BBA- Business Analytics
Syllabus
2025-2028

FIRST SEMESTER

BBN1101 FUNDAMENTALS OF BUSINESS ANALYTICS AND PROBLEM SOLVING [1 0 4 3]

Introduction to Business Analytics: Scope and Significance of Business Analytics. Categories of Business Analytical methods and models, Business Analytics in practice, Big Data - Overview of using Data, Types of Data- Business decision modeling. Business Problems: Introduction, Types of Problems and their advantages, Human Brain and Problem Solving. Understanding Business Problems: Framing the problem, Facts and opinions, Business Model Canvas, conducting research without any bias, Building a hypothesis. Formulating, Hypotheses: Interviewing Frameworks, SPIN, SMART, 5Cs and PESTEL Framework, MECE Approach, analyzing possible solutions, Prioritizing Options, Considering Implications, Implementing Solutions, Proof of Concept Approach. Industry Demonstrations: Issue Tree Framework, 7Ps Framework; Case Studies: Air Crash Investigation, Big Data Consultant, Starbucks. Wal Store Project: Use the 5W's.
Overview of Linear Optimization, Non-Linear Programming Integer Optimization, Cutting Plane algorithm and other methods, Decision Analysis – Risk and uncertainty methods - Text analytics Web analytics

References:

- Fundamentals Of Business Analytics by R. N. Prasad and Seema Acharya, Latest Edition
- Data Analytics Made Accessible by Anil Maheshwari, 2023 edition.

BBN1102 DATA ANALYSIS IN EXCEL [1 0 4 3]

Introduction to Excel: Excel Interface, Sort & Filter, Report Making, Printing, Page Layout, Passwords and Naming Files, Shortcuts, Complex Functions, Cell Referencing, Creating and Formatting Charts, Pivot Tables, Common Errors, VLOOKUP, Advanced Excel: Text, Statistical, and Logical Functions, Conditional Formatting, What-If Analysis, Macros, Data Analysis Tool pack, Visual Basics for Applications, Financial Functions: Time Value of Money, Capital Budgeting, Financial Functions: Depreciation, SI, PV, FV, NPV, IRR, Annuity, Superstore Sales Project: Create a report containing a summary of sales for the corporatecustomer segment at Superstore Sales retail store.

References:

- Alexander, Kusleika, & WalkerBAch;
- Excel 2019 Bible;Wiley
- John WalkenBach; Excel Charts, Wiley,2019

BBN1103 PRINCIPLES OF MANAGEMENT [3 0 0 3]

Introduction to Management: Concept, Scope of Management, Management a Science or Art, Levels of Management, Managerial Skills, Roles of a Manager Classical Theory: introduction, contribution, and limitation; Human relations and Behavioural science theories; System Theory; Decision Theory; Management Science Theory; Contingency Theory; Emerging Management Concepts: workforce diversity, outsourcing, knowledge management, learning organization. Functions of Management: Planning: Concept, Importance, Decision making, Process of Planning. Organizing: Concept, Importance, Process of Organizing, Types of Organizational Structures, Span of Management, Centralization and Decentralization. Staffing: Concept, Scope of Staffing, Manpower Planning, Recruitment and Selection, Training and Development, Performance Appraisal. Directing: Concept, Importance, Motivation: Concept, Importance, Maslow's Need Hierarchy theory, Leadership-Concept, Characteristics of Leadership, and Leadership styles, Communication-. Coordinating: Definition, Characteristics, Principles and Techniques of Coordination. Controlling: Concept, Importance, Process of Controlling. Fundamentals of International Management; Multinational Companies: meaning, types, advantages, and disadvantages; Digital dimensioning and Planning, Organizing, Influencing, and Controlling.

References:

- Stephen P. Robbins, Mary Coulter, David De Cenzo: Fundamentals of Management, Ninth Edition, Pearson Education India, 2016.
- Mitra, J.K.: Principles of Management, Oxford Publication, Latest Edition.
- Koontz, H.: Essentials of Management, Tata McGraw Hill Education, Latest Edition.
- Bhushan, Y.K.: Fundamentals of Business Organization and Management, Sultan Chand &

BBN1104 BUSINESS ECONOMIC [3 0 0 3]

Introduction to Business Economics- Introduction, Importance, Business economics Decision Making Process, Role of Business Economist, Fundamental Concepts of BusinessEconomics- Opportunity Cost, Time Perspective, Incremental Cost, Time Value of Money, Equi-marginal Concept, Concept of Utility: Cardinal and Ordinal, Marginal Average and Total Utility concepts, Indifference curves, income consumption curve and price consumption curve, Theory of Demand- Introduction, Factors affecting Demand, Law of Demand and elasticity of Demand,Supply analysis- Introduction, Factors affecting supply, Production and Costs: MarginalAverage and Total Cost concepts, Production functions and the short-run vs. long-run production, Types of costs: fixed costs, variable costs, total costs, and marginal costs, Economies and diseconomies of scale, Cost minimization and profit maximization, Revenue Analysis- Introduction, Total , marginal and average revenue, Elementary theory of markets- perfect competition, pure monopoly, monopolistic competition and oligopoly. Welfare Economics and Market Failures- Externalities and public goods, Market interventions: taxes, subsidies, and price controls, Consumer and producer surplus, Efficiency vs. equity considerations

References:

- Mankiw Gregory N, Principles of Economics, CENGAGE publication
- Lipsey R G: *Textbook of Positive Economics,* Longman Higher Education.
- Samuelson P A: *Economics,* Harvard University Press; Enlarged edition.

BBN1105 FUNDAMENTALS OF FINANCIAL ACCOUNTING [3 1 0 4]

Introduction to Financial Accounting: Definition, scope and objective of Financial Accounting. Accounting as a System, – Generally Accepted Accounting Principles; Nature of Accounts, Rules of Debit and Credit; Recording Transactions in Journal; Subsidiary books: cash book, and other Subsidiary Books; Depreciation, Provisions and Reserves. Preparation of Ledger Accounts; Preparation of Trial Balance; Preparation of Trading Account, Profit & Loss Account and Balance Sheet, Adjustment Entries (not very advanced), Overview of Accounting Standards and IFRS: Introduction to Accounting standard and IFRS, Role of Accounting Standard Board ,Difference between IFRS , Beneficiaries of Convergence of Accounting Standards(AS) into Indian Accounting Standards(Ind-AS) as per IFRS Introduction to Corporate Financial Statements: Preparation of Cash Flow Statement, dividends, distributable profits and types of shares.

References:

- Monga, J.R., Financial Accounting: Concepts and Applications, Mayur Paper Backs
- Tulsian, P.C., Financial Accounting, Pearson
- Maheshwari S.N. & Maheshwari S.K., Financial Accounting for B. Com., CA, CS, & ICWA
- (Foundation) Courses, Vikas Publishing House Pvt. Ltd.
- Balwani, N, Accounting and Finance for Managers, Excel Books
- Gupta, A: Financial Accounting for Management, Prentice Hall College, Latest Edition
- Bhattacharyya, A Financial Accounting for Business Managers, PHI
- Jain, S.P. & Narang, K.L., Advanced Accountancy, Kalyani Publishers

BBA1021: UNIVERSAL HUMAN VALUES [2 0 0 2]

Introduction to Value Education: Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness, and Prosperity – the Basic Human Aspirations, Right Understanding, Relationship and Physical Facility, Happiness, and Prosperity – Current Scenario, Method to Fulfill the Basic Human Aspirations. Harmony in the Human Being: Understanding Human being as the Co-existence of the Self and the Body, distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self, Understanding Harmony in the Self, Harmony of the Self with the Body, Program to ensure self-regulation and Health. Harmony in the Family and Society: Harmony in the Family – the Basic Unit of Human Interaction, Values in Human-to-Human Relationship, 'Trust' – the Foundational Value in Relationship, 'Respect' – as the Right Evaluation, Understanding Harmony in the Society, Vision for the Universal Human Order. Harmony in the Nature/Existence: Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence. Implications of the Holistic Understanding – aLook at Professional Ethics: Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A Basic for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in

Professional Ethics, Holistic Technologies, Production Systems and Management Models- Typical Case Studies, Strategies for Transition towards Value-Based Life and Profession

References:

- A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
- Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi.
- Sadri S & Sadri, J Business Excellence Through Ethics & Governance, 2nd edition

IMB1104 BUSINESS MATHEMATICS [3 1 0 4]

Set Theory: Notation of sets, Singleton set, Finite Set, Infinite Set, Equal Set, Null Set, Sub-Set, Proper subset, Universal set, Union of sets, Intersection of sets, Disjoint sets, Power set, Venn diagram, Complementary set, Uses of set theory is business, Elementary permutations, and combinations. Matrices & Determinants: Introduction, types of matrices, Addition of matrices, Subtraction of matrices, Multiplication of matrices, Transpose of matrix, Expansion of determinants, Minor and Cofactors, Properties of determinant, Adjoint and Inverse of matrices, System of linear equations, Applications of matrix operations in business decision making. Commercial Arithmetic and Mathematical Series: Arithmetic progression, Geometric progression (in terms of time, money values) Harmonic progression, relationship among AP, GP and HP. Differential Calculus: - Concepts of differentiation, Derivative of a function, Differential coefficient of product and quotient of two functions, Differentiation of different forms of functions – Chain rule, Exponential, Logarithmic, Parametric functions and derivatives of higher order, Maxima and Minima, Applications of differentiation in business. Integral Calculus & Differential Equations: Concept of integration, Elementary integration, (single variable function, logarithmic, trigonometry, exponential, polynomial), integration by substitution, Integration by parts, Applications of integration in business, Linear Differential equations, Order and degree of differential equations, Solution of linear differential equations in variable separable form.

References:

- Gupta, KL, Agarwal, Ravi Kant & Jain, Praveen, Business Mathematics, Nirupam Sahitya Sadan. Sancheti DC & Kapoor VK, Business Mathematics, Sultan Chand & Sons.
- Gupta, BN, Business Mathematics, SBPD.

SECOND SEMESTER

BBN1201 PRINCIPLES OF MACRO ECONOMICS [3 0 0 3]

Circular Flow of Income, Economic Sectors, Growth and Development defined. National Income Accounting [GNP, GDPO, NNP and Net Economic Welfare], Business Cycles Theory, Inflation, Deflation and Stagflation. Theory of Unemployment and Income, Elementary Keynesian Economics [Marginal Propensity to consume, Marginal Propensity to Invest, Multiplier, Accelerator], Money Supply, Elementary Monetary policy and Elementary Financial Policy, Business Environment: Contemporary Issues – from Complacency to Social Responsibility of Business, Economic Environment: Economic System, Green Initiatives NGT Triple Bottom Line. Government: Economic role of Government – Fiscal Policies, Import & Export Policy, Emerging Structure of Indian Economy, Globalization, SEZ. Business & Legal Environment: Investors Protection Act 1986, Regulation of Stock exchange, SEBI, FEMA 2000. NRI Investments.

References:

- Vaish M C, Macro Economic Theory, Vikas Publishing House Pvt. Ltd., Delhi,
- Barro R.J, Macro Economics, PHI Learning Pvt. Ltd., Delhi,
- Shapiro E., Macroeconomic Analysis, Galgotia Publication Pvt. Ltd.,
- Dwivedi D N, Macroeconomics Theory and Policy, Tata McGraw Hill Education Pvt. Ltd., New Delhi,
- Souza E D, Macroeconomics, Pearson, New Delhi,
- Jhingan M L, Macro Economic Theory, Vikas Publishing House Pvt. Ltd., Delhi,

BBN1202 COST ACCOUNTING [3 0 0 3]

Cost Accounting: Concept of Cost, Classification of cost: - Types of Cost, Distinctions between Financial and Cost Accounting, Cost accounting methods, Cost accounting techniques, Alternative cost accounting

principles, Elements of Cost. Presenting information: - Purchasing, receiving and storage of material, Pricing of material issues, Material control. Recording of Labor Cost, Direct Expenses. Overhead: Classifications allocation, apportionment, re-apportionment, and absorption of overhead costs. Production Account, Methods of Costing: Unit costing, Job costing. Contract Costing. Process costing (process losses, Joint and By- products, Inter-Process Profits, Costing of Work-in-Progress) Operating Costing (only for transport services).

References:

- Jawaharlal & Srivastawas, Cost Accounting, McGraw Hill Education (India) Pvt. Ltd.,
- Arora M N, A Text Book of Cost & Management Accounting, Vikas Publishing House Pvt. Ltd., New Delhi.
- Bhattacharya A K. "Principles & Practice of Cost Accounting" PHI Learning.

BBA1203: Organizational Behavior [3 0 0 3]

Introduction and Concept of Organisational Behaviour (OB): Major Disciplines and their Contributions, Challenges and Opportunities for Managers, OB Models. Foundations of Individual Behaviour: Attitude and Job Satisfaction, Components of Attitude, Major Job Attitude, Job Satisfaction, Personality and Values, Big 5 Personality Traits. Motivation and Leadership: Concept, Definition and Theories of Motivation, Maslow's Need Hierarchy Theory, ERG Theory, Theory X and Theory Y, Two Factor Theory, McClelland's Theory, Equity Theory, Vroom's Expectancy Theory. Concept and Theories of Leadership: Traits of Good Leader, Difference between Leader and Manager. Groups and Teams: Foundations of Group Behaviour, Formation of Group, Group Classification, Properties, Roles, Norms, Status, Size and Cohesiveness, Group Decision Making, Understanding Teams, Creating Effective Teams, Conflict Resolution Management. Culture: Definition, Culture's Function, Need for and Importance of Cross-Cultural Management.

References:

- Robbins (2022), Timothy Judge, Seema Sanghi, Organizational Behavior, Stephen Pearson Prentice Hall,12 edition
- Neharika Vohra Stephen P. Robbins, Timothy A. Judge (2022). Organizational Behaviour, Pearson, 18 edition.
- Fred Luthans (2019), Organizational Behavior, McGraw Hill Inc.
- John Newstrom and Keith Davis (2021), Organizational Behavior, Tata McGraw Hill, 11 editions.

BBN1204 FINANCIAL MANAGEMENT [3 1 0 4]

Meaning, objectives, scope, and importance of Financial Management; Finance functions; Role of finance manager in managing finance; Objectives of financial management; Emerging issues in financial management, including Environmental, Social, and Governance (ESG) considerations in financial decision-making. Time Value of Money – Concept and reasons for the time perspective of money, future value and present value, loan amortization, and other applications of time value of money. Investment Decision: Concept and computation of capital budgeting, Capital budgeting techniques such as Payback Period, NPV, IRR, and Profitability Index. Project selection based on investment decisions. Management of Working Capital: Concepts, components, determinants, and need for working capital. Computation of working capital for a company, Receivable Management – Concept, credit policies, credit terms, collection policies. Cost of Capital – Computation of cost of debt, preference share, equity, retained earnings, and weighted average cost of capital. Capital Structure – Concept, determinants, and theories including Net Income (NI), Net Operating Income (NOI), Traditional, and Modigliani-Miller (MM) approaches. Leverage – Operating, Financial, and Combined leverage and their implications on business risk and return. Dividend Decisions.

References:

- Khan & Jain, *Financial Management,* Tata McGraw-Hill,
- Pandey I M, *Financial Management*, Vikas Publishing House,
- Chandra, P *Financial Management*, Tata McGraw-Hill.

LLC1210 Business Communication [2 1 0 3]

Introduction: Definition of Communication, Features, Process, Shannon-and-Weaver Model of Communication, Functions, Feedback. Definition and Significance of Business and Organizational Communication, Medium: Verbal and Non-verbal communication. Channels: Formal and Informal. Levels of Communication, Direction of Communication: Downward, Upward, and Diagonal. Effective Communication and Barriers, Understanding the significance of cross-cultural communication: Stereotyping, Cultural shock, Ethnocentrism. Gender and Communication: Sensitivity and awareness about gender neutrality while communicating. Subject-Verb Agreement, Listening Skills: Effective listening, Barriers to effective listening, Note-taking. Speaking Skills: Self-Introduction, Public Speaking, Power Point Presentation and Extempore, Group Discussion, Interview. Writing Skills: Guidelines for Effective Writing - Bloom's Taxonomy, Difference between Summarizing and

Paraphrasing, Formal Letter Writing, Formal E-mail Writing, Formal Report Writing, Citation and Plagiarism, Cover Letter, Agenda and Minutes, Resumé, Statement of Purpose; Reading Skills: Reading Comprehension and Precis writing, Skimming, and Scanning, One-word Substitution: Malapropism, Synonyms, Antonyms. Crisis Communication and Negotiation Skills, Digital Communication and Cyber Ethics: Digital communication, Significance of Netiquettes, Ethical behavior in virtual spaces, Ethical use of AI to avoid plagiarism.

References:

1. Meenakshi Raman and S. Sharma, *Technical Communication: Principles and Practice*, Oxford University Press, 2013.
2. Mary Ellen Guffey and Dana Loewy, *Essentials of Business Communication*, Cengage Learning, 2016.
3. Patricia Lynne, *Reading and Writing Successfully in College: A Guide for Students*, Framingham State University, 2023.

IMB1204 Business Statistics [3 1 0 4]

Descriptive Statistics: Definition, Importance & Limitation, Collection of data and its tabulation, formationof frequency distribution, grouped frequency distribution, Ungrouped frequency distribution, Cumulative frequency distribution, Relative frequency distribution, Relative cumulative frequency distribution. Graphic presentation of Frequency distribution – Graphics, Pie, Bans, Histogram, Pictograph, Z graph, Band graph, cumulative frequency graph, Ogive graph, Diagrammatic; Measures of Central Tendency – Mean, Median andMode, Partition values – quartiles octiles, deciles and percentiles; Measures of variation – Range, IQR, semi inter-quartile range, Quartile deviation and its coefficients. Descriptive Statistics: Measures of dispersion: Mean deviation, Variance, Standard deviation, Coefficient of variation, Concept and measurement of skewness, moments, and kurtosis. Correlation & Regression Analysis: Correlation Coefficient; Assumptions of Correlation Analysis; Coefficients of Correlation; Measurement of Correlation- Karl Person's Methods; Spearman's Rank correlation; Limitations of Correlation Analysis; Applications of correlation analysis in business. Regression Analysis: - Meaning and definition of regression, Utility and applications of regression analysis, Types of regression, Difference between correlation and regression, Regression lines, Regression equations, Regressioncoefficients.

References:

- Jhunjhunwala, Bharat, Business Statistics, S. Chand & Company Ltd.
- Patri, DigamBBNr & Patri, DN, Business Statistics for Management, Kalyani Publishers.
- Sharma J.K. Business Statistics, Pearson Education.
- Gupta S.P., Statistical Method, Sultan Chand & Sons.
- Gupta S.C., Fundamentals of Statistics, Himalaya Publishing House

BBN1205 PYTHON FOR DATA ANALYTICS [2 0 4 4]

Introduction to Python Programming: History of Python, Features of Python, Install Python and Jupyter Notebook / Google Colab. Basic Data Types: Integer, Float, String, Boolean. Python's Built-in Data types: String, List, Tuple, Set, and Dictionary. Data Structures and Control Flow: Basic Input- Output Operations, Python user-defined functions, Defining and calling Function, Loops and statement in Python, Python Modules & Packages. File Handling: File opening in various modes and closing of a file, Reading from a file, Writing onto a file. Exception Handling: What is Exception? Handling an exception, try-except-else, try-finally clause. NumPy: Creating Arrays, Array Operations, Descriptive statistics using NumPy. Pandas: Series and Data Frames, Reading and Writing CSV Files, Data cleaning: handling missing values, Merging and Grouping Data. Data Visualization with Python: Plotting with Matplotlib and Seaborn, Line, bar, scatter, histogram, box plots, Styling and Formatting plots. Introduction to Business Statistics with Python: Mean, Median, Mode, Standard Deviation, Correlation and Covariance.

References:

1. M. Lutz, Learning Python, 5th ed. Sebastopol, CA: O'Reilly Media.
2. E. Matthes, Python Crash Course: A Hands-On, Project-Based Introduction to Programming. San Francisco, CA: No Starch Press.
3. W. McKinney, Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, 2nd ed. Sebastopol, CA: O'Reilly Media.
4. Sweigart, Automate the Boring Stuff with Python: Practical Programming for Total Beginners, 1st ed. San Francisco, CA: No Starch Press.

THIRD SEMESTER

BBN2101 Marketing Management [3 0 0 3]

Introduction to Marketing: Nature, scope, and importance of marketing in business and society. Marketing Philosophies: Production concept, Product concept, Selling concept, Marketing concept, and Societal marketing concept. Understanding the Marketing Environment: Micro and Macro Environment; Marketing Mix: Product, Price, Place, Promotion. Consumer Behaviour: Understanding the buying decision process, factors influencing consumer behaviour. Market Segmentation, Targeting, and Positioning (STP): Bases for segmentation, strategies for targeting, and positioning strategies. Product Decisions: Product classification, product lifecycle management, new product development stages, branding and packaging strategies. Pricing Decisions: Factors affecting pricing decisions, pricing methods, pricing strategies. Distribution Management: Channels of distribution, functions and types, channel management decisions. Marketing Communication: The promotion mix, Integrated Marketing Communications, advertising, personal selling, Sales promotion, public relations, and direct marketing. Introduction to Digital Marketing: Concepts of SEO, SEM, content marketing, influencer marketing, and social media engagement.

References:

- Kotler, P., Keller, K. L. (2016). *Marketing Management* (15th ed.). Pearson Education.
- Saxena, R. (2019). *Marketing Management*. McGraw-Hill Education.
- Etzel, M. J., Walker, B. J., Stanton, W. J. (2007). *Marketing* (14th ed.). McGraw-Hill.
- Kumar, A., & Meenakshi, N. (2018). *Marketing Management*. Vikas Publishing House.

BBN2102 BUSINESS RESEARCH METHODS [3 0 0 3]

Business Research: Introduction & Process. research process, constructs & concepts, variables & its types, Literature survey & finding research gaps, formulating research problem & determining research objectives, Research Design. Sampling Techniques and Procedures: sampling procedure, types/methods of sampling, sample size determination, confidence interval. Confidence Level and Significance Level. Measurement & Scaling Techniques: Types of data, Ratio, Interval, Ordinal and Nominal, Types of Scales: Comparative and Non -comparative scales, Data Collection: Primary and Secondary data, Observation and Survey (Structured & Unstructured), Methods of Survey: Interviews, Schedule, Data Collection Instruments, Questionnaire method. Data Processing data for analysis: editing, coding, classification & tabulations. Hypothesis & Testing of Hypothesis. Analysis of Data (Statistical Tools). Parametric & non -parametric tests. Practical application of all tests in SPSS. Writing the research report & Publication: preparing synopsis & summary of research work. reference writing: foot note, end note, in-text citation, bibliography, citation styles.

Reference Books:

- William G, Business Research Methods, 8th edition, Cengage Learning.
- Allan Bryman & Emma Bell, Business Research Methods 3rd Oxford publication, Kenneth S. Bordens & Bruce B. Abbitt. Research Design & Methods, A process approach. McGraw Hill, 8th edition,
- Cooper Donald, Schindler Pamela, Business Research Methods, MCG raw Hill.

BBN2103 Analyzing Patterns and Data Storytelling using Power BI [1 0 4 3]

Introduction to Data Storytelling – Data vs Insight, Story vs Report, Relevance in Decision-Making, Power BI vs Excel vs Tableau, Exploratory vs Explanatory. Insight Patterns – Trend, Correlation, Comparison, Outlier, Segment. Objective Setting & Framing – Defining Purpose, Audience Mapping, Problem Context. Power BI Interface & Workflow – Power Query, Data View, Report View, Data Import, Data Transformation. Data Modeling & Relationships – Star Schema, Relationships, DAX Basics, Calculated Columns, Measures. Data Aggregation & Derivation – Grouping, Summarizing, Row-Level & Column-Level Calculations. Visual Patterns – Temporal (Line), Distribution (Histogram), Composition (Stacked Bar), Comparison (Column), Correlation (Scatter), Hierarchy (Tree Map). Narrative Design Patterns – Argumentation, Flow, Framing, Emotion, Engagement. Stakeholder Communication – Executive Dashboards, Operational Views, User-Specific Layouts. Advanced Power BI Features – Bookmarks, Tooltips, Drillthrough, Q&A Visuals, Forecasting, Clustering. Design

Principles – Layout Planning, Color Theory, Emphasis, Gestalt Laws, Consistency. Storyboarding in Power BI – Pages, Navigation, Interactivity, KPI Design. Best Practices – Clarity, Actionability, Annotation, Minimalism. Case Study: Airbnb NYC – Data Cleaning, Insight Generation, Price Trends, Availability, Borough-Wise Analysis, Host Behavior, Stakeholder Dashboard Creation.

Reference Books:

- Storytelling with Data: A Data Visualization Guide for Business Professionals by Cole Nussbaumer Knaflic (ISBN: 9781119002253)
- Tableau Your Data! Fast and Easy Visual Analysis with Tableau Software (1st or 2nd Edition) By Daniel Murray (ISBN: 9781119001195)

BA2104 HUMAN RESOURCE MANAGEMENT [3 0 0 3]

Introduction to HRM: Evolution, objectives, functions, and importance of HR, Strategic HRM and its role in competitive advantage, HRM vs. Human Capital Management (HCM), HRM in the digital era. Workforce Planning and Talent Acquisition Job analysis and design using data analytics. Selection metrics Application of AI and ML in hiring processes. Performance Management and Employee Development, Performance appraisal systems and KPIs, Data-driven performance analysis, Learning and development strategies, Learning analytics and training ROI measurement. Compensation and Benefits, Compensation structure and strategy, Pay-for-performance and incentive analytics, HR dashboards for compensation tracking, Equity, fairness, and internal pay analytics. Employee Engagement and Retention, measuring employee satisfaction and engagement, Predictive analytics for attrition, Designing retention strategies using data insights, HR analytics tools for engagement tracking. Introduction to HRIS and HR tech tools (e.g., SAP SuccessFactors, Workday) Use of Excel, Power BI. Case studies on data-driven HR decisions

Textbooks:

Human Resource Management – Gary Dessler, A comprehensive textbook covering all key HRM concepts with practical applications.

Human Resource Management – V.S.P. Rao, Offers Indian context and examples, ideal for students studying HRM in India.

Human Resource Management: Text and Cases – K. Aswathappa, Includes relevant case studies, aligning well with academic and practical learning.

Reference Books:

HR Analytics: Understanding Theories and Applications – Dipak Kumar Bhattacharyya,Focuses on integrating analytics with HR functions in a practical and academic manner.

Predictive HR Analytics: Mastering the HR Metric – Martin Edwards & Kirsten Edwards, An essential book for understanding data-driven HR and predictive modeling.

The New HR Leader's First 100 Days – Alan Collins; Offers insights into modern HR leadership and the role of data in decision-making.

BA2105 OPERATION MANAGEMENT [3 0 0 3]

Course Content:

Introduction to Operations Management: Definition, key decisions of OM, goods vs. services. Operation Strategies-Definition, relevance, strategy formulation process. Forecasting-Definition, needs, importance, qualitative (grass roots, market research and Delphi method) and quantitative methods (simple moving average method, weighted moving average and single exponential smoothing method), forecast error. Process Selection: Definition, Characteristics that influence the choice of alternative processes (volume and variety), type of processes- job shop, batch, mass and continuous. Production Planning & Scheduling: Aggregate Planning, definition, nature, strategies of aggregate planning, methods of aggregate planning (level plan, chase plan and mixed plan, keeping in mind demand, workforce, and average inventory), Scheduling: Operation scheduling, goals of short-term scheduling, job sequencing (FCFS, SPT, EDD, LPT, CR) & Johnson's rule on two machines, Gantt charts, Just in Time (JIT).Facility and Capacity Planning: Layout planning – of layouts (Process, Product, Group technology and Fixed position layout). Location Decisions & Models: Facility Location – Objective, factors that influence location decision, location evaluation methods- factor rating method. Capacity Planning: Definition, and measures of capacity (input and output). Material Planning: issues in material management, independent demand system, dependent demand system. Emerging Issues in Planning/ Operations Management: Total Productive Maintenance, Advanced Manufacturing System, Role of computers in planning.

Reference Books:

- Mahadevan B, Operations Management Theory & Practice, Pearson Education, 2015.
- Heizer J and Render B, Production & Operations Management, Pearson Education
- Chase R B, Aquilano N J, Jacobs F R and Agarwal N, Production & Operations Management Manufacturing and Services, Tata McGraw Hill.
- Gupta S.P., Statistical methods, Sultan Chand & Sons.

BBN2106 ADVANCED BUSINESS STATISTICS [2 0 2 3]

Course Content:

Index Numbers & Time Series: Meaning and significance. Problems in construction of index numbers. Methods of constructing index numbers - Weighted and Un-weighted (simple aggregative and simple average of price relative methods). Analysis of Time Series: Measurement of trend - Freehand method, Semi-average method, Moving average, Method of least squares. Introduction to Probability: Permutation & Combination, Types of Events; Basics of Probability: Random Variables, Probability Distributions, Expected Value; Descriptive Methods: Measures of Central Tendency, Dispersion, and Shape. Basics of Probability: Random Variables, Probability Distributions, Expected Value. Probability Distributions: Discrete Probability Distributions: Probability Without Experiment, CDF, Binomial Distribution, Continuous Probability Distributions: PDF, Normal Distribution and Std. Normal. Addition and multiplication theorems of probability, Baye's Theorem of Probability, Central Limit Theorem and Sampling Methods: Sample and Population, Sampling Distributions, Properties, Central Limit Theorem, Types of Sampling Methods, Uses of Sampling in Various Domains, Additional Resources. ABC Bank Project: As a consultant for ABC Bank, you need to help them understand how well their call centres are performing and how they can improve customer satisfaction. Hypothesis testing: Null and Alternative Hypothesis, Type I and II Errors, T-Test, Chi Square Test, ANOVA, MANOVA. Time Series Analysis and Forecasting. Factor Analysis, Discriminant Analysis, Cluster Analysis.

Reference Books:

- Dunlop, Tamhane, Statistics and Data Analysis: From Elementary to Intermediate, Pearson, 2000. ASIN: B000MBV06A (Hard Copy), ISBN: 9780137444267 (Paperback)
- Levin, Richard I and Rubin, David (2007). Statistics for Management, Prentice Hall of India, New Delhi.
- Stephen, K.C. (2002). Applied Business Statistics- Text Problems & Cases, Harper and Row, New Delhi.

BBN2107 INTRODUCTION TO R-LANGUAGE [2 0 4 4]

Course Contents:

Introduction to R for Business Analytics: What is R-Language? Advantages of R-Language, History and Development of R-Language, Installing R and RStudio. Installing R packages relevant to business analytics (e.g., readxl, tidyverse, ggplot2, dplyr). R Fundamentals and Data Structures: Understanding R syntax and functions, Vectors, Character Strings, Matrices, Variables and Data Types. Data Manipulation and Cleaning with R: Data Frames & list; Importing and Exporting Data, Filtering, and Sorting Data; Merging and Joining Data. Handling missing data and outliers in managerial datasets. Data Visualization for Business Insights: Base R Plotting System, Scatter Plots, Bar Charts, Histograms using ggplot2. Dashboards and reporting basics (intro to RMarkdown). Introduction to Statistical Analysis in R: Descriptive statistics, Hypothesis testing (e.g., t-test, ANOVA) with business cases, Chi-square test and correlation analysis, Parametric and non-parametric tests.

Reference books:

1. K. Ren, Learning R Programming: Language, Tools, and Practical Techniques. Birmingham, UK: Packt Publishing, 2016.
2. N. Matloff, The Art of R Programming. San Francisco, CA: No Starch Press.
3. A. Nordeen, Learn R Programming in 24 Hours: Complete Guide for Beginners. 2020
4. O. Trejo and P. C. Figliozzi, R Programming By Example: Practical, Hands-on Projects to Help You Get Started with R. Birmingham, UK: Packt Publishing.
5. J. Jose, Beginner's Guide for Data Analysis Using R Programming. New Delhi, India: Khanna Publishing House

FOURTH SEMESTER

BBN2201 EXPLORATORY DATA ANALYSIS [1 0 4 3]

Course Content:

Business data types, Data sources, Public datasets, Private datasets, Data formats, CSV and Excel, Data quality checks, Fixing structure, Missing values, Duplicate values, Invalid entries, Standardizing values, Data filtering, Data sorting, Univariate analysis, Summary statistics, Frequency distribution, Bar charts, Histograms, Box plots, Categorical data, Numerical data, Group comparisons, Mean comparison, Median comparison, Bivariate analysis, Correlation analysis, Cross-tabulation, Scatter plots, Multivariate analysis, Pattern detection, Outlier identification, Derived metrics, Business KPIs, Trend analysis, Visual storytelling, Case studies, Sales analysis, Customer Behaviour, Marketing insights, Mini project, Real-world dataset, Excel usage, Google Sheets.

Reference Books:

Dunlop, Tamhane, Statistics and Data Analysis: From Elementary to Intermediate, ASIN: B000MBV06A (Hard Copy), ISBN: 9780137444267 (Paperback)

BBN2202 BIG DATA ANALYTICS [1 0 4 3]

Course Contents:

Introduction to Big Data Fundamental Terminologies and Concepts, A Brief History of Big Data, Business Drivers that have led to Big Data Innovations, Characteristics of Big Data, Benefits of adopting Big Data, Challenges and Limitations of Big Data. Fundamentals of Big Data Analytics Basic Big Data Analytics, "Big Data" in the Enterprise, Big Data and Traditional Business Intelligence and Data Warehouses, Big Data Visualization, Common Adoption Issues, Planning for Big Data Initiatives, New Roles Introduced by Big Data Projects, Emerging Trends. Big Data Storage and Processing Big Data Storage (Query Workload, Sharding, Replication, CAP, ACID, BASE), Big Data Processing (Parallel Data Processing, Distributed Data Processing, Shared-Everything/Nothing Architecture, SCV). Application Architectures for Big Data and Analytics, Data Modelling Approaches for Big Data and Analytics Solutions, Big Data Analytics Methodology, Extracting Value from Big Data: In-Memory Solutions, Real Time Analytics and Recommendation Systems. The Big Data Analysis Lifecycle (From Dataset Identification to Integration, Analysis and Visualization) Common Analysis and Analytics Techniques, A/B testing, Regression, Correlation, Text Analytics, Sentiment Analysis, Time Series Analysis, Network Analysis, Spatial Analysis, Automated Recommendation, Classification, Clustering, Foundational Big Data Technology Mechanisms, Big Data & Cloud Computing.

Reference Books:

- Foster Provost and Tom Fawcett, Data Science for Business, Shroff Publisher,
- Seema Acharya & Subhashini Chellappan: Big Data and Analytics, Wiley Publications, New Delhi

BBN2203 OPERATION RESEARCH [3 0 0 3]

Course Contents:

Introduction: Definition, Phases, Applications, Advantages and Limitations of Operations Research. Linear Programming problems: Assumptions, Formulation of LPP for business and non-business applications. Graphical solutions, Special cases – Degeneracy, Infeasible Solution, Unbalanced and Multiple optimal solutions. Minimization and Maximization cases. Simplex algorithm, Concept of dual, Sensitivity analysis with respect to objective function coefficients and R.H.S. values. Transportation problem: Formulation, North-West Corner (NWC) Method, Least Cost (LC) Method, Vogel's Approximation Method (VAM). Assignment problem: Solution algorithm for Assignment Problems. Unbalanced, multiple optimal solutions, Maximization and Application problems. Game theory: Introduction to game theory, two person- zero sum games, Pure and Mixed Strategies, Solution methods for 2 x 2 games, Graphical method (2 x n games; m x 2 games), Critical Path Method (CPM): General framework, Introduction to elements of the network, conventions adopted in drawing network, analyzing the network. Calculation of event and Activity times, Total Float, Free Float, Independent float, Critical path, Determination of project duration, and Project Crashing. Applications and Limitations of CPM. Project Evaluation and Review Technique (PERT): Calculation of Probabilistic/Expected event and Activity times, Variance of activity duration, Determination of critical path, probability/expectation of project completion.

References Books:

- Taha H. A., Operations Research, Pearson Education (7e), Latest edition.
- W.L. Winston, Operations Research, Thomson Asia, Latest edition.

- Vohra N. D., Quantitative Techniques in Management, Latest edition.
- Sharma S. D., Operations Research (14e), Kedar Nath Ramnath Publications, Latest edition.

BBN2204 Data Visualization and Business Intelligence using Tableau [1 0 4 3]

Overview of Data Visualization – Role in BI, Tableau vs Excel vs Power BI, Visual Thinking, Exploratory vs Explanatory Visuals. Principles of Storytelling – Narrative Framing, Audience Awareness, Data Context, Insight Messaging. Tableau Interface & Setup – Connecting to Data, Worksheets, Dashboards, Metadata Panel, Data Pane. Dimensions vs Measures – Continuous vs Discrete, Aggregations, Default Behavior. Core Chart Types – Bar, Line, Area, Pie, Histogram, Box Plot, Scatter Plot. Data Structuring – Filters, Sorting, Groups, Hierarchies, Pivoting. Advanced Charting – Tree Maps, Heat Maps, Dual-Axis, Stacked Charts, Geographical Maps. Calculated Fields & Functions – Numeric, String, Logical, Date Functions, LOD Expressions. Table Calculations – Percent of Total, Moving Average, Rank, Running Total. Dynamic Interactivity – Parameters, Top N Filters, Actions (Filter, Highlight, URL). Dashboard Design – Layout Containers, Responsive Design, Device Preview, KPI Tiles. Storytelling in Tableau – Story Points, Sequencing Views, Annotated Narratives. Publishing & Sharing – Tableau Public, Server, Cloud, Scheduling Data Refresh. Business Dashboards – Marketing Dashboard, Finance Dashboard, HR Dashboard, Sales Dashboard. Capstone Project: IPL Dashboard – Exploratory Analysis, Visual Storytelling, Infographic Design, Business KPIs.

Reference Books:
- Tableau For Dummies Paperback –by Molly Monsey (Author), Paul Sochan (Author)
- Microsoft Power BI Dashboards Step by Step| First Edition| By pearson Paperback –by Errin O'Connor (Author)
- Business Intelligence: A Managerial Approach (2011) Turban, Sharda, Delen, King, Publisher: Prentice Hall, Edition: 2nd, ISBN: 13-978-0-136-
- Business Intelligence Roadmap: The Complete Project Lifecycle for Decision-Support Applications by Larissa T. Moss References

BBN2205 BUSINESS AND CYBER LAWS [3 0 0 3]

Course Content:
Introduction: Nature and importance of Business and Cyber Laws; Legal framework governing businesses in India; Emergence of cyberspace and need for its regulation; Legal issues and different models of cyberspace regulation. Indian Contract Act, 1872: Essentials of a valid contract; Offer and acceptance; Consideration; Capacity of parties; Free consent; Legality of object; Performance and discharge of contract; Remedies for breach; Contracts of indemnity and guarantee. Special Types of Contracts: Contract of Bailment and Pledge – Definition, rights and duties of bailor and bailee, pledgor and pledgee; Contract of Agency – Modes of creation, rights and duties of agent and principal, termination of agency. Indian Partnership Act, 1932: Nature and types of partnerships; Rights and duties of partners; Registration and consequences of non-registration; Dissolution of firm. Limited Liability Partnership Act, 2008: Nature and structure of LLP; Incorporation and partners' rights and liabilities; Difference between LLP and partnership firms. Sale of Goods Act, 1930: Conditions and warranties; Transfer of ownership and title; Rights of an unpaid seller and remedies for breach. Negotiable Instruments Act, 1881: Promissory note, bill of exchange and cheque; Essential elements; Dishonor of negotiable instruments; Legal provisions related to dishonor of cheques under Section 138.
Origin and meaning of Cyberspace; Legal Issues in Cyberspace; Need of Regulation for Cyberspace; Different Models of Cyberspace Regulation. Cyber Jurisdiction: Concept of Jurisdiction, Jurisdiction in Cyberspace, Issues, and concerns of Cyberspace Jurisdiction in India. Information Technology Act: A brief overview of Information Technology Act, 2000, concept of electronic signature and digital signature, Cryptography, Public Key and Private Key. Data Protection and Privacy Concerns in Cyberspace, Privacy concerns of cyberspace Cyber Crimes : Definitions ,Nature ,Types of Cyber Crimes ,Cyber offences covered under the Information Technology Act, 2000, Issues relating to investigation of cybercrimes in India ,Civil Liabilities and Adjudication New emerging issue in: Brief introduction about Cloud Computing, Big Data, Internet of Things, Artificial Intelligence and Robotics, Blockchain.

Reference Books:
- P.C. Tulsian & Bharat Tulsian, Business Law, McGraw Hill Education (India) Pvt. Ltd.
- Akhileshwar Pathak, Legal Aspects of Business, McGraw Hill Education (India) Pvt. Ltd.
- Suresh T. Vishwanathan, Cyber Law: Texts and Cases, Bharat Law House Pvt. Ltd.
- Pavan Duggal, Cyber Law 3.0, Universal Law Publishing Company Private Limited.

- S.S. Gulshan & G.K. Kapoor, Business and Cyber Laws, New Age International Publishers.
- Ian J Lloyd, Information Technology Law, Oxford University Press,
- Rodney D Ryder & Nikhil Naren, Internet Law-Regulating Cyberspace and emerging Technologies, Bloomsbury
- Talat Fatima, Cybercrimes, Eastern Book Company, Lucknow, Second Edition.

CHY1003 ENVIRONMENTAL SCIENCE [3 0 0 3]

Course Content:

Introduction: Multidisciplinary nature, scope and importance, sustainability, and sustainable development. Ecosystems: Concept, structure and function, energy flow, food chain, food webs and ecological succession, examples. Natural Resources (Renewable and Non-renewable Resources): Land resources and land use change, Land degradation, soil erosion and desertification, deforestation. Water: Use and over-exploitation, floods, droughts, conflicts. Energy resources: Renewable and non- renewable energy sources, alternate energy sources, growing energy needs, case studies. Biodiversity and Conservation: Levels, biogeographic zones, biodiversity patterns and hot spots, India as a mega-biodiversity nation; Endangered and endemic species, threats, conservation, biodiversity services. Environmental Pollution: Type, causes, effects, and controls of Air, Water, Soil and Noise pollution, nuclear hazards and human health risks, fireworks, solid waste management, case studies. Environmental Policies and Practices: Climate change, global warming, ozone layer depletion, acid rain, environment laws, environmental protection acts, international agreements, nature reserves, tribal populations and rights, human wildlife conflicts in Indian context. Human Communities and the Environment: Human population growth, human health and welfare, resettlement and rehabilitation, case studies, disaster management, environmental ethics, environmental communication and public awareness, case studies. Field Work and visit.

References Books:

- R. Rajagopalan, Environmental Studies: From Crisis to Cure, Oxford University Press,
- A. K. De, Environmental Studies, New Age International Publishers, New Delhi,
- E. Bharucha,Textbook of Environmental Studies for undergraduate courses, Universities Press, Hyderabad,
- R. Carson, Silent Spring, Houghton Mifflin Harcourt, Latest Edition.
- M. Gadgil & R. Guha, This Fissured Land: An Ecological History of India, University of California Press.

FIFTH SEMESTER

SEMESTER V

BBN3101 DBMS with SQL [1 0 4 3]

Introduction to DBMS – Data vs Field vs Record vs Database, DBMS vs File Systems, DBMS Architecture (1-tier, 2-tier, 3-tier), Relational DBMS, OLTP vs OLAP, Schema, Three Schema Architecture, Data Independence. Keys & Constraints – Super Key, Candidate Key, Primary Key, Alternate Key, Foreign Key, Referential Integrity, Functional Dependency, Attribute Closure, Finding Super/Candidate Keys (with model questions), Basic Normalization (1NF, 2NF, 3NF). Relational Algebra & Tuple Relational Calculus – Relational Algebra Operations: Selection, Projection, Union, Set Difference, Cartesian Product, Rename, Intersection, Joins: Inner, Natural, Outer, Conditional, Division Operator, Min/Max Tuple Estimation in Joins, Advanced Queries: "More/Less than Some/Every", "Max/Min", Tuple Relational Calculus (TRC) Basics & Model Questions. Basics to Advanced – SQL Basics: SELECT, INSERT, UPDATE, DELETE, ALTER vs UPDATE, DELETE vs DROP vs TRUNCATE, Constraints: NOT NULL, UNIQUE, CHECK, DEFAULT, Aggregates, GROUP BY, HAVING, ORDER BY, Subqueries: Nested, Correlated, WITH Clause, Operators: IN, NOT IN, EXISTS, NOT EXISTS, ANY, ALL, Set Operations: UNION, INTERSECT, EXCEPT, Kth MAX/MIN, Division Operator in SQL, Views, Query Optimization, Best Practices, Business Reporting with SQL. Applications & Project – Role of DBMS in Business Analytics, SQL Integration with BI Tools (Power BI/Tableau – demo), Real-world Business Use Cases (Retail, HR, Finance), Capstone Project: Schema Design, Query Writing, Report Generation, Final Review & Model Questions

Reference Books:

- A. Silberschatz, H. F. Korth, and S. Sudarshan, *Database System Concepts*, 5th ed. New York, NY, USA: McGraw-Hill, 2006.

- P. Rob and C. Coronel, Database Systems, 7th ed. Boston, MA, USA: Cengage Learning, 2007.

BBN 3102 STRATEGIC MANAGEMENT [3 0 0 3]

Course Content:

Introduction to Strategic Management: Evolution of Strategic Management, Concept of Strategy, Levels at which strategy operates, Strategic Decision Making, Introduction to strategic management level, Elements in strategic management process, Model of Strategic Management Process. Objectives of Strategic Management: Understanding Strategic Intent, Developing Vision statement, Mission statement, Goals and objectives. Strategy Formulation: Concept of environment, External and Internal environment, Appraising the environment. Organisational Appraisal, Factors affecting organizational appraisal, Approaches to organizational appraisal, Methods for organizational appraisal (VRIO framework and Value chain analysis). Corporate-level strategies: Stability strategies, Expansion strategies (Concentration strategies, Integration strategies, Diversification strategies), Retrenchment strategies (Turnaround strategies, Divestment strategies, Liquidation strategies), Combination strategies. Business Level strategies: Cost leadership, Differentiation, focus, Integrating cost leadership and differentiation. Method of pursuing strategies: Alliances, Joint Venture, Mergers and Acquisitions. Strategic Analysis: Process of strategic choice, Corporate Portfolio Analysis: Boston Consulting Group (BCG), General Electric Nine-Cell matrix, SWOT Analysis, Industry Analysis: Porter's Five force model. Strategy Implementation: Nature of strategy implementation, Barriers to strategy implementation, Model of strategy implementation Strategy Evaluation: Overview, Importance, Barriers to evaluation, Strategic Control, Techniques of strategic evaluation and control.

Reference Books:

- J. A. Pearce, R. B. Robinson, and A. Mital, *Strategic Management: Formulation, Implementation and Control*, 12th ed. New Delhi, India: McGraw Hill Education (India) Pvt. Ltd., 2012.
- G. Saloner, A. Shepard, and J. Podolny, *Strategic Management*, 1st ed. New York, NY, USA: John Wiley & Sons, 2001
- J. A. Pearce and R. B. Robinson, *Strategic Management*, 12th ed. New York, NY, USA: McGraw-Hill/Irwin, 2010
- F. R. David and F. R. David, *Strategic Management: A Competitive Advantage Approach, Concepts and Cases*, 16th ed. Boston, MA, USA: Pearson, 2016.

BBN 3103 DIGITAL TRANSFORMATION OF BUSINESS [3 0 0 3]

Course Content:

Digital Strategy, Understand the characteristics of digital innovation, Introduction of Technology Management and Innovation, Distinguish the nature of digital innovation vs. traditional/conventional innovation, Introduction of Digital Transformation, What has changed in the last decade? Managing IT Trends & Emerging Technologies, Future of Technology evolution, advantage of Cloud, Big Data, IOT, AI, AR & VR and the new technological developments, anticipating, assessing, introducing and leveraging these technologies effectively and efficiently, Applying these concepts on business situation. Digital disruption and strategies for a digital transformation. Understand the underlying patterns of successful digital disruptors, industry 4.0 technologies, disruptive tech. transforming the business landscape, successful digital disruptors. Future of Technology Innovation and Best Practices for Digital Transformation Factors influencing future of tech. innovation, prevailing challenges business are facing while embracing tech. innovation, inventions that will change the world within five or ten years from now; changes brought by digital transformation in the business and social world, proven best practices for digital transformation, deploying new technologies, transforming organizational design, digital leader.

Reference Books:

- R. D. Galliers and D. E. Leidner, Eds., *Strategic Information Management: Challenges and Strategies in Managing Information Systems*, 4th ed. New York, NY, USA: Routledge, 2009.
- G. G. Parker, M. W. Van Alstyne, and S. P. Choudary, *Platform Revolution: How Networked Markets Are Transforming the Economy and How to Make Them Work for You*, 1st ed. New York, NY, USA: W. W. Norton & Company, 2016

BBN3104 E-COMMERCE [3 0 0 3]

Course Contents:

Evolution of E-Commerce and its transition to m-commerce, Phases of e-commerce, Dot-Com bubble burst in 2001, Advantages and Disadvantages of E-Commerce, Concept of Business Models in E Commerce, Types of Business Models, Components of E-Commerce Business Models, Selling on Internet, Types of sales transactions done on Internet, Evolution of e-tailing in India, B2B and B2C models of selling, Security and Privacy issues of

E-Commerce, Major threats to E-Commerce transactions, Types and Components of M-Commerce in India and abroad, Growth and future directions of M-Commerce and its integration with traditional ways of doing business, Emerging trends in E-Commerce, Funding E-Commerce ventures

Reference Books:

- K. C. Laudon and C. G. Traver, *E-Commerce 2023: Business, Technology, Society*, 17th ed. New York, NY, USA: Pearson, 2023
- P. T. Joseph, *E-Commerce: An Indian Perspective*, 7th ed. New Delhi, India: PHI Learning Pvt. Ltd., 2023.
- D. Chaffey, *E-Business and E-Commerce Management: Strategy, Implementation and Practice*, 5th ed. Harlow, UK: Pearson Education Limited, 2011.
- P. Skeldon, *M-Commerce: Boost Your Business with the Power of Mobile Commerce*, New Delhi, India: Pentagon Press, 2013.

BBN3105 Machine Learning I: Predictive Analytics in Business [2 0 4 4]

Introduction to Machine Learning – Definition of ML, Types of ML (Supervised, Unsupervised, Reinforcement – focus on Supervised), ML vs Traditional Analytics, Applications in Business (marketing, finance, HR), ML workflow from data to decision. Data Understanding and Preprocessing – Data types and sources, Handling missing values, Outliers, Encoding categorical variables (Label, One-hot), Feature scaling (Normalization, Standardization), Train-test split, Basics of cross-validation. Exploratory Data Analysis (EDA) – Descriptive statistics, Correlation analysis, Visualizations using pandas, seaborn, matplotlib, Business pattern identification through EDA. Regression Models – Simple and Multiple Linear Regression, Business use-cases (sales forecasting, pricing models), Model evaluation metrics (MAE, RMSE, R^2), Assumptions of linear regression, Intro to Lasso and Ridge Regularization. Classification Models – Part 1 – Logistic Regression, k-Nearest Neighbors (k-NN), Model evaluation (Confusion Matrix, Accuracy, Precision, Recall, F1-score), Business use-cases (customer acquisition, lead scoring). Business Use Cases and Labs – Business interpretation of regression and classification outputs, Communicating model results, Hands-on with Jupyter/Colab on business datasets, Report writing. Capstone Mini Project – Problem identification, Data cleaning, Model building, Result interpretation, Business presentation.

Reference Books:

- M. P. Deisenroth, A. A. Faisal, and C. S. Ong, *Mathematics for Machine Learning*, 1st ed. Cambridge, U.K.: Cambridge University Press, 2020.
- T. M. Mitchell, *Machine Learning*, 1st ed. New York, NY, USA: McGraw-Hill Education, 1997.
- Goodfellow, Y. Bengio, and A. Courville, *Deep Learning*, 1st ed. Cambridge, MA, USA: MIT Press, 2016.
- C. M. Bishop, *Pattern Recognition and Machine Learning*, 1st ed. New York, NY, USA: Springer, 2006.
- T. Hastie, R. Tibshirani, and J. Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction*, 2nd ed. New York, NY, USA: Springer, 2009.

SIXTH SEMESTER

BBN3201 PROJECT MANAGEMENT [3 0 0 3]

Course Contents:

Project: Meaning, Definition, Characteristics, Project Identification: Project Ideas, Screening of Ideas, Environmental Scanning and Opportunity Analysis, Project Life Cycle, Project Feasibility Analysis, Formulation of Detailed Project Report. PMBOK. Social Cost Benefit Analysis, Project Organization Structure, Setting Up of Organization Structure, Project Manager: Qualifications, Selections and Training; Role & Responsibility of a Project Manager. Marginal Costing Technique for Project Management, Project Evaluation Under Risk & Uncertainty: Risk Adjusted Rate Method, Certainty Equivalent Method, Probability Method, Sensitivity Analysis, Project Control: - Time Control- Scheduling and Control by Network Techniques like PERT & CPM, Cost Control-Budgetary Controls. Project Budgeting Techniques: Pay-Back, Average Rate of Return, Net Present Value & Internal Rate of Return.

Reference Books:

- N. P. Agarwal and B. K. Sharma, *Project Management*, Jaipur, India: RBD Professional Publications, 2009.
- D. Lock, *Project Management*, 10th ed. New York, NY, USA: Routledge, 2013.
- H. Maylor, *Project Management*, 5th ed. Harlow, UK: Pearson Education Limited, 2022.

- P. Chandra, *Projects: Planning, Analysis, Selection, Financing, Implementation, and Review*, 7th ed. New Delhi, India: Tata McGraw-Hill Education, 2009.
- R. Panneerselvam and P. Senthilkumar, *Project Management*, New Delhi, India: PHI Learning Pvt. Ltd., 2009.
- E. W. Larson, C. F. Gray, and G. Desai, *Project Management: The Managerial Process*, 8th ed. New York, NY, USA: McGraw-Hill Education, 2020.

BBN3102 Multivariate Analysis for Business [2 0 2 3]

Multivariate Statistics: Mean, variance, covariance, correlation, linear combinations, geometric concepts, distances; Data Preprocessing: Data cleaning, handling missing data, outliers, normalization, scaling, and multicollinearity issues. **Interdependence Methods** Principal Component Analysis (PCA): Dimensionality reduction, eigenvalues, eigenvectors, principal components; Factor Analysis: Exploratory and confirmatory, identifying latent variables; Cluster Analysis: K-means, hierarchical clustering, cluster validation. **Dependence Methods** Multiple Linear Regression: Model assumptions, coefficient interpretation, R^2, Adjusted R^2; Logistic Regression: Binary and multinomial logistic regression, confusion matrix, ROC curve; Discriminant Analysis: Linear and quadratic, classification applications. **Advanced Multivariate Techniques** Regularization: Ridge and Lasso regression; Support Vector Machines (SVM): Classification and regression; Ensemble Methods: Random Forest, Gradient Boosting Machines. **Multivariate Time Series and Forecasting** Time Series Models: Introduction to multivariate time series, VAR models; Forecasting: ARIMA, Exponential Smoothing, and model evaluation for business applications. **Real-World Business Applications** Business Applications: Customer segmentation, demand forecasting, financial modeling, risk analysis; BI Tools Integration: Using Power BI, Tableau for reporting, and SQL for querying multivariate data.
Capstone Project Capstone: Apply learned methods (regression, clustering, time series) to a real business problem, including data preprocessing, modeling, and presenting insights.

References Books:

- T. W. Anderson, *An Introduction to Multivariate Statistical Analysis*, 3rd ed. Hoboken, NJ, USA: Wiley-Interscience, 2003.
- T. Hastie, R. Tibshirani, and J. Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction*, 2nd ed. New York, NY, USA: Springer, 2009.
- W. Härdle and L. Simar, *Applied Multivariate Statistical Analysis*, 4th ed. Berlin, Germany: Springer, 2015.
- K. V. Mardia, J. T. Kent, and J. M. Bibby, *Multivariate Analysis*, 1st ed. London, U.K.: Academic Press, 1979.

BBN3203 Machine Learning II: Prescriptive Analytics in Business [2 0 4 4]

Classification Models – Part 2 – Decision Trees, Random Forest, Support Vector Machine (intro only), ROC Curve, AUC Score, Business applications (fraud detection, churn prediction). Unsupervised Learning – K-Means Clustering, Hierarchical Clustering, Silhouette Score, Customer segmentation, Intro to Market Basket Analysis (Apriori Algorithm, Association Rules). Dimensionality Reduction – Introduction to PCA (Principal Component Analysis), Feature selection vs Feature extraction, Visualizing reduced dimensions for business insights. Model Tuning and Optimization – Overfitting vs Underfitting, Hyperparameter tuning (Grid Search, Random Search), Cross-validation in depth, Feature importance, Model comparison. Model Interpretability and Ethics – Explainability in ML (Feature Importance, SHAP values), Bias and fairness in algorithms, Ethical considerations in business ML. Deployment and Reporting – Introduction to deployment, Integration with business tools (Power BI, Tableau), Automating reports and dashboards, Communicating insights to stakeholders. Capstone Business Project – Full-cycle ML implementation on real-world business data, Problem formulation, Data preparation, Model building and evaluation, Business presentation and reporting.

Reference Books:

- M. P. Deisenroth, A. A. Faisal, and C. S. Ong, *Mathematics for Machine Learning*, 1st ed. Cambridge, U.K.: Cambridge University Press, 2020.
- T. M. Mitchell, *Machine Learning*, 1st ed. New York, NY, USA: McGraw-Hill Education, 1997.
- Géron, *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow*, 2nd ed. Sebastopol, CA, USA: O'Reilly Media, 2019.
- Goodfellow, Y. Bengio, and A. Courville, *Deep Learning*, 1st ed. Cambridge, MA, USA: MIT Press, 2016.

- C. M. Bishop, *Pattern Recognition and Machine Learning*, 1st ed. New York, NY, USA: Springer, 2006.
- T. Hastie, R. Tibshirani, and J. Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction*, 2nd ed. New York, NY, USA: Springer, 2009.