regulations, CIA Model and McCumber Cube,		
UNIT III		
The AAAA Model: Identification, Authentication, Authorization & Accountability in Security, Security as a State of Being Safe, Cybersecurity vs Information Security, Expanding Cyber Scope to Users and Systems, Role of Identification–Authentication–Authorization, Technology as Threat–Asset–Protection Tool, Administrative Responsibility, Governance & Regulation, and Managerial Lessons from the Target Data Breach, Preventive, Detective & Corrective Controls: The Three Pillars of Organizational Cyber Defense	**CLO 3**	**9**
UNIT IV		
Cybersecurity Management in the Digital World: Governance, Risk, Compliance, Standards, ISO vs NIST, Enterprise Controls, and Preparedness for Evolving Cyber Threats, Cybersecurity Failure in High-Pressure Digital Businesses: DDoS Attacks, Crisis Response Gaps, Unprepared Management, Lack of Incident Planning, Vendor Weakness, PR Dilemmas, Strategic Risk Decisions, and Lessons from the iPremier Case, GRC, Governance, Risk, Compliance, ISO, NIST, Frameworks, Incident Response, Contingency Planning, DDoS, Vulnerabilities, iPremier, Management Failure, Preparedness, ROI challenge, BCP–DRP–IRP, Cybersecurity Management, High-impact attacks, "Cybersecurity Command & Compliance: Governance, Risk, Compliance, Incident Response Planning, Framework-Based Security (ISO/NIST/COBIT), Cyber Threat Readiness, and Organizational Resilience in a Digital World"	**CLO 4**	**9**
UNIT V		
Cybersecurity Strategy and Compliance: Governance, Incident Response, Risk Frameworks, and Regulatory Obligations in Digital Organizations" "Enterprise Cybersecurity Architecture: Risk Frameworks, Compliance Protocols, and Sustainable Security Governance", Policy Development, Cybersecurity Planning, Governance Structures, Legal Requirements, User Compliance, and Balancing Security with Productivity, Cybersecurity Policy, Standards, Procedures, Guidelines, SETA Awareness, EISP–ISSP–SysSP Structure, Access Control Lists, Configuration Rules, and Organizational Compliance, Resilient Engineering, Design-time Security, Safety Controllers, Network Segmentation, Cyber-physical Threats, Contingency Planning, Business Impact Analysis (BIA), IRP/DRP/BCP, Case-Based Learning,	**CLO 5**	**9**
Total Hours		**45**

Textbooks:

1. Cyber Security 2025: Basic to Advance Guide - by J. Thomas (Author)
2. Principles of Information Security 13 March 2017 - A Dimensional Approach
3. Cyber Security 2025 Trends Paperback – 23 April 2025 - by Mark Hayward (Author)

Reference Books:

1. Cyber Security for Beginners Lucas Glisson: Comprehensive and Essential Guide for Newbies to Understand and Master Cybersecurity (2022 Crash Course) Paperback – 17 October 2022 - by Lucas Glisson (Author)
2. Cyber Security 2025: Basic to Advance Guide Paperback – 1 January 2023 - by J. Thomas (Author)

Online Resources/E-Learning Resources:

1. https://onlinecourses.nptel.ac.in/noc25_cs116/preview - Cyber Security and Privacy By Prof. Saji K Mathew | IIT Madras
2. https://onlinecourses.swayam2.ac.in/nou19_cs08/preview - INTRODUCTION TO CYBER SECURITY - By Dr. Jeetendra Pande | Uttarakhand Open University, Haldwani

COURSE CURRICULUM

Name of the Program:		**MBA (BA & AI)**		**Semester: II**		**Level: PG**	
Course Name		**Structure Query Language**		**Course Code/ Course Type**		PMB113 / AEC	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
1	1	0	1	3	50	0	0
Pre-Requisite:							
Course Objectives (CO):		The objectives of Structural Query Language are: 1. To introduce students to the structure and components of relational databases and SQL. 2. To build strong foundational skills in data querying using SQL commands and clauses. 3. To perform advanced data aggregation and manipulation using SQL functions and subqueries. 4. To optimize and manage SQL databases for large-scale financial datasets. 5. To apply SQL in real-world fintech use cases such as risk analysis, fraud detection, and BI integration.					
Course Learning Outcomes (CLO):		Students would be able to: 1. Explain database types, architecture, and SQL fundamentals, and set up relational databases. 2. Write and execute SQL queries to retrieve and filter data using multiple clauses and joins. 3. Use SQL commands for data manipulation and aggregation to support financial analysis. (Apply, Analyze) 4. Implement performance-optimized queries using indexing, views, and window functions. (Analyze, Evaluate) 5. Design SQL-based dashboards and use SQL for fraud detection, compliance, and financial reporting. (Create, Evaluate)					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Fundamentals of Databases: Relational vs. Non-Relational Databases 1.2 Introduction to SQL: History, Evolution, and Importance 1.3 Database Management Systems (DBMS): MySQL, PostgreSQL, MS SQL Server 1.4 Understanding Database Architecture: Tables, Columns, Rows, Indexes 1.5 Hands-on: Setting up a MySQL/PostgreSQL database and executing basic queries	**CLO 1**	**3**
UNIT II		
2.1 SQL Syntax & Query Structure 2.2 SELECT, FROM, WHERE, ORDER BY, LIMIT, DISTINCT Clauses 2.3 Filtering Data Using Logical & Comparison Operators 2.4 SQL Joins: INNER, LEFT, RIGHT, FULL JOIN 2.5 Hands-on: Retrieving financial transactions from a fintech database	**CLO 2**	**3**
UNIT III		

3.1 INSERT, UPDATE, DELETE Statements 3.2 Using GROUP BY & HAVING for Data Aggregation 3.3 SQL Functions: COUNT, SUM, AVG, MIN, MAX 3.4 Subqueries & Nested Queries 3.5 Hands-on: Performing financial trend analysis using SQL aggregation	**CLO3**	**3**
UNIT IV		
4.1 Creating & Managing Views in SQL 4.2 Database Indexing & Performance Optimization 4.3 Common Table Expressions (CTEs) & Window Functions 4.4 Transactions & ACID Properties 4.5 Hands-on: Designing optimized queries for large financial datasets	**CLO4**	**3**
UNIT V		
5.1 Using SQL for Risk Analysis & Fraud Detection (Case Study: Credit Card Fraud Detection) 5.2 SQL in Financial Reporting & Compliance 5.3 SQL & Data Warehousing in Fintech 5.4 Integration of SQL with BI Tools (Power BI, Tableau) 5.5 Hands-on: Creating an SQL-based financial dashboard using Tableau/Power BI	**CLO5**	**3**
Total Hours		**15**

Practical Sessions

Practical No.	Practical Title	Description / Activities	Hours
1	Database Fundamentals & DBMS Setup	Install MySQL/PostgreSQL, create a sample database, understand relational vs non-relational databases	2
2	Exploring Database Architecture	Create tables, define columns, rows, primary keys, foreign keys, and indexes	2
3	Basic SQL Queries	Execute basic SELECT queries to retrieve data from tables	2
4	SQL Clauses Implementation	Use SELECT, WHERE, ORDER BY, LIMIT, DISTINCT on financial datasets	2
5	Data Filtering Using Operators	Filter transaction data using logical and comparison operators	2
6	SQL Joins for Data Analysis	Perform INNER, LEFT, RIGHT, and FULL joins on multiple tables	2
7	Data Manipulation using DML	Perform INSERT, UPDATE, DELETE operations on financial data	2
8	Data Aggregation & Functions	Use GROUP BY, HAVING, COUNT, SUM, AVG, MIN, MAX	2
9	Subqueries & Financial Trend Analysis	Use subqueries to analyze trends and customer behavior	2
10	Creating and Managing Views	Create views for summarized financial reports	2
11	Indexing & Query Optimization	Apply indexes and analyze query performance	2
12	CTEs, Window Functions & Transactions	Use CTEs, window functions, and demonstrate ACID properties	2
13	SQL for Risk & Fraud Detection	Identify suspicious transactions using SQL queries	2
14	SQL for Financial Reporting & Compliance	Generate compliance and audit reports using SQL	2
15	SQL Integration with BI Tools	Connect SQL database with Power BI/Tableau and build dashboards	2
Total			**30**

Learning resources

Textbooks:

- "Learning SQL" by Alan Beaulieu: O'Reilly Media, 3rd Edition, 2020.
- "SQL for Data Analytics" by Upom Malik, Matt Goldwasser, and Benjamin Johnston: Packt Publishing, 2nd Edition, 2022.
- "Database System Concepts" by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan (Indian Author): McGraw-Hill Education, 7th Edition, 2020.
- SQL For Smarties: Advanced SQL Programming, Joe Celko, Morgan Kaufmann
- Sams Teach Yourself SQL in 24 Hours, Ryan Stephens, Ron Plew, Sams Publishing, 5th Edition
- Practical SQL: A Beginner's Guide to Storytelling With Data, Anthony DeBarros, No Starch Press, 2nd Edition

Reference Books:

- "SQL: The Complete Reference" by James R. Groff and Paul N. Weinberg: McGraw-Hill Education, 3rd Edition, 2003.
- "Fundamentals of Database Systems" by Ramez Elmasri and Shamkant B. Navathe: Pearson Education, 7th Edition, 2016.
- "Mastering PostgreSQL in Application Development" by Dimitri Fontaine: 1st Edition, 2020.
- "MySQL Cookbook" by Paul DuBois: O'Reilly Media, 4th Edition, 2020.
- "Database Management Systems" by Raghu Ramakrishnan and Johannes Gehrke (Indian Adaptation available): McGraw-Hill Education, 3rd Edition.

Online resources:

- Oracle Academy – Intro to Databases: https://academy.oracle.com
  MongoDB vs SQL Overview: https://www.mongodb.com/compare/mongodb-vs-sql
- W3Schools SQL Intro: https://www.w3schools.com/sql/sql_intro.asp
  Khan Academy SQL Basics: https://www.khanacademy.org/computing/computer-programming/sql
- MySQL Documentation: https://dev.mysql.com/doc

COURSE CURRICULUM

Name of the Program:		**Foreign Language**		**Semester :II**		**Level: PG**	
Course Name		**German A1.1**		**Course Code/ Course Type**		**PFL101A/ AEC**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
2	0	0	0	2	50	0	0
Pre-Requisite:							
Course Objectives (CO):		The objectives of (German A1.1) are: 1. To remember new words and their spellings. 2. To analyze the new concepts. 3. To apply the basic vocab and grammar concepts. 4. To comprehend the German text. 5. To create basic sentences in German.					
Course Learning Outcomes (CLO):		Students would be able to: 1. Spell simple words in German 2. Can understand everyday expressions. 3. Able to frame simple sentences in German language. 4. Can introduce themselves and others. 5. Can answer questions about themselves.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
Guten Tag Speak about yourself and others, Speak about Countries and LanguagesGrammar — Sent ence formation and verbs usage	**CLO 1**	**6**
UNIT II		
Freunde, Kollegen und Ich Speak about your Hobbys, To fix a meeting, Speak about work andProfession, To create a profile on Internet Grammar — How to use 'The' in german, Singular and plural forms of Nouns	**CLO 2**	**6**
UNIT III		
In der Stadt To get to know about Cities and Places, how to find way and understand directions, learn international words Grammar — Negations (how to use NO in German), Definite articles, indefinite articles	**CLO3**	**6**
UNIT IV		
Guten Appetit To speak about food and food habits, to have a discussion about shoppingGrammar — int roduction of cases	**CLO4**	**6**
UNIT V		
Tag fiir Tag & Zeit mitFreunden Clock timings, To speak about family and friends, Daily routine Tospeak about free time activity, to understand the specific informationfrom the text, to order and to pay in a resta urantGrammar — Possessivarticle, Modalverbs, use of on,at,from...till,Seprable verbs and past tence	**CLO5**	**6**
Total Hours		**30**

Learning resources

Textbooks:

1. Netzwerk Al, Emst klett Verlag & Goyal Publishers & Distributors Pvt. Ltd.
2. Studio d Al, Cornelesen Verlag & Goyal Publishers & Distributors Pvt. Ltd.
3. Netzwerk Neu Al, Emst klett Verlag & Goyal Publishers & Distributors Pvt. Ltd

Reference Books:

1. Hallo Deutsch Al,Emst Klett Verlag, Goyal Publishers & Distributors Pvt. Ltd
2. ThemenAktuell 1, Hueber verlag
3. Maximal Emst klett Verlag & Goyal Publishers & Distributors Pvt. Ltd.

Online Resources/E-Learning Resources:

1. Youtube https://youtube.com/@LeamnGermanwithAnja?si=BkJY DPi7TSOf T4lr
2. hitps://youtube.com/@deutschlernenmitheidi?si=TkIClabzioaUOroZ
3. Instagram: instagram.com/leamgermanwithanja

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester: II**		**Level: PG**	
Course Name		**Basic Japanese language skill**		**Course Code/Course Type**		PFL101B/AEC	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/ Oral**
2	-	-	2	30	50	--	--

Pre-Requisite: Desire to get acquainted with the Japanese language.

Course Objectives (CO):	The objectives of Basic Japanese language skill are: 1. To meet the needs of ever growing industry, with respect to language support. 2. To get introduced to Japanese society and culture through language. 3. To acquire competitive edge in career choices. 4. To participate effectively & responsibly in a multi-cultural world. 5. To enable learners to communicate effectively inJapanese language.
Course Learning Outcomes (CLO):	Students will be able to: 1. Read and Write Hiragana script. 2. Write and Speak basic sentences. 3. Comprehend and speak about time, hobbies, likes and dislikes. 4. Write basic kanji. 5. Use the Hiragana script in discussion.

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
Introduction to Japanese Language – Introduction of script, culture, History of script ,Speaking : Self introduction, listening : short video skit on self-introduction	**CLO 1**	**6**
UNIT II		
Introduction of Hiragana Script -Writing : Hiragana script, Speak : Basic sentences, General vocabulary : Months , Days of the week ,Basic numbers, colours,	**CLO 2**	**6**
UNIT III		
Basic sentence structure : Affirmative and Negative , General vocabulary: about family	**CLO 3**	**6**
UNIT IV		
Time and verbs –Talking about routine, Writing: routine using verbs and time, reading : A clock	**CLO 4**	**6**
UNIT V		
Introduction of Katakana and basic kanji – Reading : English words, country names Writing : Basic Kanji	**CLO 5**	**6**
Total Hours		**30**

Learning resources

Textbook:

1. Minna no Nihongo , " Japanese for everyone" ,Elementary Main Textbook , Goyal Publishers & Distributors Pvt. Ltd.

Reference books:

1. Shyoho Volume 1.
2. Genki Japan
3. Haru Vol. 1 & 2

Online Resources/E-Learning Resources:

YouTube links

- **https://www.youtube.com/watch?v=shdlEapDsP4**
- **https://youtu.be/K-nw5EUxDz0?feature=shared**
- **https://youtu.be/o9sP-vaCEa0?si=l8yOvVKaItBQWXNu**
- **https://youtu.be/JnoZE51WZg4?si=9uq68USOz5plBk2n**
- **https://youtu.be/shdlEapDsP4?si=tC6RGaMtwDJgVu2d**
- **https://youtu.be/9paXgC2U8L0?si=btS1G4mvrkG5C9zi**

Apps

A) Learn Japanese - Hiragana APP available on Google play.

B) Hiragana Pro

COURSE CURRICULUM

Name of the Program:	**MBA (BA&AI)**		**Semester : II**		**Level: PG**	
Course Name	**Strategic Corporate Communication**		**Course Code/ Course Type**		**PMB114 / AEC**	
Course Pattern	**2025**		**Version**		**1.0**	
Teaching Scheme				**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA (End Semester Assessment)**	**Practical/Oral**
2	0	0	2	2	50	0	0
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):	The objectives of Strategic Corporate Communication - I are: 1. To recall key concepts and theories related to corporate communication, including definitions, scope, and historical development. 2. To recognize the importance of effective corporate communication strategies in organizational success and understand the objectives behind various communication practices. 3. To apply theoretical knowledge of corporate communication to real-world scenarios, such as developing communication strategies, conducting stakeholder analysis, and crafting messages. 4. To analyze corporate communication practices and their impact on organizational culture, reputation, and stakeholder engagement. 5. To evaluate corporate communication strategies in diverse contexts, including crisis management, internal communication, and CSR initiatives.						
Course Learning Outcomes (CLO):	Students would be able to: 1. Apply corporate communication theories to develop effective strategies for stakeholders and crises. 2. Apply audience segmentation for tailored communication. 3. Analyze corporate communication data for organizational impact. 4. Evaluate communication strategies for success metrics. 5. Create comprehensive communication plans for organizational enhancement.						

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
Unit 1: Introduction to Corporate Communication: Definition, scope & evolution of corporate communication. Importance and objectives of corporate communication. Evolution and trends in corporate communication. Internal vs. external communication. Role of communication in organizational culture. Ethical considerations in corporate communication	**CLO 1**	**6**
UNIT II		
Corporate Communication Strategy: Developing a corporate communication strategy. Stakeholder identification, analysis, and engagement strategies. Setting communication objectives and goals. Setting SMART communication objectives. Target audience segmentation and	**CLO 2**	**6**

personalized messaging. Crisis communication preparedness and response strategies. Integrating digital communication channels into the strategy.		
UNIT III		
Corporate Branding and Reputation Management: Strategies for building and managing corporate brand identity. Proactive reputation management techniques. Case studies on successful reputation recovery after crises. Leveraging storytelling and narrative in branding efforts. Online reputation management tactics and tools. Employee advocacy programs and their impact on brand reputation.	**CLO 3**	**6**
UNIT IV		
Internal Communication and Employee Engagement: Advanced techniques for fostering effective internal communication. Innovative employee engagement strategies and best practices. Creating a positive communication climate and culture. Addressing resistance to change through strategic communication. Implementing effective feedback mechanisms and communication forums. Harnessing technology for internal communication enhancement.	**CLO 4**	**6**
UNIT V		
Corporate Social Responsibility (CSR) Communication: In-depth understanding of CSR and its significance in corporate communication. Crafting impactful CSR messages for internal and external stakeholders. Measuring and evaluating the effectiveness of CSR communication initiatives. Exploring cultural nuances in CSR communication across different regions. Strategies for meaningful stakeholder engagement in CSR activities. Compliance with CSR reporting standards and frameworks.	**CLO 5**	**6**
Total Hours		**30**

Learning resources

Textbooks:

1. Strategic Corporate Communication, Paul Argenti, Sage Publications, McGraw Hill Education (25 June 2007)
2. Present-Day Corporate Communication, Rudolf Beger, Springer Publication, 1st ed. 2018
3. Corporate Communication: A guide to theory and practice Joep Cornelissen Sage Publications Ltd, 6th Ed. 23 January 2020

Reference Books:

1. "Introduction to Corporate Communication: Case Studies from India", by Charu Lata Singh and Mona Gupta, Routledge, 2023
2. "CORPORATE COMMUNICATION : Trends and Features, by Dr.Sapna.M.S, Notion Press; 1st edition (20 November 2020)
3. "Strategic Communication at Work: The Impact Paradigm", by Diane Lennard, Routledge, 1st Ed. 2018.

Online Resources/E-Learning Resources:

1. Corporate Social Responsibility (CSR): A Strategic Approach by PennX (edX)
2. Professional Communication and Office Management, University of Cape Town (edX)
3. Internal Communication Case Studies: The Terrible & The Terrific https://www.talkfreely.com/blog/internal-communication-case-studies.

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester : II**		**Level: PG**	
Course Name		**Minor Project (Start-up)**		**Course Code/ Course Type**		**PMB 120/ FP**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
1	1	-	2	3	50	0	0
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives of Minor Project (Start-up) are: 1. Recall key entrepreneurial concepts, market trends, and business planning frameworks. 2. Recognize market opportunities, gaps, and customer needs through analysis and research. 3. Apply entrepreneurial skills to generate ideas, validate concepts, and develop business plans. 4. Evaluate the effectiveness and viability of start-up ideas and plans through feedback and validation. 5. Design and implement innovative solutions, business plans, and prototypes for start-up ventures.					
Course Learning Outcomes (CLO):		Students would be able to: 1. Apply knowledge of theoretical concepts in entrepreneurship to real-world start-up scenarios. 2. Apply knowledge of market analysis techniques to identify opportunities and inform decision-making. 3. Analyze market data and feedback to make informed decisions in start-up ventures. 4. Evaluate the start-up ideas and plans for feasibility and effectiveness. 5. Create innovative solutions for start-up concepts and prototypes to address market needs.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
Introduction to Start-up Ecosystem: Overview of entrepreneurship and start-up culture. Entrepreneurship Fundamentals. Characteristics of Successful Entrepreneurs. Types of start-ups: technology-based & social enterprises. Identifying market gaps and opportunities. Role of innovation in start-up success. Ethical considerations in start-up development. Start-Up Ecosystem	**CLO 1**	**3**
UNIT II		
Ideation and Opportunity Recognition: Ideation techniques: brainstorming, mind mapping, etc. Identifying customer pain points and unmet needs. Developing a unique value proposition (UVP). Creativity and design thinking in start-up ideation. Creativity and Innovation. Market Research and Analysis. Idea Generation and Screening.	**CLO 2**	**3**
UNIT III		
Market Research and Customer Validation: Importance of market research for	**CLO 3**	**3**

start-ups. Conducting primary and secondary research. Identifying target customer segments. Customer validation techniques: surveys, interviews, etc. Analyzing competition and market trends. Ethical considerations in gathering and using market research data. Financial modeling and projections for start-ups.		
UNIT IV		
Business Plan Development: Structure and components of a start-up business plan. Writing a compelling executive summary. Defining the start-up's mission, vision, and values. Marketing strategies and go-to-market plan. Business Model Canvas. Operational planning and team structure. Ethical considerations in business plan presentation and transparency.	**CLO 4**	**3**
UNIT V		
Understanding User-Centric Design and Prototyping: Understanding user-centric design revolves around prioritizing user needs, preferences, and behaviors in the design process. Low-fidelity prototypes for early-stage exploration, high-fidelity prototypes for detailed testing. Analyze user feedback to identify strengths, weaknesses, and areas for improvement in the prototype.	**CLO 5**	**3**
Total Hours		**15 Hours**

Practical Plan

Sr. No	Assignment/Practical/Activity Title	Week Number/Turn	Details	CLO	Hours
1.	Practical 1: Exploring Entrepreneurial Opportunities	Week 1	Idea Generation Session: Brainstorm potential business ideas individually or in groups by considering interests, skills, and market trends.	CLO1	2
		Week 2	Research and analyze market trends to identify gaps and opportunities in specific industries or niches.		2
		Week 3	Invite a successful entrepreneur or industry expert to share their experiences, insights, and challenges faced during their entrepreneurial journey.		2
2.	Practical 2: Customer Discovery and Validation	Week 4	Design surveys to gather insights from potential customers regarding their preferences, needs, and pain points related to specific products or services.	CLO 2	2
		Week 5	Conduct interviews to identify real-world problems or pain points faced by target customers through surveys, interviews, or observation and validate business ideas by gathering feedback.		2
		Week 6	Based on the identified pain points, develop potential solutions or product/service offerings to address the identified needs.		2
3.	Practical 3: Strategic Planning and Business Model Development	Week 7	Use various techniques such as SWOT analysis, PESTEL analysis, and Porter's Five Forces to validate the opportunities identified in the market.	CLO 3	2
		Week 8	Work on structuring and writing a comprehensive business plan, including defining the mission, vision, and values, outlining marketing strategies, revenue models, and operational planning.		2
		Week 9	Use the Business Model Canvas framework to visualize and iterate their business models,		2

			focusing on key elements such as value proposition, customer segments, channels, and revenue streams.		
4.	Practical 4: Innovative Product Development and Pitch Presentation	Week 10	Present business plans in a simulated investor pitch scenario, where they showcase their start-up ideas, value propositions, revenue models, and operational plans.	CLO 4	2
		Week 11	Conceptualize product ideas using methods like sketching, modeling, or creating physical mock-ups with readily available materials.		2
		Week 12	Create low-fidelity prototypes of their product using basic materials like cardboard, foam, or clay, focusing on representing the core functionalities and features of the product.		2
5.	Practical 5: User Feedback and Prototype Iteration	Week 13	Conduct user feedback sessions by presenting prototypes to peers or potential users from diverse backgrounds and gather feedback on usability, functionality, and overall user experience, and make notes for iteration.	CLO 5	2
		Week 14	Iterate and improve prototypes to address any usability issues, enhance functionality, or incorporate new features based on user preferences.		2
		Week 15	Prepare comprehensive presentations showcasing their start-up ideas, product prototypes, business plans, and market validation findings.		2
Total Hours					**30**

Textbooks:

1. "Startup Opportunities: Know When to Quit Your Day Job" by Sean Wise and Brad Feld, Wiley, 2nd Edition.
2. "Disciplined Entrepreneurship: 24 Steps to a Successful Startup" by Bill Aulet, Wiley, 2nd Edition, 2024.
3. "The Art of Startup Fundraising: Pitching Investors, Negotiating the Deal, and Everything Else Entrepreneurs Need to Know" by Alejandro Cremades, John Wiley & Sons Inc, 1st edition (22 April 2016)

Reference Books:

1. "The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses" by Eric Ries,Crown Currency; Illustrated edition (13 September 2011).
2. "Zero to One: Notes on Startups, or How to Build the Future" by Peter Thiel and Blake Masters, Random House; 2014th edition (18 September 2014).
3. "Entrepreneurship Development" by S Anil Kumar, S C Poornima, M K Abraham, K Jayashree, NEW AGE International Pvt Ltd; Second edition (11 September 2023).

Online Resources/E-Learning Resources:

1. "Becoming an Entrepreneur" by Massachusetts Institute of Technology (edX)
2. "Thinking & Acting like an Entrepreneur" by RWTH Aachen University (edX)
3. "The Entrepreneurial Mindset" by Babson College (edX)

SEMESTER III

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester:** III		**Level:** PG	
Course Name		**Deep Learning**		**Course Code/ Course Type**		**PMB 201/MAJM**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	-	-	3	3	40	60	-
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives of Deep Learning course are: 1. CO1: Understand foundational concepts in data governance and regulatory frameworks related to AI and deep learning. 2. CO2: Examine privacy and compliance issues in financial and AI-based systems through regulatory and ethical lenses. 3. CO3: Evaluate ethical challenges, algorithmic fairness, and explainability in deep learning applications. 4. CO4: Explore cybersecurity strategies to secure AI systems and mitigate insider threats. 5. CO5: Apply deep learning models to real-world fintech problems and assess interpretability, fairness, and bias.					
Course Learning Outcomes (CLO):		Students would be able to: 1. CLO1 Explain key principles of data governance, roles, and data lifecycle frameworks. 2. CLO2 Evaluate data protection regulations and ethical concerns in financial AI systems. 3. CLO3 Analyze bias, fairness, and transparency in AI models using real-world case studies. 4. CLO4 Apply cybersecurity and access control techniques in AI systems. 5. CLO5 Design and implement deep learning-based applications with ethical and regulatory awareness.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Fundamentals of Data Governance: Principles & Frameworks 1.2 Probabilistic Theory, BPN 1.3 Role and responsibilities of Data Stewards & Chief Data Officers (CDOs) 1.4 Data Quality, Integrity & Lifecycle Management 1.5 Designing a Data Governance Framework	**CLO 1**	**9**
UNIT II		
2.1 Data Breaches & Incident Response (Case Study: Capital One Data Breach) 2.2 Encryption, Tokenization & Secure Data Storage 2.3 Zero Trust Security Model in Business/Institutions 2.4 Insider Threats & Behavioral Analytics for Fraud Detection 2.5 Implementing Role-Based Access Control (RBAC)	**CLO 4**	**9**

UNIT III		
3.1 AI Bias & Fairness in Deep Learning Models 3.2 Explainability & Interpretability of Neural Networks, 3.3 CNN, RNN 3.4 Case Study: Deep Learning	**CLO 5**	**9**
UNIT IV		
4.2 Consent Management & Data Subject Rights (Case Study: GDPR Fines) 4.3 Cross-Border Data Transfers & Sovereignty Issues 4.4 AI & Privacy: Ethical Considerations in Automated Decision-Making 4.5 Conducting a Privacy Impact Assessment (PIA)	**CLO 2**	**9**
UNIT V		
5.1 Ethics in AI & Machine Learning Models 5.2 Algorithmic Bias & Fairness 5.3 Explainable AI (XAI) & Transparency in Decision-Making 5.4 Responsible Data Use & Ethical Hacking 5.5 Augmented Reality and Virtual Reality,	**CLO 3**	**9**
Total Hours		**45**

Textbooks:

1. *Ethical AI and Data Management Strategies in Marketing;* Author(s): Shefali Saluja, Varun Nayyar, Kuldeep Rojhe, Sandhir Sharma; Publisher: IGI Global; Edition: 2024
2. *Artificial Intelligence for Marketing Management;* Author(s): Sara Quach; Publisher: CRC Press Edition: 2023

3. *Deep Learning and Ethics;* Author(s): Travis LaCroix, Simon J. D. Prince; Publisher: arXiv Edition: 2023
4. *Ethical Considerations in AI-Enhanced Marketing Automation: Balancing Personalization and Responsibility;* Publisher: ResearchGate; Edition: 2023
5. *Conceptualizing Ethical AI-Enabled Marketing: Current State and Agenda for Future Research;* Publisher: Springer; Edition: 2024

Reference Books

1. *Deep Learning and Ethics;* Author(s): Travis LaCroix, Simon J. D. Prince; Publisher: arXiv Edition: 2023

2. *Ethical AI and Data Management Strategies in Marketing;* Author(s): Shefali Saluja, Varun Nayyar, Kuldeep Rojhe, Sandhir Sharma; Publisher: IGI Global; Edition: 2024

3. Title: *Ethical Considerations in AI-Enhanced Marketing Automation: Balancing Personalization and Responsibility;* Publisher: ResearchGate; Edition: 2023

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester: III**		**Level: PG**	
Course Name		**AI Ethics and Governance**		**Course Code/ Course Type**		**PMB 202 / MAJM**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA**	**Practical/Oral**
3	-	-	3	3	40	60	-
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives of AI Ethics, Governance and Privacy are: 1. To introduce the ethical principles and frameworks relevant to artificial intelligence. 2. To explain the legal and governance aspects surrounding AI technologies. 3. To explore data privacy issues and regulations impacting AI development and use. 4. To analyze the societal, cultural, and economic implications of AI systems. 5. To examine best practices and case studies in responsible AI adoption and compliance.					
Course Learning Outcomes (CLO):		Students would be able to: 1. Define core ethical principles and challenges in the development and deployment of AI. 2. Explain regulatory frameworks and governance models applied to AI technologies. 3. Identify key concerns around data privacy, surveillance, and algorithmic bias. 4. Analyze the impact of AI on society, including issues of fairness, transparency, and accountability. 5. Recommend ethical and governance strategies for designing and deploying responsible AI systems.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Introduction to AI Ethics: Why It Matters 1.2 Ethical Theories in AI: Utilitarianism vs. Deontology 1.3 Bias and Fairness in AI: Case Studies on Discriminatory Algorithms 1.4 Explainability & Interpretability of AI Models 1.5 Hands-on: Identifying Bias in AI Models (Python-based Exercises)	**CLO 1**	**9**
UNIT II		
2.1 AI Governance Frameworks: OECD, IEEE, EU AI Act 2.2 Risk Management in AI Systems 2.3 Compliance with Global Regulations: GDPR, CCPA, India's DPDP Act 2.4 Auditing AI Models for Ethical Compliance 2.5 Hands-on: Conducting AI Risk Assessments in Business Contexts.	**CLO 2**	**9**
UNIT III		
3.1 AI and Data Privacy: Challenges & Solutions 3.2 Cybersecurity Risks in AI Systems	**CLO 3**	**9**

3.3 The Role of Encryption and Anonymization in AI 3.4 Legal Aspects: Intellectual Property Rights in AI 3.5 Case Study: OpenAI vs. Regulatory Compliance in AI		
UNIT IV		
4.1 AI's Role in Economic Inequality & Job Displacement 4.2 AI in Warfare: Ethical Dilemmas of Autonomous Weapons 4.3 AI and Social Media: Misinformation & Manipulation 4.4 Ethical AI in Healthcare and Financial Systems 4.5 Hands-on: Assessing Social Impact of AI Models.	**CLO 4**	**9**
UNIT V		
5.1 Building AI with Ethics by Design 5.2 The Role of Explainable AI (XAI) 5.3 Human-in-the-Loop AI: Balancing Automation with Oversight 5.4 Future of AI Ethics: Emerging Trends & Challenges 5.5 Capstone Project: Designing an AI Governance Framework for a Business	**CLO 5**	**9**
Total Hours :		**45**

Learning resources

Textbooks:

1. Artificial Intelligence: A Guide for Thinking Humans-Melanie Mitchell
2. Ethics of Artificial Intelligence" – Markus D. Dubber, Frank Pasquale, Sunit Das
3. Artificial Intelligence: A Modern Approach" – Stuart Russell & Peter Norvig
4. The Ethical Algorithm" – Michael Kearns & Aaron Roth

Reference Books:

1. Weapons of Math Destruction" – Cathy O'Neil
2. AI Ethics" – Mark Coeckelbergh
3. Rebooting AI" – Gary Marcus & Ernest Davis
4. Data and Goliath" – Bruce Schneier
5. Race After Technology" – Ruha Benjamin

Online Resources/E-Learning Resources

1. Elements of AI (https://www.elementsofai.com/)
2. Google's "Responsible AI" resources - (https://ai.google/responsibilities/responsible-ai-practices/)
3. OECD AI Policy Observatory-(https://oecd.ai/en/)
4. AI Now Institute Reports (https://ainowinstitute.org/reports.html)
5. Microsoft's "AI School" on Responsible AI (https://aischool.microsoft.com/learning-paths/1f0d40ff/responsible-ai)

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester: III**		**Level: PG**	
Course Name		**Data Visualization and storytelling**		**Course Code/ Course Type**		**PMB 203/MAJM**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA**	**Practical/Oral**
3	-	-	3	3	40	60	-
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives of Data Visualization and storytelling are: 6. 1. To understand and explain fundamental concepts of data visualization and Power BI, including terminology, data sources, and report creation. 7. 2. To develop skills in using Power BI interface for creating basic reports, dashboards, and visual representations of data. 8. 3. To apply data modeling techniques, measures, and DAX functions for effective data transformation and analysis. 9. 4. To analyze business data using interactive visualizations, filters, slicers, and hierarchies for better decision-making. 10. 5. To design and evaluate effective dashboards and data stories, and communicate insights using appropriate visualization techniques					
Course Learning Outcomes (CLO):		Students would be able to: 1. DEFINE Power BI terminology and EXPLAIN how to connect to different data sources and save a report. 2. DESCRIBE and DEMONSTRATE the Power BI interface, building basic reports, and dashboards. 3. APPLY data modeling, measures, and DAX functions to analyze and transform data. 4. ANALYZE data using interactive visualizations, filters, slicers, and hierarchies. 5. DESIGN and BUILD compelling data stories with Power BI dashboards and share them across platforms.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I Getting Started with Power BI		
Introduction to Power BI: Desktop, Service, Mobile, Power BI interface and navigation, Data sources and data connectivity, Importing and transforming data using Power Query, Data load options: Import vs DirectQuery, Saving and publishing reports to Power BI Service	**CLO 1**	**9**
UNIT II Data Preparation and Modeling		
Data cleaning and shaping using Power Query Editor, Creating relationships and data models, Working with calculated columns and measures, Introduction to DAX (Data Analysis Expressions), Creating hierarchies and date tables, Managing data types, categories, and formatting	**CLO 2**	**9**

UNIT III Data Visualization and Charts		
Basic visualizations: bar, column, line, pie, table, matrix, Advanced charts: funnel, gauge, waterfall, KPI, maps, Conditional formatting and drill-through, Creating and using slicers and filters , Tooltips, bookmarks, buttons, and selections, Custom visuals and themes	**CLO 3**	**9**
UNIT IV Calculations and Advanced Analytics		
Creating and using DAX functions: SUMX, CALCULATE, FILTER, etc., Time Intelligence functions in DAX, Calculated tables and fields, Aggregations and nested measures, What-if analysis using parameters, Using analytics pane: trend lines, forecasts, reference lines	**CLO 4**	**9**
UNIT V Storytelling and Sharing Insights		
Creating dashboards and reports, Layout optimization for desktop and mobile, Designing effective data stories using bookmarks and navigation, Embedding insights in PowerPoint, Teams, and SharePoint, Exporting to PDF and Power BI Service sharing, Best practices in dashboard design and storytelling	**CLO 5**	**9**
Total Hours :		**45**

Learning resources

Textbooks:

1. Business Analytics: The Science of Data-Driven Decision Making (3rd Edition) – U. Dinesh Kumar
2. Fundamentals of Business Analytics (Latest Edition) – R.N. Prasad & Seema Acharya
3. Data Visualization Using Python & BI Tools (Latest Edition) – Dr. G. Balamurugan
4. Storytelling with Data (2nd Edition) – Cole Nussbaumer Knaflic
5. Microsoft Power BI Step by Step (Latest Edition 2025–2026) – Nuric Ugarte & José Rafael Escalante

Reference Books:

1. The Big Book of Dashboards (Latest Edition) – Steve Wexler, Jeffrey Shaffer & Andy Cotgreave
2. Data Smart (Revised Edition) – John Foreman
3. Business Analytics (Latest Edition) – Sanjiv Jaggia & Alison Kelly
4. Microsoft Power BI Cookbook (3rd Edition, 2024) – Brett Powell & Greg Deckler
5. Data Visualization for Business Intelligence (Latest Edition) – Mico Yuk

Online Resources/E-Learning Resources

1. Microsoft Learn – (https://learn.microsoft.com/)
2. Coursera (Power BI & Data Visualization Courses) – (https://www.coursera.org/)
3. Udemy (Power BI Courses) – (https://www.udemy.com/)
4. edX (Data Analytics & Visualization Courses) – (https://www.edx.org/)
5. YouTube (Power BI Channels like Guy in a Cube, Simplilearn) – (https://www.youtube.com/)

PROFESSIONAL ELECTIVES 3

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester: III**		**Level: PG**	
Course Name		**Big Data Analytics and Cloud Computing**			**Course Code/ Course Type**		**PMB 204A/Elective**
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/ Oral**
3	-	-	3	3	40	60	0
Pre-Requisite: Bachelor degree							
Course Objectives (CO):		The objectives of Big Data Analytics and Cloud Computing course are: 1. To understand the fundamentals and architecture of Big Data and Cloud Computing. 2. To explore tools, frameworks, and databases used for large-scale data storage and processing. 3. To design and implement cloud-based analytics solutions in financial contexts. 4. To apply real-time processing tools for fintech applications such as fraud detection. 5. To integrate AI, block chain, and big data for secure, ethical, and future-ready financial services.					
Course Learning Outcomes (CLO):		Students will be able to: 1. Describe Big Data characteristics and cloud models, and set up cloud-based analytics platforms. (Understand, Apply) 2. Analyze and process large-scale financial datasets using NoSQL databases and Spark. (Analyze, Apply) 3. Implement and deploy cloud-based fintech solutions with a focus on security and compliance. (Apply, Evaluate) 4. Apply real-time data processing for financial fraud detection and event-driven systems. (Analyze, Create) 5. Design and evaluate Big Data solutions integrating blockchain, risk scoring, and ethical AI.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Fundamentals of Big Data: Characteristics (Volume, Velocity, Variety, Veracity, Value) 1.2 Traditional vs. Big Data Analytics 1.3 Cloud Computing Models: IaaS, PaaS, SaaS (AWS, Azure, Google Cloud) 1.4 Distributed Computing & Storage: Hadoop Ecosystem Overview	**CLO 1**	**9**
UNIT II		
2.1 NoSQL Databases: MongoDB, Cassandra, HBase 2.2 Data Warehousing vs. Data Lakes 2.3 ETL (Extract, Transform, Load) & Data Pipeline Design	**CLO 2**	**9**

2.4 Apache Spark & PySpark for Big Data Processing 2.5 Hands-on: Performing ETL Operations on LargeDatasets		
UNIT III		
3.1 Cloud Storage Solutions (AWS S3, Google Cloud Storage, Azure Blob) 3.2 Cloud-Based Machine Learning & AI Services (AWS SageMaker, Google Vertex AI) 3.3 Security & Compliance in Cloud Computing 3.4 Serverless Computing & Containerization (Docker, Kubernetes)	**CLO 3**	**9**
UNIT IV		
4.1 Real-Time Data Processing with Apache Kafka & Flink 4.2 Use of Stream Processing in Fraud Detection & High-Frequency Trading 4.3 Event-Driven Architecture & Microservices in Banking 4.4 Implementing Real-Time Transaction Monitoring in Fintech	**CLO 4**	**9**
UNIT V		
5.1 Cloud-Based Risk Management & Credit Scoring 5.2 AI & Big Data Integration for Algorithmic Trading 5.3 Blockchain & Big Data: Secure Data Transactions 5.4 Ethical Considerations & Future of Big Data in Financial Services 5.5 Hands-on: Building a Big Data Dashboard for Business Insights	**CLO 5**	**9**
Total Hours		**45**

Learning resources

Textbook:

1. *Machine Learning, Blockchain Technologies, and Big Data Analytics for IoTs;* **Editors:** Amit Kumar Tyagi, Ajith Abraham; **Publisher:** Wiley; **Edition:** 2024;

2. *Industry 4.0 Convergence with AI, IoT, Big Data, and Cloud Computing: Fundamentals, Challenges, and Applications;* **Editors:** Parikshit N. Mahalle, Gitanjali R. Shinde, Prachi M. Joshi; **Publisher:** Bentham Science Publishers; **Edition:** 2023
3. *Intelligent Computing on IoT 2.0, Big Data Analytics, and Block Chain;* **Editors:** Mohammad Obaidat, Padmalaya Nayak, Niranjan Ray; **Publisher:** CRC Press; **Edition:** 2024
4. *Blockchain, Big Data, and Machine Learning: Trends and Applications;* **Editors:** Neeraj Kumar, Gayathri Md Arafatur Rahman, Balamurugan Ramadass; **Publisher:** CRC Press; **Edition:** 2024
5. *Big Data and Artificial Intelligence in Digital Finance: Increasing Personalization and Trust in Digital Finance using Big Data and AI;* **Publisher:** Springer; **Edition:** 2024

Reference Books

1. *Advanced Digital Technologies in Financial and Business Management: Unleashing the Power of Artificial Intelligence, Machine Learning, Blockchain, and the Internet of Things;* **Editors:** Jyoti Batra Arora, Nitish Pathak, Neelam Sharma; **Publisher:** Apple Academic Press; **Edition:** Forthcoming July 2025

2. *Applications of Machine Learning in Big-Data Analytics and Cloud Computing;* **Editors:** Subhendu Kumar Pani, Somanath Tripathy, Talal Ashraf Butt, Sumit Kundu, George Jandieri; **Publisher:** CRC Press; **Edition:** 2024

3. *Futuristic Trends in Computing Technologies and Data Sciences;*

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester : III**		**Level: PG**	
Course Name		**E-Commerce Analytics**		**Course Code/ Course Type**		**PMB 204B/Elective**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	0	0	3	3	40	60	NA
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives **E-Commerce Analytics** of are: 1. Recall key concepts in e-commerce. 2. This module explores data-driven decision-making in e-commerce. 3. Recognise covering customer behavior analysis. 4. Apply sales forecasting methods. 5. Evaluate conversion rate optimization, and personalized marketing strategies. 6. Recognise emerging trends and practices in e-commerce and recognizing it's impact on organizational and employee management.					
Course Learning Outcomes (CLO):		Students would be able to: 1. Apply knowledge of fundamental principles of commerce. 2. Analyze e-commerce processes for the betterment of the organisation. 3. Assess various processes and inferences of e-commerce to the theories for e-commerce. 4. Analyze statistical inferences influencing various data science procedure. 5. Create data science models based on the statistical inferences					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
Unit 1		
1.1 Overview of E-Commerce Analytics & Key Metrics 1.2 Customer Journey & Touchpoints in Online Shopping 1.3 Data Sources: Web Traffic, Clickstream, Transactional Data 1.4 Analytics Tools: Google Analytics, SQL, Python, Tableau 1.5 Case Study: How Amazon Uses Data to Personalize User Experience	**CLO 1**	**9**
Unit 2		
2.1 Understanding Consumer Buying Patterns 2.2 A/B Testing for Website Optimization 2.3 Clickstream Analysis & Heatmaps (Hotjar, Google Analytics) 2.4 Predictive Modeling for Customer Lifetime Value (CLV) 2.5 Case Study: Flipkart's Big Billion Days – Optimizing Conversions	**CLO 2**	**9**
Unit 3		

3.1 Time-Series Forecasting for E-Commerce Demand 3.2 Dynamic Pricing & Discount Optimization 3.3 Inventory Management & Stock Level Prediction 3.4 The Role of AI in Demand Prediction 3.5 Case Study: Shopify's Use of AI for Demand Forecasting	**CLO3**	**9**
Unit 4		
4.1 Types of Online Fraud (Payment Fraud, Fake Reviews, Chargebacks) 4.2 Machine Learning Techniques for Fraud Detection 4.3 Customer Trust & Security in Online Transactions 4.4 Risk Management Strategies for E-Commerce Platforms 4.5 Case Study: PayPal's AI-Driven Fraud Prevention System	**CLO4**	**9**
Unit 5		
5.1 Omni-Channel Retailing: Integrating Online & Offline Channels 5.2 Personalization & Recommendation Engines in E-Commerce 5.3 Mobile Commerce & Social Commerce Trends 5.4 Customer Retention Strategies & Churn Analysis 5.5 Capstone Project: Developing a Data-Driven E-Commerce Growth Plan	**CLO5**	**9**
Total Hours		**45 hours**

Learning resources

Textbooks:

1. E-Commerce Analytics: Analyze and Improve the Impact of Your Digital Strategy; **Author(s):** Judah Phillips; **Publisher:** Wiley; **Edition:** 1st (2015)
2. Data Science and Predictive Analytics; **Author(s):** Vijay Kotu, Bala Deshpande; **Publisher:** Elsevier; **Edition:** 2nd (2023)

3. Effective Fraud Detection in E-Commerce: Leveraging Machine Learning and Big Data Analytics; **Publisher:** Elsevier; **Edition:** 2024

Reference Books

1. The Comprehensive Guide to Ecommerce Analytics in 2024; **Publisher:** History Tools; **Edition:** 2024

2. AI in E-Commerce: The Ultimate Guide; **Publisher:** eSoftSkills; **Edition:** 2024

3. FRAUDability: Estimating Users' Susceptibility to Financial Fraud Using Adversarial Machine Learning; **Author(s):** Chen Doytshman, Satoru Momiyama, Inderjeet Singh, Yuval Elovici, Asaf Shabtai; **Publisher:** arXiv; **Edition:** 2023

COURSE CURRICULUM

Name of the Program:	MBA (BA&AI)	**Semester : III**	**Level: PG**
Course Name	**Block Chain and Crypto Currency**	**Course Code/ Course Type**	**PMB 205/VAC**
Course Pattern	**2025**	**Version**	**1.0**

Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
2	**0**	**0**	2	2	50	0	0

Pre-Requisite: Bachelor's Degree

Course Objectives (CO):	The objectives of Block Chain and Crypto Currency are: 1. To introduce the foundational concepts of block chain technology and its architecture. 2. To explain how cryptocurrencies, operate and their role in digital financial systems. 3. To explore consensus mechanisms, smart contracts, and decentralized applications. 4. To examine the real-world use cases of block chain across industries. 5. To evaluate regulatory, ethical, and security aspects of block chain and cryptocurrencies.
Course Learning Outcomes (CLO):	Students would be able to: 1. To introduce the foundational concepts of block chain technology and its architecture. 2. To explain how cryptocurrencies, operate and their role in digital financial systems. 3. To explore consensus mechanisms, smart contracts, and decentralized applications. 4. To examine the real-world use cases of block chain across industries. 5. To evaluate regulatory, ethical, and security aspects of block chain and cryptocurrencies.

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
Module I		
1.1 Evolution of Blockchain: From Bitcoin to Web3 1.2 Blockchain vs. Traditional Databases: Key Differences 1.3 Types of Blockchains: Public, Private, Hybrid & Consortium 1.4 How Blockchain Works: Blocks, Nodes, Miners, and Consensus 1.5 Case Study: How Bitcoin Revolutionized Digital Transactions	**CLO 1**	**6**
Module II		
2.1 Bitcoin and Altcoins: Understanding Different Cryptocurrencies 2.2 How Cryptocurrency Transactions Work (Wallets, Keys, Signatures) 2.3 Stablecoins, CBDCs, and Tokenization of Assets 2.4 Role of Cryptocurrencies in Global Finance 2.5 Case Study: El Salvador's Bitcoin Adoption as Legal Tender	**CLO 2**	**6**

Module III		
3.1 Introduction to Smart Contracts and Solidity Programming 3.2 Ethereum & Smart Contracts: How They Work 3.3 Building DApps: Real-World Use Cases 3.4 DeFi (Decentralized Finance): Yield Farming, Lending, and Staking 3.5 Hands-on: Writing and Deploying a Smart Contract	**CLO 3**	**6**
Module IV		
4.1 Cryptography in Blockchain: Hashing, Digital Signatures, and Encryption 4.2 Blockchain Vulnerabilities: 51% Attacks, Sybil Attacks, and Smart Contract Bugs 4.3 Regulatory Frameworks: FATF, MiCA, SEC, and India's Crypto Regulations 4.4 Ethical and Legal Considerations in Blockchain and Crypto 4.5 Case Study: The FTX Collapse and Its Impact on Crypto Regulation	**CLO 4**	**6**
Module V		
5.1 Blockchain for Enterprises: Supply Chain, Healthcare, and Banking 5.2 NFTs (Non-Fungible Tokens): Digital Art, Gaming, and Ownership 5.3 Metaverse & Blockchain: The Future of Digital Economies 5.4 Emerging Trends: Zero-Knowledge Proofs, Layer 2 Scaling, and DAOs 5.5 Capstone Project: Building a Blockchain-Based Application	**CLO 5**	**6**
Total Hours :		**30**

Learning resources

Textbooks:

1. Blockchain Basics: A Non-Technical Introduction in 25 Steps" – Daniel Drescher
2. Mastering Bitcoin: Unlocking Digital Cryptocurrencies" – Andreas M. Antonopoulos
3. Mastering Ethereum: Building Smart Contracts and DApps" – Andreas M. Antonopoulos & Gavin Wood
4. Blockchain Technology and Applications" – Kumar Saurabh, Ashutosh Saxena
5. Blockchain Revolution" – Don Tapscott & Alex Tapscott

Reference Books:

1. Cryptocurrency: How Bitcoin and Digital Money Are Challenging the Global Economic Order" – Paul Vigna & Michael J. Casey
2. DeFi and the Future of Finance" – Campbell R. Harvey, Ashwin Ramachandran, Joey Santoro
3. Token Economy" – Shermin Voshmgir

Online Resources/E-Learning Resources

1. https://www.coursera.org/specializations/blockchain
2. https://cryptozombies.io/

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester: III**		**Level: PG**	
Course Name		**Strategic Management and Business Analytics**		**Course Code/ Course Type**		**PMB 207/MAJM**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA**	**Practical/Oral**
3	-	-	3	3	40	60	-
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):				The objectives of Strategic Management and Business Analytics course are: 1. To recall learning about the process of strategic management 2. To recognize strategy formulation and implementation 3. To apply the knowledge gained in functional areas of management 4. To analyze various forms of competitive strategy 5. To evaluate strategies specific to the business vision and mission			
Course Learning Outcomes (CLO):				Students would be able to: 1. CLO1: To identify the concept of Strategic Management, its relevance, Characteristics, process nature and purpose 2. CLO2: To explain how firms successfully institutionalize a strategy process 3. CLO3: To apply a competitive organizational structure for domestic and overseas operations and gain competitive advantage. 4. CLO4: To analyze how strategy is weaved in the organizational decision making process 5. CLO5: To evaluate the strategic drive in multinational firms and their decisions in different markets			

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
Concepts of Strategy - Levels at which strategy operates; Approaches to strategic decision making; Mission and purpose, objectives and goals; Strategic business unit (SBD); Functional level strategies **Analytics**: Business Analytics for KPIs such as People, Operations, Sales, Profit, ROI, operational efficiency, Revenue , total cost , employee turnover, capacity utilization, defect rate, on time delivery, time to market	**CLO 1**	**9**
UNIT II		
Environmental Analysis and Diagnosis - Environment and its components; Environment scanning and appraisal; Organizational appraisal; Strategic advantage analysis and diagnosis; SWOT analysis **Analytics**: Five-stage model of analytical competition, Gartners Analytics Maturity Model. Cases and Applications in different sectors	**CLO 2**	**9**
UNIT III		
Strategy Formulation and Choice - Modernization, Diversification Integration - Merger, take-over and joint strategies - Turnaround, Divestment and Liquidation strategies - Strategic choice - Industry, competitor and SWOT analysis - Factors	**CLO 3**	**9**

affecting strategic choice; Generic competitive strategies - Cost leadership, Differentiation, Focus, Value chain analysis, Benchmarking, Service blueprinting		
UNIT IV		
Functional Strategies: Marketing, production/operations and R&D plans and policies Personnel and financial plans and policies **Analytics**: Market trends, competitor strategies, and emerging opportunities, Competitive advantage through data-driven decisions. Cases and Applications in different sectors.	**CLO 4**	**9**
UNIT V		
Strategy Implementation - Inter - relationship between formulation and implementation - Issues in strategy implementation - Resource allocation - Strategy and Structure - Structural considerations - Organizational Design and change - Strategy Evaluation- Overview of strategic evaluation; strategic control; Techniques of strategic evaluation and control. **Analytics**: Employee engagement and performance measurement, Case studies: Enhancing HR practices with analytics.	**CLO 5**	**9**
Total Hours :		**45**

Learning resources

Textbooks:

6. Strategic Management and Business Policy (16th Edition) – Thomas L. Wheelen & J. David Hunger
7. Strategic Management: Text and Cases (Latest Edition) – V.S.P. Rao & V. Hari Krishna
8. Business Policy and Strategic Management (Latest Edition) – P. Subba Rao
9. Business Analytics: The Science of Data-Driven Decision Making (3rd Edition) – U. Dinesh Kumar
10. Competitive Strategy: Techniques for Analyzing Industries and Competitors (Revised Edition) – Michael E. Porter

Reference Books:

1. *Exploring Strategy (12th Edition)* – Gerry Johnson, Richard Whittington & Kevan Scholes
2. *Blue Ocean Strategy (Expanded Edition)* – W. Chan Kim & Renée Mauborgne
3. *Competing on Analytics* – Thomas H. Davenport & Jeanne G. Harris
4. *Strategic Management: Concepts and Cases (Latest Edition)* – Fred R. David
5. *Analytics at Work* – Thomas H. Davenport, Jeanne G. Harris & Robert Morison

Online Resources/E-Learning Resources

1. *Harvard Business Review (Strategy & Analytics Articles) – (https://hbr.org/)*
2. *Coursera (Strategic Management & Business Analytics Courses) – (https://www.coursera.org/)*
3. *edX (Business Strategy & Analytics Programs) – (https://www.edx.org/)*
4. *McKinsey Insights (Strategy & Data Analytics Case Studies) – (https://www.mckinsey.com/)*
5. *MIT Sloan Management Review (Analytics & Strategy Research) – (https://sloanreview.mit.edu/)*

Semester IV

COURSE CURRICULUM

Name of the Program:	**MBA (BA&AI)**	**Semester : IV**	**Level: PG**
Course Name	**Advanced Machine Learning and Artificial Intelligence Applications**	**Course Code/ Course Type**	**PMB 208/MAJM**
Course Pattern	**2025**	**Version**	**1.0**

Teaching Scheme				**Assessment Scheme**			
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA**	**Practical/Oral**
3	0	-	3	3	40	60	0

Pre-Requisite: Bachelor's Degree

Course Objectives (CO):	The objectives of Advanced Machine Learning and Artificial Intelligence Applications are: 1. To introduce statistical techniques and their relevance in financial data analysis. 2. To develop the ability to apply neural network architectures for complex financial applications. 3. To equip learners with natural language processing tools for interpreting unstructured financial data. 4. To explore reinforcement learning strategies for automated decision-making in financial environments. 5. To develop ethical, explainable, and secure AI systems for applications.
Course Learning Outcomes (CLO):	Students would be able to: 1. Interpret and analyze financial datasets using basic and advanced statistical techniques. (Understanding/Analyzing) 2. Apply deep learning models like CNNs, RNNs, and Transformers for solving real-world financial problems. (Applying) 3. Design and implement NLP applications such as sentiment analysis and text classification in finance. (Creating) 4. Build reinforcement learning models for algorithmic trading and investment decision-making. (Creating/Evaluating) 5. Develop ethical, interpretable, and secure AI systems, especially for fraud detection and regulatory compliance. (Creating/Evaluating)

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Advanced Regression Techniques: Ridge, Lasso, Elastic Net 1.2 Support Vector Machines (SVM) for Financial Data 1.3 Clustering & Anomaly Detection (K-Means, DBSCAN) 1.4 Ensemble Learning: Bagging, Boosting (XGBoost, AdaBoost) 1.5 Hands-on: Credit Risk Prediction using Ensemble Learning	**CLO 1**	**9**
UNIT II		
2.1 Fundamentals of Neural Networks & Deep Learning	**CLO 2**	**9**

2.2 Convolutional Neural Networks (CNN) for Image-based Financial Data 2.3 Recurrent Neural Networks (RNN) & Long Short-Term Memory (LSTM) for Time-Series Forecasting 2.4 Transformers & Attention Mechanisms in Financial Markets 2.5 Hands-on: Implementing LSTM for Stock Price Prediction		
UNIT III		
3.1 NLP Fundamentals: Tokenization, Lemmatization, Named Entity Recognition (NER) 3.2 Sentiment Analysis for Financial News & Social Media (Case Study: Twitter & Stock Market Movements) 3.3 Chatbots & Virtual Assistants in Banking & Wealth Management 3.4 Text Classification & Information Extraction (SEC Filings, Earnings Reports) 3.5 Hands-on: Building a Financial Sentiment Analysis Model	**CLO 3**	**9**
UNIT IV		
4.1 Basics of Reinforcement Learning (RL) 4.2 Markov Decision Processes (MDP) & Q-Learning 4.3 Deep Q-Networks (DQN) & Policy Gradient Methods 4.4 AI-driven Algorithmic Trading (Case Study: Renaissance Technologies) 4.5 Hands-on: Implementing a Reinforcement Learning-based Trading Strategy	**CLO 4**	**9**
UNIT V		
5.1 AI for Fraud Detection in Financial Transactions 5.2 Explainable AI (XAI) for Regulatory Compliance (Case Study: AI in Anti-Money Laundering - AML) 5.3 AI & Blockchain Integration for Secure Transactions 5.4 Ethical AI & Bias in Machine Learning Models 5.5 Hands-on: Developing an AI-based Fraud Detection System.	**CLO 5**	**9**
Total Hours		**45**

Learning Resource:

Text book:

1. Artificial Intelligence and Machine Learning-Powered Smart Finance; Author(s): Amandeep Singh, Sanjay Taneja, Pawan Kumar; Publisher: IGI Global; Edition: 1st (2024)

2. Machine Learning in Finance: Trends, Developments and Business Practices in the Financial Sector; Author(s): Musa Gün, Burcu Kartal; Publisher: Springer; Edition: 1st (2025)

3. Artificial Intelligence and Beyond for Finance; Publisher: World Scientific Publishing;

4. MACHINE LEARNING IN FINANCE: RISK MANAGEMENT, TRADING, AND FRAUD DETECTION; Author(s): Dr. Aman Gupta, Dr. Hafizah, Subharun Pal, Syamsu Rijal

Reference Books

1. *Artificial Intelligence and Machine Learning-Powered Smart Finance;* Author(s): Amandeep Singh, Sanjay Taneja, Pawan Kumar; Publisher: IGI Global; Edition: 1st (2024)

2. *Machine Learning in Finance: Trends, Developments and Business Practices in the Financial Sector;* Author(s): Musa Gün, Burcu Kartal; Publisher: Springer; Edition: 1st (2025)

3. *Artificial Intelligence and Beyond for Finance;* Publisher: World Scientific Publishing

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester :II**		**Level: PG**	
Course Name		**Digital payment and Financial Innovation**		**Course Code/ Course Type**		**PMB 209/MAJM**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA**	**Practical/Oral**
3	-	**0**	3	3	40	60	NA
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):				The objectives of Digital Payments and Financial Innovations are: 1. To trace the evolution and growth of digital payment systems globally and in India. 2. To understand the technologies and players driving modern digital transactions. 3. To explore regulatory frameworks, cybersecurity, and compliance standards in digital payments. 4. To evaluate emerging innovations like CBDCs, DeFi, and cross-border blockchain solutions. 5. To design inclusive, secure, and future-ready fintech payment models for practical use.			
Course Learning Outcomes (CLO):				Students would be able to: 1. Explain the evolution and major actors in the digital payment ecosystem globally and in India. 2. Demonstrate knowledge of mobile payment technologies, tokenization, and biometric authentication. 3. Analyze the regulatory landscape and compliance requirements governing digital payments. 4. Evaluate innovative trends such as DeFi, embedded finance, and cross-border blockchain systems. 5. Design a fintech-enabled payment solution with an emphasis on inclusion, security, and innovation.			

COURSE CURRICULUM

Descriptors/Topics	**CLO**	**Hours**
UNIT - I		
1.1 Definition, Scope, and Importance of Business Analytics in Fintech 1.2 Types of Analytics: Descriptive, Predictive, and Prescriptive (Case Study: Fraud detection in digital payments) 1.3 Data-Driven Decision Making in Financial Services 1.4 Tools & Technologies: Excel, SQL, Tableau, Power BI for Business Analytics 1.5 Case Study: How Neobanks use analytics to enhance customer experience	**CLO 1**	**9**
UNIT – II		
2.1 Basics of Data Collection, Cleaning, and Preprocessing 2.2 Structured vs. Unstructured Data in Financial Services 2.3 Data Warehousing Concepts: ETL, OLAP, Data Lakes 2.4 Big Data in Fintech: Hadoop, Spark, and Cloud Data Storage (Example: UPI transaction databases) 2.5 Data Governance and Compliance (Case Study: GDPR and its impact on financial analytics)	**CLO 2**	**9**

UNIT – III		
3.1 Data Visualization for Business Decision-Making (Using Power BI/Tableau) 3.2 KPI Dashboards and Financial Metrics 3.3 Reporting and Storytelling with Data (Case Study: Loan performance analysis in microfinance) 3.4 Predictive Analytics for Risk Assessment (Example: Credit scoring in digital lending) 3.5 Hands-on: Building an interactive Fintech dashboard	**CLO 3**	**9**
UNIT IV		
4.1 Basics of AI and Its Role in Fintech 4.2 Machine Learning vs. Traditional Business Analytics 4.3 Natural Language Processing (NLP) in Financial Services (Case Study: Chatbots in customer service) 4.4 AI in Credit Risk Assessment and Fraud Detection 4.5 Case Study: How AI-powered underwriting is changing digital lending	**CLO 4**	**9**
UNIT – V		
5.1 Bias in AI and Data Analytics: Challenges and Risks 5.2 Ethical AI in Banking and Finance (Example: AI-driven credit scoring fairness) 5.3 Regulatory Frameworks: GDPR, RBI Guidelines, AI Ethics 5.4 Explainable AI (XAI) in Financial Decision Making 5.5 Case Study: RBI's stance on AI-based credit models	**CLO 5**	**9**

Learning resources

Textbooks:

1. "Business Analytics: Data Analysis & Decision Making" by S. Christian Albright and Wayne L. Winston

2. "Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking" by Foster Provost and Tom Fawcett

3. "Financial Analytics with R: Building a Laptop Laboratory for Data Science" by Mark J. Bennett and Dirk L. Hugen

Reference Books:

1. "Artificial Intelligence in Finance" by Yves Hilpisch

2. "Data Management for Researchers: Organize, Maintain and Share Your Data" by Kristin Briney

3. "Financial Modeling in Excel For Dummies" by Danielle Stein Fairhurst

COURSE CURRICULUM -

Name of the Program:		**MBA (BA&AI)**		**Semester : IV**		**Level: PG**	
Course Name		**Capstone Project**		**Course Code/ Course Type**		**PMB 210 / MAJM**	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	**0**	**0**	3	3	40	60	0
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):				The objectives of Capstone Project are: 1. Identification of Business Problems. 2. Recall a hands-on project-based course 3. Recognise where students apply analytics and AI 4. To solve real-world business challenges. 5. Apply Internal vs. External Date sets			
Course Learning Outcomes (CLO):				**Students would be able to:** 1. Study Data Collection, Cleaning & Processing 2. Apply Model Selection & AI Implementation 3. Evaluate AI in Decision-Making & Business Impact 4. Project Execution, Documentation & Presentation 5. Design Future trends			

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
- Identifying Business Problems Suitable for AI & Analytics	**1**	**9**
- Data Sourcing: Internal vs. External Datasets	**2**	**9**
- Choosing the Right Machine Learning Algorithm	**3**	**9**
- Interpreting AI Model Results for Business Insights	**4**	**9**
- Project Execution Best Practices: Agile & CRISP-DM Framework	**5**	**9**
Total Hours		**45**

PROFESSIONAL ELECTIVES 4

COURSE CURRICULUM

Name of the Program:	**MBA (BA & AI)**	**Semester:** IV	**Level:** PG
Course Name	Customer Analytics and engagement strategy	**Course Code/ Course Type**	**PMA 211A/ Elective**
Course Pattern	2025	**Version**	1.0

Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	0	0	3	3	40	60	0

Pre-Requisite: Bachelor's Degree

Course Objectives (CO):	The objectives of the course are: 1. To prepare students understand online consumer mindset 2. To develop Strategic Digital Marketing Skills to enhance customer experiences 3. To foster Innovation through Design Thinking 4. To excel into various evolving technology roles relevant to digital marketing 5. To leverage Advanced Technologies
Course Learning Outcomes (CLO):	Students would be able to: 1. Explain the fundamentals of customer analytics and data-driven marketing 2. Apply segmentation and profiling techniques to identify customer groups 3. Map customer journeys and develop engagement strategies 4. Use predictive analytics tools to understand customer behavior 5. Evaluate ethical and strategic applications of customer data across industries

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
Unit I: Foundations of Customer Analytics - Covers the basics of customer analytics and its importance in marketing. Topics include data types and sources, structured vs. unstructured data, CRM tools, role of technology, customer-centric decision-making, and an overview of analytics platforms and tools.	**CLO 1**	**9**
UNIT II		
Customer Segmentation and Profiling - Focuses on methods of segmenting and profiling customers. Topics include demographic, geographic, behavioral, and psychographic segmentation, RFM analysis, buyer personas, clustering techniques, segmentation tools (Excel, SPSS, Python), and a case study on e-commerce.	**CLO 2**	**9**
Customer Journey and Engagement Mapping - Explores how to map and optimize customer journeys and engagement. Topics include customer journey stages, experience mapping, omnichannel strategy, lifecycle management, engagement metrics, NPS, AI-driven personalization, gamification, and digital experience design.	**CLO 3**	**9**

UNIT IV		
Predictive Analytics and Customer Behavior - Introduces predictive analytics to understand and forecast customer behavior. Topics include CLV prediction, churn models, recommendation engines, uplift modeling, A/B testing, CRO, behavior tracking, and real-time personalization techniques.	**CLO 4**	**9**
UNIT V		
Strategic Application and Ethics in Customer Analytics - Focuses on applying customer analytics in strategic decision-making with an emphasis on ethics. Topics include campaign analytics, cross-channel analysis, customer feedback, dashboard tools, ethical data use, privacy laws (e.g., GDPR), industry-specific applications, and a capstone case study.	**CLO 5**	**9**
Total Hours		**45**

Learning resources

Textbooks:

1. Customer Analytics For Dummies"The easy way to grasp customer analytics" - Jeff Sauro John Wiley & Sons, 2 Feb 2015
2. Predictive Customer Analytics - Predictive Customer Analytics - linkedin.com (Firm)
3. Business Analytics: Applications to Consumer Marketing - Applications to Consumer Marketing (English, Hardcover, Kuruganti Sandhya) - Author - Kuruganti Sandhya

Textbooks:

1. 52 Things We Wish Someone Had Told Us About Customer Analytics - 2018 - Reference Books: By: Alex Sherman (Author) , Mike Sherman (Author) | Publisher: Independently Published | Publisher Imprint: Independently Published
2. Customer Analysis and Management in Database Marketing
3. Analytics and Dynamic Customer Strategy: Big Profits from Big Data (WILEY Big Data Series) - Author: John F. Tanner Jr.

Online Resources/E-Learning Resources:

1. https://books.google.co.in/books/about/Customer_Experience_Analytics.html?id=MPSnEAAAQBAJ&redir_esc=y
2. https://www.verint.com/Assets/resources/resource-types/white-papers/aberdeen-customer-analytics-how-to-make-best-use-of-customer-data.pdf
   https://www.cb-india.com/books/web-development/analytics/customer-experience-analytics-the-key-to-real-time-adaptive-customer-relationships/?srsltid=AfmBOoq80INcMcnlfvN9b4xAex51x69tZ__3cG1ginLEyIixu9wwu4yz&__cf_chl_tk=wPKR6U_JiYWUm9mpq3GJF9xwRWFhtW9WbFV_YBU8Er0-1744028833-1.0.1.1-VnF68Z1yPVy6QuuVZAZky14OWxH7dCv9JkVjtMMHsWU

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester :IV**		**Level: PG**	
Course Name		**Data-Driven Decision Making in Marketing**		**Course Code/ Course Type**		**PMB 211B/Elective**	
Course Pattern		**2025**		**Version**		**1.0**	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
3	**-**	**0**	3	3	40	60	NA
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):		The objectives of Data Driven decision making in marketing are: 1. To understand how marketing decisions can be enhanced through data-driven strategies. 2. To explore various data collection methods, analytics tools, and metrics used in marketing. 3. To develop analytical skills for customer segmentation, targeting, and campaign evaluation. 4. To apply machine learning, AI, and predictive analytics in real-time marketing scenarios. 5. To enable students to build, assess, and improve data-driven marketing strategies.					
Course Learning Outcomes (CLO):		Students would be able to: 1. Explain the importance of data in marketing decision-making across the customer lifecycle. 2. Apply data analysis techniques to optimize customer segmentation and targeting. 3. Analyze campaign performance using metrics such as CLV, CAC, and ROI. 4. Evaluate marketing strategies with the help of dashboards, A/B testing, and analytics tools. 5. Design and execute a data-driven marketing campaign using real-world data.					

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I		
1.1 Introduction to Data-Driven Marketing & Its Impact 1.2 Key Marketing Metrics: CAC, CLV, ROAS, Conversion Rates 1.3 Customer Segmentation & Behavioral Analysis 1.4 Marketing Dashboards & Reporting with Tableau/Power BI 1.5 Hands-on: Building a Marketing KPI Dashboard	**CLO 1**	**9**
UNIT II		
2.1 Identifying High-Value Customers Using RFM Analysis 2.2 Predicting Customer Churn with Machine Learning 2.3 Personalization & Recommendation Engines 2.4 Customer Journey Mapping & Attribution Modeling 2.5 Hands-on: Building a Customer Retention Model	**CLO 2**	**9**

UNIT III		
3.1 A/B Testing & Experimentation in Marketing 3.2 Attribution Models: First-Touch, Multi-Touch, and Last-Touch 3.3 Budget Optimization Using Marketing Mix Models 3.4 Google Analytics & Ad Performance Tracking 3.5 Hands-on: Designing an A/B Test for an Ad Campaign	**CLO 3**	**9**
UNIT IV		
4.1 Demand Forecasting & Sales Predictions 4.2 Sentiment Analysis for Brand Monitoring 4.3 Social Media Analytics & Trend Prediction 4.4 AI-Powered Chatbots & Conversational Marketing 4.5 Hands-on: Predicting Sales Using Time Series Forecasting	**CLO 4**	**9**
UNIT V		
5.1 Ethical Considerations in Consumer Data & Privacy (GDPR, CCPA) 5.2 Case Study 1 5.3 Case Study 2 5.4 Future of AI in Marketing Decision-Making 5.5 Project: Designing a Data-Driven Marketing Strategy	**CLO 5**	**9**
Total Hours		**45 Hours**

Learning Resource:
Textbook-

1. Mastering Marketing Data Science; by Iain Brown; Publisher: Wiley; Edition: 2024

2. AI-Driven Marketing Research and Data Analytics; Editors: Reason Masengu, O.T. Chiwaridzo, M. Dube, B. Ruzive; Publisher: IGI Global; Edition: 2024

3. Predictive Analytics and Generative AI for Data-Driven Marketing Strategies; Editors: Hemachandran K, Debdutta Choudhury, Raul Villamarin Rodriguez; Publisher: CRC Press; Edition: 2024

4. Data Engineering for Data-Driven Marketing; Editors: Balamurugan Baluswamy, Veena Grover, M.K. Nallakaruppan, Vijay Anand Rajasekaran, Mariofanna Milanova; Publisher: Emerald Publishing Limited; Edition: 2025

5. Data-Driven Decision Making (2024); Editors: Jeanne Poulose, Vinod Sharma, Chandan Maheshkar Publisher: Palgrave Macmillan; Edition: 2024

Reference Books

1. Advanced Digital Marketing Strategies in a Data-Driven Era; Editor: Jose Ramon Saura; Publisher: IGI Global; Edition: 2021

2. Intelligent Data-Driven Marketing; Author: Mathias Elsässer; Publisher: Columbia University Press

3. Digital Marketing 2024: Mastering AI, SEO, Social Media, and Data-Driven Strategies for Business Growth; Author: K. Connors; Edition: 2024

COURSE CURRICULUM:

Name of the Program:	MBA (BA&AI)	Semester: IV	Level: UG
Course Name	Entrepreneurship Development	Course Code/ Course Type	PMB 212/VAC
Course Pattern	2025	Version	1.0

Teaching Scheme					Assessment Scheme		
Theory	Practical	Tutorial	Total Credits	Hours	CIA	ESA	Practical/Oral
2	-	-	2	2	20	30	-

Pre-Requisite: Basics of Entrepreneurship, Networking & Marketing

Course Objectives (CO):	The objectives of the course are: 1. To recall the concept of entrepreneurship. 2. To recognize methods of idea generation and explore opportunities. 3. To apply success & failure stories of ventures tone's self-enterprise. 4. To analyze new venture concepts in terms of complexity of new venture initiation. 5. To evaluate one's personal strength & write a comprehensive, solid, executable new venture business plan
Course Learning Outcomes (CLO):	Students would be able to: 1. To identify key entrepreneurship concepts, theories and principles, including knowledge of different types of entrepreneurs. 2. To explain the product related opportunities and do feasibility checks. 3. Apply knowledge of the various perspectives of entrepreneurship that reflect sustainable value for business and society through launches. 4. Analyze the strategies of an existing business venture and leverage role of support organizations and small businesses. 5. To evaluate industry relevant success stories and technology developments.

COURSE CONTENTS:

Descriptors/Topics	CLO	Hours
UNIT I		
ENTREPRENEURSHIP DEFINED: Concept and Definitions, Entrepreneurial Competencies, Factor Affecting Entrepreneurial Growth, Traits/Qualities of an Entrepreneurs, Steps of entrepreneurial process.	**CLO 1**	**6**
UNIT II		
PRODUCTS & OPPORTUNITIES: Opportunity / Identification and Product Selection, Product Selection, Conducting Feasibility Studies, Entry strategies, Intellectual Property.	**CLO 2**	**6**
UNIT III		

SMALL ENTERPRISES AND ENTERPRISE LAUNCHING FORMALITIES: Definition of Small Scale; Rationale; Objective; Scope; Role of SME in Economic Development of India; SME; Registration; NOC from Pollution Board; Machinery and Equipment Selection; PROJECT REPORT PREPARATION: Specimen of Project Report; Project Planning and Scheduling using Networking Techniques of PERT / CPM; Methods of Project Appraisal - economic viability and market feasibility, requirements of financial institutions, projected financial statement preparation.	**CLO 3**	**6**
UNIT IV		
ROLE OF SUPPORT INSTITUTIONS AND MANAGEMENT OF SMALL BUSINESS: Director of Industries; DIC; SIDO; SIDBI; Small Industries Development Corporation (SIDC);SISI; NSIC; NISBUED; State Financial Corporation SFC; Information : assistance from different organizations in setting up a new venture, technology parks, industrial corporations, directorate of industries / cottage and small scale industries, SISI, Khadi & Village Industries Corporation / Board; DGS & DNSIC, export & import, how to apply for assistance – procedure, forms, procedures for obtaining contract from Railways, Defense, P & T etc., SIDBI; Laws : Liabilities under the Factories Act, Shops & Establishment Act, Industrial Employment (Standing Orders) Act, Environment Protection Act, Sale of Goods Act, maintenance & submission of statutory records & returns, understanding labor - management relationship.	**CLO 4**	**6**
UNIT V		
CASE STUDIES: Diagnostic case studies of successful/ unsuccessful entrepreneurs, key variables explaining success/ failures, industrial sickness, industrial reconstruction, technology obsolescence, technology, transfer.	**CLO 5**	**6**
Total Hours		**30**

LEARNING RESOURCES:

Textbooks:

1. Holt H. David (2005), Entrepreneurship New Venture Creation, Prentice-Hall
2. Histrich D. Robert and Peters P. Michal Shepherd A Dean (2007), Entrepreneurship, McGraw Hill
3. Suhail Abidi and Manoj Joshi, The VUCA Company, 2016, Jaico Publishing India, ISBN 978-81-8495-662-7

Reference Books:

1) Sharma, Apoorv and Shukla, Balvinder and Joshi, Manoj, Can Business Incubators Impact the Start-Up Success? India Perspective! (October 20, 2014). Available at SSRN: https://ssrn.com/abstract=2511944 or http://dx.doi.org/10.2139/ssrn.2511944
2) Sharma, Apoorv and Joshi, Manoj and Shukla, Balvinder, Is Accelerator an Option? Impact of Accelerator in Start-up Eco-System! (May 19, 2014). Available at SSRN: https://ssrn.com/abstract=2438846 or http://dx.doi.org/10.2139/ssrn.2438846
3) Joshi, Manoj and Srivastava, Apoorva and Shukla, Balvinder, International Lessons on Innovation for Socio Economic Development in India (October 13, 2014). Available at SSRN: https://ssrn.com/abstract=2509060 or http://dx.doi.org/10.2139/ssrn.2509060

Online Resources/E-Learning Resources:

1. Entrepreneurship Essentials, HBS, https://online.hbs.edu/courses/entrepreneurship-essentials/
2. New Venture Finance: Startup Funding for Entrepreneurs, https://www.coursera.org/learn/startup-funding?specialization=business-entrepreneurship
3. Developing New Business Ventures (Online): From Ideation to Successful Launch, https://execed.business.columbia.edu/programs/developing-new-business-ventures-online

COURSE CURRICULUM

Name of the Program:		**MBA (BA&AI)**		**Semester : IV**		**Level: PG**	
Course Name		**Research / Field Project**		**Course Code/ Course Type**		PMB213/FP	
Course Pattern		**2025**		**Version**		1.0	
Teaching Scheme					**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA (Continuous Internal Assessment)**	**ESA (End Semester Assessment)**	**Practical/Oral**
0	4	0	4	8	50	100	NA
Pre-Requisite: Bachelor's Degree							
Course Objectives (CO):				1. Develop a comprehensive understanding of research methodologies. 2. Enable students to identify, analyze, and interpret secondary data for solving business problems. 3. Enhance critical thinking and problem-solving skills. 4. Prepare students for future professional roles by equipping them with research, analytical, and writing skills. 5. Strengthen the ability to communicate research findings effectively through structured reports and presentations.			
Course Learning Outcomes (CLO):				1. Students will be able to formulate research objectives based on secondary data. 2. Students will be able to review and synthesize existing research to identify gaps. 3. Students will be able to evaluate and interpret secondary data for meaningful insights. 4. Students will be able to develop a structured report and present research effectively. 5. Students will be able to follow ethical research practices and proper citation.			

Course Overview:
The MBA Research / Field Project (Sem IV) is designed to provide students an opportunity to engage in independent research, using secondary data, to explore contemporary business issues or solve organizational problems. Since students are already working, the project will focus on applying theoretical knowledge to real-world business situations and contribute to professional growth.

Course Contents/ Syllabus:
(All the units carry equal weightage in Summative Assessment and equal engagement)

Descriptors/Topics
UNIT I
Module 1: Introduction to the Research Project Objective: Understanding the scope and process of the research project. Key Tasks: Selecting a relevant topic using secondary data. Understanding secondary data sources (academic databases, market reports, government databases, etc.). Crafting a research proposal: clearly defining the problem, research objectives, methodology, and data sources. Deliverable: Research Proposal Submission.
UNIT II
Literature Review and Conceptual Framework Objective: Building a foundation of existing research to identify knowledge gaps.

Key Tasks: Conducting a thorough literature review using academic sources, reports, and other relevant secondary data. Identifying key theories, concepts, and research gaps. Developing a conceptual framework or hypotheses based on the literature. Deliverable: Literature Review Submission.
UNIT III
Data Collection and Secondary Data Analysis: Objective: Collecting and analyzing secondary data relevant to the research problem. Key Tasks: Identifying secondary data sources such as industry reports, governmental statistics, company annual reports, etc. Evaluating the credibility and relevance of the data sources. Performing basic statistical or content analysis on the data (e.g., descriptive statistics, regression analysis). Deliverable: Data Analysis Report.
UNIT IV
Report Writing and Synthesis Objective: Writing the full research report and synthesizing the findings. Key Tasks: Structuring the research report: Introduction, Literature Review, Methodology, Results, Discussion, Conclusion, and Recommendations. Integrating the findings from secondary data analysis into the discussion section. Making clear, actionable recommendations for practitioners based on the research findings. Deliverable: Draft Report Submission, Final Report.
UNIT V
Presentation and Viva Objective: Presenting the research findings in a professional manner. Key Tasks: Preparing a concise presentation summarizing the research problem, methodology, analysis, and key findings. Defending the project in front of a panel, answering questions on methodology, data analysis, and conclusions. Deliverable: Final Presentation and Viva

3. Rules and Regulations for MBA Research Project

General Guidelines:

1. Eligibility: All students in Semester IV who have completed the required coursework are eligible to undertake the Research Project.
2. Research Topic:
   - The topic must be relevant to the student's professional field and current business issues.
   - The topic should be approved by the faculty supervisor before proceeding with the project.

3. Use of Secondary Data:
   - As students are employed, primary data collection is not permissible. Only secondary data should be used for the project.
   - Students must ensure that the secondary data is credible, relevant, and ethically sourced.

4. Proposal Submission:
   - A detailed research proposal (covering objectives, methodology, and sources of secondary data) must be submitted within the first 2 weeks of the course.
   - The proposal will be reviewed and approved by the course instructor or assigned supervisor.

5. Guidance and Supervision:
   - Each student will be assigned a faculty supervisor. The student must meet with the supervisor at least twice during the semester for feedback and guidance.
   - Supervisors will provide support with the research methodology, data analysis, and report writing.

6. Literature Review and Data Analysis:
   - A comprehensive literature review must be completed by Week 4. It must showcase understanding of existing work in the chosen field.
   - All data analysis should be rigorous and should use appropriate software tools (Excel, SPSS, etc.).

7. Submission Deadlines:
   - Viva-Voce / Presentation: Last Week of End of Teaching

8. Formatting and Style:
   - Reports should be submitted in APA or MLA citation format.
   - The final report should not exceed 75 pages (excluding appendices, tables, and references).

9. Plagiarism:
   - All students must ensure that their research is original and properly cited. Any form of plagiarism will result in immediate disqualification and disciplinary action.

10. Evaluation Criteria:
- Research Proposal (10%)
- Literature Review (10%)
- Data Collection & Analysis (20%)
- Final Report (30%)
- Presentation & Viva (30%)

11. Viva and Presentation:
- Each student must present their research findings to a panel of faculty members.
- The presentation should focus on the problem statement, methodology, key findings, and recommendations.
- A viva will follow the presentation where the student will defend their research methodology, data analysis, and conclusions.

12. Academic Integrity:
- Students must follow the highest standards of academic integrity. Any malpractice, such as falsification of data or misrepresentation of secondary sources, will lead to severe academic penalties.

13. Extensions:
- Extensions for submission deadlines will only be considered in the case of valid medical or personal emergencies, with prior approval from the course instructor and HOD.

COURSE CURRICULUM

Name of the Program:	**MBA (BA&AI)**		**Semester: IV**		**Level: PG**	
Course Name	**Advanced Statistical Methods**		**Course Code/ Course Type**		**PMB214**	
Course Pattern	**2025**		**Version**		**1.0**	
Teaching Scheme				**Assessment Scheme**		
Theory	**Practical**	**Tutorial**	**Total Credits**	**Hours**	**CIA**	**ESA**	**Practical/Oral**
3	-	-	3	3	40	60	-
Pre-Requisite: Bachelor's Degree							

Course Objectives (CO):	The objectives of Advanced Statistical Methods are: 1. To Recall Basic R syntax, programming structures, and data types. Explain fundamental statistical concepts and R-based data handling techniques. 2. Apply R functions for data manipulation, visualization, and analysis. 3. Analyze data using regression, classification, and time series models in R. 4. Evaluate statistical models using performance metrics and diagnostics in R. 5. Design and build predictive models and visualizations using real-world data in R.
Course Learning Outcomes (CLO):	Students would be able to: 1. **DEFINE and EXPLAIN** basic R programming concepts, syntax, data types, and fundamental statistical techniques for data handling. 2. **APPLY** R functions and packages to perform data cleaning, manipulation, and visualization for business datasets. 3. **ANALYZE** datasets using statistical models such as regression, classification, and time series techniques in R. 4. **EVALUATE** statistical and predictive models using appropriate performance metrics and diagnostic tools in R. 5. **DESIGN and DEVELOP** data-driven solutions by building predictive models and visualizations using real-world datasets in R.

Course Contents/Syllabus:

Descriptors/Topics	**CLO**	**Hours**
UNIT I Introduction to R and Basic Programming Concepts		
Introduction to R and RStudio environment, Downloading and installing R and RStudio. Understanding the R console and script editor. Data types in R: character, numeric, logical, complex, Data structures: vectors, lists, matrices, arrays, data frames, and factors. Operators, variables, and basic expressions in R. Flow control structures: if-else, for loop, while loop, repeat loop. Built-in functions and user-defined functions. Web scraping in R.	**CLO 1**	**9**
UNIT II Data Handling, Manipulation and Visualization in R		
File operations: reading/writing text files, CSV, Excel, SPSS, SAS. Data transformation and exploration. Subsetting, merging, concatenating data: cbind(), rbind(), merge(). Apply family of functions: apply(), lapply(), sapply(), tapply(). Inspecting data: str(), class(), length(), nrow(), ncol(), head(), tail(). Importance of Exploratory Data Analysis (EDA), Summary statistics, outlier detection. Visualizing data using base, lattice, and ggplot2 graphics, creating line plots, bar plots, histograms, pie charts, table plots, Customizing plots: titles, labels, legends, colours.	**CLO 2**	**9**
UNIT III Hypothesis Testing and Statistical Inference		
Hypothesis testing: z-test, t-test, F-test, chi-square test, testing proportions, correlations. One-way and Two-way ANOVA, interaction effects. Summarizing	**CLO 3**	**9**

data and using cross-tabulations. Domain-specific case studies using R.		
UNIT IV Regression and Classification Techniques		
Linear Regression: Concept, OLS, multiple regression, assumptions, multicollinearity, residual analysis. Logistic Regression: Concept, odds ratios, log-likelihood, ROC curves, classification tables. Discriminant Analysis: Linear Discriminant Function, classification performance. Step-wise and dummy variable regression. Use of R for all methods with domain-based case studies. Dimension reduction: Introduction to PCA and Factor Analysis.	**CLO 4**	**9**
UNIT V Time Series and Predictive Analytics		
Time series data structures in R. Decomposition of time series: trend, seasonality, residuals. ACF and PACF plots, forecasting methods: Exponential smoothing, Holt's Winter. ARMA, ARIMA modelling and validation. Use of time series forecasting in different domains using R	**CLO 5**	**9**
Total Hours :		**45**

Learning resources

Textbooks:

6. R for Everyone: Advanced Analytics and Graphics, by Jared P. Lander, Publisher - Pearson Education India
7. Applied Statistics with R, by Dr. R. N. Prasad & Seema Acharya, Publisher -Wiley India
8. R Programming for Beginners by Sandip Rakshit , Publisher-Tata McGraw Hill
9. R for Business Analytics, by A Ohri (Author), Publisher - Springer-Verlag New York Inc
10. A First Course in Statistical Programming with R , by John Braun, Publisher - Cambridge University Press.

Reference Books:

11. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data by Hadley Wickham , Garrett Grolemund , Publisher- O'Reilly
12. Advanced R Statistical Programming and Data Models: Analysis, Machine Learning, and Visualization by Matt Wiley , Joshua F. Wiley , Publisher -Apress
13. *Data Science Using R* – Dr. G. Balamurugan
14. *Statistical Methods* – S.P. Gupta

Online Resources/E-Learning Resources

6. **Coursera – R Programming (Johns Hopkins University)** – (https://www.coursera.org/learn/r-programming)
7. **DataCamp – R Programming Courses** – (https://www.datacamp.com/learn/r)
8. **Codecademy – Learn R** – (https://www.codecademy.com/learn/learn-r/)
9. **R Project (Official Website)** – (https://www.r-project.org/)
10. **RStudio / Posit Learning Resources** – (https://posit.co/resources/)