

**PRESTIGE**  
**INSTITUTE OF MANAGEMENT, GWALIOR**  
UGC NAAC ACCREDITED 'A' GRADE INSTITUTE  
UGC APPROVED AUTONOMOUS INSTITUTE

**MASTER OF BUSINESS  
ADMINISTRATION (BUSINESS  
ANALYTICS)**

**SYLLABUS  
AND  
EXAMINATION SCHEME  
2020– 2022**

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**MBA I AND II SEMESTER: 2019-2020**

**MASTER OF BUSINESS ADMINISTRATION (BUSINESS ANALYTICS) (FULL-TIME)**

**(FOUR SEMESTER PROGRAMME)**

**CHOICE BASED CREDIT SYSTEM**

**INTERNAL ASSESSMENT = IA; EXTERNAL ASSESSMENT = EA**

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# COURSE STRUCTURE AND SCHEME OF EXAMINATION

## MBA –BUSINESS ANALYTICS

### SEMESTER - I

S. No	Course code	Course Type	Course Name	L	T	P	Hour/ Week	Credit
		Core/AE/SD					L+T+P=Total	
1	MBA-B A 101	Core	Management Concepts & OB	3	1	0	3+1+0=4	4
2	MBA-BA 102	Core	Managerial Economics	3	1	0	3+1+0=4	4
3	MBA-BA 103	Core	Financial Reporting and Analysis	3	1	0	3+1+0=4	4
4	MBA-BA 104	Core	Introduction to Business Analytics and Data Science	2	0	4	2+0+2=4	4
5	MBA-BA 105	Core	Business Environment	3	1	0	3+1+0=4	4
6	MBA-BA 106	Core	Business Statistics	3	1	0	3+1+0=4	4
7	MBA-BA 107	SD	Industry Readiness (Personality Development)	0	1	2	0+1+1=2	2
8	MBA-BA 108	SD	Introduction to Python for Business Analytics	0	0	4	0+0+2=2	2
9	MBA-BA 109	SD	Comprehensive Viva	0	0	4	0+0+2=2	2
TOTAL				17	6	14		30

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**SEMESTER II**

S. No	Course code	Course Type	Course Name	L	T	P	Hour/Week	Credit
		Core/AE/SD					L+T+P=Total	
1	MBA-B A 201	Core	Marketing Management	3	1	0	3+1+0=4	4
2	MBA-BA 202	Core	Operation & Supply Chain Management	3	1	0	3+1+0=4	4
3	MBA-BA 203	Core	Corporate Finance	3	1	0	3+1+0=4	4
4	MBA-BA 204	Core	Machine Learning & Applications	3	1	0	3+1+0=4	4
5	MBA-BA 205	Core	Human Resource Management	3	1	0	3+1+0=4	4
6	MBA-BA 206	Core	Decision Science	3	1	0	3+1+0=4	4
7	MBA-BA 207	SD	Machine Learning using R (Practical)	0	0	4	0+0+2=2	2
8	MBA-BA 208	SD	Database and SQL Lab (Practical)	0	0	4	0+0+2=2	2
9	MBA-BA 209	SD	Learning Management concepts through Movies	0	0	4	0+0+2=2	2
TOTAL				18	6	12		30

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### SEMESTER III

S. No	Course code	Course Type	Course Name	L	T	P	Hour/ Week	Credit
		Core /AE/ SD					L+T+P=Total	
1	MBA-B A 301	Core	Strategic Management	3	1	0	3+1+0=4	4
2	MBA-BA 302	Core	Advertising & Sales Management	3	1	0	3+1+0=4	4
3	MBA-BA 303	Core	Investment Analysis & Portfolio Management	3	1	0	3+1+0=4	4
4	MBA-BA 304	Core	Business Forecasting & Econometrics	3	1	0	3+1+0=4	4
5	MBA-BA 305	Core	Multivariate Data Analysis	3	1	0	3+1+0=4	4
6	MBA-BA 306	Core	Big Data Analytics	3	1	0	3+1+0=4	4
7	MBA-BA 307	SD	Practical Lab on Big Data Analytics	0	0	4	0+0+2=2	2
8	MBA-BA 308	SD	Data Visualization And Descriptive Analytics Using R	0	0	4	0+0+2=2	2
9	MBA-BA 309	SD	Summer Training Report & Presentation	0	0	4	0+0+2=2	2
TOTAL				18	6	12		30

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*Shruti*



**SEMESTER IV**

S. No	Course code	Course Type	Course Name	L	T	P	Hour/ Week	Credit
		Core/AE/SD					L+T+P=Total	
1	MBA-B A 401	Core	Entrepreneurship and Small Business Development	3	1	0	3+1+0=4	4
2	MBA-BA 402	Core	Social Media & Web Analytics	3	1	0	3+1+0=4	4
3	MBA-BA 403	Core	Marketing Analytics	3	1	0	3+1+0=4	4
4	MBA-BA 404	Core	Financial Analytics	3	1	0	3+1+0=4	4
5	MBA-BA 405	Core	HR Analytics	3	1	0	3+1+0=4	4
6	MBA-BA 406	Core	Cyber Security & Law	3	1	0	3+1+0=4	4
7	MBA-BA 407	SD	Dissertation Report & Viva Voce	0	5	6	0+5+3=8	8
			<b>TOTAL</b>	<b>18</b>	<b>11</b>	<b>6</b>		<b>32</b>

The Scheme of Assessment (including Marks of Sessionals, minimum Pass Marks, Division of Examination) & Scheme of Promotion to next Semester will be Governed by Ordinance 168 A of Jiwaji University Gwalior (Based on 14 A of Devi Ahilya Vishwavidyalaya; As Approved by the Coordination Committee in its meeting held on 25/10/2017 and Adopted by Devi Ahilya Vishwavidyalaya in its EC meeting held on 04/12/2017)

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**MBA-BA I SEMESTER  
MANAGEMENT CONCEPTS & OB  
COURSE CODE: MBA-BA -101**

**MANAGEMENT CONCEPTS & ORGANISATIONAL BEHAVIOUR**

**Credits: 04**

**Course Objectives**

The course comprehends the functions of management and individual, group and organizational behavior; models and metrics to measure the behaviors; and associated behavioral & organizational changes.

**Course Outcomes:** Upon completion of this course, the student will be able:

CO1: Integrate management principles into management practices.

CO2: Determine the nature of organization structure.

CO3: Understand and apply control methods.

CO4: Understand models of organizational behavior, perception, organizational change, group dynamism and organizational conflict.

CO5: Measure Employees' attitude and Personality Types, motivation factors, leadership styles, and stress.

**UNIT I**

**Management:** Concept; Nature, Importance; Management: Art and Science; Management as a Profession; Management Skills, Levels of Management; Approaches to management

**Planning:** Concept & Types of Plans; Planning Process; Introduction to PERT-CPM

**Decision Making:** The Decision Making Process; Managers Making Decision: Rationality, Bounded Rationality, Types of Decision Making; Measurement of Biases & Errors.

**UNIT II**

**Organizing:** Concept; Organizational design & its elements; Organization Structure & types; Span of Control.

**Staffing:** Concept & Process

**Directing:** Concept; Principles & Techniques of Directing.

**UNIT III**

**Controlling:** Concept; Process; Types of Control: Feed forward/Concurrent/Feedback Controls; Financial Control: Ratio Analysis; Informational Control; Balance Scorecard

**Introduction to Organizational Behavior:** Nature; Importance; Disciplines Contributing to OB; Models of OB. **Perception and Attribution Theory:** Concept; Nature; Process; Perceptual Errors. **Learning:** Concept and Theories of Learning.

**UNIT IV**

**Attitude:** Concept; Process; Importance; Techniques of Attitude Measurement;

**Personality:** Concept; Nature; Types and Theories of Personality; Big Five Personality Model.

**Motivation:** Concept; Theories of Motivation: Need Hierarchy Theory, Two Factor theory; Mc Clelland's Theory, Expectancy theory, Self Determination Theory, Equity theory; Organizational Justice

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**Groups & Group Dynamics:** Meaning; Classification; Stages of Group Development; Teams vs Groups; Dysfunctional Groups

#### UNIT V

**Leadership:** Style and Theories of Leadership: Trait; Behavioral and Situational Theories.

**Organisational Power and Politics:** Understanding dynamics of Power, Influence and Organizational Politics. Intrapersonal, Interpersonal, Intergroup and Institutional power

**Conflict:** Concept; Classification; Functional & Dysfunctional Conflict; Resolution of Conflict; Grievance Handling

**Organizational Change:** Nature and forces of change, Resistance to change and Kurt Lewin theory of change; **Work stress:** sources and consequences of stress and its management.

#### Suggested Readings:

- Gilbert, D.R. Stoner, F. & Freeman, R.E. (2001). Management. Pearson Education.
- Wehrich, H. & Koontz, H. (2005). Management: A Global Perspective. Tata McGraw Hill.
- Robbins, S. P. & Coulter, M. (2012). Management. Pearson.
- Ouchi, W. G. & Dowling, J. B. (1974). Defining the Span of Control. Administrative Science Quarterly. 357-365.
- Watkins, K. E. & Marsick, V. J. (2003). Demonstrating the Value of an Organization's Learning Culture: The Dimensions of the Learning Organization Questionnaire. Advances in Developing Human Resources. 132-151.
- Fred, L. (2011). *Organizations Behaviour* (12th edition ed.). New York; Mc Graw Hill.
- Robbins, Judge & Vohra (2018). *Organizational Behavior* (18<sup>th</sup> edition). New Delhi: Pearson Education.
- K; A. (2016). *Organizational Behaviour* (12th edition ed.). New Delhi: Himalaya Publishing House.
- Stephen; P. (2013). *Organizational Behaviour* (15th edition ed.). New Delhi: Pearson Education.
- Udai; P. (2016). *Understanding Organizational Behaviour* (4th edition ed.). New Delhi: Oxford Higher Education.

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**MBA-BA I SEMESTER  
MANAGERIAL ECONOMICS  
PAPER CODE: MBA-BA –102**

**MANAGERIAL ECONOMICS**

**Credits: 04**

**Course Objective:** The basic aim of this course is to impart knowledge of basic statistical tools & techniques with emphasis on their application in Business decision process and Management. Statistical analysis informs the judgment of the ultimate decision-maker—rather than replaces it—some key conceptual underpinnings of statistical analysis will be covered to insure the understandability of its proper usage.

**Course Outcomes:**

After completion of this course the student will be

**CO1:** understanding theories, concepts, processes and frameworks of demand and supply, market structures, production cost and marketing strategies and demonstrate national income; identify its components, demonstrate circular flow of income and illustrate inflation and its types

**CO2:** analyzing real world business problems with reference to economic environment, conditions, and indicators and various income identities with government

**CO3:** applying time series analysis, forecasting technique and updating predicted probabilities to analyze risk evaluation, encourage critical thinking and analytical skills which help in taking complex economic decision

**CO4:** evaluating and measuring trend setting factors for projection of sales and demand curves; elasticity's of demand and supply and measuring control on inflation

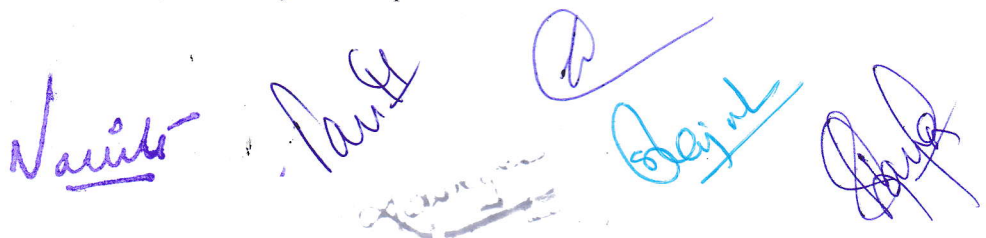
**Unit 1:**

**Introduction** to Managerial Economics: Introduction to Economics, Economic Terminology, What is managerial economics? Problem in Decision making, Principles for decision making, Sensitivity Analysis

**Theory of the firm and Demand Analysis – I:** Theory of the firm: A simple model, Basics of demand, determinants of demand, demand forecasting, Analysis using Excel- regression analysis, time series model. Elasticity, Price Elasticity of Demand, Income Elasticity of Demand, Cross elasticity of demand; Supply models and basic terminologies.

**Unit 2: Production and Cost Analysis**

**Production Analysis:** Basic production concepts, Production with one variable input and production in the long run, Measuring production function, Production decisions. Cost of Production: Relevant costs, The cost of production, TR, AR and MR, Cost analysis and optimal decision



### Unit 3: Market Structure and Competitive Environment

Market Structures and Competition: Perfect Competition, Monopoly and its setting, the perfect competition versus pure monopoly, Monopoly and monopolistic competition, Oligopoly model, Comparison of all market structures.

### Unit 4: Decision Making Applications

Uncertainty, Probability, and expected value, Decision tree, The value of information, Bayes theorem, Asymmetric information, A Principal-Agent model, Negotiation strategies

### Unit 5:

National Income: Concepts; Measuring the Value of Economic Activity through Gross Domestic Product, GDP Deflator, Real GDP vs. Nominal GDP; Other Measures of Income; Inflation: Types; Causes and Measurement; Business Cycle; Savings, the balance of payments, and the money supply; Exchange rate

### Text Books:

- By Paul G. Keat, Philip K.Y. Young, Stephen E. Erfle and Sreejata Banerjee "Managerial Economics: Economics tools for today's decision makers" Pearson Paperback, 7th edition, 2018

### References:

- Samuelson & Marks, "Managerial Economics: International Students Version" Wiley, 6<sup>th</sup> edition, 2014
- Truett & Truett, "Managerial Economics", John Wiley & Sons, 8th edition, Singapore, 2004
- Samuelson & Nordhus, "Economics", Tata McGraw-Hill Edition, 16th edition, New Delhi, 1998
- Petersen, Lewis and Jain, "Managerial Economics", Pearson Education, New Delhi, 2006.
- Hirschey, "Economics for Managers", Thompson, New Delhi, 2006
- Suma Damodaran, "Managerial Economics", Oxford University Press, 2006

*Naresh* *Paul* *R*  
*Banerjee* *Sandeep* *Raj*



**MBA-BA I SEMESTER  
FINANCIAL REPORTING AND ANALYSIS  
PAPER CODE: MBA-BA -103**

**FINANCIAL REPORTING AND ANALYSIS**

**Course Outcomes:**

**Credits: 04**

The objective of this course is to help student to understand the financial reporting and analysis and enhance the financial decision making skills.

**Course Outcomes:** On completion of this course, student will able to understand the:

**CO 1.** Accounting terminology and accounting principles.

**CO 2.** Appropriate tools of financial analysis.

**CO 4.** Legal Requirements for financial statements under Legal Requirements under Companies Amendment Act 2013.

**CO4.** Financial Reporting of different entities.

**CO 5.** Financial decision making on the basis of analysis.

**Unit 1: Financial Analysis and reporting: an Introduction**

**Financial Reporting:** An Overview- Concept of financial reporting, financial reporting and financial statements, objectives of financial reporting, uses of financial information, benefits of financial reporting, Qualitative characteristics of financial reporting information.

**Conceptual Framework-** Concept, need and benefits of conceptual framework, ASB's framework for preparation and presentation of financial statements, IASB's (earlier IASC) conceptual framework, USA's FASB's conceptual framework.

**Unit 2: Understanding Financial Statements**

**Understanding Financial Statement;** Nature, Legal Requirements under Companies Act 2013, Preparation of Statement of Profit & Loss Account and Balance Sheet; Cash Flow Statement (IND AS 3)- Classification of Cash Inflows and Outflows, presentation of cash flow statement,

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preparation of cash flow statement. Cash Flow Statement (IND AS 7); Major changes in AS 7 vis-a-vis notifies AS 3.

### **Unit 3: Financial reporting**

Financial reporting – Concepts – users, Objectives of financial reporting – Qualitative characteristics of information in financial reporting – basic problems of disclosure – Role of SEBI in IFRS – Statutory disclosures in IFRS – Corporate reporting practices in India Challenges in financial reporting

### **Unit 4: Elements of Financial Statements**

Assets- Meaning and characteristics of Assets, Assets valuation; objectives/concepts, types of assets, Introduction to IND AS 10 (Property, Plant and Equipment), Provisions and features of IND AS 16; IND AS 19- Provisions of Lease. Liabilities- meaning of Liabilities, types of liabilities, features of AS 22 about accounting for taxes on Income.

Revenues, Expenses, Gains and Losses- Concept of revenues and expenses, revenue recognition criteria, concept of gains and losses, difference between revenue and gains.


### **Unit 5: Analysis and Interpretation of Financial Statements**

Financial Statement Analysis: Meaning and Objectives, Types of financial Analysis, Techniques of Financial Statement Analysis, Financial Statement Valuation by types of Industry.

Ratio Analysis- meaning, advantages, practical problems on different classification of ratios. Use of ratios and financial Statements for industry wise comparison. Analysis of financial reporting by corporate sector.

### **Reference Readings:**

- Gibson, C. H. (2012). Financial Reporting and Analysis. United States: Cengage Learning.
- Gibson, C. (2008). Financial Reporting and Analysis: Using Financial Accounting Information. United States: Cengage Learning.
- Financial Reporting and Disclosure Practices. (2000). India: Deep & Deep Publications.
- Corporate financial reporting and analysis, second edition. (2019). (n.p.): phi learning Pvt. Ltd.



**MBA-BA I SEMESTER**  
**INTRODUCTION TO BUSINESS ANALYTICS AND DATA SCIENCE**  
**PAPER CODE: MBA-BA -104**

**INTRODUCTION TO BUSINESS ANALYTICS AND DATA SCIENCE**

**Credits: 04**

**Course Objectives:**

1. Understanding the Role of Business Analyst and Data Science in business.
2. Understanding the basic concept of data management and data mining techniques
3. To understand the basic concept of machine learning
4. To understand the application of business analysis.
5. Understanding the basic concept of Data Science Project Life Cycle.

**Course Outcomes:** Upon the successful completion of this course, the student will be able to:

- CO1. Understand the basics of business analytics, types, data science and career opportunities.
- CO2. Determine the process of data collection, preprocessing, and handling Data science project life cycle.
- CO3. Understand the data mining concept and its techniques.
- CO4. Understand and Analyzing machine learning concept.
- CO5. Explore the application of business analytics in different domain.

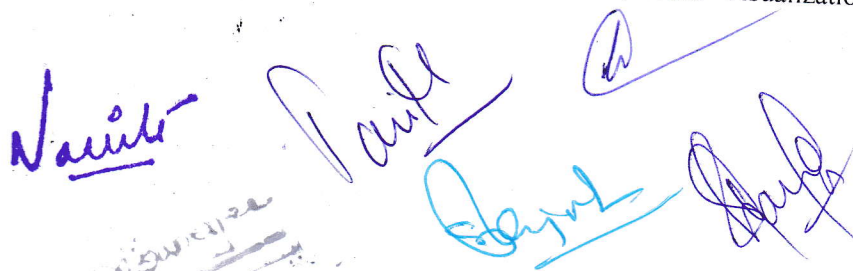
**Unit 1:**

**Introduction:** What is business analytics? Historical Overview of data analysis, Data Scientist vs. Data Engineer vs. Business Analyst, Career in Business Analytics, what is data science, Why Data Science, Applications for data science, Data Scientists Roles and Responsibility

**Unit 2:**

**Data Science Project Life Cycle:** Business Requirement, Data Acquisition, Data Preparation, Hypothesis and Modeling, Evaluation and Interpretation, Deployment, Operations, Optimization.

**Data:** Data Collection, Data Management, Big Data Management, Organization/sources of data, Importance of data quality, Dealing with missing or incomplete data, Data Visualization, Data Classification



**Unit 3:**

Introduction to Data Mining, The origins of Data Mining, Data Mining Tasks, OLAP and Multidimensional data analysis, Basic concept of Association Analysis and Cluster Analysis.

**Unit 4:**

Introduction to Machine Learning: History and Evolution, AI Evolution, Statistics Vs Data Mining Vs, Data Analytics Vs, Data Science, Supervised Learning, Unsupervised Learning, Reinforcement Learning, Frameworks for building Machine Learning Systems.

**Unit 5:**

Application of Business Analysis: Retail Analytics, Marketing Analytics, Financial Analytics, Healthcare Analytics, Supply Chain Analytics.

**Text Books:**

1. Essentials of Business Analytics: An Introduction to the methodology and its application, Bhimasankaram Pochiraju, Sridhar Seshadri, Springer
2. Introduction to Machine Learning with Python: A Guide for Data Scientists 1st Edition, by Andreas C. Müller, Sarah Guido, O'Reilly
3. Introduction to Data Science, Laura Igual Santi Seguí, Springer

**Reference Book:**

1. Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson Education India
2. An Introduction to Business Analytics, GerKoole, Lulu.com, 2019

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**MBA\_BA I SEMESTER  
BUSINESS ENVIRONMENT  
PAPER CODE: MBA\_BA -105**

**BUSINESS ENVIRONMENT**

**Course Objectives:**

**Credits: 04**

1. The basic objective of the course is to develop understanding and provide knowledge about business environment to the management students.
2. To promote basic understanding on the concepts of Business Environment and international business environment.
3. Understanding of the environmental factors influencing business organizations.
4. Develop understanding of the policy and planning framework of economic system.

**Course Outcomes:** Upon the successful completion of this course, the student will be able to:

CO 1. Understand the concept, factors of the business environment and interaction between different environments.

CO 2. Evaluate the global environment, various laws impacting the business.

CO 3. Understand various government policies, institutions and its role in business.

CO 4. Understand the concept, role and process of EXIM policy, LPG, FDI, WTO, Global environment.

CO 5. Practical learning of SWOT, Stock Exchange and analysis of companies.

**Unit I**

The Concept of Business Environment, Significance and Nature, Dynamics of Business Environment – Technological, Political, Social and Cultural Environment. Environment Scanning: Meaning, Nature and Scope, Process of Environmental Scanning, Interaction between Internal and External Environments, Social Responsibility of Business Enterprises.

**Unit II**

An introduction to MRTP, Competition Act, FEMA, SICA (Special Provisions) 1985, Consumer Protection Act, The Changing Dimensions of these Laws and their Impact on Business.

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### Unit III

Philosophy and Strategy of Planning in India; Industrial Policy in Recent Years; Policy with regard to Small Scale Industries; Monetary Policy and Fiscal Policy, Features and components of Indian Financial system recent developments- Stock Exchanges, Investor Protection and Role of SEBI and RBI, Banking Structure Reforms:-Narasimhan committee recommendations, BASEL norms; Financial Sector Reforms.

### Unit IV

Consumerism, New Economic Policy- Globalization, Liberalization and Privatization; EXIM policy; FDI Policy; Global environment, Multinational Corporation (MNCs) and Transnational Corporations (TNCs); Understanding of WTO, trading blocks, Dumping and Anti-dumping measures; Global Competitiveness.

### Unit V

#### Practical learning exercises:

- SWOT analysis practical.
- Understanding Stock Exchange Data.
- Comparative Analysis of companies.

#### Suggested Readings:

- Cherunilam, F. (2010). Business Environment. Himalaya Publishing House.
- Misra, S. K., & Puri, V. K. (2004). Economic Environment of Business. Himalaya Publishing House.
- Shaikh, S. (2010). Business Environment, 2/E. Pearson Education India.
- Paul, J. (2010). Business Environment. Tata McGraw-Hill Education.

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**MBA-BA I SEMESTER  
BUSINESS STATISTICS  
PAPER CODE: MBA-BA -106**

**BUSINESS STATISTICS**

**Credits: 04**

**Course Objective:** This course aims to equip students coming from diverse streams to handle data meaningfully and to ensure that statistics is interpreted correctly.

**Course Outcomes:** Upon successful completion of this course students will be able to

- CO-1. Understand the basic concept of descriptive and inferential statistics and produce appropriate graphical and numerical descriptive statistics for different types of data.
- CO-2. Apply probability rules and concepts relating to discrete and continuous random variables.
- CO-3. Demonstrate and understand normality and its distribution.
- CO-4. Use regression models to analyses the underlying relationships between the variables.
- CO-5. Conduct and interpret a variety of hypothesis tests to aid decision making in a business context.
- CO-6. Use statistical package frequently used by practitioners to analyses the data.

**Unit I**

**Basic concept of Statistics:** Importance of Statistics, data collection methods: Primary and secondary data, data classification, data tabulation. **Presentation of Data:** Bar Diagrams, Histograms, Frequency Polygon, and Frequency Distribution Curves.

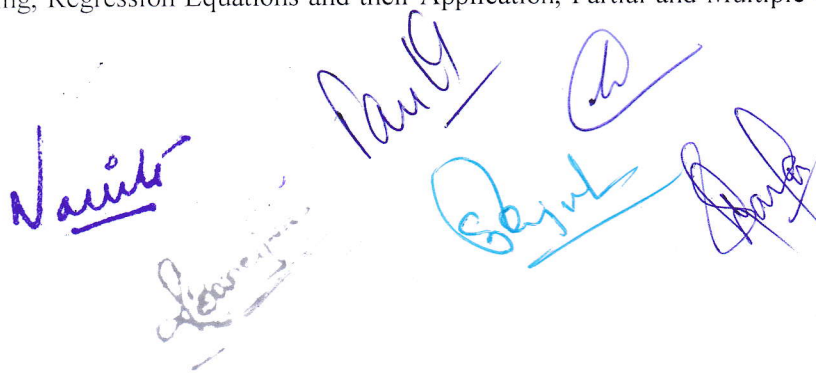
**Unit II**

**Measures of Central Tendency and Dispersion:** Mean, Median and Mode and their implications, Range, Mean Deviation, Standard Deviation, Coefficient of variation (C.V.), Skewness, Kurtosis.

**Unit III**

**Correlation:** Meaning and types of Correlation, Karl Pearson and Spearman Rank Correlation.

**Regression:** Meaning, Regression Equations and their Application, Partial and Multiple Correlation and Regression.





## Unit IV

**Probability:** Concept of Probability and its Uses in Business Decision, Addition and Multiplication Theorems, Bayes Theorem and its applications. **Probability Theoretical Distribution:** Concept and Application of Binomial, Poisson and Normal Distribution.

## Unit V

**Test of Significance:** Sampling Distribution, Formulation of hypothesis, Application of Z- test, t- test, F- test, Chi-square test, Techniques of association of attributes. Introduction to Business Analytics, Use of spread sheet to analyze data: descriptive and predictive analytics.

## Suggested Readings:

1. Herkenhoff, L., & Fogli, J. (2013). *Applied Statistics for Business and Management using Microsoft Excel*. New York, NY: Springer New York. <https://doi.org/10.1007/978-1-4-614-8423-3>
2. Keller, G. (2015). *Statistics for Management and Economics, Abbreviated*. Cengage Learning
3. Levine, D. M., Berenson, M. L., Stephan, D., & Lysell, D. (1999). *Statistics for managers using Microsoft Excel* (Vol. 660). Prentice Hall Upper Saddle River, NJ.
4. Beri, G.C. (2009). *Business Statistics*. McGraw Hill Education
5. Black, Ken. *Applied Business Statistics*. Wiley Indi

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**MBA-BA I SEMESTER  
INDUSTRY READINESS  
PAPER CODE: MBA-BA -107**

**INDUSTRY READINESS**

**Course Objectives:**

**Credits: 02**

The student is able to develop the required skills to get placement through personality development and communication.

**Course Outcomes:**

- CO 1. Students will learn fine prints of business communication.
- CO 2. Students will be able to participate effectively into group discussion.
- CO 3. Students will learn how to face interviews through mock sessions.
- CO 4. Students will learn presentation skills.
- CO 5. Students will be able to write business letters and official communication.
- CO 6. Students will be able to effectively use social media for communication.

**Interviews : Online and Off Line**

**Coverage for Online Interviews:** Modes of Conducting Online Interviews (Interview Via E-Applications Like Zoom, Cisco Webex, Google Meet, Google Duo, Google Hangout etc., Telephonic Interviews ), Pre-Requisites for appearing for online interviews, Key pints to remember pre, During and Post Interview, Do's and Don'ts of Online Interviews, Evaluation parameters of Online Interview.

**Coverage for Offline Interviews:** Pre-Requisites for appearing in Offline interviews, Key pints to remember pre, During and Post Interview, Do's and Don'ts of physical Interviews, Evaluation parameters of Offline Interviews Interview.

**Areas to be Covered for Both:** Appearance, Content, SWOT of candidate as well as organization, Gestures, Postures, Accent, how to defend your resume, Fitment for the Job role.

**Group Discussion: Online and Offline**

**Communication in Organization**

**Coverage:** Basics of Email Writing to Senior, Colleagues and Junior, Communication via Telephonic call at all level of organization, Selection of words while texting your seniors, Managers, colleagues and Juniors, What need not to be there in your communication via any mode to your Seniors, managers, Colleagues and Juniors, Sample of Professional Email, Text messages, What's App messages, Do's and Don't's while you are communicating at different hierarchical level in your organization, Importance and need of Acknowledgement to communication which you receives at different level in organization, How to greet your seniors, Colleagues and Juniors face to face or via any virtual Mode, Few sample sentences, idioms, Phrases, Salutations for making communication effective

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**MBA-BA I SEMESTER**  
**INTRODUCTION TO PYTHON FOR BUSINESS ANALYTICS**  
**PAPER CODE: MBA-BA -108**

**INTRODUCTION TO PYTHON FOR BUSINESS ANALYTICS (PRACTICAL)**

**Credits: 02**

**Course Objectives:** The course objective of this course is to predict the result of a given piece of Python code and Write Python code to read, write, filter, merge, summarize, and graph a given dataset. Analyze data from a variety of industries and uncover business insights and communicate effectively the purpose, methodology, and result of an analysis involving Python to a non-technical business audience.

**Course Outcomes:** On completion of this course student will be able to learn

- CO 1. Understand the basic concept of programming used in Python.
- CO 2. Apply variables, statements, strings and files used in Python programming.
- CO 3. Demonstrate the rules and logic applied on data with Python.
- CO 4. Use inbuilt models available in Python programming to analyse data
- CO 5. Interpret a variety of alternatives to tests to aid decision making in a business context by using models in Python programming.

**Course**

1. Programming Logic: Introduction to Programming, Python Types, Variables, Statements and Conditional Execution, Functions, Iterations
2. Data Structures: Strings and Files, Lists and Dictionaries, Tuples and Set, Pandas DataFrame Basics, Pandas Data Structure, Reading and Writing CSV files
3. Basic Analysis: Introduction to Plotting, Data Assembly, Missing Data
4. Data Munging: Tidy Data and Data Types, Text Data, Pandas Apply and Groupby Operations
5. Case studies

**Text Books:**

1. "Python for Everybody" by Charles R. Severance
2. "Pandas for Everyone" by Daniel Y. Chen
3. Learning Python, 5th Edition by Mark Lutz, O'reilly

**Reference Books:**

- Python Programming for the Absolute Beginner By Michael Dawson, 2nd Edition, Premier Press, 2003
- Image Processing and Pattern Recognition, Volume 5, 1st Edition, By Cornelius Leondes, Academic Press

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**MBA\_BA II SEMESTER  
MARKETING MANAGEMENT  
PAPER CODE: MBA\_BA -201**

**MARKETING MANAGEMENT**

**Credits: 04**

**Course Objective:** The overall objectives are to understand consumers and to identify profitable Marketing strategies. Understand the Marketing context: Market, performance metrics, and role of strategic planning in marketing. Describe marketing strategies of segmenting, targeting, positioning, and differentiation. Know how to use marketing functions of product, pricing, distribution, and marketing communication for a firm's Marketing strategy. Evaluate several customer relationship management (CRM) strategies using analytics.

**Course Outcomes:**

On completion of the course students will

CO1: Memorize the concepts related to marketing management.

CO2: Explain the concepts of the marketing mix.

CO3: Apply various marketing mix tools.

CO4: Examine the effectiveness of various strategies used for marketing.

CO5: Evaluate the corporate and unit level marketing plan.

CO6: Synthesize the integrated and comprehensive marketing plan.

**UNIT I INTRODUCTION TO MARKETING**

Definition, Nature, Elements and Scope of Marketing; Marketing concepts; Marketing philosophies. Customer value- customer Life Time value, Practical problems in measuring Customer Life Time value; Holistic Marketing. Concept of marketing orientation and consumer orientation; Concept of marketing environment- Micro and Macro.

**UNIT II MARKETING STRATEGY**

Market Segmentation- Purpose and Methods of Marketing Segmentation, Levels of segmentation, Patterns, Bases of Segmentation. Concept of Targeting: Selection of Target Markets, Strategies, Concept of positioning: Types, major errors, Product Differentiations: Variables in Differentiation.

**UNIT III Marketing Mix**

Product Planning - Product Mix Decisions, Product Line, New Product Development, Product Life Cycle; Branding: Brands and Brand strategies; Pricing: Objectives, Methods, strategies; Channel of Distribution(COD): Levels, role, COD Strategies. Role in Value Chain -Inbound and outbound logistics;

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Promotional Mix: Sales Promotion, Advertisement, personal Selling and Sales Management, Public Relation, Publicity.

#### UNIT IV E-MARKETING RESEARCH

Data Drive Strategy – Marketing Knowledge Management; Social Media Marketing: defining goals and measurement plans, Categories of Social Media, evaluating ROI; improving post performance; Technology Enabled Approaches in Marketing, Real-Space Approaches, Marketing Databases and Data Warehouses; Data Analysis and Distribution,

#### UNIT V RETAIL ANALYTICS

Customer Analytics Overview, Quantifying Customer Value; The digital evolution of retail marketing, Digital natives, Search Engine Optimization: content marketing, search analytics; Website Analytics: common metrics, dimensions, and KPIs; Social Listening: share of voice, sentiment analysis, and other approaches focusing user-generated content to inform marketing research and monitor brand image; identifying and targeting potentially influential users.

#### Text Books:

- Kotler, P., Keller, K. L., Koshy, A., Jha, M. Marketing Management: A South Asian Perspective. New Delhi: Pearson Education, 14th edn., 2013
- Rajan, S. Marketing Management. India: New Delhi: Tata McGraw-Hill Education. 4th edn, 2005
- Digital Marketing: Strategy, Implementation and Practice, Chaffey D., Ellis-Chadwick F., Pearson, 5th Edition, 2012

#### REFERENCE BOOKS:

- David Meerman Scott, "The New Rules of Marketing and PR: How to Use Social Media, Blogs, News Releases, Online Video, and Viral Marketing to Reach Buyers Directly", Wiley 4th Edition, Jan 2010
- Karunakaran, K. Marketing Management. New Delhi: Himalaya Publishing House. 3<sup>rd</sup> edition, 2013
- Kumar, A., Meenakshi. Marketing Management. New Delhi: Vikas Publishing House Pvt Ltd., 2nd edition, 2013
- Ramaswamy, V. S., Namakumari, S. Marketing Management Global Perspective, Indian Context. New Delhi: Macmillan India Limited. 3rd edition, 2009

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**MBA-BA II SEMESTER  
OPERATIONS AND SUPPLY CHAIN MANAGEMENT  
PAPER CODE: MBA-BA -202**

**OPERATIONS AND SUPPLY CHAIN MANAGEMENT**

**Course Objectives:**

The students learn the nuances of forecasting, facility design, location, inventory, aggregate planning; students will also learn elements of supply chain, network design & logistics management, purchasing & vendor management.

**Credits: 04**

**Course outcomes:** On completion of the course, the students will be able to:

CO-1 - Learn the general concepts of operations, plant location Layout planning and concepts of supply chain.

CO-2- Understand the concepts of forecasting and concepts of Production planning and Capacity planning.

CO-3- Demonstrate the concepts of Aggregate planning and concepts of Inventory management.

CO-4- Analyze the Network Design, Logistics Management of a firm and Purchasing & Vendor Management.

CO-5- Understand the recent issues in supply chain management and role of IT in supply chain.

**UNIT I**

**Introduction**

An overview, Definition of operations management, Responsibilities of Operations Manager, Plant Location, Process selection and design, Layout Planning.

Basic Concepts, Objectives, Essential Features and Benefits of Supply Chain, Evolution of SCM, Various Flows (Cash, Value and Information), Key Issues in SCM.

Numerical problems on deciding plant location through Centroid Method.

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## **UNIT II**

### **Forecasting**

Forecasting as a planning tool, Forecasting types and methods (Qualitative and Quantitative).

### **Capacity Planning**

Production Planning techniques, Capacity management, Line of balance, scheduling types and principles.

Numerical problems on Quantitative methods of Forecasting and system capacity & system efficiency.

## **UNIT III**

### **Aggregate Planning**

Introduction of Aggregate Planning, Techniques for Aggregate Planning, Aggregate Planning in Services, Disaggregating the aggregate plan.

### **Inventory Management**

Inventory Management- Objective, Nature and Importance of Inventories, Requirements for effective Inventories, Inventory Ordering Policies, Inventory control techniques- ABC, VED, EOQ, SED, FSN Analysis.

Numerical problems on Inventory control techniques.

## **UNIT IV**

### **Network Design and Logistics Management**

The role of Network Design in the Supply Chain, Factors influencing Network Design Decisions, Logistics as part of SCM, Logistics Costs, Different Models, Logistics Sub- System, Inbound and Outbound Logistics, Bullwhip Effect in Logistics, Distribution and Warehousing Management.

### **Purchasing and Vendor Management**

Centralized and Decentralized Purchasing, Functions of Purchase Department and Purchase Policies, Single Vendor Concept, Management of Stores, Accounting for Materials.

Practical - Use of Mathematical Model for Vendor Rating / Evaluation.

## **UNIT V**

### **Recent Issues in SCM**

Role of Computer/ IT in Supply Chain Management, The Supply Chain IT Framework, Customer Relationship Management, Internal Supply Chain Management, Supplier Relationship Management, The Transaction Management Foundation, The Future of IT in the Supply Chain, Risk Management in IT, Supply Chain IT in Practice.

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### Suggested Readings:

- Stevenson, W. J. (2018). *Operations Management*, 12th Ed. McGraw Hill Education.
- Krajewski, L. J., Ritzman, L. P., Malhotra, M. K. and Srivastava, S. K. (2011). *Operations Management: Processes and Supply Chains*, 9<sup>th</sup> Ed. Pearson.
- Chase, R. B., Jacobs, F. R., Aquilano, N. J. (2003). *Operations Management for Competitive Advantage*, 10<sup>th</sup> Ed. Tata McGraw Hill.
- Mahadevan, B. (2010). *Operations Management: Theory and Practice*, 2<sup>nd</sup> Ed. Pearson.
- Chary, S. N. (2009). *Production & Operations Management*, 4<sup>th</sup> Ed., Tata McGraw Hill.
- Chopra, S., Meindl, P. (2007). *Supply Chain Management: Strategy, Planning & Operation*, 3<sup>rd</sup> Ed. PHI.
- Chopra, S., Meindl, P., Kalra, D.V. (2013). *Supply Chain Management: Strategy, Planning and Operation*, 5<sup>th</sup> Ed. Pearson.
- Reghuram G. (I.I.M.A.). *Logistics and Supply Chain Management*, 1<sup>st</sup> Edition.
- Krishnan Dr. G. *Material Management*, 5<sup>th</sup> Edition, Pearson.
- Agarwal D.K. *A Text Book of Logistics and Supply Chain Management*, 1st Edition Macmillan.
- Sahay B.S. *Supply Chain Management*, 1<sup>st</sup> Edition Macmillan.

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<b>MBA_BA II SEMESTER</b> <b>CORPORATE FINANCE</b> <b>PAPER CODE: MBA_BA -203</b>
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**CORPORATE FINANCE**

**Credits: 04**

**Course Objective:**

**This course** is intended to introduce the basic theory, concepts, and practical applications in **Corporate finance** and to enable students to analyze various corporate decisions.

**Course Outcomes: Upon completion of this course, the students will be**

**CO-1** Understanding the fundamentals, various models and agency problems of Corporate Finance.

**CO-2** Familiarizing with about practical aspects of corporate finance.

**CO-3** Acquiring knowledge about various techniques used for analyzing various long-term projects.

**CO-4** Analyzing the various capital structure techniques and selecting the best source of finance.

**CO-5** Evaluating of various dividend models and its applicability.

**CO-6** Gaining Acquaintance of students about corporate valuation in mergers and acquisitions.

**Unit I**

**Introduction to Finance & Corporate Finance:** Corporate Finance, objectives & its scope, Corporate Governance and Agency Problem, Corporate valuation Models: Asset Based Valuation Model, Earning based Valuation Model, Cash flow-based Model, Introduction to start-up finance, Financial Decisions, Time Value of Money.

**Unit II**

**Investment and Financing Decision:** Concept of Opportunity Cost, Cost of Debenture, Preference and Equity capital, Composite Cost of Capital, Capital Budgeting Decisions, Calculation of NPV and IRR, Excel Application in Analyzing Projects.

**Unit III**

**Financial Decision:** Capital Structure, Capital Structure Theories: Relevance and Irrelevance theory, Leverage analysis – financial, operating and combined leverage along with its implications, EBIT- EPS Analysis, Point of Indifference.

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**Unit IV Dividend Decisions:** Dividend Policy, Factors affecting Dividend Policy, Forms of Dividends, Types of Dividend Policies, Dividend Models: Walter and Gordon Model, Miller-Modigliani (MM) Hypothesis. Overview of Working Capital Decision: Concept, Components, Factor Affecting working Capital Requirement, working Capital Management: Management of Cash, Inventory and Receivables.

Mergers and Acquisition: Introduction, Exchange Ratio, Synergy Benefits, Post Merger EPS, Post Merger Price of share, Required rate of return of merged company, De-Merger

#### Unit V

Corporate Finance Report on Research on an Industry (Application of the learnings of each of the four units)

#### Suggested Readings

- Graham, J. R., and Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. Journal of financial economics, 60(2), 187-243. [http://publicsde.regieenergie.qc.ca/projets/72/DocPrj/R-3807-2012-C-ACIG-0059-DDR-REPDDR-2012\\_12\\_20.pdf](http://publicsde.regieenergie.qc.ca/projets/72/DocPrj/R-3807-2012-C-ACIG-0059-DDR-REPDDR-2012_12_20.pdf)
- Stulz, R. (1996). Rethinking risk management. Journal of applied corporate finance, 9, 8-25. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.200.9948&rep=rep1&type=pdf>
- Subrahmanyam, A. (2008) Behavioural Finance: A review and synthesis <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.127.9964&rep=rep1&type=pdf>
- Berenson, A. (2004) The Number: How America's Balance Sheet Lies Rocked the World's Financial Markets. [http://www.amazon.co.uk/Number-Americas-Balance-FinancialMarkets/dp/0743468090/ref=asap\\_bc?ie=UTF8](http://www.amazon.co.uk/Number-Americas-Balance-FinancialMarkets/dp/0743468090/ref=asap_bc?ie=UTF8)

#### Text Books

- Khan and Jain - Financial Management (Tata McGraw Hill, 7th Ed.)
- Pandey I M - Financial Management (Vikas, 11th Ed.)
- William HakkaBettnerCarcello- Financial and Management Accounting (TMH-16th Ed.)
- Sheebakapil-Fundamental of financial management (Wiley,2015)
- Prasanna Chandra - Fundamentals of Financial Management (TMH, 9th Ed.)
- Bark DemazoThampy- Financial Management (Pearson,2nd Ed.)
- R P Rustagi - Financial Management (Galgotia, 2000, 2nd revised ed.)
- Damodaran, A., Applied Corporate Finance, 3rd Edition, Wiley, 2012
- Ravi.M Kishore – Financial Management (Taxman, 7th Ed)
- Fundamentals to Financial Management, Brigham & Houston, 14/e, Cengage Learning
- Van Horne - Financial Management and Policy (Prentice hall, 2003, 12th Ed.)
- Brealey, R., Myers, S. and Allen, F. (2019), Principles of Corporate Finance, McGraw-Hill

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**MBA\_BA II SEMESTER  
MACHINE LEARNING & APPLICATIONS  
PAPER CODE: MBA\_BA -204**

**MACHINE LEARNING & APPLICATIONS**

**Course Objectives:** The objective of the course is to learn what machine learning is and how it is related to data analysis and statistics. The course will impart knowledge on how various machine learning algorithms search for data patterns which can be used to make decisions and predictions for practical problem solving.

**Credits: 04**

**Course Outcomes:** Students will be able to:

- CO 1. Gain knowledge about basic concepts of Machine Learning
- CO 2. Identify machine learning techniques suitable for a given problem
- CO 3. Understand how to evaluate models generated from data.
- CO 4. Apply the algorithms to a real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.
- CO 5. Design application using machine learning techniques.

**Unit 1: Introduction to Machine Learning:** Learning Issues, designing a learning system, perspectives & issues in machine learning, concept learning and general to specific ordering. Overview of different tasks: classification, regression, clustering.

**Unit 2: Categorization of Machine Learning Techniques** Categories of machine learning techniques with brief introduction of each category: Decision trees, Bayesian learners, Ensemble learners, neural networks, support vector machines, rule-based learning, search-based techniques.

**Unit 3: Decision Trees and Artificial Neural Networks** Decision Trees: Introduction, Tree representation, Appropriate problems, Hypothesis space search, inductive bias, issues. Artificial Neural Networks: Introduction, Network representation, appropriate problems, perceptions, back-propagation.

**Unit 4: Bayesian Learners** Bayesian learners: Introduction, Bayes theorem and concept learning, maximum likelihood and least-squared error hypothesis, maximum likelihood hypothesis for predicting probabilities, minimum description length principle.

**Unit 5: Unsupervised Learning** Introduction, Clustering & Association, k-nearest neighbor learning, Apriori algorithm for association rule learning problems.

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**Text books:**

- Mitchell, T. (2013), Machine Learning, McGraw Hill.
- Malhotra, R. (2016).

**Reference Books:**

- L.H. Witten & E. Frank (2005), Data Mining: Practical Machine Learning Tools & Techniques, Elsevier, Second Edition.
- Murphy, K.P. (2012), Machine Learning: A probabilistic perspective, MIT Press.
- Mohri, M., Rostamizadeh, A. and Talwalkar, A. (2012), Foundations of Machine Learning, MIT Press.
- Harrington, P. (2012), Machine Learning in Action, Dreamtech Press. Suggested Reading
- Bell, J. (2014), Machine Learning for Big Data: Hands-On for Developers and Technical Professionals, Wiley.
- Haykin, S. (2016), Neural Networks and learning Machines, Pearson

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**MBA\_BA II SEMESTER**  
**HUMAN RESOURCE MANAGEMENT**  
**PAPER CODE: MBA\_BA -205**

**HUMAN RESOURCE MANAGEMENT**

**Course Objective:** The course objective of this course is to enable the students to understand HR Management system at various levels in industries or organizations. To enable them to integrate the understanding of various HR concepts along with the domain concept in order to take correct business decisions

**Credits: 04**

**Course Outcomes:** On completion of the course, the students will be able to:

- CO1: Develop an understanding of the concepts of HRM and its importance in the organization.
- CO2: Inculcate the essential skill sets required to function as an HR manager.
- CO3: Integrate the knowledge of HR concepts to take the best managerial decisions.
- CO4: Contribute to the implementation and evaluation of plans related to employee recruitment, selection, retention, and appraisal processes in an organization.
- CO5: Evaluate and implement employee training and development programs.
- CO6: Design rationally the salary and compensation structure.
- CO7: Create pay slip, offer letter, develop and use HR Metrics and write Job Advertisements.
- CO8: Handle employee issues and understand the new trends in HRM.

**UNIT-I**

**The Dynamic Environment of HRM:** Introduction, Functions, Scope and Significance of HRM; Human Capital in Organizations; Managing Human Resources in Organizations; HR Management Roles, Evolution of HRM, HR Management Competencies and Careers

**UNIT-II**

**Manpower Acquisition:** HR planning, Job Analysis- Nature, Methods and approaches, Job Description, Job Specification, Job Evaluation, Recruitment-Types and Sources, Selection – Process and Techniques, Role of Technology in recruitment & Selection  
**Training –** Concept, training process, techniques

**UNIT-III**

**Establishing the Performance Management System:** Introduction; Purpose; Appraisals Process, Appraisals Methods, Tools for measuring employee performance  
**Internal Mobility and Separation of Employees** Transfer, Promotion and Separation of employees  
**Employee welfare:** A brief introduction

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**UNIT-IV**

Employee Absenteeism: Types of Absenteeism, Controlling Absenteeism;  
Employee Turnover: Concept and Types of Employee Turnover  
Compensation Management - Components of Pay  
Contemporary issues in HRM- HR Audit, HRIS, SHRM, IHRM - A Brief Introduction.

**UNIT-V****Practical component:**

Writing a job advertisement.  
Self Appraisal & Peer Appraisal  
Offer Letter & Pay Slips  
Ask students to collect manpower data of your institute and prepare HR Dashboards.

**Suggested Readings:**

- Decenzo, D. A., & Robbins, S. P. (2010). Fundamentals of Human Resource Management. John Wiley & Sons, Inc.
- Mathis, R. L., & Jackson, J. H. (2008). Human Resource Management. Thomson South Western.
- Rao, P. (2014). Essentials of Human Resource Management and Industrial Relations. Himalaya Publishing House.

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**MBA-BA II SEMESTER  
DECISION SCIENCE  
PAPER CODE: MBA-BA -206**

**DECISION SCIENCE**

**Credits: 04**

**Course Objective:** The course aims in providing the students with a comprehensive study of various application areas of decision science through relevant examples. The main objective is to provide necessary mathematical support and confidence to the students to tackle real life problems.

**Course Outcomes:** On successful completion of the course, students will be able to

- CO-1. Know and understand the various techniques of Decision Science.
- CO-2. Apply LP technique to translate a real-world problem, given in words, into a mathematical formulation.
- CO-3. Sketch graphical representation and classify two-dimensional linear programming model.
- CO-4. Evaluate cost of transporting, jobs assignment, job scheduling, replacement of equipment and project completion time.
- CO-5. Understand and quantify variations in statistical quality control.

**UNIT I**

**Operations Research:** Uses, Scope and Applications of operations research in managerial decision making. **Decision Making Environment:** Decision making under certainty; Uncertainty and Risk situations; Decision tree approach and its applications.

**UNIT II**

**Linear Programming:** Mathematical formulations of LP models for Product-Mix problem; Graphical and Simplex methods of solving LP problem; Duality. **Transportation Problem:** Various methods of finding initial basic feasible solution: NWCR, LCM and VAM, Optimal solution: MODI method. **Assignment Model:** Algorithm and its applications.

**UNIT III**

**Game Theory:** Concepts of game, Two- person Zero-sum game; Pure and Mixed strategy game; Saddle point; Dominance method, Odds method and Graphical method for solving Mixed Strategy game. **Sequencing Problem:** Johnsons algorithm for n jobs and two machines; n jobs and three machines; two jobs and m- machines Problems.

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#### UNIT IV

**Queuing Theory:** Characteristics of M/M/1 Queue model, Application of Poisson and Exponential distribution in estimating arrival rate and service rate. **Statistical Quality Control:** Meaning; Benefits of SQC; Control chart for variable mean chart, R- chart; Control chart for attributes: c-chart, np-chart, p-chart.

#### UNIT V

**Replacement problem:** Replacement of assets that deteriorate with time, replacement of assets which fail suddenly. **Project Management:** Rules for drawing the network diagram; Applications of CPM and PERT techniques in Project planning and control; Crashing of operations

#### Suggested Readings:

1. Hillier, F. S., & Lieberman, G. J. (2017). *Introduction to Operation Research*. McGraw Hills.
- Kapoor, V. k. (2013). *Operations Research: Quantitative Techniques for Management*. Sultan Chand & Sons .
2. Taha, H. A. (2017). *Operations Research: An Introduction*. Pearson education.
3. Vohra, N.D. (2017). *Quantitative Techniques in Management*. McGraw Hills.
4. Gupta, P.K. & Hira, D.S. (2012). *Introduction to Operations Research*. S. Chand & Co.
5. Sharma, J.K. *Operations Research*. Pearson education.

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James

**MBA\_BA II SEMESTER**  
**MACHINE LEARNING USING R**  
**PAPER CODE: MBA\_BA -207**

**MACHINE LEARNING USING R (Practical)**

**Course Objectives:** The objective of the course is to learn applications of various machine learning concepts using R language. The course would enable the ability to understand and critically assess available data using machine learning methods. **Credits: 02**

**Course Outcomes:** Students will be able to:

CO1: Understand the basics and use of R programming in terms of constructs, control statements, string functions.

CO2: Learn to apply R programming for various application areas

CO3: Able to appreciate and apply the R programming from a statistical perspective

**Unit 1: R Basics and Language**

Getting and Installing R, The R user Interface, A short R tutorial, R packages. Overview: Expressions, Objects, Symbols, Functions. Syntax: Constants, Operators, Expressions, Control Structures, Accessing Data Structures. R Objects: Primitive object types, vectors, lists, other object types. Symbols and Environment: Symbols, Global environment, environment and functions, exceptions.

**Unit 2: Functions and Object Oriented Programming Functions:**

Arguments, Return values, Function as arguments, side effects. Object Oriented Programming: Overview, Defining Classes, new objects, accessing slots, working with objects, creating coercion methods, methods, basic classes. High performance R with built in math functions, lookup tables etc.

**Unit 3: Working with Data**

Entering Data Within R, Entering Data Using R Commands, Using the Edit GUI, Saving and Loading R Objects, Importing Data from External Files, Exporting and Importing Data from Databases. Preparing Data: Combining Data Sets, Transformations, Binning Data, Subsets, Summarizing Functions, Data Cleaning, An overview of R graphics.

**Unit 4: Statistics with R**

Analyzing Data: Summary Statistics, Correlation and Covariance, Principal Components Analysis, Factor Analysis, Bootstrap Resampling. Probability Distributions: Normal Distribution, Common Distribution-Type Arguments, Distribution Function Families. Statistical Tests for Continuous and Discrete Data, Power Tests: Experimental Design

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## Unit 5: Regression Analysis

Regression Models: A Simple Linear Model, Fitting a Model, Refining the Model, Details About the lm Function, Assumptions of Least Squares Regression, Subset Selection and Shrinkage Methods, Stepwise Variable Selection, Ridge Regression, Lasso and Least Angle Regression. Principal Components Regression and Partial Least Squares Regression. Implementation of Machine Learning models using R.

### Textbooks:

- Adler, J. (2012), R in a Nutshell: A Desktop Quick Reference, O'reilly publications, Second Edition.
- Lantz, B. (2013), Machine Learning with R, Packt publishing Ltd.

### Reference Books

- Lesmeister, C. (2015), Mastering Machine Learning with R, Packt Publishing, First Edition.
- Wickham, H. & Grommund, G. (2016), R for Data Science: Import, Tidy, Transform, Visualize, and Model Data, O. Reilly Media.
- Gillespie, C., Lovelace, R. (2016), R for Data Science: Import, Tidy, Transform, Visualize, and Model Data, O'Reilly Media.
- StrickLand, J.S., Predictive analytics using R, Lulu Inc.

- **Suggested Reading**

- Singh, A. & Ramasubramanian, K. (2016), Machine Learning using R, Apress.

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**MBA\_BA II SEMESTER  
DATABASE & SQL LAB  
PAPER CODE: MBA\_BA -208**

**DATABASE AND SQL LAB**

**Credits: 02**

**Course Objectives:**

This course has theory and practical lab session to provide a foundation in data management concepts and database systems. It includes representing information with the relational database model, manipulating data with an interactive query language (SQL) and database programming, database development including internet applications, and database security, integrity and privacy issues.

**Course Outcomes:** After completion of this course student will be able to

- CO 1. Understand the concept of Database Management System, tables, SQL queries and ER-Model
- CO 2. Create our own relational database management system in Oracle or MS-Access.
- CO 3. Describe and define the major components of the relational database model and normalization in database design.
- CO 4. Apply the Structured Query Language (SQL) for database definition and manipulation.
- CO 5. Develop relationship mapping between entities (e.g. 1:1, 1:M, and M:M) in database.
- CO 6. Perform join operation to fetch data from multiple table.

**Unit 1: Introduction to database and data models**

Database: Definition, purpose of database system, various view of data; database architecture: View/Schema, Logical-view, conceptual-view, physical-view and their interrelationship, transaction management; Data Models: The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction.

**Unit 2: Database Design, ER-Diagram and Normalization:**

Database design and ER Model: overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, weak entity sets, Codd's rules, Relational Schemas: Logical view of data, keys, integrity rules. Relational Database design: features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF).

**Unit 3: SQL Basics**

SQL Data Types, Basic SELECT Statement, Selecting All Columns, Selecting Specific Columns, Writing SQL Statements, Column Heading Defaults, Arithmetic Expressions, Using Arithmetic Operators, Operator Precedence, Using Parentheses, Defining a Null Value, Null Values in Arithmetic Expressions, Defining a Column Alias, Using Column Aliases, Concatenation Operator, Using the Concatenation Operator, Literal Character Strings, Using Literal Character Strings, Duplicate Rows, Eliminating Duplicate Rows

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#### Unit 4: Restricting and Sorting Data, SQL Function

Limiting Rows Using a Selection, Limiting the Rows Selected, Using the WHERE Clause, Character Strings and Dates, Comparison Conditions, Using Comparison Conditions, Other Comparison Conditions, Using the BETWEEN Condition, Using the IN Condition, Using the LIKE Condition, Using the NULL Conditions, Logical Conditions, Using the AND Operator, Using the OR Operator, Using the NOT Operator, Rules of Precedence, ORDER BY Clause, Sorting in Descending Order, Sorting by Column Alias, Sorting by Multiple Columns; **SQL Function:** Character Functions, Case Manipulation Functions, Number Functions, Date Functions, Conversion Functions, Elements of the Date Format Model, Using the TO\_CHAR Function with Dates

#### Unit 5: Displaying Data from Multiple Tables, Aggregate Function, sub-queries

Obtaining Data from Multiple Tables: Cartesian Product, Equijoin, Non-Equijoins, Natural Joins, Cross Join, inner join, outer join, left outer join, right outer join, Full outer Join; **Aggregate Function:** Group Function, Group function with null values, group by clause, Having Clause; **Sub-queries:** Single row sub-queries, multiple row sub query, group function and having clause in sub-query, handling null values in sub queries.

1. Basics of Relational Model and integrity Constraints
2. Data Retrieval from Single Table, Data retrieval with condition
3. SQL Function
4. Data retrieval from multiple table
5. Subquery

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