

**BIKANER TECHNICAL UNIVERSITY, BIKANER**  
बीकानेर तकनीकी विश्वविद्यालय, बीकानेर



**PROGRAMME SYLLABUS**  
**MBA [BUSINESS ANALYTICS]**

# **SYLLABUS OF MBA (BUSINESS ANALYTICS) – I SEMESTER 2023-24**

## **BA-101 Management Concepts And Organisational Behaviour**

### **1. COURSE OBJECTIVES:**

To provide basic understandings of management processes  
To help the students understand the concepts of organizational behaviour  
To apply the concepts of management and organizational behaviors in real world situations  
Familiarizing the students with the contemporary issues in management.  
Developing managerial and leadership skills among students

### **2. COURSE CONTENT**

#### **UNIT I**

Fundamentals of Management: Management practices from past to present, Different levels of management, Managerial skills and Managerial Functions , Case Studies  
Planning- Objective of planning, Planning process, Types of planning, Types of plans, Management by Objective, Decision-making- types, process & techniques,. Case Studies

#### **UNIT-II**

Organising & Staffing- Types of organization, Organization structure and decentralization of authority, Meaning of staffing, Recruitment, selection & placement, Training & development..  
Directing & Controlling- Principle of directing, Essence of coordination, Different control techniques, Management by exception. Case Studies

#### **UNIT III**

Fundamentals of individual behavior, Personality, types of personality, Personal effectiveness, meaning of Attitudes, Types, Components, attitude formation and attitude change. Meaning & Type of Group Behaviour, Interpersonal skills, Transactional Analysis, Johari Window,

#### **UNIT IV**

Motivation:, Theory of Motivation: Maslow's, Herzberg's, McClelland, Contemporary theories of Motivation: Self Determination Theory, Self Efficacy Theory, Vroom's Expectancy Theory, Equity Theory, Reinforcement Theory, Meaning of Perception, process, behavioral applications of perception. Case Studies

#### **UNIT V**

Leadership: What is leadership, types of leaders and leadership styles, traits and qualities of effective leader, trait theory, LSM – Leadership Situational Model, Team Building, Tuckman Model of Team Development. Organizational Change: Meaning of organizational change approaches to managing organizational change, creating a culture for change, implementing the change, Kurt Lewin Model of change. Case Studies

## **COURSE OUTCOME**

CO 1: Developing understanding of managerial practices and their perspectives.

CO2: Understanding and applying the concepts of organizational behavior

CO 3: Applying the concepts of management and analyze organizational behaviors in real world situations

CO 4: Comprehend and practice contemporary issues in management.

CO 5: Applying managerial and leadership skills among students

## **SUGGESTED READINGS**

Koontz Harold & Weihrich Heinz – Essentials of management (Tata McGraw Hill, 5th Edition, 2008)

L. M. Prasad- Principles and Practices of Management, Sulatn Chand & Sons, 7th edition, 2007.

Stephen P. Robbins, —Organizational Behaviour, 12th Edition, Prentice Hall

Dr. Premvir Kapoor, Principles and Practices of Management, Khanna Publishing House, Delhi

Robbins & Coulter - Management (Prentice Hall of India, 9th Edition)

Principles of Management, George R. Terry & S.G. Franklin, AITBS, Delhi.

N M Khandelwal- Indian Ethos & Values for Management- Himalyan Publishing

Fred Luthans, —Organizational Behaviour, 12th Edition, McGraw Hill International Edition

Aswathappa K, —Organizational Behaviour (Text, Cases and Games), Himalaya Publication

Udai Pareek, —Organizational Behavior, Oxford University Press

## **BA-102 MANAGERIAL ECONOMICS**

### **1. COURSE OBJECTIVE:**

To understand the importance of Managerial Economics in management and businesses

To apply the principles of managerial economics in achieving business objectives

Be equipped with the tools necessary in forecasting product demand

Understand and be able to apply latest pricing strategies

Understand and analyze the macro environment affecting the business decision making.

### **2. COURSE CONTENTS:**

#### **UNIT –I**

Basic Concepts and principles: Definition, Nature and Scope of Economics-Micro Economics and Macro Economics, Managerial Economics and its relevance in business decisions. Fundamental Principles of Managerial Economics - Incremental Principle, Marginal Principle, Opportunity Cost Principle, Discounting Principle, Concept of Time Perspective, Equi-Marginal Principle, Utility Analysis, Cardinal Utility and Ordinal Utility. Case Studies

#### **UNIT –II**

Demand and Supply Analysis: Theory of Demand, Types of Demand. Determinants of demand, Demand Function, Demand Schedule, Demand curve, Law of Demand, Exceptions to the law of Demand, Shifts in demand curve, Elasticity of Demand and its measurement. Price Elasticity, Income Elasticity, Arc Elasticity.

Cross Elasticity and Advertising Elasticity. Uses of Elasticity of Demand for managerial decision making, Demand forecasting meaning, significance and methods.( numerical Exercises) Case Studies  
Supply Analysis; Law of Supply, Supply Elasticity; Analysis and its uses for managerial decision making.  
Price of a Product under demand and supply forces. Case Studies

### **UNIT –III**

Production and cost Analysis: Production concepts & analysis; Production function, Types of production function, Laws of production: Law of diminishing returns, Law of returns to scale.

Cost concept and analysis: Cost, Types of costs, Cost output relationship in the short-run. Cost output relationship in the Long-run. Estimation of revenue, Average Revenue, Marginal Revenue. Case Studies

### **UNIT –IV**

Market structures: Perfect and Imperfect Market Structures, Perfect Competition, features, determination of price under perfect competition. Monopoly: Feature, pricing under monopoly, Price Discrimination. Monopolistic: Features, pricing under monopolistic competition, product differentiation. Oligopoly: Features, kinked demand curve, cartels, price leadership. Case Studies

### **UNIT –V**

National Income; Concepts and various methods of its measurement, Circular flows in 2 sector, 3 sector, 4 sector economies, Inflation, types and causes, Business Cycle & its phases.

## **3. COURSE OUTCOMES:**

CO1: Students will be able to remember the concepts of micro economics and also able to understand the various micro economic principles to make effective economic decisions under conditions of risk and uncertainty.

CO2: The students would be able to understand the law of demand & supply & their elasticity's, evaluate & analyse these concepts and apply them in various changing situations in industry . Students would be able to apply various techniques to forecast demand for better utilization of resources.

CO3: The students would be able to understand the production concept and how the production output changes with the change in inputs and able to analyse the effect of cost to business and their relation to analyze the volatility in the business world

CO4: The students would be able to understand & evaluate the different market structure and their different equilibriums for industry as well as for consumers for the survival in the industry by the application of various pricing strategic

CO5: The students would be able to analyse the macroeconomic concepts & their relation to micro economic concept & how they affect the business & economy.

## **4.SUGGESTED READINGS**

Managerial Economics ,D.N.Dwivedi,Vikas Publication, 7th Ed

Managerial Economics, GEETIKA, McGraw-Hill Education 2nd Ed.

Managerial Economics: Concepts and Applications (SIE), THOMAS& MAURICE, McGraw-Hill Education, 9th Ed

Managerial Economics, H.L Ahuja, S.Chand, 8th Ed

Managerial Economics – Theory and Applications, Dr.D.M.Mithani, Himalaya Publications, 7th Ed.

Sociology & Economics for Engineers, Dr. Premvir Kapoor, Khanna Publishing House

## **BA-103 FINANCIAL ACCOUNTING AND ANALYSIS**

### **1. COURSE OBJECTIVES:**

- To understand the fundamentals, basic theory and concepts of financial accounting.
- To have a knowledge about various Accounting Standards used in preparation of financial statements.
- To have an understanding of preparation and presentation of financial statements.
- To acquire knowledge about various techniques used for analysing financial statements with its application.
- To enable students acquainted with current trends and social responsibility accounting

### **2. COURSE CONTENTS**

#### **UNIT I**

Meaning and Scope of Accounting: Evolution and Users of Accounting, Basic Accounting terminologies, Principles of Accounting, Accounting Concepts & Conventions, Accounting Equation, Depreciation Accounting.

#### **UNIT II**

Mechanics of Accounting: Accounting Standards and IFRS: International Accounting Principles and Standards; Matching of Indian Accounting Standards with International Accounting Standards, Double entry system of Accounting, journalizing of transactions; Ledger posting and Trial Balance.

#### **UNIT III**

Presentation of Financial Statement: Preparation of final accounts (Profit & Loss Account and Balance Sheet) according to companies act 2013 (vertical format), Excel Application to make Balance sheet, Case studies and Workshops, Preparation of Cash Flow Statement and its analysis.

#### **UNIT IV**

Analysis of financial statement: Ratio Analysis- Solvency ratios, Profitability ratios, activity ratios, liquidity ratios, Market capitalization ratios; leverage Ratio, Detailed Analysis using excel application.

#### **UNIT V**

Financial Statement Analysis and Recent Types of Accounting: Common Size Statement; Comparative Balance Sheet and Trend Analysis of manufacturing, Service & banking organizations, Case Study and Workshops in analysing Balance sheet. Human Resource Accounting, Forensic Accounting, Accounting for corporate social responsibility.

### **3. Course Outcome:**

- CO1. Understand and apply accounting concepts, principles and conventions for their routine monetary transaction.
- CO2. Understand about IFRS, Ind AS and IAS for preparation and reporting of financial statements.
- CO3. Create and prepare financial statements and Cash flow in accordance with Generally Accepted Accounting Principles
- CO4. Analyse, interpret and communicate the information contained in basic financial statements and explain the limitations of such statements.
- CO5. Recognising various types of accounting and utilize the technology and social responsibility in facilitating and enhancing accounting and financial reporting processes

#### 4. SUGGESTED READINGS

Maheshwari S.N & Maheshwari S K – A text book of Accounting for Management (Vikas, 10<sup>th</sup> Edition)  
Essentials of Financial Accounting (based on IFRS), Bhattacharya (PHI, 3rd Ed)  
Khan and Jain - Financial Management (Tata McGraw Hill, 7th Ed.)  
PC Tulsian- Financial Accounting (Pearson, 2016)  
Dhamija - Financial Accounting for managers: (Prentice Hall, 2nd Edition).  
Narayanswami - Financial Accounting: A Managerial Perspective (PHI, 5th Ed)  
DhaneshkKhatrri- Financial Accounting (TMH, 2015)  
Ambrish Gupta - Financial Accounting: A Managerial Perspective (Prentice Hall, 4th Edition)  
Ramchandran & Kakani - Financial Accounting for Management (TMH, 2nd Edition).  
Mukherjee - Financial Accounting for Management (TMH, 2nd Edition).

### BA: 104 BUSINESS STATISTICS & ANALYTICS

#### 1. COURSE OBJECTIVES

Understand the different basic concept / fundamentals of business statistics.

Understand the importance of measures of Descriptive statistics which includes measures of central tendency, Measures of Dispersion, Time Series Analysis, Index Number, Correlation and Regression analysis and their implication on Business performance.

Understand the concept of Probability and its usage in various business applications.

Understand the Hypothesis Testing concepts and use inferential statistics- t, F, Z Test and Chi Square Test

Understand the practical application of Descriptive and Inferential Statistics concepts and their uses for Business Analytics.

#### 2. COURSE OUTCOME

Unit I: Descriptive Statistics

Meaning, Scope, types, functions and limitations of statistics, Measures of Central tendency – Mean, Median, Mode, Quartiles, Measures of Dispersion – Range, Inter quartile range, Mean deviation, Standard deviation, Variance, Coefficient of Variation, Skewness and Kurtosis.

Unit II: Time Series & Index Number

*Time series analysis:* Concept, Additive and Multiplicative models, Components of time series, Trend analysis: Least Square method - Linear and Non- Linear equations, Applications in business decision-making.

Index Numbers:- Meaning , Types of index numbers, uses of index numbers, Construction of Price, Quantity and Volume indices:- Fixed base and Chain base methods.

Unit III: Correlation & Regression Analysis

*Correlation Analysis:* Rank Method & Karl Pearson's Coefficient of Correlation and Properties of Correlation.

*Regression Analysis:* Fitting of a Regression Line and Interpretation of Results, Properties of Regression

Coefficients and Relationship between Regression and Correlation.

Unit IV: Probability Theory & Distribution

*Probability*: Theory of Probability, Addition and Multiplication Law, Baye's Theorem

*Probability Theoretical Distributions*: Concept and application of Binomial; Poisson and Normal distributions.

Unit V: *Hypothesis Testing & Business Analytics*

*Hypothesis Testing*: Null and Alternative Hypotheses; Type I and Type II errors; Testing of Hypothesis: Large Sample Tests, Small Sample test, (t, F, Z Test and Chi Square Test)

*Concept of Business Analytics*- Meaning types and application of Business Analytics, Use of SpreadSheet to analyze data-Descriptive analytics and Predictive analytics.

### 3. COURSE OUTCOME

CO1. Gaining Knowledge of basic concept / fundamentals of business statistics.

CO2. To compute various measures of central tendency, Measures of Dispersion, Time Series Analysis, Index Number, Correlation and Regression analysis and their implication on Business performance.

CO3. Evaluating basic concepts of probability and perform probability theoretical distributions

CO4. To apply Hypothesis Testing concepts and able to apply inferential statistics- t, F, Z Test and Chi Square Test

### 4. SUGGESTED READINGS

G C Beri – Business Statistics, 3rd ed, TATA McGrawHill.

Chandrasekaran & Umavathi-Statistics for Managers, 1st edition, PHI Learning

Davis , Pecar – Business Statistics using Excel, Oxford

Ken Black – Business Statistics, 5th ed., Wiley India

Levin and Rubin – statistics for Management, 7th ed., Pearson

Lind, Marchal, Wathen – Statistical techniques in business and economics, 13th ed, McGrawHill

Newbold, Carlson, Thorne – Statistics for Business and Economics, 6th ed., Pearson

S. C.Gupta – Fundamentals of Statistics, Himalaya Publishing

Walpole – Probability and Statistics for Scientists and Engineers, 8th ed., Pearson

## BA-105 MARKETING MANAGEMENT

### 1. COURSE OBJECTIVES

Assess market opportunities by analyzing customers, competitors, collaborators, context, and the strengths and weaknesses of a company.

Understand consumers' requirements and their behaviors.

Develop effective marketing strategies to achieve organizational objectives.

Communicate and defend your recommendations and critically examine and build upon the recommendations of your classmates both quantitatively and qualitatively.

Develop the understanding the current global and digital aspect of marketing.

## **2. COURSE CONTENTS**

### **Unit 1**

Introduction: Nature and scope of marketing, Various marketing orientations, Need, Want, Demand, Elements of Marketing mix, customer value and the value delivery process.

Understanding Consumer Behavior: Buying motives, factors influencing buying behavior, buying habits, stages in consumer buying decision process, types of consumer buying decisions.

### **Unit 2**

Market segmentation, Targeting and Positioning: Meaning, Factors influencing segmentation, Market Aggregation, Basis for segmentation, Segmentation of Consumer. Targeting: Meaning, Basis for identifying target customers, Target Market Strategies. Positioning: Meaning, product differentiation strategies, tasks involved in positioning. Branding: Concept of Branding, Brand Types, Brand equity, Branding Positioning.

### **Unit 3**

Product Decisions: Concept, product hierarchy, new product development, diffusion process, Product Life cycle, Product mix strategies. Packaging / Labeling: Packaging as a marketing tool, requirement of good packaging, Role of labeling in packaging. Pricing Decisions: Pricing concepts for establishing value, Pricing Strategies-Value based, Cost based, Market based, Competitor based, New product pricing – Price Skimming & Penetration pricing

### **Unit 4**

Place Decision: Meaning, Purpose, Channel alternatives, Factors affecting channel choice, Channel design and Channel management decisions, Channel conflict, Retailing & Types of Retailers. Advertising: Advertising Objectives, Advertising Budget, Advertising Copy, AIDA model, Public Relation: Meaning, Objectives, Types, and Functions of Public Relations. Sales Promotion: Sales Promotion Mix, Kinds of promotion, Tools and Techniques of sales promotion, Push-pull strategies of promotion, Personal Selling: Concept, Features, Functions, Steps/process involved in Personal Selling, Direct Marketing: Meaning, Features, Functions, Growth and benefits of direct marketing, different forms.

### **Unit 5**

CRM: Meaning, Relationship Marketing Vs. Relationship Management, Types of Relationship Management, Significance of Customer Relationship Management. Global Marketing: current scenario, Global Marketing environment, Entry strategies, Global P's of Marketing., Recent trends and Innovation in Marketing- Green Marketing, Agile Marketing

## **3. COURSE OUTCOME**

CO1. Remember and Comprehend basic marketing concepts.

CO2. Understand marketing Insights on application of basic marketing concepts.

CO3. Able to Apply and develop Marketing Strategies and Plans

CO4. Understand and Analyzing Business/ Consumer Markets and ability Identify & evaluate Market Segments and Targeting

CO5. Develop skills to understand the current global and digital aspect of marketing.

## **4. Recommended Text Books :**

Marketing Management: A South Asian Perspective - Kotler, Keller, Kevin 15/e, Pearson Education,



2016.

Marketing Management - Ramaswamy V. S. & Namakumari S, 6/e, Sage Publication India Pvt Ltd., 2018.

Marketing Management - Tapan Panda, 5/e, Excel Publication, 2007.

Fundamentals of Marketing Management - Etzel M. J, B J Walker & William J. Stanton, 14/e, McGraw Hill Education Publishers, 2015.

Marketing: Asian Edition Paul Bainies, Chris Fill Kelly Page third edition, Oxford.

## **BA-106 INTRODUCTION TO BUSINESS ANALYTICS AND DATA SCIENCE**

### **1. Course Objectives:**

Understanding the Role of Business Analyst and Data Science in business.

Understanding the basic concept of data management and data mining techniques

To understand the basic concept of machine learning

To understand the application of business analysis.

Understanding the basic concept of Data Science Project Life Cycle.

### **2. COURSE CONTENTS**

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

#### **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.

### **3. COURSE OUTCOME**

- CO1. Understand the basics of business analysis and Data Science
- CO2. Understand data management and handling and Data Science Project Life Cycle
- CO3. Understand the data mining concept and its Techniques
- CO4. Understand and Analyzing machine learning concept
- CO5. Understand the application of business analysis in different domain

### **4. Text Books:**

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

### **5. Reference Book:**

- Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson Education India
- SA n Introduction to Business Analytics, Ger Koole, Lulu.com, 2019

## **BA-107 DESIGN THINKING**

### **1. Course Objectives:**

- How to make use of practical design thinking methods in every stage of your problem, with the help of method templates
- How to apply design thinking to your problems in order to generate innovative and user centric solutions
- How to initiate a new working culture based on a user-centric approach, empathy, ideation, prototyping, and playful testing
- How to employ ethnographic and analysis methods, such as interviews, focus groups, and surveys
- How to prototype early and fast, as well as test your prototypes so as to reduce risks and accelerate organizational learning

### **2. COURSE CONTENT**

#### **Unit 1**

Innovation & Creativity: What is Innovation? What is creativity? Difference between innovation and creativity, Role of creativity and innovation in organizations, dynamics of creative thinking, becoming creatively fit as an individual, creative insight, idea generation, idea evaluation, creativity in teams, team's environment and creativity, creating climate for creativity and an enterprise, creating an environment that keeps creative people creating, managing creative employees, leading for creativity and innovation, creativity to innovation

#### **Unit 2**

Fundamentals of Design: Introduction to elements and principles of design. Learning basics of design– dot, line,

shape, form as fundamental design components. Principles of design – simplicity, unity, proportion, emphasis, rhythm and balance. Learning design laws such as Gestalt’s law.

### **Unit 3**

Empathy & Understanding Problem: Learn how to understand users, techniques to empathize with users and identify key user problems. Learn how to gain insights from empathy and define problems statements. Empathy tools – techniques for getting empathy insights through interviews empathy maps, emotional mapping, observation

### **Unit 4**

Design Thinking Process: Introduction to design thinking, history of design thinking, wicked problems, case studies in design thinking, design thinking process, implementing the process in driving innovation, design thinking in social innovations Tools of design thinking – persona, customer journey map, AS-IS, TO-BE Processes, product lockdown workshops An exercise in design thinking– implementing design thinking for making the process of a user better. Student to choose one industry segment to implement design thinking process.

### **Unit 5**

Design Thinking in Various Sectors (Health sector, Finance, Education, Infrastructure) Design thinking case studies in retail, design thinking case studies in banking, design thinking case studies in management decisions

## **3. Course Outcomes**

- CO1. How to make use of practical design thinking methods in every stage of your problem.
- CO2. How to apply design thinking to your problems in order to generate innovative and user centric solutions
- CO3. How to initiate a new working culture based on a user- centric approach, empathy, ideation, prototyping, and playfultesting
- CO4. How to employ ethnographic and analysis methods, such as interviews, focus groups, and surveys
- CO5. How to prototype early and fast, as well as test your prototypes so as to reduce risks and accelerate organizational Learning

## **4. Text Books:**

Hundred things every designer needs to know about people – Susan Weins Chenk, New Riders Publication

101 Design Methods: A Structured Approach for Driving Innovation in Your Organization byVijay Kumar, Wiley Publication

Design of Business: Why Design Thinking is the Next Competitive Advantage by Roger L. Martin,Harvard Business Press Reference Books:

How to kill creativity - Amabile, T. (2006) , SAGE Publication

Universal principles of Design - William Lidwell, Kritina Holden, Jill Butler, Rockport Publishers

Universal methods of design – Bruce hanignton, Rockport Publishers

Empathy: Why it matters, how to get it - Roman Kizanie, TarcherPerigee Publishers

The Art of Empathy: A complete Guide to life’s most essential skill - Karla McLaren, Sounds True Publishers

## **BA-108 IT SKILLS LAB-1**

### **1. Course Objectives**

To provide knowledge about the functioning of computers and its uses for managers

To provide hands on learning on Internet and its applications

To provide hands on learning on Word processing software

To provide hands on learning of applications on Spreadsheet software

To provide hands on learning on Presentation software

### **2.COURSE CONTENTS**

#### **UNIT I** Conceptual Framework

*Hardware:* (a) Input devices - keyboard, printing devices, voice speech devices, scanner, MICR, OMR, Bar code reader, digital camera etc. (b) Output devices - Visual Display UNIT, printers, plotters (c) Storage Devices – Magnetic storage devices, Optical storage devices, Flash Memory. *Software:* Types of software with examples; Introduction to languages, compiler, interpreter and Assembler, Operating System Functions, Types and Classification, Elements of GUI based operating system. Network and Internet: Types of computer networks (LAN, WAN and MAN), Netiquettes, Basic services over Internet like WWW, FTP, Telnet, Gopher, URL, Domain names, Web Browsers, Multimedia and its applications: Concepts of Text, Graphics, Animation, Audio, Images, Video. Multimedia Application in Education, Entertainment, Marketing. Names of common multimedia file formats,

#### **UNIT II:** Windows and Users Interface (Lab Work)

Windows operating System: Introduction and characteristics, Elements of GUI. Using Mouse, My Computer Icon, The Recycle Bin, Status Bar, Start and Menu & Menu-selection, Running an Application, Windows Explorer: Viewing of File, Folders and Directories Creating and Renaming of files and folders Opening and closing of different Windows, Windows Setting: Control Panels, Wall paper and Screen Savers Setting the date and Sound. Concept of menu, Using Help, Using right Button of the Mouse, Creating Short cuts, Basics of Window Setup, Notepad, Window Accessories

#### **UNIT III:** Word Processor Software (Lab Work)

Word processing concepts: Opening, Saving, Closing the file, Opening an existing document, Selecting text, Editing text, Finding and replacing text, printing documents, Creating and Printing Merged Documents, Character and Paragraph Formatting, Page Design and Layout. Editing and Profiling Tools: Checking and correcting spellings. Using Graphics, Tables, Charts, Document Templates and Wizards.

#### **UNIT IV:** Spreadsheet Software (Lab Work)

Spreadsheet Package Spreadsheet: Concept and Working Interface, Creating, Saving and Editing a Workbook, Inserting, Deleting Work Sheets, entering data in a cell / formula Copying and Moving from selected cells, handling operators in Formulae. Functions in Spreadsheet: Mathematical, Logical, statistical, text, financial, Date and Time functions, Using Function Wizard. Formatting a Worksheet and Cell: changing data alignment, changing date, number, character or currency format, changing font, adding

borders and colors. Printing worksheets, Charts and Graphs – Creating, Previewing, and Modifying Charts. Integrating word processor, spread sheets, web pages.

#### **UNIT V: Presentation Software (lab Work)**

Interface of the Presentation Package: Creating, Opening and Saving Presentations. Professional Look of the Presentation: Working in different Design & Views, Working with Slides. Formatting and Editing: Text, Image and Paragraph formatting, Checking Spelling and Correcting Typing Mistakes, Making Notes Pages and Handouts, Drawing and Working with Objects, Adding Clip Art and other pictures, Designing Slide Shows, Running and Controlling a Slide Show, Printing Presentations.

### **3. COURSE OUTCOME**

CO1. Gain in depth knowledge about the functioning of computers and its uses for managers

CO2. Learn to use Internet and its applications

CO3. Understand and implement Word processing software

CO4. Learn applications on Spread sheet software's

CO5. Analyse and learn Presentation software

### **4. SUGGESTED READINGS**

1. Nasib Singh Gill – Handbook of Computer Fundamentals, Khanna Publishing House, Delhi
2. Shrivastava-Fundamental of Computer & Information Systems (Wiley Dreamtech)
3. Leon A and Leon M - Introduction to Computers (Vikas, 1st Edition).
4. ITL ESL – Introduction to Information Technology (Pearson, 2nd Edition).
5. Introduction to Computers, Norton P. (TATA McGraw Hill)
6. Leon - Fundamentals of Information Technology, (Vikas)
7. Satish Jain-BPB's Computer Course Windows 10 with MS Office 2016 (BPB)
8. Linda Foulkes- Learn Microsoft Office 2019: A comprehensive guide to getting started with Word, PowerPoint, Excel, Access, and Outlook (Packt Publishing Limited)

## **BA 109 – BUSINESS COMMUNICATION & TECHNICAL WRITING LAB**

### **1. COURSE OBJECTIVES**

To enable the students to become aware of their communication skills and sensitize them to their potential to become successful managers

1. To introduce them to some of the practices in business communication that are in vogue
2. To help them acquire some of the necessary skills to handle day-to-day managerial responsibilities, such as
  - making speeches,
  - controlling one-to-one communication,

- enriching group activities and processes,
  - giving effective presentations,
  - writing letters, memos, minutes, reports and advertising and
  - maintaining one's poise in private and in public
3. To build their confidence and to install competitiveness by projecting a positive image of themselves and of their future.

## 2. COURSE CONTENT

### OVERVIEW OF BUSINESS COMMUNICATION

Understanding Business Communication: Concept of Business Communication concept, Models of Communication, Process of Communication, Principles of Communication, Characteristics of effective business communication, Barriers to communication environment and ways to overcome them, Communication and Ethics, Cross Cultural Communication

### CHANNELS OF COMMUNICATION AND LISTENING

Channels of communication, Types of communication: Verbal, Non-Verbal, Formal, Informal communication. Body Language, Listening: Importance of Listening, Types of Listening, Barriers to Listening and overcoming them, Listening situations, Developing Listening Skills

### BUSINESS WRITING

**Business Writing:** Fundamental of Business writing, Principles of Written Communication: 7 C.s of written communication. Types of Business letter: Inquiries, Claims, Invitations, Reservations and Orders, Refusal & Collection Letters, Sales Letters; Inter-office Memos; Circulars, Notices & Recommendation Letters.

### BUSINESS REPORTS

Business Reports and Proposals: Introduction, What is a Report, Steps in Writing a Routine Business Report, Parts of a Report, Corporate Reports, Business Proposals.

### RESUME WRITING

Careers and Resumes : Introduction, Career Building, Understanding yourself, setting a career goal, job search / looking at various options, preparing your resume, resume formats, traditional, electronic and video resumes, online recruitment process.

### VI SPOKEN ENGLISH AND INTERVIEWS

Spoken skills Conducting Presentation, Oral presentation, Debates, Speeches, Interview, Group Discussion, English Pronunciation, Building Vocabulary. Mastering the art of giving interviews in selection or placement interviews, discipline interviews, appraisal interviews and exit interviews

## 3. COURSE OUTCOME

On completion of this course, the students will be able to:

1. To distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization and to draft effective business correspondence with brevity and clarity.
2. To stimulate their Critical thinking by designing and developing clean and lucid writing skills.
3. To demonstrate his verbal and non-verbal communication ability through presentations.

#### **4. TEXT BOOKS**

1. Mishra. B, Sharma. S, Communication Skills for Engineers and Scientists. PHI Learning Pvt. Ltd. ISBN: 8120337190.
2. Chaturvedi P. D, Chaturvedi M., Business Communication: Concepts, Cases and Applications. Pearson Education India. ISBN: 8131718727.
3. Greenbaum. Sidney. College Grammar of English. Longman Publishers. ISBN: 9780582285972.

#### **5. REFERENCE BOOKS**

1. Pal, Rajendra and Korlahalli, J.S., Essentials of Business Communication. Sultan Chand & Sons. ISBN: 9788180547294.
2. Kaul, Asha, Effective Business Communication. PHI Learning Pvt. Ltd. ISBN: 9788120338487.
3. 3. Murphy, R., Essential English Grammar, CUP. ISBN: 8175960299.
4. 4. C. Muralikrishna and S. Mishra, Communication Skills for Engineers, Pearson education. ISBN: 9788131733844.

# **SYLLABUS OF MBA (BUSINESS ANALYTICS) – II SEMESTER 2023-24**

## **BA-201 BUSINESS ENVIRONMENT & LEGAL ASPECTS OF BUSINESS**

### **1. COURSE OBJECTIVES:**

- The basic objective of the course is to develop understanding and provide knowledge about business environment to the management students.
- To promote basic understanding on the concepts of Business Environment and international business environment.
- To provide basic understanding of law of contract
- To impart basic understanding of provisions of Companies Act concerning incorporation and regulation of business organizations.
- To appraise the students on the leading practical application oriented case studies – relevant and updated and analyzing case laws in arriving at conclusions facilitating business decisions.

### **2. COURSE CONTENT**

#### **Unit I**

Introduction to Micro Environment –

Meaning of Business & Business Environment,, Types of Business Organizations , SWOT analysis , Types of Environment-Internal to the Enterprise (Value System, Management Structure and Nature, Human Resource, Company Image and Brand Value, Physical Assets, Facilities, Research & Development, Intangibles, Competitive Advantage), External to the Enterprise , Micro- Suppliers, Customers, Market Intermediaries; Macro- Demography, Natural, Legal & Political, Technological,) Michael Porter’s Five Forces Analysis, Competitive Strategies

#### **Unit II**

Macro Cont: Economic, Socio-Cultural, Competitive & International Environment – Economy, Competition, Socio-cultural and International); Business Environment with reference to Global Integration; Comparative Analysis of Business Environment: India and Other Countries, Factors affecting international business environment, Business Policy :LPG model & International forces in business.

#### **UNIT- III**

Law of Contract: Definition, essentials and types of contracts, offer definition and essentials, acceptance – definition and essentials, consideration – definition and essentials, exceptions to the rule, no consideration, no contract, doctrine of privacy of contract, capacity of parties, free consent, quasi contract, legality of object, performance of contract, termination of contract, remedies for breach of contract.

Sale of Goods Act: Essentials, sale v/s agreement to sell. Condition v/s warranties, rights of unpaid seller



#### **UNIT IV**

Companies Act Definition, characteristics and kinds of companies, steps in formation of company. Memorandum of Association, Articles of Association, prospectus. Directors: appointment, power, duties and liabilities, meeting and resolutions: types of meetings. Auditor: appointment, rights and liabilities, modes of winding up of a company.

#### **UNIT V**

Consumer Protection Act: Definitions - Aims and objectives, Consumer protection councils, Redressal agencies and penalties for violation. The Information Technology Act: Definition, Digital Signature, Electronic Governance, Attribution, Acknowledgment and Dispatch of Electronic Records, Sense Electronic Records and Sense Digital Signatures, Regulation of Certifying Authorities, Digital Signature Certificates, Duties of Subscribers, Penalties and Offences.

#### **4. COURSE OUTCOME**

- CO1 Develop understanding and fundamental knowledge about business environment
- CO2 Develop understanding on the concepts of Business Environment and international business environment.
- CO3 Develop basic understanding of law of contract
- CO4 understanding of provisions of Companies Act concerning incorporation and regulation of business organizations
- CO5 Able to analyze case laws in arriving at conclusions facilitating business decisions.

#### **5. SUGGESTED READINGS**

1. Business Environment ---Francis Cherunilam, Himalaya Publishing House
2. Business Environment: Test and Cases , PAUL, Mc Graw Hill Education , 3rd Ed.
3. V. Neelamegam – Business Environment (Vrinda Publications , 2nd Edition)
4. Shaikh & Saleem - Business Environment (Pearson, 2nd Edition)
5. International Business Environment—Ian Brooks, Jamie Weatherstom and Graham Wilkinson
6. Kuchhal M.C. - Business Law (Vikas Publication)
7. Gulshan S.S. - Business Law Including Company Law (Excel Books)
8. N D Kapoor – Elements of Mercantile Law – Sultan Chand-2014.

### **BA-202 Data Mining Techniques – Predictive Modelling and Pattern Discovery- using R**

#### **1. COURSE OBJECTIVES**

- Understanding of data mining and its functions
- Understanding of classification, clustering algorithms
- To apply classification and clustering methods applicable to predictive analytics using R
- Understanding of how to formulate predictive analytics using R
- Understand pattern discovery using R

## 2. COURSE CONTENTS

### Unit 1

Data Mining: Overview, Motivation, Definition & Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning. : Missing Values, Noisy Data,(Binning, Clustering, Regression, Computer and Human inspection),Inconsistent Data, Data Integration and Transformation. Data Reduction:-Data Cube Aggregation, Dimensionality reduction, Data Compression.

### Unit 2

Classification: Definition, Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisons, Statistical measures in large Databases, Statistical-Based Algorithms, Distance-Based Algorithms, Decision Tree-Based Algorithms. Clustering: Introduction, Similarity and Distance Measures, Hierarchical and Partitional Algorithms. Hierarchical Clustering- CURE and Chameleon. Association rules: Introduction, Large Item sets, Basic Algorithms, Parallel and Distributed Algorithms, Neural Network approach

### Unit 3

Data Mining process- CRISP -DM Methodology, Data Collection and Business understanding, Data and Datasets, importing data into R, Data Preprocessing: Data Cleaning, Transforming variables, creating variables, Dimensionality Reduction, Modeling: Exploratory data analysis, dependency modeling using association rules, clustering, anomaly detection,

### Unit 4

Predictive analytics-Evaluation Metrics, Tree-Based Model, Support Vector Machines, Artificial Neural Networks and deep learning, Model Ensembles, Evaluation- The holdout and random subsampling, cross validation, bootstrap estimates, recommended procedures, reporting and deployment, Case Study.

### Unit 5

Transactional Dataset, Apriori Analysis, Generating Filtering Rules, Plotting, Sequential Dataset, Apriori Sequence Analysis, Understanding The Results, Business Cases

## 3. COURSE OUTCOME:

CO1: Understanding of data mining and its functions

CO2: Understanding of classification, clustering algorithms

CO3: To apply classification and clustering methods applicable to predictive analytics using R

CO4: Understanding of how to formulate predictive analytics using R

CO5: Understand pattern discovery using R

## 4. TEXT BOOKS :

1. Data Mining with R: Learning with Case Studies, Luís Torgo, Chapman and Hall/CRC; 2 edition

## **5. REFERENCE BOOKS:**

1. R Data Mining: Implement data mining techniques through practical use cases and real world datasets, Andrea Cirillo, Packt Publishing; 1 edition
2. R Data Science Essentials, By Raja B. Koushik, Sharan Kumar Ravindran, Packt Publishing

## **BA-203 BUSINESS RESEARCH METHODS**

### **1. COURSE OBJECTIVES**

1. Understand the concept / fundamentals of research and their types.
2. Understand the practical application of various research techniques.
3. Understand the importance of scaling & measurement techniques and sampling techniques
4. Understand the importance of coding, editing, tabulation and analysis in doing research.
5. Understanding and applying the concept of statistical analysis which includes ANOVA technique and technique of report writing.

### **2. COURSE CONTENTS**

#### **Unit 1**

Research: – Definition, Meaning, Importance types and Qualities of Research; Research applications in functional areas of Business, Emerging trends in Business research.

Research & the Scientific Method: Characteristics of scientific method. Steps in Research Process

, Concept of Scientific Enquiry: – Formulation of Research Problem – Management Question – research Question – Investigation Question , Research Proposal – Elements of a Research Proposal, Drafting a Research Proposal, evaluating a research proposal.

#### **Unit 2**

Research design: Concept, Features of a good research design, Use of a good research design; Qualitative and Quantitative research approaches, Comparison – Pros and Cons of both approaches., Exploratory Research Design: Concept, Types: Qualitative techniques – Projective Techniques, Depth Interview, Experience Survey, Focus Groups, Observation.

Descriptive Research Designs: Concept, types and uses. Concept of Cross-sectional and Longitudinal Research , Experimental Design: Concept of Cause, Causal relationships, Concept of Independent & Dependent variables, concomitant variable, extraneous variable, Treatment, Control group.

#### **Unit 3**

Scaling & measurement techniques: Concept of Measurement: Need of Measurement; Problems in measurement in management research – Validity and Reliability. Levels of measurement – Nominal, Ordinal, Interval, Ratio. Attitude Scaling Techniques: Concept of Scale – Rating Scales viz. Likert Scales,

Semantic Differential Scales, Constant Sum Scales, Graphic Rating Scales – Ranking Scales – Paired comparison & Forced Ranking – Concept and Application.

#### **Unit 4**

Sampling: Basic Concepts: Defining the Universe, Concepts of Statistical Population, Sample, Characteristics of a good sample. Sampling Frame (practical approach for determining the sample frame expected), Sampling errors, Non Sampling errors, Methods to reduce the errors, Sample Size constraints, Non Response., Probability Sample: Simple Random Sample, Systematic Sample, Stratified Random Sample, Area Sampling & Cluster Sampling. , Non Probability Sample: Judgment Sampling, Convenience Sampling, Purposive Sampling, Quota Sampling & Snowballing Sampling methods. Determining size of the sample – Practical considerations in sampling and sample size, sample size determination.

#### **Unit 5**

Data Analysis: Editing, Coding, Tabular representation of data, frequency tables, Construction of frequency distributions, Graphical Representation of Data: Appropriate Usage of Bar charts, Pie charts, Histogram.

Hypothesis: Qualities of a good Hypothesis –Framing Null Hypothesis & Alternative Hypothesis. Concept of Hypothesis Testing – Logic & Importance. Analysis of Variance: One way and two way Classifications.

Mechanism of Report Writing- Report Preparation: Types, Report Structure: preliminary section, main report, interpretation of results, suggestions and recommendations, limitations of the study, Report formulation.

### **3.COURSE OUTCOME**

- CO1. Knowledge of concept / fundamentals for different types of research.
- CO2. Applying relevant research techniques.
- CO3. Understanding relevant scaling & measurement techniques and should use appropriate sampling techniques
- CO4. Synthesizing different techniques of coding, editing, tabulation and analysis in doing research.
- CO5. Evaluating statistical analysis which includes ANOVA technique and prepare research report.

### **4.SUGGESTED READINGS**

1. Research Methodology, Deepak Chawla, Neena Sondhi, Vikas Publication
2. Business Research Methods, Naval Bajpai, Pearson Education
3. Research Methodology, C R Kothari, New Age International.
4. Business Research Methods by Donald Cooper & Pamela Schindler, TMGH, 9th Edition.  
Business Research Methods by Alan Bryman & Emma Bell, Oxford University Press, 2nd Edition.
5. Business Research Methods by T N Srivastava & Shailaja Rao, TMH Publication, 2nd Edition

## **BA-204 FINANCIAL MANAGEMENT AND CORPORATE FINANCE**

**1. COURSE OBJECTIVES:** This course is intended to introduce the basic theory, concepts and practical applications in corporate finance and to enable students to analyse various corporate decisions. The course objectives are outlined below:

- 1) To understand the fundamentals, various models and agency problems of Corporate Finance.
- 2) To acquire knowledge about various techniques used for analysing various long-term projects.
- 3) To have an understanding about various capital structure techniques and selecting best source of finance.
- 4) To have an understanding of various dividend models and its applicability.
- 5) To acquaint students about corporate valuation in mergers and acquisitions.

## **2. COURSE CONTENT**

### **UNIT I**

Introduction to Finance & Corporate Finance: Corporate Finance & its scope, Corporate Governance and Agency Problem, Corporate valuation Models: Asset Based Valuation Model, Earning based Valuation Model, Cash flow-based Model, CAPM Model, APT, EVA Analysis, 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, Cash Flows as Profit and components of Cash Flows, Capital Budgeting Decisions, Calculation of NPV and IRR, Excel Application in Analysing Projects.

### **UNIT III**

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

### **UNIT IV**

Dividend Relevance: Factors affecting Dividend Policy, Forms of Dividends, Types of Dividend Policies, Dividend Models: Walter and Gordon Model, Miller- Modigliani (MM) Hypothesis.

### **UNIT V**

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.

### **3.COURSE OUTCOME**

- CO1 Understand the different basic concept / Models of Corporate Finance and Governance
- CO2 Understand the practical application of time value of money and evaluating long term investment decisions
- CO3 Develop analytical skills to select the best source of capital, structure and leverage.
- CO4 Understand the use and application of different models for firm's optimum dividend pay-out.
- CO5 Understand the recent trends of mergers and acquisition and its valuation

### **4.SUGGESTED READINGS**

1. Khan and Jain - Financial Management (Tata McGraw Hill, 7th Ed.)
2. Pandey I M - Financial Management (Vikas, 11th Ed.)
3. William Hakka Bettner Carcello- Financial and Management Accounting (TMH-16th Ed.)
4. Sheebakapil- Fundamental of financial management (Wiley, 2015)
5. Prasanna Chandra - Fundamentals of Financial Management (TMH, 9th Ed.)
6. Bark Demazo Thampy- Financial Management (Pearson, 2nd Ed.)
7. R P Rustagi - Financial Management (Galgotia, 2000, 2nd revised ed.)
8. Damodaran, A., Applied Corporate Finance, 3rd Edition, Wiley, 2012
9. Ravi.M Kishore – Financial Management (Taxman, 7th Ed)
10. Fundamentals to Financial Management, Brigham & Houston, 14/e, Cengage Learning
11. Van Horne - Financial Management and Policy (Prentice hall, 2003, 12th Ed.)

## **BA-205 OPERATIONS MANAGEMENT**

### **1. COURSE OBJECTIVES**

- To understand the role of Operations in overall Business Strategy of the firm.
- To understand the application of operations management policies and techniques to the servicesector as well as manufacturing firms.
- To identify and evaluate the key factors and their interdependence of these factors in the design of effective operating systems.
- To understand the trends and challenges of Operations Management in the current business environment.
- To familiarize the students with the techniques for effective utilization of operational resources and managing the processes to produce good quality products and services at competitive prices.

## 2. COURSE CONTENT

### UNIT –I Production Concepts:

Introduction, meaning, nature and scope of production and operations management. Difference between production and operations management. Productivity, factors affecting productivity and productivity measurement. Work study—Method study and work measurement. Production Technology – Types of manufacturing processes. Plant location and types of plant layout.

### UNIT –II Operations Concepts:

Services scenario in India, difference between product and service, characteristics of services, classification of services, product and service design, factors affecting service design, service designing process, service blueprinting, service capacity planning. Dimensions of quality in services, understanding service quality gap, measuring service quality using SERVQUAL model. Case Studies

### UNIT-III Material and Inventory Management:

Types of production planning, process of production planning and control (PPC) – routing, scheduling and loading. Master production schedule, aggregate production planning. Types of inventories, inventory control techniques- EOQ, ABC, VED, FSN, HML and SDE (Simple numerical problems on Inventory control techniques). Just-in-time (JIT) and KANBAN. Case Studies

### UNIT-IV Supply Chain Management:

Overview of supply chain management, conceptual model of SCM, supply chain drivers, measuring supply chain performance, core and reverse supply chain, global supply chain, inbound and outbound logistics, Bullwhip effect in SCM, push and pull systems, lean manufacturing, agile manufacturing, role of IT in SCM. Demand forecasting in supply chain— Simple moving average method, weighted moving average method, linear regression and exponential smoothing method. Case Studies

### UNIT-V Productivity and Quality:

TQM, Deming's 14 principles, Juran's quality trilogy, PDCA cycle, KAIZEN, quality circles, 7QC tools and its 7 new management tools, ISO 9000-2000 clauses, six sigma, Total Productive Maintenance (TPM), 5S. Case Studies

## 3. COURSE OUTCOME

CO1 Understand the role of Operations in overall Business Strategy of the firm - the application of OM policies and techniques to the service sector as well as manufacturing firms.

CO2 Understand and apply the concepts of Material Management, Supply Chain Management and

TQM perspectives.

CO3 Identify and evaluate the key factors and their interdependence of these factors in the design of effective operating systems.

CO4 Analyze / understand the trends and challenges of Operations Management in the current business environment.

CO5 Apply techniques for effective utilization of operational resources and managing the processes to produce good quality products and services at competitive prices

#### **4. SUGGESTED READINGS:-**

1. Aswathappa, K. & Bhat, K.S.-- Production and Operations Management (Himalaya Publishing House, 2nd Edition)
2. Chase, R.B., Shankar, R. & Jacobs, F.R. -- Operations & Supply Chain Management (Tata McGraw Hill, 14th Edition)
3. Chunawalla, S.A. & Patel, D.R. – Production & Operations Management (Himalaya Publishing House, 9th Edition)
4. Chary, S.N. -- Production and Operations Management (Tata McGraw Hill, 6th Edition)
5. Charantimath, P.M. – Total Quality Management (Pearson Education, 3rd Edition)
6. Bedi, Kanishka – Production & Operations Management (Oxford University Press, 3rd Edition)
7. Adam, Everett E. & Ebert, Ronald J. – Production and Operations Management (Prentice Hall, 5th Edition)
8. Gopalakrishnan, P. & Sundaresan, M. – Materials Management (Prentice Hall of India)

### **BA-206 QUANTITATIVE TECHNIQUES FOR MANAGER**

#### **1. COURSE OBJECTIVES**

- Understand the importance of the use of OR application in decision Making environment
- To formulate LPP and Obtain Graphical Solutions & Acquire General idea of the Simplex method.
- To understand and solve transportation & assignment models.
- To know optimal sequence model and understand concepts of queuing theory.
- To identify right time for replacement of equipment and understand project management techniques



## 2. COURSE CONTENTS

### Unit I Operations Research & Decision Making Environments

Operations Research:- Uses, Scope and Applications of Operation Research in managerial decision making .*Decision-making environments*:- Decision-making under certainty, uncertainty and risk situations; Decision tree approach and its applications.

### Unit II Linear Programming Problem & Transportation Problem

*Linear programming*: Mathematical formulations of LP Models for product-mix problems; graphical and simplex method of solving LP problems; duality.

*Transportation problem*: Various methods of finding Initial basic feasible solution-North West Corner Method, Least Cost Method & VAM Method and optimal solution-Stepping Stone & MODI Method, Maximization Transportation Problem

### Unit III Assignment model & Game Theory

*Assignment model*: Hungarian Algorithm and its applications, Maximization Assignment Problem.

*Game Theory*: Concept of game; Two-person zero-sum game; Pure and Mixed Strategy Games; Saddle Point; Odds Method; Dominance Method and Graphical Method for solving Mixed Strategy Game.

### Unit IV Sequencing & Queuing Theory

Sequencing Problem: Johnsons Algorithm for n Jobs and Two machines, n Jobs and Three Machines, Two jobs and m - Machines Problems.

*Queuing Theory*: Characteristics of M/M/I Queue model; Application of Poisson and Exponential distribution in estimating arrival rate and service rate; Applications of Queue model for better service to the customers.

### Unit V Replacement Problem & Project Management

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.

## 3.COURSE OUTCOMES

- Be able to understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type.
- To formulate linear programming problem and to find optimal solution by graphical simplex method.
- Be able to build and solve Transportation Models and Assignment Models also to solve game theory problems by understanding pure and mix strategies.
- To assign optimal sequence of different jobs on different machines and develop understanding of queuing theory concepts.
- To implement replacement of equipments at right time and able to implement project management concepts like CPM, PERT to reduce cost and time.

## **4.SUGGESTED READINGS**

1. R. Panneerselvam - Operations Research ( PHI, 2<sup>nd</sup> Edition)
2. Sharma J K - Operations Research (Pearson, 3rd Edition)
3. Apte-Operation Research and Quantitative Techniques (Excel Books)
4. S Kalawathy-Operation Research (Vikas IVth Edition)
5. Natarajan- Operation Research(Pearson)
6. Singh & Kumar—Operation Research(UDH Publisher edition 2013)
7. Taha Hamdy - Operations Research - An Introduction (Prentice-Hall, 9th edition)
8. Vohra - Quantitative Techniques in Management (Tata McGraw-Hill, 2nd)
9. Kothari - Quantitative Techniques (Vikas 1996, 3rd Edition).

## **BA-207 INTRODUCTION TO PYTHON**

### **1.COURSE OBJECTIVE**

- Understand fundamentals of Python and Jupyter Notebook.
- Understand the data structure, dataframes and Pandas Idioms
- Knowledge of Natural Language Processing and learning algorithm for machine learning
- Understanding of Image and Pattern Recognition

### **2.COURSE CONTENTS**

#### **Unit 1**

Introduction of Python, Jupyter Notebook, Python Functions, Python Types and Sequences, Python More on Strings, Reading and Writing CSV files

#### **Unit 2**

Advanced Python Objects, map(), Numpy, Pandas, Visualization DataMatplotlib, Bar Charts, Line Charts, Scatterplots

#### **Unit 3**

The Series Data Structure, Querying a Series, The DataFrame Data Structure, DataFrame Indexing and Loading, Querying a DataFrame, Indexing Dataframes, Merging Dataframes

#### **Unit 4**

Data Aggregation and Group Operations, Time Series, Date and Time Data Types and Tools, Time Series Basics, Date Ranges, Frequencies, and Shifting, Time Zone Handling, Periods and Period Arithmetic, Resampling and Frequency Conversion, Time Series Plotting, Moving Window Functions

### **Unit 5**

Natural Language Processing, Image Processing, Machine Learning K Nearest Neighbors Algorithm for Classification, Clustering

### **3.COURSE OUTCOMES**

CO1: Students will be able to understand fundamentals of Python and Jupyter Notebook.

CO2: Students would be able to understand the data structure, data frames and Pandas Idioms.

CO3: Understand date time functions in python

CO4: The students would be able to understand and apply Natural Language Processing and learning algorithm for machine learning techniques.

CO5: Understand Image Processing and Pattern Recognition.

### **4.Text Books:**

1. Learning Python, 5<sup>th</sup> Edition by Mark Lutz, O'reilly
2. Mastering Apache Spark 2.x - Second Edition, by Romeo Kienzler, Packt Publishing Ltd.

### **5.Reference Books:**

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

## **BA-208 SEMINAR ON CONTEMPORARY ISSUES**

### **1.COURSE OBJECTIVES**

1. Describe, discuss and critically reflect upon selected contemporary issues in different disciplines of business management.
2. Identify and summarize the major practical implications of the selected issues for organizations as well as for society at large.
3. Independently identify relevant contemporary issues in management as well as gathering scientific knowledge and present the report.

## **2.COURSE CONTENTS**

The exact themes for emphasis will alter as contemporary issues change. Some of the themes that might be focused upon are:

- Talent management
- Organizational learning and knowledge management
- Cross-cultural management
- Managing diversity
- Creative processes and innovation
- Mergers and Acquisitions
- Recent trends in Marketing
- Current Economic Issues
- Stock Market Development
- Other related and relevant themes may be chosen by the student in consultation with the faculty member

### **Subject Instructions**

The course consists of several different forms of learning opportunities, including lectures, seminars and presentations. The composition of the learning environment is naturally used as an important asset in the discussion of the contemporary issues in management from a global perspective.

The faculty members will assign contemporary issues concerning with Business World. The student will prepare seminar under guidance of faculty members to be allotted by the Director/ Head/ Principal of the institute. The student will submit written report and make an oral presentation before a panel of internal examiner (Director/ Head/ Principal of the institute or his or her nominee) and External examiner (to be appointed by Director/ Head/ Principal of the institute from a panel proposed by the Board of Studies and approved by the Vice Chancellor of Bikaner Technical University (BTU). The assessment of the report and its presentation will be jointly done by the internal and external examiner.

## **2. COURSE OUTCOMES**

1. Identify and critically evaluate contemporary issues in business world.
2. Express qualified opinions and question traditional approaches of the business and industry.
3. Synthesis new ideas and evaluate implications on the approaches of business and industry.

## **BA-209 IT SKILLS LAB-2**

### **1.COURSE OBJECTIVE**

- To develop pivot table and understand the validating & auditing techniques
- To understand different charting techniques in MS Excel
- To understand different formatting techniques in MS

### **2.COURSE CONTENTS**

#### **Unit I ( Lab work on spreadsheet )**

Pivot Table: Developing Pivot Table, Analyzing data using goal seek and solver, Scenarios Create named scenarios. Show, edit, delete scenarios, Creating a scenario summary report. Validating and Auditing: Set, edit validation criteria for data entry in a cell range like: whole number, decimal, list, date, time, Trace precedent, dependent cells. Identify cells with missing dependents. Creating applications in Spreadsheet and Macros.

#### **Unit II ( Lab work on spreadsheet)**

Creating and formatting Charts: Understanding chart types, column chart, bar chart, line chart, pie chart, XY Scatter chart, Area chart, surface chart, bubble chart. Create a combined chart like: column and line, column and area. Change the chart type for a defined data series, delete a data series in a chart, Re-position chart title, legend, data labels. Change scale of value axis: minimum, maximum number to display, major interval. Change display units on value axis without changing data source: hundreds, thousands, millions. Format columns, bars, pie slices, plot area, chart area to display an image.

#### **References**

Excel Data Analysis: Modeling and Simulation, Hector Guerrero (Springer )

### **3.COURSE OUTCOME**

- CO1. To gain knowledge of pivot table and understand the validating & auditing techniques
- CO2. Learn to use different charting techniques in MS Excel
- CO3. Learn to use different formatting techniques in MS Excel

# SYLLABUS OF MBA (BUSINESS ANALYTICS) – III SEMESTER 2024-25

## BA-301 STRATEGIC MANAGEMENT

### 1.Course Objectives

1. A clear understanding of the key concepts and principles of strategic management
2. A set of useful analytical skills, tools and techniques for analyzing a company strategically
3. To provide a basic understanding of the nature and dynamics of the strategy formulation and implementation processes.
4. To encourage students to think critically and strategically.
5. The ability to identify strategic issues and design appropriate courses of action.

### 2.COURSE CONTENTS

#### UNIT 1

**Introduction:** meaning nature, scope, and importance of strategy; Model of strategic management, Strategic Decision Making Process. **Corporate Governance:** Composition of the board, Role and Responsibilities of the board of directors, Trends in corporate governance, Corporate Social Responsibility

#### UNIT 2

**Environmental Scanning:** *Understanding the Macro Environment:* PESTEL Analysis, Industrial Organization (IO) & the Structure Conduct Performance (SCP) approach, Porter's Five Forces Model, *Understanding the Micro Environment:* Resource Based View (RBV) Analysis, VRIO Framework, Using resources to gain Competitive advantage & its sustainability, Value Chain Analysis

#### UNIT 3

**Strategy Formulation:** Situational Analysis using SWOT approach **Business Strategies:** Competitive **Strategy:** - Cost Leadership, Differentiation & Focus, Cooperative **Strategy:** - Collusion & Strategic Alliances

**Corporate Strategies:** Directional **Strategy:** Growth strategies, Stability Strategies & Retrenchment Strategies. Corporate Parenting **Functional Strategies:** Marketing, Financial, R&D, Operations, Purchasing, Logistics, HRM & IT. *The sourcing decision:* Outsourcing & offshoring

#### Unit 4

**Strategy Choice and Analysis:** Scenario Analysis Process, Tools & Techniques of strategic Analysis: BCG Matrix, Ansoff Grid, GE Nine Cell Planning Grid, McKinsey's 7'S framework

**Strategy implementation:** Developing Programs, Budget and Procedures, Stages of Corporate Development, Organizational Life cycle, *Organizational Structures:* Matrix, Network &

Modular/Cellular; Reengineering and Strategy implementation, Leadership and corporate culture,

## Unit 5

**Strategy Evaluation & Control:** Evaluation & Control process, *Measuring performance:* types of controls, activity based costing, enterprise risk management, primary measures of corporate performance, balance scorecard approach to measure key Performance, responsibility centers, Benchmarking, Problems in measuring Performance & Guidelines for proper control. Strategic Audit of a Corporation

### 3.COURSE OUTCOME

- CO1.** Formulate organizational vision, mission, goals, and values.
- CO2.** Develop strategies and action plans to achieve an organization's vision, mission, and goals.
- CO3.** Develop powers of managerial judgment, how to assess business risk, and improve ability to make sound decisions and achieve effective outcomes.
- CO4.** Evaluate and revise programs and procedures in order to achieve organization goals
- CO5.** Consider the ethical dimensions of the strategic management process

### 4.SUGGESTED READINGS

1. Wheelen, L. Thomas and Hunger, David J.; Concepts in Strategic Management and Business Policy, Pearson Education,
2. Stewart Clegg, Chris Carter, Martin Kornberger & Jochen Schweitzer : Strategy - Theory and Practice 3<sup>rd</sup> Ed.(SAGE Publishing India)
3. Kazmi, Azhar; Business Policy and Strategic Management; McGraw-Hill Education. David, Fred; Strategic Management: Concepts and Cases; PHI Learning.
4. Thomson, Arthur A. and Strickland, A. J.; Strategic Management: Concept and Cases; McGraw Hill Education,
5. Jauch, L.F., and Glueck, W.F.; Business Policy and Strategic Management; McGraw-Hill Education,

## BA-302 AI AND MACHINE LEARNING FOR BUSINESS

### 1. COURSE OBJECTIVES:

1. To understand the need of Machine Learning & Statistics for solving various problems
2. To understand the basic concepts of Supervised and Unsupervised learning.
3. To apply regression analysis on the data available.
4. To design appropriate machine learning and apply on real world problems
5. To optimize different Machine Learning & Deep Learning Techniques

## **2.COURSE CONTENT**

### **UNIT 1: Artificial Intelligence for Business Planning**

Introduction and Data sources for AI, Knowledge acquisition, Knowledge representation, History of ML, Framework for building ML Systems-KDD process mode, Introduction of Machine Learning Approaches – (Artificial Neural Network, Clustering, Reinforcement Learning, Decision Tree Learning, Bayesian networks, Support Vector Machine, Genetic Algorithm), Issues in Machine Learning, Data Science Vs. Machine Learning.

### **UNIT 2: Supervised Learning and Applications**

Supervised Learning: Introduction to classification, Linear Regression, Metrics for evaluating linear model, Multivariate regression, Non-Linear Regression, K-Nearest Neighbor, Decision Trees, Logistic Regression, Support Vector Machines, Model Evaluation, Applications of supervised learning in multiple domains Application of supervised learning in solving business problems such as pricing, customer relationship management, sales and marketing.

### **UNIT 3: Unsupervised Learning algorithms**

Unsupervised Learning: Clustering, Hierarchical clustering, Partitioning Clustering- K-mean clustering, Density Based Methods DBSCAN, OPTICS, Applications of unsupervised learning in multiple domains, Association rules: Introduction, Large Item sets, Apriori Algorithms and applications

### **UNIT 4: Artificial Neural Networks & Deep Learning**

Perceptron model, Multilayer perceptron, Gradient descent and the Delta rule, Multilayer networks, Back propagation Algorithm,

DEEP LEARNING - Introduction, concept of convolutional neural network, Types of layers – (Convolutional Layers, Activation function, pooling, fully connected), Concept of Convolution (1D and 2D) layers, Training of network, Recent Applications

### **UNIT 5: Reinforcement Learning**

Introduction to Reinforcement Learning , Learning Task, Example of Reinforcement Learning in Practice, Learning Models for Reinforcement – (Markov Decision process , Q Learning - Q Learning function, Q Learning Algorithm), Application of Reinforcement Learning, Introduction to Deep Q Learning.

## **3.COURSE OUTCOME**

- To understand the need of Machine Learning & Statistics for solving various problems
- To understand the basic concepts of Supervised and Unsupervised learning
- To apply regression analysis on the data available.
- To design appropriate machine learning and apply on real world problems
- To optimize different Machine Learning & Deep Learning Techniques



#### **4.REFERENCE BOOKS**

1. Artificial Intelligence for Business Leaders: Ajit Kr. Jha
2. Machine Learning in Business: John C. Hull
3. An Introduction to Statistical Learning with Applications in R : James, G., Witten, D., Hastie, T., Tibshirani, R. (Springer)
4. Artificial Intelligence Business Applications: How to Learn Applied Artificial Intelligence and Use Data Science for Business. Includes Data Analytics, Machine Learning for Business and Python : William J Ford
5. AI and Machine Learning: Was Rahman, SAGE Publishing India

### **BA-303 UNIVERSAL HUMAN VALUES AND PROFESSIONAL ETHICS**

#### **1. COURSE OBJECTIVES**

1. To impart Human Value Education to the students and make them aware about their Natural Acceptance.
2. To teach students to live in harmony at all levels like-Self, Family, society and Nature
3. To make students aware about the concept of existence is co-existence.

#### **2. COURSE CONTENT**

**NEED, BASIC GUIDELINES, CONTENT AND PROCESS FOR VALUE EDUCATION** Understanding the need, basic guidelines, Self Exploration - its content and process; „Natural Acceptance“ and Experiential Validation, Continuous Happiness and Prosperity- Human Aspirations, Right understanding, Relationship and Physical Facilities, Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario. Method to fulfill the above human aspirations: understanding and living in harmony at various levels

#### **UNDERSTANDING HARMONY IN THE HUMAN BEING - HARMONY IN MYSELF**

Understanding human being as a co-existence of the sentient „I“ and the material „Body“  
Understanding the needs of Self („I“) and „Body“ - Sukh and Suvidha  
Understanding the Body as an instrument of „I“, Understanding the characteristics and activities of „I“ and harmony in „I“  
Understanding the harmony of I with the Body: Sanyam and Swasthya;  
correct appraisal of Physical needs, meaning of Prosperity in detail, Programs to ensure Sanyam and Swasthya.

#### **UNDERSTANDING HARMONY IN THE FAMILY AND SOCIETY- HARMONY IN HUMAN-HUMAN RELATIONSHIP**

Understanding harmony in the Family, Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) , meaning of Vishwas; Difference between intention and competence, meaning of Samman, Difference between respect and differentiation; the other salient values in relationship, harmony in the society , Samadhan, Samridhi, Abhay, Sahastitva as comprehensive Human Goals , Visualizing a universal harmonious order in society- Undivided Society (AkhandSamaj), Universal Order (SarvabhaumVyawastha )- from family to world family.

### **UNDERSTANDING HARMONY IN THE NATURE AND EXISTENCE - WHOLE EXISTENCE AS COEXISTENCE**

Understanding the harmony in the Nature. Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature. Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all pervasive Space. Holistic perception of harmony at all levels of existence

### **IMPLICATIONS OF THE ABOVE HOLISTIC UNDERSTANDING OF HARMONY ON PROFESSIONAL ETHICS. NATURAL ACCEPTANCE OF HUMAN VALUES**

Definitiveness of Ethical Human Conduct. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in Professional Ethics: a) Ability to utilize the professional competence for augmenting universal human order, b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems, technologies and management models. Strategy for transition from the present state to Universal Human Order: At the level of individual: as socially and ecologically responsible engineers, technologists and managers. Case studies related to values in professional life and individual life.

### **3. COURSE OUTCOMES**

Upon successful completion of the course, the students will be able to:

- CO1: Recognize the need and importance of value education
- CO2: Understand harmony in human being (with body & self)
- CO3: Understand harmony in family and society
- CO4: Understand harmony in nature & learn how to implement these values in their real life and engineering
- CO5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

### **4. TEXT AND REFERENCE BOOKS**

1. R. R. Gaur, R Sangal, G P Bagaria, A Foundation Course in Human Values and Professional Ethics, Excel Books, 2009. ISBN: 978-9-350-62091-5
2. R. Subramanian, Professional Ethics includes Human Values, Oxford Univ. Press.
3. A. N. Tripathy, 2003, Human Values, New Age International Publishers.
4. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including

- Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.
5. B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books.
  6. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.

## **BA-304 SUPPLY CHAIN ANALYTICS**

### **1. COURSE OBJECTIVE**

- Understanding of global supply chain design and bullwhip effect
- Understanding of supply chain profitability and risk pooling
- Understanding of forecasting and effect of forecasting errors
- Understanding of supply chain coordination and supply contracts
- Understanding of supply chain relationship management.

### **2. COURSE CONTENTS**

#### **Unit 1**

Linking supply chain strategy with corporate strategy, Global Supply Chain Design, Supply Chain Restructuring, Supply Chain Metrics. Bullwhip Effect: Demand-Supply mismatch, causes of bullwhip effect – order, synchronization, order batching, trade promotions and forward buying, and shortage gaming.

#### **Unit 2**

Supply Chain Profitability: Factors affecting supply chain profit, Demand-supply, mismatch and role of inventory, Price discounts, News vendor model and optimal order quantity, Risk Pooling.

#### **Unit 3**

Forecasting and effect of forecast errors, Collaborative forecasting, Postponement and, Quick response system, Vendor managed Inventory, Pricing and revenue management.

#### **Unit 4**

Supply Chain Coordination: Concept of double marginalization, Supply Contracts – buy, back contract, revenue sharing contract, quantity flexibility contract.

#### **Unit 5**

Supply Chain Relationship Management: Importance of relationship management in SC, Supplier relationship management, Purchasing portfolio models, Customer relationship management, Relationship management frameworks

### 3. COURSE OUTCOME

CO1. Understanding of global supply chain design and bullwhip effect

CO2. Supply chain profitability and risk pooling

CO3. Forecasting and effect of forecasting errors

CO4. Supply chain coordination and supply contracts

CO5. Supply chain relationship management.

### 4. SUGGESTED READINGS:

- Chopra, S., P. Meindl, D.V. Kalra, Supply Chain Management: Strategy, Planning, Operations, Pearson India, New Delhi.
- Cachon, G.P., C. Terwiesch, Matching Supply with Demand: An Introduction to Operations Management, Tata McGraw Hill, New Delhi.

## BA-305 MARKETING ANALYTICS

### 1. COURSE OBJECTIVES

- To understand the basic concepts of Marketing Analytics
- To study various tools to have marketing insights in various marketing areas through empirical data
- To interpret the marketing data for effective marketing decision making
- To draw inferences from data in order to answer descriptive, predictive, and prescriptive questions relevant to marketing managers

### 2. COURSE CONTENTS

#### Unit -1: Introduction to marketing Analytics

Meaning, characteristics, advantages and disadvantages of marketing analytics, Market Data Sources (Primary and Secondary). **Market Sizing:** Stakeholders, Applications & Approaches (Top-down and Bottom-up), PESTLE Market Analysis, Porter Five Force Analysis

#### Unit-2: Pricing Analytics

Pricing Policy and Objectives, **Estimating Demand:** Price Elasticity, Estimating Linear and Power Demand Curves, Optimize Pricing, Incorporating Complementary Products, Pricing using Subjective Demand Curve, Pricing Multiple Products,

**Price Bundling & Nonlinear Pricing:** Pure Bundling & Mixed Bundling, Determine Optimal Bundling Pricing, Profit Maximizing strategies using Nonlinear Pricing Strategies, Price Skimming & Sales, **Revenue Management:** Markdown Pricing and Handling Uncertainty

#### Unit-3: Sales Forecasting

Introduction, Simple Linear Regression & Multiple Regression model to forecast sales, Forecasting in Presence of Special Events, Modeling trend and seasonality; Ratio to moving average forecasting

method, Using S curves to Forecast Sales of a New Product

#### **Unit-4: Customer Analytics**

**Customer Lifetime Value:** Concept, Basic Customer Value, Measuring Customer Lifetime value, Estimating Chance that customer is still active, Using Customer Value to value a business

**Market Segmentation :** The segmentation-targeting-positioning (STP) framework, Segmentation, The concept of market segmentation, managing the segmentation process, Deriving market segments and describing the segments using Cluster analysis,

#### **Unit-5: Retailing & Advertising Analysis**

**Market Basket analysis:** Computing two way and three way lift, RFM Analysis, **Allocating Retail Space and Sales Resources:** Identifying the sales to marketing effort relationship & its modeling, optimizing sales effort

**Advertising Analysis:** Measuring the Effectiveness of Advertising, Pay per Click (PPC) Online Advertising

### **3. Course Outcome**

**CO1.** Students will develop the skill in marketing analytics

**CO2.** Students will be acquainted with better understanding of real life marketing data and its analysis

**CO3.** Students will develop analytical skill for effective market decision making in real life environment.

### **4. SUGGESTED READINGS:**

1. Marketing Analytics: Data-Driven Techniques with Microsoft Excel by Wayne L
2. Winston Wiley India Pvt. Ltd.
3. Marketing Analytics: Strategic Models and Metrics by Stephan Sorger, Create
4. Space Publishing
5. Marketing Engineering and Analytics by Gary Lilen, Arvind Rangaswamy, and Arnaud De Bruyn, Decision Pro, Inc.
6. Marketing Metrics by Dugar Anurag, SAGE Publishing India

## **BA-306 SIMULATION MODELLING**

### **1. COURSE OBJECTIVES**

The course enables students to:

1. To study and develop the concepts, techniques, tools for modeling and simulation models.
2. To study the various aspects of discrete and stochastic systems modeling and conducting the experiments with the simulation models.
3. To understand the concept in modeling and simulation

## 2. COURSE CONTENTS

### UNIT

**Introduction:** Introduction to simulation, Discrete and Continuous simulation, Simulation models, Types of Models, Steps in Simulation study.

### UNIT 2

**Random Numbers:** Properties of Random Numbers, Generation of Random number, Testing for Random numbers, Techniques for generating Random Numbers, Random Variate Generation.

### UNIT3

**Analysis the Input Modeling:** Data collection, Identification and distribution with data, parameter estimation, Goodness of fit tests, Selection of input models without data, Multivariate and time series analysis.

### UNIT4

**Analysis the Output Modeling:** Stochastic Nature of output data, Measures of Performance and their estimation, Output analysis of terminating simulation, Output analysis of steady state simulations.

### UNIT5

**Analysis the Verification and Validation:** Model Building – Verification of Simulation Models – Validation of Simulation Models.

**Languages and Applications:** Simulation Languages and Simulators – Simulation of Queuing system – Simulation of Inventory system –Simulation of Manufacturing.

## 3. COURSE OUTCOMES

At the end of the Course students will be able to:

- CO1 Understand the basic concepts in modeling and simulation.
- CO2 Understand the Random Numbers.
- CO3 Analysis the Input Modeling.
- CO4 Analysis the Output Modeling.
- CO5 Analysis the Verification and Validation.
- CO6 Understand the Simulation Languages and Applications.

## 4. REFERENCE BOOKS

1. Averill, M. L. and David, W. K., Simulation Modeling and Analysis, 3rd Edition, McGraw Hill, 2000.
2. David W. K., Sadowski, R. P. and Sasowski, D. A., Simulation with ARENA, McGraw Hill, 2002.
3. Gordon, G., Systems Simulation, Prentice Hall, 2002.

## 5. SUGGESTED READINGS

1. Banks, J., Carson, J. S. and Nelson, B. L., Discrete Event System Simulation, 4th edition, Pearson Education Asia, 2006.
2. Modeling and Simulation by Pushpa Singh, Narendra Singh.

## BA-307 BUSINESS MODEL WITH SPREADSHEETS

### Course Objective:

- Understand fundamental of Visual Basic to be able to create front-end and back-end applications
- Develop skills in translating business decision problems into mathematical models and selecting appropriate mathematical techniques to solve the model.
- Learn to formulate, solve, and interpret practical decision-making and planning models using spreadsheets.
- Work through numerous examples of linear and integer programming, as well as Monte Carlo simulation, decision analysis, and queuing theory.
- Transform the student into an efficient and effective modeler for managing or consulting.

### Lab Exercise

Practical No	Lab Module	No of Labs work / class
<b>1</b>	Headers/Footers, Cell Comments, Worksheet Protection, Writing Macros, Drop-Down Lists, Form Controls,	<b>2</b>
<b>2</b>	Error Checking, and Conditional Formatting, VBA Programming in Excel for Decision Support Systems	<b>2</b>
<b>3</b>	Excel modeling tools, Waiting Lines and Queuing Theory,	<b>1</b>
<b>4</b>	Monte Carlo Simulation, Queuing Theory	<b>1</b>
<b>5</b>	Optimization with Excel Solver Problem formulation, use of solver, Sensitivity analysis	<b>2</b>
<b>6</b>	Applications include investment problem, inventory problem,	<b>2</b>
<b>7</b>	optimal product mix, workforce scheduling, assignment problem, transportation problem	<b>3</b>
<b>8</b>	Estimating a Demand Curve with an exercise	<b>2</b>
<b>9</b>	Pricing Products by Using Tie-Ins with an exercise	<b>2</b>
<b>10</b>	Pricing Products by Using Subjectively Determined Demand with an exercise	<b>3</b>
<b>11</b>	Weibull and Beta Distributions: Modeling Machine Life and Duration of a Project,	<b>3</b>
<b>12</b>	Using the Lognormal Random Variable to Model Stock Prices, The Economic Order Quantity Inventory Model, Inventory Modeling with Uncertain Demand.	<b>3</b>

### 3. COURSE CONTENT

CO1: Ability to work on MS Excel and VBA.

CO2: Able to apply Excel Modeling Tools in business scenario.

CO3: Ability to understand and apply Solver, travelling salesman problem and optimization techniques in business problem

CO4: Develop and understand estimating a Demand Curve

CO4: Develop and understand estimating a Demand Curve

#### 4. Text Books:

1. Microsoft Excel Data Analysis and Business Modeling, By Wayne Winston, Microsoft Press

#### 5. Reference Book:

1. Business Modeling with Spreadsheets, 3E, By Thin-Yin Leong, Michelle Cheong, McGraw Hill

### BA-308 MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE USING PYTHON

**Course objectives:** This course will enable students to

1. Make use of Data sets in implementing the machine learning algorithms
2. Implement the machine learning and artificial intelligence concepts and algorithms using python

#### Lecture contents

Basic Concepts and understanding the application & usage of Machine Learning.

Meaning and basics of AI and its practical scenario and its application in medical, manufacturing etc.

Introduction to Neural Network

#### Lab Work:

S.N	Lab Module	Lab work / Class
1	Write a Python program to load the iris data from a given csv file into a data frame and print the shape of the data, type of the data and first 3 rows.	2
2	Write a Python program using Scikit-learn to print the keys, number of rows-columns, feature names and the description of the Iris data	2
3	Write a Python program to split the iris dataset into its attributes (X) and labels (y). The X variable contains the first four columns (i.e. attributes) and y contains the labels of the dataset	2



4	Write a Python program to draw a scatterplot, then add a joint density estimate to describe individual distributions on the same plot between Sepal length and Sepal width.	2
5	Write a Python program using Scikit-learn to split the iris dataset into 70% train data and 30% test data. Out of total 150 records, the training set will contain 120 records and the test set contains 30 of those records. Print both datasets.	2
6	Implement and demonstrate the any suitable algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a <i>.CSV file</i> .	2
7	For a given set of training data examples stored in a <i>.CSV file</i> , implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples.	2
8	Write a program to demonstrate the working of the decision tree using any suitable algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.	2
9	Build an Artificial Neural Network by implementing the Backpropagation algorithm.	2
10	Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a <i>.CSV file</i>	2
11	Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set.	2
12	Apply any suitable algorithm to cluster a set of data stored in a <i>.CSV file</i> . Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering.	1
13	Write a program to implement k-Nearest Neighbor algorithm to classify the iris data set.	1
14	Implement the non-parametric Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.	1
15	Write a Python program to get the accuracy of the Logistic Regression.	1

### 3. COURSE OUTCOME

CO1: Ability to use data sets in implementing the machine learning algorithms

CO2: Ability to build an Artificial Neural Network

CO3: Understand and ability to implement k-Nearest Neighbor algorithm

CO4: Ability to implement the Regression algorithms

CO5: Ability to use Scikit-learn for machine learning

# SYLLABUS OF MBA (BUSINESS ANALYTICS) – IV SEMESTER 2023-24

## BA-401 EMERGING TECHNOLOGIES IN GLOBAL BUSINESS ENVIRONMENT

### Course Objectives

1. To give students an exposure to the VUCA environment of International Business
2. To provide in-depth understanding of digital transformation on business processes
3. To understand the impact of Industry 4.0 has on the context of International Business
4. To understand in detail, the shifts taking place in the Political, Economic, Social and Technological environments that are shaping business realities
5. To understand the changing role of International Organizations and changing dynamics in Geo Politics.

### Unit 1: Industry 4.0 and Digital Transformation

Meaning and Nature of Industry 4.0 and Latest Trends. Realignment in Political, Economic, Socio-Cultural, Technological Factors that are driving change in International Business Management, the changing nature of Globalization, The changing nature of regulatory environment, natural environment, new age ethics. Overview of Digital Transformation.

### Unit 2: Emerging Technologies as Drivers of Global Business

**Artificial Intelligence**- Machine Learning, Deep Learning Singularity – Time Lines and Implication. **Augmented Reality**, Virtual Reality and Mixed Reality and Applications. **Block chain** – Concepts and Industrial Applications, Challenges in adopting Block chain. **Additive Manufacturing**: Advantages and Disadvantages, new applications of additive manufacturing, impact of additive manufacturing on supply chain management, mass customization and the customer experience. Introduction of **Neuroscience in Business**. **Internet of Things (IoT)**.

### Unit 3: New Age Economies

**Circular Economy**- Concept of Circular Economy, difference between Linear and Circular Economy, Role of Circular Economy in Sustainable Business and Innovation. **Behavioral Economics**- Core Concepts of Behavioral Economics, Nudging and Choice Architecture, Ethical Concerns of Behavioral Economics. **Economic Nationalism** -Nature of Economic Nationalism, Contemporary Cases in Economic Nationalism, Future of Economic Integration.

**Sharing Economy** – New Business Models , Characteristics , Difference Between Platforms and Traditional Business Models, Different Types of Platforms , implications on future of work.

### Unit 4: Changing Natures of Global Politics

**Identity Politics** – Issues & Challenges, The Rise of Authoritarianism and what that means for geo politics, Reviving Democratic Ideals, The Rise of China and its impact on global trade.

### Unit 5: Social, Cultural and Global Challenges

**Diversity of different generations** in the workplace, issue of inter-generational equity.

**Migration** –Political, Economic and Human Rights Perspective, the Migrant Crisis in the EU.

**Climate Change** –Political Dimensions of Climate Change, Plight and Issue of Climate Refugees, Sustainable Development Goals.

**Rising Inequality:** Historical Context of Inequality and Social Unrest, Global Inequality, Social and Economic Reforms. **Privacy in the Digital World** – Complexity of Privacy Issues, Basics of GDPR (General Data Protection Regulation), Importance of Personal Data, **Existential Threats** – Five Types of Risks associated with AI, Need for New Age Ethics .

### 3.COURSE OUTCOMES

CO1: To get an overview of the changing context of International Business in the wake of Industry 4.0

CO2: Conceptual understanding of the new technologies that are driving change in business operations and strategy

CO3: Understand shifts in economic thought and its impact on business decisions.

CO4: Understand changing geo politics and analyses its impact on international Business

CO5: Critically think about issues and challenges in the Global World and find sustainable solutions

### Suggested Readings

1. Kapoor, Mansi – Global Business Environment: Shifting Paradigms in the Fourth Industrial Revolution, SAGE Publishing India
2. Narendra Jadhav, New Age technology an Industrial Revolution 4.0(Konark Publisher)
3. Pranjal Sharma, India Automated (McMillan)
4. Kapoor, M – Global Business Environment: Shifting Paradigms in the Fourth Industrial Revolution, SAGE India
5. Arun Sundararajan, The Sharing Economy: The End of Employment and the Rise of Crowd-Based Capitalism (MIT Press)
6. Mark Van Rijmenam, The Organisation of Tomorrow: How AI, blockchain and analytics turn your business into a data organisation (Routledge)
7. Nitin Seth, Winning in Digital Age (Penguin)
8. Hu, Ming, Sharing Economy (Springer)
9. Hill, International Business , Mc Graw-Hill
10. Cherunilam, F - International Trade and Export Management, Himalaya
11. Daniels - International Business (Pearson)

### BA-402 HR ANALYTICS

#### COURSE OBJECTIVES:

1. This course introduces the student to the theory, concepts, and business application of HR analytics, and the ability to track, store, retrieve, analyze and interpret HR data to support decision making.
2. The student will use applicable benchmarks/metrics to conduct research and statistical analyses related to Human Resource Planning and Recruitment and Selection.
3. Employ appropriate software to record, maintain, retrieve and analyze Performance and training effectiveness.

4. Apply quantitative and qualitative analysis to understand and design compensation system.
5. Demonstrate how to connect HR results to business results.

## 2. COURSE CONTENTS

### UNIT 1

**Introduction to HR Analytics:** Evolution of HR Analytics, HR information systems and data sources, Evolution of HR Analytics; HR Metrics and HR Analytics; Intuition versus analytical thinking; HRMS/HRIS and data sources; Analytics frameworks like LAMP, HR Scorecard & Workforce Scorecard.

### UNIT 2

**Human Resource Planning and forecasting:** Quantitative and Qualitative Dimensions of HR Planning, Methods and Techniques of HR Demand Forecasting, Data Base for Manpower Forecasting.  
**Recruitment and Selection Analytics:** Evaluating Reliability and validity of selection models, Finding out selection bias, Predicting the performance and turnover.

### UNIT 3

**Performance Analysis:** Predicting employee performance, Training requirements, evaluating training and development, optimizing selection and promotion decisions, Analyzing and Classifying training needs, measuring training effectiveness, Predicting training effectiveness and performance.  
**Designing a Compensation System:** Understanding compensation Analytics, quantifiable data, Factors affecting Compensation & Benefits, Analytics for compensation planning, Competency Scorecard.

### UNIT 4

**Monitoring impact of Interventions:** Tracking impact interventions, Evaluating stress levels and value-change. Formulating evidence based practices and responsible investment, Evaluation mediation process, moderation and interaction analysis.

### UNIT 5

**Applications of HR Metrics and Creating HR Dashboards:** HR Metrics, Types of HR Metrics, Staffing Metrics, Training and Development Metrics, Application-oriented Exercises : Dashboards: Few Key Excel Add-ins/Functions to Help Create Dashboards, Name Range, The Developer Tab, Form Controls, Important Excel Formulas Useful for Creating Dashboards, VLOOKUP, INDEX, SUMIF, AVERAGEIF and COUNTIF, Application of Excel Functions in Creating HR Dashboards, Storyboarding: Connecting the Dots and Integrating the Findings.

## 3. SUGGESTED READINGS

1. Bhattacharya Kumar Dipak, HR Analytics Understanding Theories and Applications, SAGE Publishing
2. Banerjee Pratyush, Pandey Jatin and Gupta Manish (2019), Practical Applications of HR Analytics, SAGE Publishing
3. Sesil. J, Applying advanced analytics to HR management decisions: Methods for recruitment, managing performance and improving knowledge management. Prentice Hall.
4. Barnett K, Berk J, Human Capital Analytics. Word Association Publication. Fitz-Enz J,

5. The HR Analytics: Predicting the Economic Value of your Company's Human Capital Investments, AMACOM.

## **BA-403 SOCIAL MEDIA AND WEB ANALYTICS**

### **1.COURSE OBJECTIVES:**

- a. To provide basic understanding of the use and deployment of Digital marketing tools and web/social/mobile analytics platforms
- b. Gaining a grounded understanding of web analytics and business implication.
- c. To prepare the students with growth potentials for Web Analysts professionals

### **2.COURSE CONTENTS**

#### **Unit 1**

**Social Media & Analytics:** Introduction to Social Media, Social media landscape, Social Media Analytics & its need. SMA in Small and large organizations; Application of SMA in different social media platforms.

**Introduction to Web Analytics:** Definition, Process, Key terms: Site references, Keywords and Key phrases; building block terms: Visit characterization terms, Content characterization terms, Conversion metrics; Categories: Offsite web, on site web; Web analytics platform, Web analytics evolution, Need of web analytics, Advantages & Limitations.

#### **Unit 2**

**Network fundamentals:** The social networks perspective - nodes, ties and influencers, Socialnetwork, web data and methods.

**Data Collection and Web Analytics Fundamentals:** Capturing Data: Web logs, web Beacons, java script tags, packet sniffing; Outcome data: E-commerce, Lead generation, Brand/ Advocacy and support; Competitive Data: Panel Based measurement, ISP based measurement, Search Engine Data; Organizational Structure.

Type and size of data, identifying unique page definition, cookies, Link Coding Issues.

#### **Unit 3**

**Web Metrics & Analytics:** Common metrics: Hits, Page views, visits, unique page views, Bounce, Bounce rate & its improvement, Average time on site, Real time report, traffic source report, custom campaigns, content report, Google analytics; Key Performance Indicator: Need, characteristics, perspective and uses.

Graphs and Matrices- Basic measures for individuals and networks. Random graphs & network evolution, Social Context: Affiliation & Identity

**Web analytics tools:** A/B testing, online surveys, Web crawling and Indexing. Natural Language Processing Techniques for Micro-text Analysis

#### **Unit 4**

**Facebook Analytics:** Introduction, parameters, demographics. Analyzing page audience: Reach and engagement analysis. Post-Performance on FB; Social Campaigns: Goals and evaluating outcomes, Measuring and analyzing social campaigns, Social Network Analysis like Instagram, twitter,

LinkedIn, YouTube etc. Ad Words, Benchmarking, Categories of traffic: Organic traffic, Paid traffic; **Google Analytics:** Brief introduction and working, Google website optimizer, Implementation technology, Limitations, Performance concerns, Privacy issues.

## **Unit 5**

**Qualitative Analysis:** Heuristic evaluations: Conducting a heuristic evaluation, Benefits of heuristic evaluations; Site Visits: Conducting a site visit, Benefits of site visits; Surveys: Website surveys, Post-visit surveys, creating and running a survey, Benefits of surveys.

**Web analytics 2.0:** Web analytics 1.0 & its limitations, Introduction to WA 2.0, competitive intelligence analysis and data sources; website traffic analysis: traffic trends, site overlap and opportunities.

### **3.COURSE OUTCOME**

CO1: Students will develop knowledge, understanding and skills in analysis of Social Media

CO2: Acquainted with better understanding of implementation Web Analytics tool

CO3: Develop analytical skills for effective decision alternatives in social media problems

CO4: Develop the knowledge, understanding and skills in Facebook and google analytics.

CO5: Acquainted with better understanding of implementation of web analytics strategies and develop analytical skills for effective decision alternatives in social media operations.

### **4.SUGGESTED READINGS**

1. Rob Stokes, (2014), e marketing: The Essential Guide to Digital Marketing, Quirk Education.
2. Tuten & Bikramjit Rishi, Social Media Marketing, 3<sup>rd</sup> Ed. 2020, SAGE Publishing India
3. Dave Chaffey, Fiona Ellis-Chadwick, Richard Mayer, Kevin Johnston, (2012), Internet Marketing: Strategy, Implementation and Practice, Prentice Hall.
4. Liana Evans, Social Media Marketing: Strategies for Engaging in Facebook, Twitter & Other Social Media, Que Publishing.
5. Vandana Ahuja, (Digital Marketing, 1st edition, Oxford University Press.
6. Avinash Kaushik, Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity,
7. Clifton B., Advanced Web Metrics with Google Analytics, Wiley Publishing, Inc. 2nd ed.
8. Kaushik A., Web Analytics 2.0, The Art of Online Accountability and Science of Customer Centricity, Wiley Publishing, Inc. 1st ed.
9. Sterne J., Web Metrics: Proven methods for measuring web site success, John Wiley and Sons
10. Annmarie Hanlon, Digital Marketing, SAGE Publishing India

## **BA-404 HEALTHCARE ANALYTICS**

### **1.Course Objectives:**

- To use data to make pertinent and accurate decisions in healthcare.
- Understanding of tools of analytics provides the capability to identify patterns in data and to implement the knowledge in developing strategies and improving performance.
- The objectives of this course are to enable students to develop an understanding of basic principles of data analysis and familiarize them with key tools and techniques that would

enable them to take data driven decisions in healthcare.

## **2.COURSE CONTENTS**

### **Unit I: Health Care Data**

Data as an asset for health care organization; Data, information, knowledge and wisdom hierarchy; Types and sources of healthcare data; Data governance, methods for effective use of data analytics; Ethics, data ownership and privacy.

### **Unit II: Working with Data**

Common data analytics terms, Steps of data analytics; Enterprise data architecture in health care organizations; Common data types; Selection, aggregation, querying and transformation of data; Descriptive and visual analytics; Common patterns or distributions in data.

### **Unit III: Healthcare analytics tools**

Predictive analytics tools, classification, regression; Introduction to text mining, contextual analysis, social media analytics; Text mining, social media analytics; Basics of image Analysis; analysis of multimedia Data

### **Unit IV: Decision analysis**

Decision tree, select prescriptive analytics applications in health care operations management, Scheduling, resource allocation, project management, waiting line management etc.

### **Unit V: Innovations in Health Care**

Advances in medical technology – sensors, digital medical treatment and diagnostic devices, Advances in healthcare informatics related areas like mobile health and cloud-based technologies, Newer service delivery models – remote monitoring and tele-health

## **3.SUGGESTED READINGS:**

1. Anderson, D., Sweeney, D., Williams, T., Martin, R.K.. An introduction to management science: quantitative approaches to decision making. Cengage Learning, India.
2. Davenport, T. H., Harris, J. G., & Morison, R. Analytics at work: Smarter decisions, better results. Harvard Business Press.
3. Madsen, L. B. Data-driven healthcare: how analytics and BI are transforming the industry. Wiley India Private Limited.
4. Meier, Kenneth J., Jeffrey L. Brudney, and John Bohte. Applied Statistics for Public and Nonprofit Administration, 9th Edition, Cengage.
5. McLaughlin, Daniel B. and Hays Julie M. Healthcare Operations Management. Health Administration Press.
6. McNeill, D., & Davenport, T. H. Analytics in Healthcare and the Life Sciences: Strategies, Implementation Methods, and Best Practices. Pearson Education.
7. Reddy, C. K., & Aggarwal, C. C. (Editors.). Healthcare data analytics (Vol. 36). CRC Press.
8. Strome, T. L., & Liefer, A. Healthcare analytics for quality and performance improvement. Hoboken, NJ, USA: Wiley.
9. Veney, James E., John F. Kros, and David A. Rosenthal. Statistics for Health Care Professionals: Working with Excel, Jossey-bass.

## **4.COURSE OUTCOMES:**

- CO1. Identify sources of data, suggest methods for collecting, sharing and analyzing data  
CO2. Understanding the issues involved in data quality and their management  
CO3. Discuss the difference between descriptive, predictive and prescriptive analytics.

CO4. Able to use basic data presentation and visualization tools and manipulate simple datasets

CO5. Able to identify decision problems willing for analytics-based solutions. Understand how data analytics can provide potential solutions to improve quality and lower cost

## **BA-405 BUSINESS APPLICATIONS OF BLOCK CHAIN TECHNOLOGIES**

### **1.COURSE OBJECTIVES:**

- Understanding Blockchain and its significance
- Understanding Cryptography and Blockchain networks
- Understanding Business Challenges
- Understanding domain specific Blockchain business cases
- Understanding Crypto Economy and Decentralized Internet

### **2.COURSE CONTENTS**

#### **Unit 1: Introduction**

What is Blockchain, Game Theory and Cryptography, Blockchain vs Traditional architecture, Database Vs. Ledger, State Transitions and State Machines, The Consensus Algorithms, Software.

#### **Unit 2: Benefits and Trust Layer**

A new Trust Layer, Decentralization of Trust, A spectrum of Trust Services, The Blockchain Landscape, Benefits and Indirect benefits, Trusted Blockchain enabling services, Identify ownership and representation, Decentralized data security, Blockchain as Cloud.

#### **Unit 3: Blockchain Framework**

Blockchain with a Framework approach, Technical Challenges, Business Challenges, Legal Barriers, Behavioral/ Educational Challenges.

Public, Private, and Consortium Blockchain networks, Blockchain pitfalls, Distinctions and Considerations of Resource and Control. Comparative Study and Use case: Ethereum

#### **Unit 4: Blockchain Business Case**

Blockchain domain specific Business Case – Supply chain, Financial markets, Healthcare & Transportation, BFSI, Insurance, Digital Marketing.

#### **Unit 5: Blockchain Architecture**

Internal Strategies for tackling the Blockchain, The Blockchain Czar, Organizational Model, A Blockchain Functional Architecture, Core & Protocol, Decision Making Framework. Decentralized internet, The crypto Economy.

### **3.COURSE OUTCOMES**

CO1: Understanding Blockchain and its significance

CO2: Understanding Cryptography and Blockchain networks

CO3: Business Challenges in Blockchain

CO4: Understanding domain specific Blockchain business cases

CO5: Understanding Crypto Economy and Decentralized Internet



#### 4.TEXT BOOK

- Blockchain: The blockchain for beginners guide to blockchain technology and leveraging blockchain programming”, by Josh Thompsons

#### 5.REFERENCE BOOK

1. “Mastering Bitcoin: Unlocking digital cryptocurrencies”, by Andreas M. Antonopoulos
2. “Blockchain: Blueprint for a New Economy”, by Melanie Swan
3. “Ethereum: Blockchains, Digital Assets, Smart Contracts, Decentralized Autonomous Organizations”, by Henning Diedrich
4. “The Business Blockchain: Promise, Practice, and Application of the Next Internet Technology”, by William Mougayar

### BA-406 DATABASE MANAGEMENT SYSTEMS

**COURSE OBJECTIVE:** The course has been designed to introduce the students with the applications of systems designed to manage the data resources of organizations.

#### COURSE CONTENTS

##### Unit-I

**Introduction:** Overview, database system Vs file system, Database system concept and architecture, data model schema and instances, data independence and database language and interfaces, data definitions language, DML, Overall Database Structure. **Data modeling using the Entity Relationship Model:** ER model concepts, notation for ER diagram, mapping constraints,

##### Unit-II

**Relational data Model and Language:** keys, Concepts of Super Key, candidate key, primary key, Relational data model concepts, integrity constraints, entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, and tuple and domain calculus.

##### Unit-III

**Introduction on SQL:** Characteristics of SQL, advantage of SQL. SQL data type and literals. Types of SQL commands. SQL operators and their procedure. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations, Joins, Unions, Intersection, Minus, Cursors, Triggers, and Procedures in SQL/PL SQL

**Data Base Design & Normalization:** Functional dependencies, normal forms, first, second, third normal forms.

##### Unit-IV

**Transaction Processing Concept:** Transaction system, Testing of serializability, serializability of schedules, conflict & view serializable schedule, recoverability, backup ,Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.

**Concurrency control,** Locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi version schemes,

## **Unit-V**

**Recent Trends in Database Management Systems:** Centralized and Client-Server Architectures, Distributed Databases, Object-Oriented Database, Spatial & Temporal Databases, Decision Support Systems, Data Analysis, Data Mining & Warehousing, Data Visualization, Mobile Databases, OODB & XML Databases, Multimedia & Web Databases, Spatial and Geographical Databases, Web and Mobile Databases, Active Databases

### **3.SUGGESTED READINGS:**

1. Navathe E - Fundamentals of Database Systems (Pearson Education,)
2. Majumdar and Bhattacharya - Database Management System (Tata McGraw Hill)
3. Chakrabarti- Advance Database Management System (Wiley Dreamtech)
4. Beynon -Davies P- Database Systems (Palgrave)
5. Karthikeyan-Understanding Database Management System (Acme Learning)
6. Hoffer - Modern Database Management (Pearson Education)

### **4.COURSE OUTCOME**

CO1: Knowledge about the DBMS Technology

CO2: Understanding the business application of DBMS

CO3: Application of DBMS for business process

CO4: Knowledge and uses of Data mining techniques

CO5: Working knowledge of DBMS Software ORACLE

## **BA-407 FINANCIAL CREDIT RISK ANALYTICS**

### **1.COURSE OBJECTIVES:**

1. Understand about various types of financial credit.
2. Understand the credit risk and its rating
3. Understanding of credit commitments and its application
4. Understanding of risk management and corporate governance.
5. Measure riskiness of a stock or a portfolio position.

### **2.COURSE CONTENTS**

#### **UNIT I: Introduction**

Financial Credit: Meaning & Objectives, Credit Risk, Credit Analysis, Seven C's, Credit Analysis Process, Credit Process, Documentation, Loan Pricing and Profitability Analysis. Regulations, Types of Credit Facilities: Various types of Credit Facilities- Cash Credit, Overdrafts, Demand Loan, Bill Finance – Drawee Bill Scheme, Bill Discounting. Cash Delivery: Types of Facilities, Modes of Delivery.

#### **UNIT II: Trade Credit Risk**

Sole -Banking Arrangement, Multiple Banking Arrangement, Consortium Lending, Syndication. Credit Thrust, Credit Priorities, Credit Acquisitions, Statutory & Regulatory restrictions on Advances. Credit

Appraisal: Validation of proposal, Dimensions of Credit Appraisals, Structuring of Loan documents, Credit Risk, Credit Risk Rating, Credit Worthiness of Borrower, Purpose of Loan, Source of Repayment, Cash Flow and Collateral.

### **UNIT III: Letter of Credit and Loan Commitments**

Quasi Credit Facilities: Advantages of Non-Fund Facilities, Various types of NFB Facilities, Various types Letter of Credits, Assessment of LC limits, Bills Purchase/ Discounting under LC.

Loan commitments, Un-funded lines of credit and their characteristics

Various types of Bank Guarantees: Performance Guarantee, Financial Guarantees, Deferred Payment Guarantees, Types of Performance and Financial Guarantees, Assessment of Bank Guarantees Limit, Period of Claim under Guarantee.

### **UNIT IV: Operational Risk: Overview**

Risk & Uncertainty, Financial Sector, Risk Types, Operational Risk Management- Recruitment & Training, Work flow Design, Work Flow Documentation, Delegation of Authority, Independent Internal Audit, Independent Compliance Function, Independent Risk Management Function, System Audit, Corporate Governance, Whistle Blower Policy, Risk Management Culture.

### **UNIT V: Credit Analysis & Rating**

Importance of credit analysis, Stages of credit analysis profitability analysis and pricing of loans, Credit risk analysis (Debt ratios and risk of leverage), Analysis of working capital, liquidity ,operating and cash cycle risk .

Credit Rating: Measurement of Risk, Objective of Rating, Internal & External Rating, Model Credit Rating, Methodology of Rating, Internal & External Comparison, Model Rating Formats.

### **3.COURSE OUTCOME:**

CO1: Understand about various types of financial credit

CO2: Understand the credit risk and its rating.

CO3 : Understanding of credit commitments and its application

CO4: Understanding of risk management and corporate governance.

CO5: Measure riskiness of a stock or a portfolio position

### **4.SUGGESTED READINGS:**

#### **Reference Books**

1. Fundamentals of Credit and Credit Analysis: Corporate Credit Analysis Kindle Edition by Arnold Ziegel (Author), Ronna Ziegel (Editor)
2. Credit Appraisal Risk Analysis & Decision Making Paperback ,1 January by V.Rajaraman (Author)
3. Financial Engineering, Risk Management & Financial Institutions (English, Paperback, Rao S.S. Prasada)
4. The Bank Credit Analysis Handbook: A Guide for Analysts, (Wiley Finance) by Jonathan Golin (Author), Philippe Delhaise (Author)
5. Credit Risk Measurement: New Approaches to Value at Risk and Other Paradigms (Wiley Finance) Hardcover – Import, 20 March 2002 by Anthony Saunders (Author), Linda Allen (Author)
6. Credit Risk Analytics: Measurement Techniques, Applications, and Examples in SAS (Wiley

and SAS Business Series) by Daniel Roesch (Author), Harald Scheule (Author), Bart Baesens (Author)

7. Credit Risk Modeling Theory And Applications by David Lando, New Age International (P) Ltd., Publisher.

## **BA-408 DATA SCIENCE LAB**

### **1. COURSE OBJECTIVE**

- Understand and analyze problems with data science and able to solve those problems from a statistical perspective.
- Collect, Visualize, Blend Data from Different Data Sources. Perform Exploratory Data Analysis and create data products for business applications.
- Understand Data Science Project Life Cycle and understand the basics of Supervised Regression Techniques and Supervised Classification Techniques.

### **2. COURSE CONTENTS**

**Introduction:** Introduction to Data Science, Need for Business Analytics, Data Science Life Cycle, Different Tools available for Data Science (Python, R, SQL, Spark, Hive)

**Data Exploration & Data Structure:** R Packages and R Operators, Importing and Exporting Data from external source, Data Exploratory analysis, R Data Structure (Vector, Scalar, Matrices, Array, Data Frame, List), Functions.

**Data Visualization & Statistics:** Visual Data Analytics and Tools, Bar Graph, Histogram, Pie Chart, Line Chart, Box Plot, Scatter

**Supervised Learning:** Supervised Learning - Linear Regression, Bivariate Regression, Multiple Regression Analysis, Correlation. Logistic Regression. Machine Learning - Uses, Process & Categories

**Unsupervised Learning:** Clustering and its Use, K-means Clustering, Canopy Clustering, Hierarchical Clustering.

**Big Data and other Emerging Trends:** Big Data and its impact on analytics, Role and importance of Data Scientist, Data Cleaning, Big Data & Data Warehousing, Market Basket Analysis, Sentiment Analysis, Location Based Analysis - Geospatial Analytics, Issues of Legality, Privacy, and Ethics.

### **3. COURSE OUTCOME**

- Master key facets of data investigation, including data management, exploratory analysis, regression and classification and prediction.
- Implement foundational concepts of data computation, such as data structure, data exploratory analysis.
- Leverage knowledge of key areas in data science such as data exploration, trend analysis, or data visualization.

### **4. REFERENCE BOOKS**

1. Murtaza Haider, Getting Started with Data Science, Publisher : Pearson
2. James D Miller, Statistics for Data Science, Publisher : Packt Publishing Limited
3. HBR Guide to Data Analytics Basics for Managers - Paperback 20 May 2018

4. Jeeva Jose, Data Analysis Using R Programming, Publisher : Khanna Publishing

**5. TEXT BOOKS**

1. Annalyan Ng & Kenneth Soo, Data Science for Layman, Publisher : McGraw Hill Education

2. V.K. Jain, Data Science and Analytics, Publisher : Khanna Publishing

3. Ramesh Sharda - Dursun Delen & Efraim Turban, Business Intelligence, Analytics and Data Science, Publisher : Pearson

4. Cielen Davy, Introducing Data Science, Publisher : Dreamtech Press India Private Limited