Syllabus prescribed for

MBA Semester – II

MBA IN BUSINESS ANALYTICS

Sr. No.	Subject Code	Name of Subject	Course Type
1	MBA/201/BA	Quantitative Business Analysis	DSC
2	MBA/202/BA	Data Mining For Business Intelligence	DSC
3	MBA/203/BA	Machine Learning Application For Business	DSC
4	MBA/204/BA MBA/205/BA	Data Visualization / Web Analytics	DSE
5	MBA/206/BA	BA & Tools Of BA - R, Python, SPSS	DSC
6	MBA/207/BA	Business Communication	DSC
7	MBA/208/BAC	Entrepreneurship	DSC

MBA/201/BA

QUANTITATIVE BUSINESS ANALYSIS

Course Outcomes: On successful completion of the course the learner will be able to

CO	Course Outcome
1	Apply Quantitative Methods: Students will be able to apply various quantitative techniques, such as statistical analysis, data modelling, and optimization, to solve complex business problems.
2	Data Interpretation: Students will demonstrate the ability to collect, analyse, and interpret data, making informed decisions based on quantitative insights.
3	Critical Thinking: Develop critical thinking skills by critically evaluating quantitative information and its implications on business decisions.
4	Effective Communication: Improve the ability to communicate quantitative results and findings clearly and persuasively.

Unit 1: Introduction to Quantitative Business Analysis:

Importance of quantitative analysis in business, Data types and sources, Introduction to Excel for data analysis, Descriptive Statistics, Measures of central tendency, Measures of dispersion, Frequency distributions, Data visualization, Probability and Probability Distributions, Probability concepts, Discrete and continuous probability distributions, Normal distribution and its applications, Unit 2: Strategic Marketing Planning

Unit 2: Statistical Inference, Sampling and sampling distributions :-

Confidence intervals, Hypothesis testing, Regression Analysis, Simple and multiple regression, Model interpretation, Practical applications in business, Decision Analysis, Decision-making under uncertainty, Decision trees, Sensitivity analysisUnit 4: Marketing Ethics and Global Marketing

Unit 3: Probability Concepts and Rules, Introduction to Probability: -

Definition of probability, Sample space and events, Basic probability rules (addition, multiplication, and complement rules), Expected value and variance for discrete random variables, Common Discrete Distributions, Binomial distribution, Poisson distribution, Hypergeometric distribution, The Normal Distribution and Its Applications, The Normal Distribution, Characteristics of the normal distribution, Standardization and the z-score, Using z-tables and calculators.

Unit 4: Linear programming, Integer programming: -

Goal programming, Application of optimization in business, Determine the optimal production mix to maximize profit or minimize costs, Supply chain optimization, optimize logistics and distribution operations, Financial portfolio optimization, create diversified portfolios with minimal risk, Network flow problems.

Suggested Readings:

1. "Quantitative Methods for Business" by David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, and Jeffrey D. Camm

2. "Business Analytics" by James R. Evans

3. "Data Science for Business" by Foster Provost and Tom Fawcett

4. "Principles of Statistics" by M.G. Bulmer

5. "Operations Research: Applications and Algorithms" by Wayne L. Winston

6. "Business Analysis with Microsoft Excel" by Conrad Carlberg

7. "Quantitative Analysis for Management" by Barry Render, Ralph M. Stair Jr., and Michael E. Hanna

8. "Statistics for Business and Economics" by Paul Newbold, William L. Carlson, and Betty Thorne

DATA MINING FOR BUSINESS INTELLIGENCE

Course Outcomes: On successful completion of the course the learner will be able to

CO	Course Outcome
1	Understand the principles and concepts of data mining.
2	Apply data preprocessing techniques to prepare data for analysis.
3	Utilize data mining algorithms to discover patterns and trends in business data.
4	Create effective data visualizations for business intelligence.
5	Apply data mining and visualization tools to real-world business problems.

Unit 1: Introduction to Data Mining and Business Intelligence:

Understanding data mining and its applications in business, Overview of business intelligence and decision support systems, Data-driven decision-making in business.

Unit 2: Data Preprocessing:

Data cleaning, transformation, and integration, Handling missing data and outliers, Data reduction and feature selection, Data Mining Techniques, Supervised learning, Classification and regression, Unsupervised learning: Clustering and association analysis, Introduction to ensemble methods.

Unit3: Data Mining Tools and Software:

Overview of data mining tools and software (e.g., Python, R, Weka), Selection of appropriate tools for different tasks, Data Visualization Principles, Principles of effective data visualization Types of charts and graphs for business data, Designing dashboards for business intelligence.

Unit 4: Data Visualization Tools:

Introduction to data visualization tools (e.g., Tableau, Power BI), Hands-on practice with data visualization software, Creating interactive visualizations, Business Data Mining and Visualization Projects, Forming project teams, Identifying real-world business problems, Project planning and proposal development, Project Implementation and Presentations, Data collection and preprocessing for project, Applying data mining and visualization techniques, Final project presentations and submissions.

Textbooks and Reference Materials:

"Data Mining: Concepts and Techniques" by Jiawei Han, Micheline Kamber, and Jian Pei -

"Data Visualization: A Successful Design Process" by Andy Kirk -

Online resources and tutorials for data mining and visualization tools such as Python, R, Tableau, and Power BI.

MBA/203/BA

MACHINE LEARNING APPLICATION FOR BUSINESS

Course Outcomes: On successful completion of the course the learner will be able to

CO	Course Outcome
1	Understand the core concepts and principles of machine learning.
2	Identify and evaluate business problems suitable for machine learning solutions.
3	Apply machine learning algorithms to analyse and interpret business data.
4	Create predictive models for business decision-making.
5	Effectively communicate results and recommendations derived from machine learning.

Unit 1: Introduction to Machine Learning:

What is machine learning, Types of machine learning (supervised, unsupervised, reinforcement learning, Machine learning in business decision-making, Data Preprocessing and Exploration, Data cleaning and preparation, Feature engineering, Data visualization for business insights

Unit 2: Supervised Learning:

Linear regression, Logistic regression, Decision trees and ensemble methods (random forests, gradient boosting), Unsupervised Learning, Clustering techniques (K-means, hierarchical clustering), Dimensionality reduction (PCA), Anomaly detection.

Unit3: Model Evaluation and Validation:

Model evaluation metrics (accuracy, precision, recall, F1-score), Cross-validation, Hyperparameter tuning, Introduction to Deep Learning, Neural networks and deep learning concepts, Feedforward neural networks, Deep learning libraries (e.g., TensorFlow, PyTorch).

Unit 4: Business Applications of Machine Learning:

Customer segmentation and targeting, Churn prediction, Recommender systems, Sentiment analysis, Machine Learning Projects, forming project teams, Identifying, and defining real-world business problems, Project implementation and presentations.

Textbooks and Reference Materials:

"Introduction to Machine Learning with Python" by Andreas C. Müller & Sarah Guido -

"Machine Learning: A Probabilistic Perspective" by Kevin P. Murphy -

Online tutorials, documentation, and resources related to Python, scikit-learn, and other machine learning libraries.

MBA/204/BA

DATA VISUALISATION

By the end of this course, students will be able to:

CO	Course Outcome
1	Understand the importance of data visualization in data-driven decision-making.
2	Create clear and effective data visualizations using various tools and techniques.
3	Apply design principles for visual communication.
4	Analyze and critique data visualizations for accuracy and clarity.
5	Develop a portfolio of data visualizations for diverse purposes.

Unit 1: - Introduction to Data Visualization - The role of data visualization in data analysis and communication, Types of data visualizations (e.g., charts, graphs, maps), Data visualization tools and software, Overview of popular data visualization tools and software (e.g., Tableau, Excel, Python libraries), Features and capabilities of selected tools, Exploration of design principles, including colour theory, typography, and layout, Importance of visual hierarchy and consistency in visualization design.

Unit 2:- Data Visualization Principles - Design principles for effective data visualization, Color theory and usage in data visualization, Human perception and cognition in visualization design, Tools and Techniques, Introduction to data visualization tools (e.g., Tableau, Python libraries)., Creating basic charts and graphs, Interactive and dynamic visualizations.

Unit 3: - **Exploratory Data Visualization -** Data exploration and visual data profiling, Univariate and multivariate data visualization, Visualizing patterns, outliers, and distributions, Storytelling with Data, Narrative structure in data storytelling, building data-driven narratives, using visualizations to support storytelling.

Unit 4: - Advanced Topics: Geographic and spatial data visualization (e.g., maps and geospatial analysis), Network and hierarchical data visualization, Visualizing time series and temporal data, Future Trends and Emerging Technologies, Exploration of future trends in data visualization, Discussion of emerging technologies (e.g., VR, AR) in data visualization.

Textbooks and Reference Materials:

"Storytelling with Data: A Data Visualization Guide for Business Professionals" by Cole Nussbaumer Knaflic: Focuses on the art of storytelling through data visualization.

"The Visual Display of Quantitative Information" by Edward R. Tufte: A classic book on data visualization principles.

"Data Points: Visualization That Means Something" by Nathan Yau: Explores the principles of meaningful data visualization.

Online resources and academic papers on data visualization best practices and case studies.

MBA/205/BA

WEB ANALYTICS

Course Objectives: By the end of this course, students will be able to:

CO	Course Outcome
1	Understand the importance of web analytics in digital marketing and e-commerce.
2	Utilize web analytics tools (e.g., Google Analytics) to collect and interpret data.
3	Analyze website traffic, user behavior, and conversion funnels.
4	Make data-driven recommendations to optimize website performance.
5	Apply web analytics to various business scenarios and industries.

Unit 1: - Introduction to Web Analytics: Overview of web analytics and its role in business, Introduction to web analytics tools (e.g., Google Analytics), Key metrics and KPIs for website performance,

Unit 2: - Web Analytics Tools and Setup: Setting up and configuring web analytics accounts, implementing tracking codes and goals, Understanding data collection and privacy considerations, Measuring Website Traffic, Analysing website traffic sources (organic, direct, referral, paid),

Unit 3: - Identifying user demographics and interests: Understanding user flow and navigation, Conversion Tracking, setting up and tracking conversions (e.g., sales, leads, sign-ups), Analysing conversion rates and funnels, Conversion rate optimization strategies.

Unit 4: - User Behaviour Analysis - Analyzing user behaviour through pageviews, sessions, and bounce rates, Heatmaps and session recordings for user interaction analysis, Identifying user engagement patterns, Advanced Web Analytics, Event tracking for user interactions (e.g., clicks, downloads), E-commerce tracking and product performance analysis, Multichannel attribution and marketing ROI.

Textbooks and Reference Materials:

"Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity" by Avinash Kaushik: A comprehensive guide to web analytics concepts and practices.

Online resources, blogs, and tutorials on web analytics and Google Analytics best practices.

Academic papers and articles on web analytics trends and case studies.

BA & TOOLS OF BA - R, PYTHON, EXCEL

Course Outcomes: On successful completion of the course the learner will be able to

CO	Course Outcome
1	Demonstrate a deep understanding of business analytics principles.
2	Proficiently use R, Python, and Excel for data analysis, visualization, and modelling.
3	Apply advanced statistical techniques to solve complex business problems.
4	Develop predictive models and make data-driven recommendations.
5	Collaborate effectively in teams on real-world analytics projects.

Unit 1: Introduction to Business Analytics:

Data analysis, statistical methods, and predictive modelling to make data-driven decisions and solve complex business problems, insights from data, optimize processes, improve decision-making, and achieve their goals, Business analytics fundamentals, data-driven strategy, and the use of data to gain a competitive advantage, leveraging analytics in business operations, Role of data in decision-making, Data collection and sources, Introduction to R, Python, and Excel for analytics, Data Preprocessing and Cleaning, Data cleaning and transformation, Handling missing data, Data quality assurance, Advanced data visualization principles.

Unit 2: Exploratory Data Analysis:

Advanced descriptive statistics, Data visualization with R and Python, Identifying patterns and trends, Storytelling with data, Advanced Statistical Analysis, Hypothesis testing and advanced techniques, Regression analysis with multiple predictors, ANOVA and advanced statistical tests, Practical applications of advanced statistics, Predictive Modelling and Machine Learning, Introduction to predictive modelling, Advanced regression techniques, Classification and clustering with machine learning, Model evaluation and tuning.

Unit 3: Time Series Analysis:

Time series data and analysis, Forecasting techniques and methods, Applications in business and finance, Time series modelling with R and Python, Big Data Analytics, Introduction to big data and its challenges, Hadoop and Spark for big data processing, Big data analytics with R and Python, Real-world big data applications, R and Python libraries and tools for big data analytics, example, R packages like 'rhipe' and Python has 'PySpark' for big data analysis, Using R and Python for big data analytics in data scientists to leverage for analyzing large datasets.

Unit 4: Final Project and Presentations:

Suggested Readings:

"Data Science for Business" by Foster Provost and Tom Fawcett:

"Python for Data Analysis" by Wes McKinney:

"R for Data Science" by Hadley Wickham and Garrett Grolemund: This book is a valuable resource for learning R, focusing on data analysis and visualization.

"Excel 2019 Bible" by Michael Alexander and Richard Kusleika:

"Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die" by Eric Siegel

MBA/207/BA

Business Communication

Course Outcomes: On successful completion of the course the learner will be able to

CO	COURSE OUTCOMES
1	Demonstrate students to verbal and non-verbal communication ability to solve workplace communication issues.
2	Create and deliver effective business presentations, using appropriate tools.
3	Draft effective business correspondence with brevity and clarity.
4	Develop the students for job market.

Unit-1

Significance of Verbal Communication- Need of Communication Skills for Managers, Channels ,forms and dimensions of communication, Non-Verbal communication, Principles of non-verbal communication - through clothes and body language, Barriers of communication and how to overcome barriers.

Unit-2

Presentation skills: Principles of Effective Presentations, Planning, Structure and Delivery, Presentation Style, Tools used to make Presentation impactful, Dynamics of group presentation and individual presentation. Just-a-Minute Presentation, Listening Skills, Negotiation Skill.

Unit-3

Do's and Don'ts of Business Writing: Business correspondence, Report Writing, Email Etiquette, Resume Writing. Meetings - Meeting and Boardroom Protocol - Guidelines for planning a meeting, Case Analysis.

Unit-4:

Interview Techniques- Essentials of placement interviews, web /video conferencing, telemeeting, Preparation for Interview, Group Discussions-Do's and Don'ts of GD, mock GD's on 2 topics.

Suggested Readings:

1) Business Communication for Managers, Payal Mehra, Pearson Education India; Second edition.
2) Business Communication, Asha Kaul, Prentice Hall India Learning Private Limited
3) Business Communication Today, Bovee C L et. al., Pearson Education
4) Business Communication, P.D. Chaturvedi, Pearson Education.
5) Business Communication, T N Chhabra, Bhanu Ranjan, Sun India
6) Verbal and Non-Verbal Reasoning, Prakash, P, Macmillan India Ltd., New Delhi
7) Objective English, Thorpe, E, and Thorpe, S, Pearson Education, New Delhi

Entrepreneurship

Course Outcomes: On successful completion of the course the learner will be able to

CO	COURSE OUTCOMES
1	Explore entrepreneurial path and acquaint them with the essential knowledge of starting new ventures.
2	Students will learn tools and techniques for generating, testing and developing innovative startup ideas into successful enterprise.

Unit I: Foundations of Entrepreneurship Development

Concept and Need of Entrepreneurship Development, Concepts of Entrepreneur, Intrapreneur/Corporate Entrepreneur comparative study, Entrepreneurship Career opportunities, Entrepreneurship as a style of management, The Entrepreneur's Role, Task and Personality, Entrepreneurship in emerging economies.

Unit II: Idea Generation

Definition of Innovation, Invention, Creativity, Identification of profitable pain points, Idea evaluation & validation methods, Opportunity recognition and entry strategies: New product, Franchising, Partial Momentum, Sponsorship and Acquisition, The Strategic Window of Opportunity: Scanning, Positioning and Analyzing.

Unit III: Business Planning Process

Types of Entrepreneurial Venture and the Entrepreneurial Organization, The business plan as an entrepreneurial tool, elements of Business Plan, Market Analysis, Development of product/idea, Critical risk contingencies of the proposal and its management Scheduling, Role of the following Govt. Agencies in the Entrepreneurship Development

Unit IV: Project Management and Role of Government

Technical, Financial, Marketing Personnel and Management feasibility Reports,

Project financing: Debt, Venture Capital Funding, Angle Capitalist, Role of Central Government and State Government in promoting Entrepreneurship with various incentives, subsidies, grants etc.

Suggested Readings:

1. Dynamics of Entrepreneurship Development – Vasant Desai.
2. Entrepreneurship: New Venture Creation – David H. Holt
3. Entrepreneurship Development New Venture Creation – Satish Taneja, S.L.Gupta
4. Project management – K. Nagarajan.

5. Entrepreneurship: Strategies and Resources – Marc J. Dollinger

6. Innovation and Entrepreneurship – Peter F. Drucker

7. New Vistas of Entrepreneurship: Challenges & Opportunities – A. Sahay, M.S.Chhikara

8. Entrepreneurship and Small Business Management – Siropolis

9. The Entrepreneurial Connection - GurmeetNaroola

10. Corporate Entrepreneurship – Vijay Sathe

11. Make The Move: Demystifying Entrepreneurship – Ishan Gupta, RajatKhare