

Program Education Objective (PEO)

- **PEO1:** Take an active role and participate in their continuous professional development including the essential philosophies and practices of Business and Data Analytics technologies to achieve their career goals
- **PEO2:** Maintain ethical and professional standards in their careers equip with specific knowledge in the areas of Business and Data Analytics
- **PEO3:** Practice the domain knowledge in the application oriented discipline including methodologies, tools and technologies involved in Business and Data Analytics
- **PEO4:** Provide students with sufficient background that will allow them to pursue their careers in the Business and Data Analytics area.

Program Outcome (PO)

On successful completion of the course students will be able to:

- **PO 1:** Identify the confluence of the language, theory and models of Business and Data Analytics in real-time delivery.
- **PO 2:** Demonstrate proficiency and cognitive knowledge of the skills required in the field of Business and Data Analytics as well as in identifying, assessing and selecting Data Analytics opportunities.
- **PO 3:** Apply the knowledge to critically analyze, synthesize and solve complex unstructured business problem
- **PO 4:** Investigate, evaluate and interpret the data for solutions to address the issues in globalised markets that are constantly changing and increasingly networked.
- **PO 5:** Estimate the financial, operational, and moral consequence of data driven way out developed in structure or unstructured and ambiguous situations
- **PO 6:** Construct and develop an ethical decision making model for both long run welfare of the organization and society

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Syllabus of BBA in Business and Data Analytics
(Effective for 2022-2023 Admission Session)
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140 Credit (3-Year UG)

Semester I

Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 101	Overview of Business Management- Analytic Approach

Preamble	This course provides students with a basic understanding to the various concepts of Business Management
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concepts of Business management	Understanding	Conceptual
CO2	Explain the approaches of various management thought and different schools of decision making process	Analyzing	Conceptual
CO3	Apply the techniques of various organization design and structure	Applying	Analytical
C04	Gain a clear understanding of motivation and leadership with the help of case studies	Remembering	Conceptual
C05	Discuss about various analytical applications of spreadsheet for business management in identification and resolution of problems pertaining to real-world	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 101
Overview of Business Management- Analytic Approach
Total Credit: 4 (Total Hours of Lectures: 40 Hours)

Sl.	Topic/Module	Hours
1.	Module 1 : Introduction to Management-Nature, meaning and significance of management, Management as a Science or an Art, Difference between management & administration; management as a process, management as a functions, managerial skills, and managerial roles in organization; quality of a good manager;	10
2.	Module 2 : Approaches to Management – Classical, Neo-classical and Modern Contributors to Management Thought ; Taylor and Scientific Theory, Fayol’s and Organization Theory, Elton Mayo & Behavioural school & human relations school; Peter Drucker and Management Thought.; Various Approaches to Management i.e. system approach , contingency approach etc., Indian Management Thought.	10
3.	Module 3 : Planning and Decision Making- Planning: Nature, importance, forms, types, making planning effective, Significance & Limitations of Planning; Planning Premises – Meaning & Types, Strategic Planning – Meaning & level, BCG model etc, MBO – Meaning, Process , importance ; Decision Making – Meaning, Types, Process, schools of decision making	5
4.	Module 4 : Organization Design and Structure - Organization – Meaning, Process, Principles, Or Organization Structure – Determinants and Forms: Line, Functional, Line & Staff, Project, Matrix and Committees; Formal and Informal Organization; Departmentation – Meaning and Bases; Span of Control – Meaning and Factors Influencing; Authority, Responsibility and Accountability; Delegation – Meaning, Process; Principles; Centralization and Decentralization – Meaning; Degree of Decentralization; Difference between Delegation and Decentralization. Organization structure common in tourism industry	10
5.	Module 5 : Directing – motivation & leadership- Motivation – Meaning , Definition, Significance & Limitations; contemporary theories of motivation; Financial and non-financial incentives of Motivation; Leadership Definition, Significance of Leadership, Leadership styles ; Process and Barriers of Communication.	5

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Paper Code: BBA (A)-191
Paper Name: Overview of Business Management- Analytic Approach (LAB)
Total Credit: 2 (Total Hours of Labs: 20 Hours)

Sl.	Topic/Module	Hours
1	Module 1: Basic Concepts Of Spreadsheet for Business	5
2	Module 2: Functionality Using Ranges, Creating Formulas, Spreadsheet Charts, Spreadsheet Tools	5
3	Module 3: Applications of Spreadsheet for Business Management	10

Suggested Readings:

- Management: Stoner James. A, Freeman Edward, Gilbert Daniel , Pearson
- Weihrich and Koontz, et al: Essentials of Management; Tata McGraw Hill
- V.S.P Rao & Hari Krishna: Management-Text & Cases, Excel Books.
- Ramaswami T: Principles of Mgmt., Himalaya Publishing.
- Robbins, S. P: Management, Prentice Hall.
- Prasad L M: Principles and Practice of Management, Sultan Chand & Sons-New Delhi.
- Microsoft Excel 2016 Data Analysis and Business Modeling by Wayne L. Winston.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA(A)-102	Overview of Business Economics

Preamble	This course provides students with a basic understanding to the various concepts of Business Economics
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concepts of factor pricing ,product pricing and various concept of macroeconomics	Understanding	Conceptual
CO2	Explain the approaches of the firm under different market condition	Analyzing	Conceptual
CO3	Apply the techniques of causes and consequences of different market situations	Applying	Analytical
CO4	Gain a clear understanding of demand supply, growth rate, inflation, national income etc	Remembering	Conceptual
CO5	Discuss about various applications of price and output decision of firms under various market structure by studying various case studies structure	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Name: Overview of Business Economics

Paper Code: BBA (A) – 102

Total Credit: 6 (Total Hours of Lectures: 60 Hours)

Sl.	Topic/Module	Hours
1.	<p>Module 1: Introduction: Basic Problems of an Economy, Working of Price Mechanism and Resource Allocation.</p> <p>Elasticity of Demand: Concept and Measurement of Elasticity of Demand, Price, Income and Cross Elasticities; Average Revenue: Marginal Revenue, and Elasticity of Demand, Determinants of Elasticity of Demand.</p> <p>Production Function: Law of Variable Proportions, Ridge Lines. Isoquants, Economic Regions and Optimum Factor Combination. Expansion Path, Returns of Scale, International and External Economies and Diseconomies of Scale.</p> <p>Theory of Costs: Short-Run and Long Run Cost Curves – Traditional Approaches Only.</p>	12
2.	<p>Module 2 : Market Structures</p> <p>Perfect Competition: Characteristics, Profit Maximization and Equilibrium of Firm and Industry, Short- Run and Long Run Supply Curves, Price and Output Determination, Practical Applications.</p> <p>Monopoly: Characteristics, Determination of Price under monopoly, Equilibrium of a Firm, Comparison Between Perfect Competition and Monopoly, Price Discrimination, Social Cost of Monopoly</p> <p>Monopolistic Competition: Meaning and Characteristics, Oligopoly: Characteristics,</p>	12
3.	<p>Module 3:</p> <p>Factor Pricing: Marginal Productivity Theory and Demand for Factors (Statement and assumption only).</p> <p>Concept of Rent;</p> <p>Concept of Labour: Wage Rate, Nominal Wage, Real Wage. Concept of Capital</p>	6

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4.	<p>Module 4: Introduction to Macroeconomics. Concept of Aggregate Demand and Aggregate Supply, Marginal Propensity to Consume(MPC),APC, MPS, MPI: Gross National Product (GNP), Gross Domestic Product (GDP), Net National Product and Net Domestic Product, Personal Income, Disposable Income and Per Capita Income, Indian money market</p>	15
5.	<p>Module 5 : Public Finance Public Revenue: Concept of Taxes, Sources of Revenue of Central and State Government, GST, CGST, SGST (only definition). Public Expenditure, Public debt; Deficit Financing: Role and Importance. Budget: Need and Types, Concept of Different Types of Deficit (Revenue Deficit. Budgetary Deficit,</p>	6
6.	<p>Module 6 : International Trade and Finance: Need for international trade, Absolute and Comparative Cost Advantage Theory, Gains from international trade, Terms of Trade Balance of Payments International Financial Institutions; Concept of Inflation</p>	9

Suggested Readings:

- Dominic Salvatore – Managerial Economics: Principles and Worldwide Applications, Oxford
- Microeconomics, Koutsoyiannis
- Mankiw: Principles of Macroeconomics, Cengage Learning
- D N Dwivedi: Managerial Economics, Vikas Publishing House

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 103	Mathematics for Analytics & Statistical Concept

Preamble	This course provides students with a basic understanding to the various concepts of mathematics and statistics
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concept mathematics and statistics	Understanding	Conceptual
CO2	Calculate various diverse examples of mathematics and statistics pertaining to real life situation	Analyzing	Conceptual
CO3	Applying and estimating various relationships among measurable attributes of object and determine measurements	Applying and Creating	Analytical
CO4	Identify a clear relation between various statistical methods, datasets and relating this with graphical summaries	Remembering	Conceptual
CO5	Discuss about various analytical applications of statistical software to perform statistical computations, display numerical and publish various reports,	Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Name: Mathematics for Analytics & Statistical Concept

Paper Code: BBA (A) – 103

Total Credit: 6 (Total Hours of Lectures: 60 Hours)

Sl.	Topic/Module	Hours
1.	<p>Module 1 : <i>The Number System</i> – Positive and Negative Integers, Fractions, Rational and Irrational Numbers, Real Numbers, Problems Involving the Concept of Real Numbers.</p> <p><i>Basic Algebra</i> – Algebraic Identities, Simple Factorizations; Equations: Linear and Quadratic (in Single Variable and Simultaneous Equations). Surds and Indices; Logarithms and Their Properties (Including Change of Base); Problems Based on Logarithms.</p>	8
2.	<p>Module 2 : <i>Set Theory</i>-Introduction; Representation of sets; Subsets and supersets; Universal and Null sets; Basic operations on sets; Laws of set algebra; Cardinal number of a set; Venn Diagrams; Application of set theory to the solution of problems</p> <p><i>Permutations and Combinations</i> – Fundamental principle of counting; Factorial notation. Permutation: Permutation of n different things; of things not all different; restricted permutations; circular permutations. Combination: different formulas on combination; complementary combination; restricted combination; Division into groups. Mixed problems on permutation and combination. Concept of Probability</p>	7
3.	<p>Module 3: <i>Determinants</i>- Determinants of order 2 and 3; minors and cofactors; expansion of determinants; properties of determinants; Cramer’s rule for solving simultaneous equations in two or three variables</p> <p><i>Matrices</i>- Different types of matrices; Matrix Algebra – addition, subtraction and multiplication of matrices; Singular and non-singular matrices; adjoint and inverse of a matrix; elementary row / column operations; Solution of a system of linear equations using matrix algebra.</p> <p>Concept of Eigen Value, Eigenvector.</p>	7
4	<p>Module 4: Differentiation: Meaning & geometrical interpretation of differentiation; standard derivatives (excluding trigonometric functions); rules for calculating derivatives; logarithmic differentiation.</p> <p>Integration: Meaning, Standard formulas, Substitution, Integration by parts (Excluding Trigonometric functions)</p>	4
5.	<p>Module 5: <i>Data</i>-Collection, Editing and Presentation of Data: Primary data and secondary data; Methods of collection; Scrutiny of data. Presentation of data: textual and tabular presentations; Construction of a table and the different components of a table. Diagrammatic representation of data: Line diagrams, Bar diagrams, Pie charts and divided-bar diagrams.</p>	7
6.	<p>Module 6 : <i>Frequency Distributions</i>- Attribute and variable; Frequency distribution of an attribute; Discrete and continuous variables; Frequency distributions of discrete and continuous variables; Bivariate and Multivariate Frequency Distributions. Diagrammatic representation of a frequency distribution: case of an attribute; case of a discrete variable: column diagram, frequency polygon and step diagram; case of a continuous variable: histogram</p>	7

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7.	Module 7: Measures of Central Tendency- Definition and utility; Characteristics of a good average; Different measures of average; Arithmetic Mean; Median; Other positional measures – quartiles, deciles, percentiles; Mode; Relation between Mean, Median and Mode; Geometric and Harmonic Mean. Choice of a suitable measure of central tendency.	10
8.	Module 8: Measures of Dispersion- Meaning and objective of dispersion; Characteristics of a good measure of dispersion; Different measures of dispersion – Range, Quartile deviation, Mean deviation, Mean Absolute deviation, Standard deviation; Comparison of the different measures of dispersion. Measures of relative dispersion – Coefficient of Variation. Combined mean and standard deviation, Combined mean and standard deviation. Introduction to Skewness, Kurtosis, Moments. Practical applications	10

Suggested Readings

- H. S. Hall & S. R. Knight – Higher Algebra; Radha Publishing House
- Reena Garg, Engineering Mathematics, Khanna Publishing House
- Sancheti & Kapoor – Business Mathematics; Sultan Chand & Company
- R. S. Soni – Business Mathematics – Pitambar Publishing House.
- N G Das, Statistical Methods (Combined edition volume 1 & 2), McGraw Hill Education.
- J K Sharma: Business Statistics, fifth edition, Vikas Publishing house.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 104	Overview of Business Communication

Preamble	This course provides students with a basic understanding to the various concepts of Business Communication
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand communications in domestic and international business situation	Understanding	Conceptual
CO2	Explain and list barriers to effective communication	Analyzing	Conceptual
CO3	Apply the writing skill for various effective email communication	Applying	Conceptual
CO4	Gain a clear understanding of an effective oral presentation	Remembering	Conceptual
CO5	Discuss about various techniques of writing effective reports and analysis related to it	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Name: Overview of Business Communication

Paper Code : BBA (A) – 104

Total Credit: 2 (Total Hours of Lectures: 20 Hours)

Sl.	Topic/Module	Hours
1.	Module 1 : Functional Grammar & Vocabulary: Tense: Formation and application; Affirmative / Negative / Interrogative formation; Modals and their usage; Conditional sentences; Direct and indirect speech; Active and passive voice; usage of common phrasal verbs, synonyms & antonyms.	2
2.	Module 2 : Reading Skills: Comprehension passages; reading and understanding articles from technical writing. Interpreting texts: analytic texts, descriptive texts, discursive texts; SQ3R reading strategy.	2
3.	Module 3: Writing Skills: Writing business letters - enquiries, complaints, sales, adjustment, collection letters, replies to complaint & enquiry letters; Job applications, Résumé, Memo, Notice, Agenda, Reports – types & format, E-mail etiquette, advertisements.	6
4.	Module 4 : Listening & Speaking Listening: Listening process, Types of listening; Barriers in effective listening, strategies of effective listening Speaking: Presentations, Extempore, Role-plays, GD, Interview	10

Suggested readings

- Bhatnagar, M & Bhatnagar, N (2010) Communicative English for Engineers and Professionals. New Delhi: Pearson Education.
- Raman, M & Sharma, S (2017) Technical Communication. New Delhi: OUP.
- Kaul, Asha (2005) The Effective Presentation: Talk your way to success. New Delhi: SAGE Publication.
- Sethi, J & Dhamija, P.V. (2001), A Course in Phonetics and Spoken English. New Delhi: PHI.

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Semester II

Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 201	Marketing Management

Preamble	This course provides students with a basic understanding to the various concepts of Marketing Management
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concept of marketing management	Understanding	Conceptual
CO2	Explain the marketing process for different types of product and services	Analyzing	Conceptual
CO3	Apply the tools used by marketing managers in decision situations	Applying	Analytical
CO4	Gain a clear understanding of marketing environment with the help of case studies	Remembering	Conceptual
CO5	Discuss about various analytical skills in identification and resolution of problems pertaining to marketing management	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Name: Marketing Management
Paper Code: BBA (A)- 201
Total Credit: 6 (Total Hours of Lectures: 60 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to Marketing –Definition, Scope, Marketing Concepts-Traditional and Modern; Selling vs. Marketing; Functions and Evaluation of Marketing. Marketing Environment, Macro and Micro Environment, SWOT Analysis, Marketing Mix, Marketing Information System. Consumer Behavior- Meaning, Determinants- Cultural, Social, Personal, Psychological. Industrial Buying Behavior-Meaning, Characteristics; Differences Between Consumer Buying and Industrial Buying Behavior.	10
2.	Module 2: Market Segmentation Targeting & Positioning (STP) - Meaning, Benefits of Market Segmentation, Basis of Segmentation; TargetMarket; Introduction to segmentation techniques. Branding- Definition, Importance, Branding Strategy, Packaging.	6
3.	Module 3: Concepts of Products, Product Mix, Product Line, Product Width, Depth; Product Life Cycle Meaning and Stages, Strategies Involvedin PLC Stages, New Product Development- Steps	6
4.	Module 4: Pricing- Meaning, Importance of Price in the Marketing Mix, Objectives and Methods of Pricing, Factors Affecting Price of a Product/Service, Discounts and Rebates, Introduction to pricing models using Excel.	6
5.	Module 5: Introduction to distribution channels, Introduction to Integrated Marketing Communications.	8
6.	Module 6: Introduction to marketing modelling techniques : RFM, CLV, PPC, Marketing Mix allocation etc.	10
7.	Module 7: Introduction to Marketing Metrics: Types, Application, Computation etc.	8
8.	Module 8: Other forms of Marketing and Future of Marketing.	6

Suggested Readings:

- Kotler Philip and Armstrong Gary: Principles of Marketing, Pearson.
- Arun Kumar: Marketing Management, Vikas Publishing House.
- Saxena, Rajan: Marketing Management, TMH.
- Gandhi, J.C.: Marketing, TMH.
- Wayne L. Winston: Marketing Analytics, Willey.
- Farris: Marketing Metrics, Pearson.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 202	Financial Accounting

Preamble	This course provides students with a basic understanding to the various concepts of Financial Accounting
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concepts of financial modeling practices for analytical strategy	Understanding	Conceptual
CO2	Explain the approaches of the performance of companies through their financial statement	Analyzing	Conceptual
CO3	Apply the efficient forecasting techniques	Applying	Analytical
CO4	Gain a clear understanding of general functions and purposes of accounting	Remembering	Conceptual
CO5	Discuss about various analytical applications to describe the main elements of financial accounting information like asset , liabilities, revenue and expenses pertaining to real-world	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Name: Financial Accounting
Paper Code: BBA (A) - 202
Total Credit: 6 (Total Hours of Lectures: 60 Hours)

Sl.	Topic/Module	Hours
1.	<p>Module 1</p> <p>Introduction to Financial Accounting: Meaning and Scope of Accounting; the users of financial accounting information and their needs; Accounting Principles: Accounting Concepts and Conventions, GAAP; Accounting Transactions: Accounting Equation, Journal, Rules of debit and credit, Ledger, Trial Balance, Cash Book. Accounting Standards: Introduction, Objectives of Accounting Standards, Advantages of Accounting Standards, Accounting Standards in India and IFRS.</p>	15
2.	<p>Module 2</p> <p>Final Accounts: Introduction, Meaning, Objectives and Characteristics of Final Accounts; Final Statements of Sole Proprietorship without adjustment, Adjustments in Preparation of Final Statements.</p>	10
3.	<p>Module 3</p> <p>Partnership Accounts: Meaning and Features, Partnership Deed and Contents; Admission, Retirement, and Death of a Partner. Dissolution of Partnership including Garner Vs. Murray rule.</p>	10
4.	<p>Module 4</p> <p>Company accounts: Issue of shares (application, allotment, first call, final call), Calls in arrear & forfeiture of shares.</p>	5
5.	<p>Module 5</p> <p>Depreciation and Provisions: Concept of depreciation; Causes of depreciation; depletion, amortization; Depreciation accounting; Methods of recording depreciation; Straight line and diminishing balance method, Provisions and Reserves: Preparation of provision for doubtful debt account, provision for discount on Debtors account and provision for Discount on Creditors account.</p>	10
6.	<p>Module 6</p> <p>Bank Reconciliation Statement: Introduction, Meaning of Bank Reconciliation Statement, Importance of Bank Reconciliation Statement, Reasons for Difference, Procedure for Reconciliation; Rectification of errors.</p> <p>Financial Reporting and Case Study</p>	10

Suggested Readings:

- Ashoke Banerjee: Financial Accounting, Excel Books
- Basu & Das : Financial Accounting, Rabindra Library
- Ramchandran Kakani: Financial Accounting for Managers, TMH
- P. C. Tulsian: Financial Accounting, Pearson.
- M. Hanif, A. Mukherjee: Financial Accounting, TMH.
- Dr. S. N. Maheshwari, Sharad K. Maheshwari: Financial Accounting for BBA, VikasPublishing House Pvt. Ltd.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 203	Managing Information- IT for Business Analytics

Preamble	This course provides students with a basic understanding to the various concepts of IT for Business Analytics
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's TaxonomyLevel	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concepts of information , technology for business analytics	Understanding	Conceptual
CO2	Foster and ability to critically analyse synthesise and solve complex unstructured business problem	Analyzing	Conceptual
CO3	Apply and identify and create various model to solve decision problem in different situations	Applying & Creating	Analytical
CO4	Gain a clear understanding of interpreting results, solutions , and identifying appropriate courses of action for a giving managerial solutions whether a problem on opportunity	Remembering	Conceptual
CO5	Discuss about various analytical applications through some specific software (e.g.-Excel, R, Python, Jamovi etc.) to create viable solution to decision making problem	Creating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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**Paper Name: Managing Information- IT for
Business Analytics**
Paper Code: BBA (A)- 203
Total Credit: 4 (Total Hours of Lectures: 40 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to Business Intelligence: BI concept, BI architecture, BI in today's perspective, BI Process, Applications of BI like Financial analysis, statistical analysis, sales analysis, CRM, result pattern and ranking analysis, Balanced Scorecard, BI in Decision Modelling: Optimization, Decision making under uncertainty. Ethics and business intelligence.	8
2.	Module 2: Elements of Business Intelligence: Reports & ad hoc queries; Analyse OLAP data; Dashboards & Scorecards development, Metadata Models; Automated tasks & events; Mobile & disconnected BI.	8
3.	Module 3: Building the BI Project: Planning the BI project, Project Resources, Project Tasks, Risk Management, Cost-justification, Collecting User Requirements, Requirements-Gathering Techniques, Prioritizing & Validating BI Requirements, Changing Requirements, BI Design and Development, Best Practices, Post-Implementation Evaluations.	8
4.	Module 4: Data Science: The concept, process and typical tools in data science. Example of different algorithms i.e. segmentation, classification, validation, regressions, recommendations.	8
5.	Module 5: Data Visualization and Dashboard Design: Responsibilities of BI analysts, Importance of data visualization, types of basic and composite charts, dashboards.	8

Paper Code: BBA(A)-293
Paper Name: Managing Information- IT for Business Analytics (LAB)
Total Credit: 2 (Total hours of Labs: 20 hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to Tableau, R, Power BI	10
2.	Module 2: Data Visualization using Tableau, R, Power BI	10

Suggested Readings:

- Management Information Systems Paperback – 1 July 2017 by by James A. O'Brien (Author), George M. Marakas (Author), Ramesh Behl (Author)
- Information Systems Project Management by David Olson
- Business-Driven Information Systems by Paige Baltzan; Amy Phillips
- Quantitative Methods for Business Perfect Paperback – 1 February 2013

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 204	Environmental Science & Sustainable Development

Preamble	This course provides students with a basic understanding to the various concepts of Environmental Science & Sustainable Development
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand and evaluate the global scale of environmental problems	Understanding	Conceptual
CO2	Explain the interconnectedness and interdisciplinary nature of environmental studies	Analyzing	Conceptual
CO3	Apply the problem solving and methodological approaches of the social science natural science and humanities in environmental problem solving	Applying	Analytical
CO4	Gain a clear understanding of the integrated approach to environmental issues with a focus on sustainability	Remembering	Conceptual
CO5	Discuss about various roles responsibilities and identities as citizens , consumers and environmental participants in a complex and inter connected world	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) - 204
Paper Name: Environmental Science & Sustainable Development
Total Credit: 2 (Total hours of lectures: 20 hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction: Multidisciplinary nature, Scope and importance; the need for environmental education. Concept of sustainability and sustainable development.	3
2.	Module 2: Ecosystems: Definition, Structure: food chains, food webs and function of ecosystem: Energy flow, nutrient cycle and ecological succession. Ecological Interactions, Biodiversity and Conservation – Levels, India as a mega-biodiversity nation, Threats to biodiversity, Ecosystem and biodiversity services	3
3.	Module 3: Environmental Pollution: Types:- Air pollution, Water pollution, Land pollution, Noise pollution; pollutants, Effects of pollution, Control and Remedial measures.	4
4.	Module 4: Environmental Protection: Report of the Club of Rome: Sustainable Development, Different Renewable Energy Sources- Wind Power, Water Power, Bio Fuel/Solid Bio Mass, Geothermal Energy, Nuclear Power, Environmental Movements- Chipko movement; Narmada Bachao movement; Tehri Dam conflict.	5
5.	Module 5: Environmental Policies and Legislations: Environmental Regulations Different Acts, Environmental Ethics Environmental Impact Assessment (EIA), EIA – Methods and Tools, Appraisal and Clearance for Industry, Evaluation System.	5

Suggested Readings:

- G.N. Pandey: Environmental Management, Vikas Publishing House Pvt. Ltd.
- Cunningham: Environmental Science, TMH.
- R. Rajagopalan: Environmental Studies, Oxford.
- R. Joshi & Munish Kapila: Environment Management, Kalyani Publishers.
- C.S. Rao: Environmental Pollution Control Engineering, New Age International Publication

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Semester 3

Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 301	Data Structure

Preamble	This course provides students with a basic understanding to the various concepts and the application of Data Structure
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.	Understanding	Conceptual
CO2	Understand and Analyze the basic data structures such as arrays, linked lists, stacks and queues.	Analyzing	Conceptual
CO3	Describe the hash function and concepts of collision and its resolution methods	Evaluating	Analytical
CO4	Solve problem involving graphs, trees and heaps	Applying and Calculating	Analytical
CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data	Applying and Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 301

Paper Name: Data Structures

Total Credit: 6 (Total Hours of Lectures: 60 Hours)

Sl.	Topic/Module	Hours
1.	Module – 1: Data Structures Basics: Structure and Problem Solving, Data structures, Data structure Operations, Algorithm: complexity, Time- Space trade-off.	06
2.	Module 2: Linked List: Introduction, Linked lists, Representation of linked lists in Memory, Traversing a linked list, Searching a linked list, Memory allocation and Garbage collection, insertion into linked list, Deletion from a linked list, Types of linked list.	06
3.	Module 3: Stack and Queue: Introduction, Array Representation of Stack, Linked List Representation of stack, Application of stack, Queue, Array Representation of Queue, Linked List Representation of Queue.	06
4.	Module 4: Trees: Definitions and Concepts, Operations on Binary Trees, Representation of binary tree, Conversion of General Trees to Binary Trees, Sequential and Other Representations of Trees, Tree Traversal.	08
5.	Module 5: Graphs: Matrix Representation of Graphs, List Structures, Other Representations of Graphs, Breadth First Search, Depth First Search, Spanning Trees.	08
6.	Module 6: Applications of Graphs: Topological Sorting, Shortest-Path Algorithms – Weighted Shortest Paths – Dijkstra’s Algorithm, Minimum spanning tree- Prim’s Algorithm.	08
7.	Module 7: Searching and Sorting Techniques, Sorting Techniques: Bubble sort, Merge sort, Selection sort’, Heap sort, Insertion Sort. Searching Techniques: Sequential Searching, Binary Searching, Search Trees.	08
8.	Module 8: Well Known Sorting Algorithms – Insertion sort, Bubble sort, Selection sort, Shell sort, Heap sort, Divide and Conquer Divide and Conquer Strategy; Binary Search; Max. and Min.; Merge sort; Quick sort. Application with case studies	10

Suggested Readings:

- Lipschutz Seymour: Data Structures with C, McGraw Hill Education India.
- Salaria : Data Structures & Algorithms Using C 5 Edition, Khanna Publishers.
- Prof. Dipannita Mondal, Data Structures and Algorithms, Everest Publishing House.
- M.A.Weiss, Data structures and Algorithm Analysis in C, 2nd edition, Pearson.
- Thomas H. Cormen, Charles E. Leiserson, Introduction to Algorithms (Eastern Economy Edition), PHI Publication
- Karumanchi Narasimha, Data Structures and Algorithms Made Easy, Careermonk Publications

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 302	Foundation of AI and ML with Python

Preamble	This course provides students with a basic understanding to the Foundation of AI and ML with Python
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Provide the foundations of Machine Learning and AI, so that students can better understand these methods, use them, and potentially develop their own custom based ones that can also use to advance their respective fields;	Understanding	Conceptual
CO2	Provide an overview of some of the most important machine learning methods used in research and practice;	Analyzing	Conceptual
CO3	Provide students not only with a historical perspective of these fields, but also with a view of the state-of-the-art methodologies and research advances as well as views on future directions;	Remembering	Conceptual
CO4	Help students use machine learning methods appropriately in their research fields, with the aim of developing insights that are only feasible due to the usage of these new "microscopes".	Applying and Calculating	Analytical
CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data	Applying and Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 302
Paper Name: Foundation of AI and ML with Python
Total Credit: 4 (Total hours of lectures: 40 hours)

Sl	Name of the Topic	Hours
1	<p>Module 1: Introduction to Machine Learning</p> <ul style="list-style-type: none"> • Introduction: Definition of learning systems. Goals and applications of machine learning. Aspects of developing a learning system: training data, concept representation, function approximation. • Inductive Classification: The concept learning task. Concept learning as search through a hypothesis space. General-to-specific ordering of hypotheses. Finding maximally specific hypotheses. Version spaces and the candidate elimination algorithm. Learning conjunctive concepts. 	10
2	<p>Module 2: Ensemble Learning</p> <ul style="list-style-type: none"> • Introduction: Using committees of multiple hypotheses. Bagging, boosting, and DECORATE. Active learning with ensembles. • Boosting: General boosting procedure, etc. • Bagging: Two ensemble paradigm, Bagging algorithm • Diversity: Ensemble diversity, Error decomposition 	10
3	<p>Module 3: Fuzzy Logic</p> <ul style="list-style-type: none"> • Tagaki-Sugeno Fuzzy Logic, Mamdani Fuzzy Logic, Decision Method, Membership Functions, Fuzzification and Defuzzification, Fuzzy system Modeling Planning and making decisions. 	10
4	<p>Module 4: Instance-Based Learning</p> <ul style="list-style-type: none"> • Constructing explicit generalizations versus comparing to past specific examples. • K-Nearest-neighbor algorithm. • Case-based learning. 	10

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Paper Code: BBA (A) – 392

Paper Name: Foundations of AI and ML with Python Lab

Total Credit: 2 (Total Hours of Labs: 20 Hours)

Sl. No.	Topic/Module	Hours
1	Module 1 : Python libraries (Numpy, Pandas), Python libraries (Matplotlib, Sklearn), k Nearest Neighbors, Linear Regression, Logistic Regression	10
2	Module 2 : Decision Trees, Random Forests, Neural Networks, Matlab Fuzzy Logic Toolbox, Decision Support Systems with Fuzzy Logic	10
	Total Hours	20

Suggested Readings:

- John Slavic- Machine Learning for Beginners: An Introduction to Artificial Intelligence and Machine Learning
- Hastie, T., R. Tibshirani, J. Friedman, “The Elements of Statistical Learning”, Springer
- Python and R for the Modern Data Scientist by Rick J. Scavetta, Boyan Angelov.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 303	Behavioral Science for Business Organization

Preamble	This course provides students with a basic understanding to the various concepts of Business Organization
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concepts of the importance of Interpersonal Skills; Challenges and opportunities for Organizational Behavior	Understanding	Conceptual
CO2	Explain Application of perception in individual decision making	Analyzing	Conceptual
CO3	Apply the Basic approaches used by managers in Leadershi in decision making situations	Applying	Analytical
C04	Gain a clear understanding of HR Functional Areas for Organizational Excellence	Remembering	Conceptual
C05	Discuss about various skills need for conducting HR Audit & Accounting	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 303

Paper Name: Behavioral Science for Business Organization

Total Credit: 6 (Total hours of lectures: 60 hours)

Sl.	Topic/Module	Hours
1.	Module 1: The importance of Interpersonal Skills; Challenges and opportunities for Organizational Behavior, Foundations of Individual Dimensions; Attitudes and Job Satisfaction; Personality Tests and Measurement of Employees' Values.	10
2.	Module 2: Perception and Making judgments on others; Application of perception in individual decision making; Using Motivation concepts for employee involvement; Implication of Emotional Intelligence in the workplace.	10
3.	Module 3: Foundation of Group Behaviour; Basic approaches to Leadership; Factors contributing to political behaviour; Bargaining strategies in the Negotiation Process; Fundamentals of Organization Structures.	10
4.	Module 4: Introduction to HRM; HR Functional Areas for Organizational Excellence; Recruitment and Selection Methodology; HR planning techniques.	5
5.	Module 5: Concepts of HRD; Performance Appraisal Systems; HRIS; Software of HR Analytics.	10
6	Module 6: HR Audit & Accounting; Balance Scorecard; Stream Analysis.	15

Suggested Readings:

- Robbins, Stephen P, Judge, Timonthy A & Vohra, Neharika- Organizational Behaviour. Pearson
- Pattanayak, Biswajeet- Human Resource Management. Prentice Hall of India
- Desseler, Gary & Biju Varkkey- Human Resource Management. Pearson
- Sanghi, Seema- Human Resource Management. Macmillan
- Chatterjee S.K.- Business Organisation. Tata McGraw Hill
- Prakash, Jagdish - Business Organisation and Management. Kitab Mahal
- Sherlekar S.A.- Business Organisation and Management. Himalaya Publishing House
- Singh & Chhabra- Business Organisation. New India Publication

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 304	Business Intelligence Model

Preamble	This course provides students with a basic understanding to the various concepts of Business Intelligence Model
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concepts and components of Business Intelligence (BI)	Understanding	Conceptual
CO2	Explain Application of various technologies that make up BI (data warehousing, OLAP)	Analyzing	Conceptual
CO3	Apply the various approaches to define how BI will help in different decision-making situations	Applying	Analytical
CO4	Gain a clear understanding of technological architecture that makes up BI systems	Remembering	Conceptual
CO5	Discuss and create various the implementation of a BI system like- Machine Learning, , BI Search & Text Analytic, Advanced Visualization etc.	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 304

Business Intelligence Model

Total Credit: 6 (Total Hours of Lectures: 60 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to Business Intelligence: BI concept, BI architecture, BI in today's perspective, BI Process, Applications of BI like Financial analysis, statistical analysis, sales analysis, CRM, result pattern and ranking analysis, Balanced Scorecard, BI in Decision Modelling: Optimization, Decision making under uncertainty. Ethics and business intelligence.	08
2.	Module 2: Elements of Business Intelligence: Reports & ad hoc queries; Analyse OLAP data; Dashboards & Scorecards development, Metadata Models; Automated tasks & events; Mobile & disconnected BI.	08
3.	Module 3: Building the BI Project: Planning the BI project, Project Resources, Project Tasks, Risk Management, Cost-justification, Collecting User Requirements, Requirements-Gathering Techniques, Prioritizing & Validating BI Requirements, Changing Requirements, BI Design and Development, Best Practices, Post-Implementation Evaluations.	10
4.	Module 4: Data Science: The concept, process and typical tools in data science. Example of different algorithms i.e. segmentation, classification, validation, regressions, recommendations.	08
5.	Module 5: Data Visualization and Dashboard Design: Responsibilities of BI analysts, Importance of data visualization, types of basic and composite charts, dashboards.	10
6	Module 6: Reporting authoring: Building reports with relational vs Multidimensional data models ; Types of Reports – List, crosstabs, Statistics, Chart, map, financial etc., Data Grouping & Sorting, Filtering Reports, Adding Calculations to Reports, Conditional formatting, Adding Summary Lines to Reports.	08
7	Module 7: Future of Business Intelligence: Emerging Technologies, Machine Learning, Predicting the Future with the help of Data Analysis, BI Search & Text Analytics – Advanced Visualization – Rich Report, Future beyond Technology.	08

Suggested Readings:

- Vercellis Carlo: Business Intelligence, Wiley India Pvt. Ltd.
- Meenakshi Gupta: Business Intelligence and Applications, BUUKS.
- Dr. Manoj Kumar Patel: Business Intelligence in Decision Making, BUUKS.
- Ramesh Sharda (Author), Dursun Delen (Author), Efraim Turban: Business Intelligence and Analytics: Systems for Decision Support, Pearson Education.
- Surma Jerzy: Business Intelligence, Business Expert Press.
- Sharda Ramesh: Business Intelligence and Analytics, Pearson.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 305	Soft-skill & Presentation Development

Preamble	This course provides students with a basic understanding of Soft-skill & Presentation Development
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand and develop effective communication skills	Understanding	Conceptual
CO2	Demonstrate various inter-personal skills, team management skills, and leadership skills	Analyzing	Conceptual
CO3	Apply the skills with a mature outlook to function effectively in different circumstances.	Applying	Analytical
CO4	Gain a clear understanding of Pillars of personality development like - Introspection, Self-Assessment, Self-Appraisal, Self-Development., Self-Introduction, Defining Success	Remembering	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Name: Soft-skill & Presentation Development
Paper Code: BBA (A) – 305

Total Credit: 2 (Total hours of lectures: 20 hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction: • Meaning and Definition of Personality. • Factors affecting Personality Development: Biological, Home Environment and Parents, School Environment and Teachers, Peer Group, Sibling Relationships and Mass Media, Cultural Factors, Spiritual Factors, Public Relations	4
2.	Module 2: Personality Traits. • Meaning and Definition: Personality Traits. • Developing Positive Personality Traits: Attitude: Factors that determine Attitude, Benefits of Positive Attitude and Consequences of negative attitude, steps to Build positive attitude. • Personality habits	4
3.	Module 3: Pillars of personality development: Introspection, Self-Assessment, Self-Appraisal, Self-Development:, Self-Introduction, Defining Success, Concept of Failure, Self Esteem: Sigmund Freud ID, EGO and SUPER EGO Concepts.	4
4.	Module 4: Personality Formation Structure: Mind mapping, Strategies of gaining power and influence. Enhancing personality through effective communication. HR Matrix for analytics, Competency mapping, Predictive analytics	8

Suggested Readings:

- Stephen Covey: Seven Habits of Highly Effective People, Simon & Schuster.
- Shiv Khera: You Can Win – A Step-by-Step Tool for Top Achievers, Bloomsbury India.
- Three Basic Managerial Skills for All – Hall Of India Pvt Ltd New Delhi.
- Wehtlel David A and Kin S Kemerron: Developing Managerial Skills – Pearson Education New Delhi.
- Rajendra Pal and J. S. Korlhalli: Essentials of Business Communication - Sultan Chand

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Semester IV

Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 401	Research Methodology for Business

Preamble	This course provides students with a basic understanding to the various concepts of Research Methodology for Business
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand advanced design, methodologies and analysis in business research methods, including key terms, classifications and systematic applications to the research data and design of a research project.	Understanding	Conceptual
CO2	Demonstrate and generate ideas and identify core business problem and distil into a research problem based on the scope and objectives of the study, and/or relate the problem with major theory, concepts and constructs.	Analyzing	Conceptual
CO3	Apply the skills on how the identified problem could be addressed, what are the different theories, design, methods have been followed and developed a conceptual framework in the existing literature	Applying	Analytical
CO4	Gain a clear understanding of Classification & presentation of Data, Sampling Design, Hypothesis Testing etc.	Remembering	Conceptual
CO5	Discuss, apply and create various tools / models by applying data analytics techniques and application software like SPSS/R/JAMOVI	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 401

Paper Name: Research Methodology for Business

Total Credit: 4 (Total hours of lectures: 40 hours)

Sl	Topic/Module	Hours
1.	Module 1: Meaning, scope and significance of social research: Types of Research: (a) Pure and Applied, (b) Exploratory, Descriptive, (c) Experimental; Steps in Social Research & types Conceptualization and Formulation of Hypothesis.	5
2.	Module 2: Literature Review: Concept, necessity, research gap, reference, and plagiarism. Scientific Study of Social Phenomena: (a) The Scientific Method, Logic in Social Science, (b) Objectivity and Subjectivity in Social Science, (c) Positivism and Empiricism. Methods of research: (a) Quantitative and Qualitative (Characteristics and Differences Sources of Data: Primary & Secondary.	5
3.	Module 3: Techniques of Data Collection: (a) Survey, (b) Observation, (c) Questionnaire & Scheduled, (d) Interview, (e) Case Study.	5
4.	Module 4: Sampling: Design: Types, Advantages and Limitations.	5
5.	Module 5: Classification & presentation of Data: (a) Coding, Tables, Graphs, (b) Measures of Central Tendency & Dispersion.	5
6.	Module 6: Hypothesis Testing: Definition, Concepts, Types of hypothesis, Test Statistics, Critical Value, Decision Rule, Procedure, Hypothesis testing for mean, proportion etc.	6
7.	Module 7: Introduction to Data Analysis Techniques: Introductory Concepts to Univariate, Bi-variate and Multi-variate techniques.	6
8.	Module 8: Data Ethics: Concept, business benefits, Principles, Ethical use of algorithms.	3

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Paper Code: BBA (A) – 491

Paper Name: Research Methodology for Business: LAB

Total Credit: 2 (Total hours of Labs: 20 hours)

Sl	Topic/Module	Hours
1.	Module 1: SPSS- Creating, Editing & Managing Data file, Creating & Editing Graphs & Charts, Frequencies, Descriptive Statistics, Cross tabulation & Chi-Square, MEANS Procedure, Bivariate Correlation.	5
2.	Module 2:SPSS- T-test, ANOVA Procedure, Simple Linear Regression, Non-parametric Procedures, Reliability Analysis, Factor Analysis, Cluster Analysis, Discriminant Analysis.	5
3.	Module 3: Overview of R: Commands, Matrices, Arrays, Factors, Programming using R, Debugging, Import & Export, Application using R	5
4.	Module 4: Overview of Jamovi: Basic Educational Statistics; Null Hypothesis Significance Testing, Descriptive of Nominal or Ordinal Variables, Descriptive of Continuous Variables, Syntax Mode , Application using Jamovi	5

Suggested Readings:

- S N Murthy and U Bhojanna: Business Research Methods, Excel Books.
- D.R. Cooper and P.S. Schindler: Business Research Methods, Tata McGraw –Hill
- Kothari, C.R.: Research Methodology – Methods and Techniques, New Age International Ltd.
- U. Sekharan and R Bougie: Research Methods for Business: John Wiley and Sons
- J. K .Das: Business Mathematics and Statistics: Academic Publishers
- P Mishra: Business Research Methods, Oxford University Press.
- Arora, Malik: R Programming For Beginners, Book centre
- Vries Andrie De, R Programming for Dummies, Wiley India Pvt. Ltd

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 402	Customer Relationship Management in Business

Preamble	This course provides students with a basic understanding to the various concepts of Customer Relationship Management in Business
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concept of CRM, the benefits delivered by CRM, the contexts in which it is used, the technologies that are deployed and how it can be implemented.	Understanding	Conceptual
CO2	Demonstrate how CRM practices and technologies enhance the achievement of marketing, sales and service objectives throughout the customer life-cycle stages of customer acquisition, retention and development whilst simultaneously supporting broader organizational goals	Analyzing	Conceptual
CO3	Apply various technological tools for data mining and also successful implementation of CRM in the Organizations	Applying	Analytical
CO4	Gain a clear understanding of to Sales Force Automation, Marketing Automation, Service Automation, CRM metrics	Remembering	Conceptual
CO5	Design customer relationship management strategies by understanding customers' preferences for the long-term sustainability of the Organizations.	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 402
Paper Name: Customer Relationship Management in Business
Total Credit: 6 (Total Hours of Lectures: 60 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to CRM: Definition, Components, Models, Contexts	6
2.	Module 2: Understanding Relationship: Relationship, loyalty, Relationship quality, Customer lifetime value, Customer Satisfaction.	7
3.	Module 3: Managing Customer Lifecycle: Customer acquisition, customer retention, Introduction to Customer Life-time Value, calculation.	7
4.	Module 4: Types of CRM: Types, Difference, Subcomponents of each type.	7
5.	Module 5: Strategic CRM: Customer Portfolio Management, Delivering customer-experienced value, CRM metrics.	7
6.	Module 6: Operational CRM: Introduction to Sales Force Automation, Marketing Automation, Service Automation, CRM metrics.	7
7.	Module 7: Analytical CRM: Customer-related databases, Development and managing customer-related databases, CRM metrics.	7
8.	Module 8: Realizing Benefits of CRM and Looking in to future: Implementing CRM, Social CRM, Collaborative CRM, e-CRM.	6
9.	Module 9: Business Case Studies	6

Suggested Readings:

- Francis Buttle: Customer Relationship Management: Concepts and Tools, Routledge.
- Francis & Stan Maklan Buttle: Customer Relationship Management : Concepts and Technologies, T&F India
- Jagdish N Sheth, Parvatiyar Atul, et al. Customer Relationship Management: Emerging Concepts, Tools and Applications, McGraw Hill Education.
- Dr. Ruchi Jain and Dr. Ruchika Jeswal: CRM Customer Relationship Management: a conceptual approach, Galgotia Publishing Company.
- Lars Helgeson: CRM for Dummies, Wiley.
- Payne : Strategic Customer Management: Integrating Relationship Marketing and CRM, Cambridge University Press.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 403	Entrepreneurship Development

Preamble	This course provides students with a basic understanding to the various concepts of Entrepreneurship Development
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand various qualities required for entrepreneurship	Understanding	Conceptual
CO2	Demonstrate various entrepreneurship models	Analyzing	Conceptual
CO3	Apply various technological tools like Six hat techniques, Five S for various entrepreneurial Development process	Applying	Analytical
CO4	Gain a clear understanding of Policy towards Small Scale Industries (SSI's), Entrepreneurial strategy	Remembering	Conceptual
CO5	Discuss and apply National Policy, Supporting Programs, Employment and Income Generation-cum- production units.	Evaluating	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 403

Paper Name: Entrepreneurship Development

Total Credit: 6 (Total Hours of Lectures: 60 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to Entrepreneurship: Definition of Entrepreneur, Entrepreneurial Traits, and Entrepreneur vs. Manager, Entrepreneur vs. Entrepreneur. The Entrepreneurial decision process. Role of Entrepreneurship in Economic Development, Ethics and Social responsibility of Entrepreneurs. Opportunities for Entrepreneurs in India and abroad.	10
2.	Module 2: Entrepreneurial Behaviors: Entrepreneurial Motivation, Need for Achievement Theory, Risk-taking Behavior, Innovation and Entrepreneur. Entrepreneurial Talents : Definitions, Characteristics of Entrepreneurs, Entrepreneurial Types, Functions of Entrepreneur.	14
3.	Module 3: Entrepreneurial Development in India: History, Objectives, Stages of Growth, Target Group, Programmes, Govt. Policy towards Small Scale Industries (SSI's). Organization Assistance: Start-ups and Govt. schemes for encouraging starts-ups like Mudra, e Biz New Ventures, Industrial Park (Meaning, Features, & Examples), 10Special Economic Zone (Meaning, Features & Examples) Financial Assistance by Different Agencies , Small Scale Industries, The Small Industries Development Bank of India (SIDBI) , The State Small Industries Development Corporation (SSIDC), Science and Technology Entrepreneurs' Park (STEP) etc.	16
4	Module 4: Entrepreneurial strategy: New Entry, Entry Strategy, Risk Reduction Strategy for New Entry.	4
5.	Module 5: Conceptual Framework for detecting sickness in SSIs, Status, Dimensions of SSIs, Symptoms for detecting sickness, Causes for Sickness, Govt. Policies to strengthen the SSIs.	6
6.	Module 6: Woman as Entrepreneurship: Introduction, Scope, National Policy, Supporting Programs, Employment and Income Generation-cum-production units.	10

Suggested Readings:

- Lall & Sahai : Entrepreneurship, Excel Books
- Pareek, U & Venkateswara Rao, T : Developing Entrepreneurship – A Handbook on Systems, Learning Systems, New Delhi.
- Druckar, Peter : Innovation and Entrepreneurship, Heinemann.
- Chakraborty, Tridib: Introducing Entrepreneurship Development, Modern Book Agency.
- Manimala, M.J.: Entrepreneurial Policies and Strategies, TMH.
- McClelland, D.C. & Winter, W.G.: Motivating Economic Achievement, Free Press.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 404	Data Analytics

Preamble	This course provides students with a basic understanding to the various concepts of Data Analytics
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the Overview, Definition, Need, Analytics in decision making, Game changer and innovator, Power of analytics, Predictive Analytics.	Understanding	Conceptual
CO2	Demonstrate types and techniques of Predictive Analytics	Analyzing	Conceptual
CO3	Apply the skills of Multiple Linear Regression, Logistic Regression	Applying	Analytical
CO4	Gain a clear understanding of Decision Trees, Chi-Square Automatic Interaction Detectors (CHAID), Classification and Regression Tree (CART).	Remembering	Conceptual
CO5	Discuss, apply and create various tools / models by applying data analytics techniques and application software like SPSS/R/JAMOVI	Create & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 404

Paper Name: Data Analytics

Total Credit: 4 (Total Hours of Lectures: 40 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to Analytics: Overview, Definition, Need, Analytics in decision making, Game changer and innovator, Power of analytics, Predictive Analytics.	5
2.	Module 2: Types and techniques of Predictive Analytics, Application of Predictive Analytics in Manufacturing, Health, Telecommunication, Supply Chain, Information Technology etc. Digital Analytics.	5
3.	Module 3: Simple Linear Regression (SLR): Introduction, Overview, Importance, Types, SLR: Model Building, OLS Estimation, Model interpretation, validation.	8
4.	Module 4: Multiple Linear Regression: Multiple Linear Regression, Estimation of Regression Parameters, Model Diagnostics, Introduction to Dummy, Derived & Interaction Variables, Multi-Collinearity, Model Deployment, Demo using software.	8
5.	Module 5: Logistic Regression: Discrete choice models, Logistic Regression, Logistic Model Interpretation, Logistic Model Diagnostics, Logistic Model Deployment, Demo using software.	8
6.	Module 6: Introduction to Decision Trees: Overview, Application, Terminologies, Model validation, Introduction to Chi-Square Automatic Interaction Detectors (CHAID), Classification and Regression Tree (CART).	10
7.	Module 7: Introduction to Unstructured data analysis and other. Classifiers: Sentiment Analysis, Naïve Bayes algorithm.	8
8.	Module 8: Introduction to Forecasting and Time series Analysis: Forecasting, Time Series Analysis, Additive & Multiplicative models, Forecasting Accuracy, Moving average models, Exponential smoothing Techniques.	8

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Paper Code: BBA (A) – 494

Paper Name: Data Analysis: LAB

Total Credit: 2 (Total hours of Labs: 20 hours)

Sl	Topic/Module	Hours
1	Module 1: R- Object oriented Programming, Hypothesis testing, Different Statistical Distribution, Regression, Time Series Analysis, Graphics, Customised Plotting	5
2.	Module 2: Python- Python Data Structure (Array, List, Set, and Dictionary), Advanced Numpy, Advanced Pandas, Advanced Matplotlib and Advanced Seaborn.	5
3.	Module 3: SPSS- General Linear Models- Two way ANOVA, Three way ANOVA, MANOVA & MANCOVA, Multidimensional Scaling, Logistic Regression, Loglinear Model.	5
4.	Module 4: Jamovi: Linear Regression, Logistic Regression, T-test, ANOVA Demonstration, Binomial test, Goodness Fit test, McNemar Test, Big Big 5, Configuration Factor analysis.	5

Suggested Readings:

- Eric Siegel: Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die, Wiley.
- Bari: Predictive Analytics for Dummies, Wiley.
- Dr. Anasse Bari, Mohamed Chaouchi: Predictive Analytics for Dummies , John Wiley & Sons.
- Namakum R N Prasad (Author), Seema Acharya (Author): Fundamentals of Business Analytics, Wiley.
- Alvaro Fuentes: Hands-On Predictive Analytics with Python: Master the complete predictive analytics process, from problem definition to model deployment, Ingram short title.
- Stephen Sorger. Marketing Analytics - Strategic Models and Metrics, Amazon Digital Service

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Semester V

Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 501	Operation & Supply Chain Analytics

Preamble	This course provides students with a basic understanding to the various concepts of Operation & Supply Chain Analytics
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the important role of change management, develop key skills to implement new business solutions and processes	Understanding	Conceptual
CO2	Demonstrate and explain key principles of Supply Chain Planning, and a typical end-to-end planning process flow	Analyzing	Conceptual
CO3	Apply the skills of Supply Chain Effectiveness, Supply Chain Relationship, Building long-Term Relationship with Vendors	Applying	Analytical
CO4	Gain a clear understanding of Integrated logistics and Supply Chain Management from Indian Perspective	Remembering	Conceptual
CO5	Discuss, create and apply various tools/models and Techniques (Inventory Management Decisions-Multi-item, Deterministic Constraint Models & probabilistic Models, AHP Applications, optimization for SCM support etc.).	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 501
Paper Name: Operations & Supply Chain Analytics
Total Credit: 6 (Total Hours of Lectures: 60 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Operations Management – Concepts; linkage with business functions and objectives. Operations Management functions: Purchase & procurement; vendor selection, production, maintenance, quality assurance and control, logistics and distribution	8
2	Module 2: Concept of logistics: Introduction, Objective, Types, Concept of Logistic Management, Evolution, Role of logistics in economy, Difference between logistics and supply chain, Logistics and Supply Chain Management, Logistic mix, Logistics and competitive Advantage.	6
3.	Module 3: Integrated logistics: Introduction, Objective, Concept of Integrated Logistics, Information flow, Inventory flow, Inventory Ownership, Measurement system, Barriers, Logistics Performance Cycle, Procurement Performance Cycle.	6
4.	Module 4: Introduction to Supply Chain: Introduction, Objective, Concept, Defining Value Chain, Organisation Level Activities, Industry level, Value Reference Model, Functions, Contributions, Creating Value, Leveraging Value Chain Partners.	8
5.	Module 5: Framework for Supply Chain Management, Supply Chain Effectiveness, Supply Chain Relationship, Building long-Term Relationship with Vendors.	7
6.	Module 6: Sourcing strategy: Manufacturing management, Make or buy decision, Capacity management, Materials Management, Choice of sources, Procurement planning.	7
7.	Module 7: Demand Forecasting: Introduction, Objective, Concept and impact of Demand Forecasting, Forecasting Process and Techniques.	8
8.	Module 8: Supply Chain Management from Indian Perspective.	2
9.	Module 9: Introduction to Supply Chain Analytics: Introduction to Tools and Techniques (Inventory Management Decisions-Multi-item, Deterministic Constraint Models & probabilistic Models, AHP Applications, optimization for SCM support etc.).	8

Suggested Readings

- Sunil Chopra: Supply Chain Management, Pearson Prentice Hall.
- Sunil Chopra, Peter Meindl, D.V. Kalra: Supply Chain Management, Pearson.
- Michael Hugos: Essentials of Supply Chain Management, Wiley.
- Richard B, Ravi Shankar, F. Robert Jacobs: Operations and Supply Chain Management, McGraw Hill Education.
- James Stevens: Supply Chain Management: Strategy, Operation & Planning for Logistics Management, Createspace Independent Pub.
- Ashley McDonough: Operations and Supply Chain Management Essentials You Always Wanted to Know, Vibrant Publishers.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 502	Optimization Techniques

Preamble	This course provides students with a basic understanding to the various concepts of Optimization Techniques
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the theoretical foundations of various issues related to linear programming modeling to formulate real-world problems as a Linear Programming Problem (LPP) and conduct LP-Duality And Sensitivity Analysis	Understanding	Conceptual
CO2	Demonstrate and explain the theoretical workings of the graphical, simplex and analytical methods for making effective decision on variables so as to optimize the objective function.	Analyzing	Conceptual
CO3	Apply appropriate equipment replacement technique to be adopted to minimize maintenance cost by eliminating equipment break-down	Applying	Analytical
CO4	Gain a clear understanding of appropriate optimization method to solve complex problems involved in various industries	Remembering	Conceptual
CO5	Discuss and apply the appropriate algorithm for allocation of resources to optimize the process of assignment	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 502
Paper Name: Optimization Techniques
Total Credit: 4 (Total Hours of Lectures: 40 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to Linear Programming Problem (LPP), Graphical method, simplex method, Two Phase method, degeneracy, alternative optima, Graphical sensitivity analysis	8
2.	Module 2: LP-Duality And Sensitivity Analysis: Definition of Dual, Primal-Dual Relationships, Dual Simplex Sensitivity or Post Optimal Analysis.	8
3.	Module 3: Revised Simplex Method, Bounded-Variable Algorithm, Duality, Parametric programming.	8
4.	Module 4: Formulation and Applications-Cutting Plane Algorithm-Branch and Bound Method; Assignment, Transportation, Travelling Salesman.	10
5	Module 5: EOQ models, EOQ with price breaks, Multi-Item EOQ with storage limitation.	6

Paper Code: BBA (A) - 592
Paper Name: Optimization Techniques (LAB)
Total Credit: 2 (Total hours of Labs: 20 hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to Lingo, Excel Solver	10
2.	Module 2: Introduction to Linear Programming Problem (LPP) using Lingo and Excel Solver	10

Suggested Readings:

- Optimization Techniques Hardcover – Import, 30 April 2009 by Chander Mohan (Author), Kusum Deep (Author)
- Introduction to optimization- Edwin K.P. Choang
- Operations Research – Kanti Swarup
- Linear Algebra & Optimization for Machine Learning – Charu Agarwal.
- Algorithm for Optimization- Moykel J. Kochenderfer.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 503	Design & Analysis of Algorithms

Preamble	This course provides students with a basic understanding to the various concepts of Design & Analysis of Algorithms
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concept of Greedy Programming Algorithmic Strategies Principle, control abstraction, time analysis of control abstraction	Understanding	Conceptual
CO2	Demonstrate and explain the Dynamic Programming Algorithmic Strategies Principle, control abstraction, time analysis of control abstract	Analyzing	Conceptual
CO3	Apply Backtracking Principle, control abstraction, time analysis of control abstraction, 8-queen problem, graph coloring problem etc.	Applying	Analytical
CO4	Gain a clear understanding of Complexity Theory, Turing machine, polynomial and non-polynomial problems, deterministic and non-deterministic algorithms	Remembering	Conceptual
CO5	Discuss, interpret and apply the Practical Algorithmic Case-studies using Python, R & Application Software	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 503
Paper Name: Design & Analysis of Algorithm
Total Credit: 4 (Total hours of lectures: 40 hours)

Sl.	Topic/Module	Hours
1.	<p>Module 1: Problem solving and Algorithmic Analysis</p> <ul style="list-style-type: none"> • Problem solving principles: Classification of problem, problem solving strategies, classification of time complexities (linear, logarithmic etc.) problem subdivision – Divide and Conquer strategy. • Asymptotic notations, lower bound and upper bound: Best case, worst case, average case analysis, amortized analysis. • Performance analysis of basic programming constructs. • Recurrences: Formulation and solving recurrence equations using Master Theorem 	10
2.	<p>Module 2: Greedy Programming Algorithmic Strategies Principle, control abstraction, time analysis of control abstraction, knapsack problem, scheduling algorithms-Job scheduling and activity selection problem.</p>	5
3.	<p>Module 3: Dynamic Programming Algorithmic Strategies Principle, control abstraction, time analysis of control abstraction, binomial coefficients, OBST, 0/1 knapsack, Chain Matrix multiplication.</p>	5
4.	<p>Module 4: Backtracking Principle, control abstraction, time analysis of control abstraction, 8-queen problem, graph coloring problem, sum of subsets problem.</p>	5
5.	<p>Module 5: Branch-n-Bound Principle, control abstraction, time analysis of control abstraction, strategies – FIFO, LIFO and LC approaches, TSP, knapsack problem.</p>	5
6.	<p>Module 6: Complexity Theory Turing machine, polynomial and non-polynomial problems, deterministic and non-deterministic algorithms, P class, NP class & NP complete problems- vertex cover and 3-SAT and NP-hard problem – Hamiltonian cycle. The menagerie of complexity classes of Turing degrees. Concept of randomized and approximation algorithms: Solving TSP by approximation algorithm, Randomized sort algorithms and Approximating Max Clique.</p>	10

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Paper Code: BBA (A) – 593
Paper Name: Design & Analysis of Algorithms Lab
Total Credit: 2 (Total Hours of Labs: 20 Hours)

Sl. No.	Topic/Module	Hours
1	Module 1 to Module 5: Divide and Conquer Algorithm, Knapsack Problem, Matrix Chain Multiplication, Longest Common Subsequence Problem, Job Scheduling Problem	10
2	Module 6 to Module 10: Activity Selection Problem, Graph Coloring Problem, Branch-n-Bound Problem, Sum of Subsets Problem, Traveling Salesman Problem	10
	Total Hours	20

Suggested Readings:

- Sridhar, S: Design and Analysis of Algorithms. Oxford University Press
- Kleinberg: Algorithm Design. Pearson
- Corma, Thomas H: Introduction to Algorithms. Prentice Hall of India
- Goodrich, Michael: Data Structures and Algorithms in Python. Wiley

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Semester VI

Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 601	Overview of Data Mining Tool

Preamble	This course provides students with a basic understanding to the various concepts of Data Mining Tool
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concept of Data mining, Basic Statistical descriptions of data, Measuring Data Similarity and Dissimilarity, Basics of data Pre-processing.	Understanding	Conceptual
CO2	Demonstrate and explain the data warehousing like-OLTP, OLAP, Data Cube, Data Mart.	Analyzing	Conceptual
CO3	Apply Mining Patterns, Associations: Basic Concepts, Terminologies, Apriori Algorithm, and Model evaluation Backtracking in practical situation	Applying	Analytical
CO4	Gain a clear understanding of Dimension Reduction Techniques: Concepts, Terminologies, PCA.	Remembering	Conceptual
CO5	Discuss, interpret and apply the Model evaluation for practical case study using application software	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) - 601
Paper Name: Overview of Data Mining Tool
Total Credit: 4 (Total hours of lectures: 40 hours)

Sl.	Topic/Module	Hours
1.	Module 1: Introduction to Data Mining: Concept, Methodology (SEMMA/CRISP - DM), Kind of patterns, Technologies, Application, Issues, Data Objects, Attribute types, Basic Statistical descriptions of data, Measuring Data Similarity and Dissimilarity, Basics of data Pre-processing.	6
2.	Module 2: Introduction to Data Warehousing: Basic Concepts, OLTP, OLAP, Data Cube, Data Mart.	6
3.	Module 3: Mining Patterns, Associations: Basic Concepts, Terminologies, Apriori Algorithm, and Model evaluation.	4
4.	Module 4: Introduction to Cluster Analysis: Definition, Terminologies Technologies: Hierarchical and Non-hierarchical clustering, K-Means.	10
5.	Module 5 : Introduction to Dimension Reduction Techniques: Concepts, Terminologies, PCA.	8
6.	Module 6: Introduction to Classification: Definition, Concepts, Applications, and Techniques: Decision tree Induction, KNN, Bayes Classifiers, Rule-based classification: Basic Concepts, Terminologies, Applications, Only introductory concepts of Neural Network.	6

Paper Code: BBA (A) – 691
Overview of Data Mining Tool Lab
Total Credit: 2 (Total Hours of Labs: 20 Hours)

Sl. No.	Topic/Module	Hours
1	Module 1: Apriori Algorithm, Decision tree Induction, Bayes Classifiers, Single Layer Perceptron, Multi-Layer Perceptron	10
2	Module 2: Support Vector Machines, K-Means Clustering, Hierarchical Clustering, Principal Component Analysis, Sentiment Analysis	10
	Total Hours	20

Suggested Readings:

- Jhan, M Kambel & J Pei: Data Mining Concepts & Techniques, Morgan Kaufmann Series.
- Soumendra Mohanty: Analytics in Practice, Tata McGraw-Hill Education Private Limited.
- Arun Pujari: Data Mining, Prentice Hall India.
- Satish Kumar : Neural Network: Tata McGraw Hill.
- Nitin R Patel & Peter C Bruce: Data Mining for Business Intelligence, Wiley, India.
- Han & Kamber: Data Mining Concepts and Techniques, Morgan Kaufman.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 602	Business Law

Preamble	This course provides students with a basic understanding to the various concepts of Business Law
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the Meaning of- Law like- Indian Contract Act,1872, Sale of goods Act etc., Sources, Business Law – definition, sources	Understanding	Conceptual
CO2	Describe Negotiable Instruments Act, 1881, Companies Act, 2013 etc.	Analyzing	Conceptual
CO3	Gain a clear understanding of Consumer Protection Act, 1986, SEBI Act, 1992, Intellectual Property Rights etc.	Applying	Conceptual
CO4	Discuss various acts like- SEBI Act, 1992, Competition Act, 2002 etc.	Remembering	Conceptual

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) - 602

Paper Name: Business Law

Total Credit: 6 (Total hours of lectures: 60 hours)

Sl.	Topics	Hours
1	Module 1: Meaning – Law, Sources, Business Law – definition, sources	6
2	Module 2: Indian Contract Act, 1872 – Essential elements of Contract, Types of Contract, Discharge of Contract, Remedies for breach of Contract; Special Contracts – Indemnity, Guarantee, Law of Agency	6
3	Module 3: Sale of goods Act, 1930 – Essentials of contract of sale; Doctrines, Unpaid seller	6
4	Module 4: Negotiable Instruments Act, 1881- Meaning, Features, Types, Crossing of Cheque, Penalty for dishonor of cheque	6
5	Module 5: Companies Act, 2013: Forms of Business Organizations, Features & Types of Companies, Incorporation, Memorandum & Articles of Associations, Doctrines, Prospectus, Shares & Debentures, Management, Meetings	6
6	Module 6: Corporate Governance, Corporate Social Responsibility (CSR)	6
7	Module 7: Consumer Protection Act, 1986 – Objectives, Rights of Consumers, Consumer Redressal Agencies, Remedies	6
8	Module 8: Intellectual Property Rights – Patents, Copyright & Trade mark	6
9	Module 9: SEBI Act, 1992 – Objectives, Functions, Information Technology Act, 2000 (Cyber Law)	6
10	Module 10: Competition Act, 2002 – Objectives, Anti-competitive Agreements; Alternate Dispute Resolutions (ADR) – Arbitration, Conciliation, Negotiation, & Mediation; GST Act 2017	6

Suggested Readings:

- N.D.Kapoor – Elements of Mercantile Law, Sultan Chand & Sons
- Avtar Singh – Contract & Companies Act – Eastern Bok Company, Lucknow
- Akhileswar Pathak – Legal Aspects of Business, Tata McGraw Hill – New Delhi
- Bare Act – All individual Acts
- ICSI & ICAI – Study Materials

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Elective I

Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 504A	DBMS and SQL

Preamble	This course provides students with a basic understanding to the various concepts of DBMS and SQL
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the basic elements of a relational database management system.	Understanding	Conceptual
CO2	Describe the data models for relevant problems.	Analyzing	Conceptual
CO3	Apply the entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data into RDBMS and formulate SQL queries on the data.	Applying	Analytical
CO4	Gain a clear understanding of key notions of query evaluation and optimization techniques.	Remembering	Conceptual
CO5	Discuss, interpret and apply normalization for the development of application software's.	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 504A

Paper Name: DBMS and SQL

Total Credit: 4 (Total Hours of Lectures: 40 Hours)

Sl. No.	Topic/Module	Hours
1	Module 1: Introduction to database systems: Characteristics of databases, File system vs Database system, Users of Database system, approaches to building a database, data models, database management system, Data Independence, DBMS system architecture, challenges in building DBMS, various components of DBMS	6
2	Module 2: Entity Relationship Model: Conceptual Data Modeling, motivation, entities, entity types, various types of attributes, relationships, relationship types, Entity set types, participation constraints, entity relationship diagram, extended entity relationship model, examples	6
3	Module 3: Relational Data Model: Concepts of relations, schema-instance distinction, keys, referential integrity, foreign keys, converting database specification in entity relationship notation to relational schema, Relational algebra operators: selection, projection, cross product, various types of joins, division, set operations, queries, tuple relational calculus, domain relational calculus, SQL fundamentals	6
4	Module 4: Relational Database Design: Importance of good schema design, problems encountered with bad schema designs, motivation for normal forms, dependency theory, functional dependencies, Armstrong's axioms, set closures, minimal covers, Normalization, Normal Forms: 1NF, 2NF, 3NF, BCNF, decompositions, multi-valued dependencies, 4NF, join dependencies, 5NF, de-normalization	6
5	Module 5: SQL: SQL Syntax, SQL Data Types, SQL Operators, SQL Expressions, SQL comments, Data Manipulation Language commands and operations, Data Definition Language commands and operations	8
6	Module 6: Data Storage and Indexing: Data Storage and Indexes, File organizations, primary, secondary index structures, various index structures, hash-based, dynamic hashing techniques, multi-level indexes, B and B+ trees	8

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Choice Based Credit System
140 Credit (3-Year UG)

Paper Code: BBA (A) – 594A
DBMS and SQL Lab
Total Credit: 2 (Total Hours of Labs: 20 Hours)

Sl. No.	Topic/Module	Hours
1	Module 1: Basic SQL 1 (Table Creation, Insertion, Updation, Deletion), Basic SQL 2 (Select, Order By, Select Distinct, Where Clause), Basic SQL 3 (Like, In, Between Operators, Wildcards), Advanced SQL 1 (Different Joins, Scripts), Advanced SQL 2 (Views, Functions, Triggers)	10
2	Module 2: Normalization (1NF, 2NF, 3NF, 4NF), ODBC (Backend: Python and Frontend: Visual Basic)	10
	Total Hours	20

Suggested Readings

- Silberschatz, H. F. Korth, S. Sudarshan, Database System Concepts, McGraw-Hill Education, 6th edition, 2019
- R. Ramakrishnan, J. Gehrke, Database Management Systems, McGraw-Hill Education, 3rd edition, 2018
- P. Rob, C. Coronel, Database System Concepts, Indian Edition, Cengage Learning, 2011
- S. Sumathi, S. Esakkirajan, Fundamentals of Relational Database Management Systems, Springer, 2007

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140 Credit (3-Year UG)

Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 504B	Project Management

Preamble	This course provides students with a basic understanding to the various concepts of Project Management
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the meaning, components and architecture of Ecommerce.	Understanding	Conceptual
CO2	Describe the knowledge about the process flows in E-commerce transactions.	Analyzing	Conceptual
CO3	Apply the various aspects of risks and controls in Ecommerce.	Applying	Analytical
CO4	Gain a clear understanding of applicable laws and guidance governing ECommerce.	Remembering	Conceptual
CO5	Discuss, interpret and apply the various Computing Technologies like Cloud Computing, Grid Computing, Mobile Computing, Green Computing and BYOD etc.	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A)- 504B
Paper Name: Project Management
Total Credit: 4 (Total hours of lectures: 40 hours)

Sl.	Topic/Module	Hours
1.	Module 1: Project Management tools, functions, activities	6
2.	Module 2: Project Selection management - feasibility - types and checkpoints in the Project Management, Life Cycle	6
3.	Module 3: Project Planning and Scheduling (Network Analysis, CPM, PERT, Crashing and Resource Optimization; Project Work Breakdown and structure (functions, activities and tasks); Project cost estimation.	10
4.	Module 4: Project Roles, Team Types and Team Building. Organization structure for effective project implementation.	6
5.	Module 5: Project risk Management and Mitigation Strategies; Social cost-benefit analysis. Project Control. Project Management measuring, monitoring and tracking techniques; Resource allocation and scheduling and purchasing.	12

Paper Code: BBA (A) – 594B
Paper Name: Project Management: LAB
Total Credit: 2 (Total hours of Labs: 20 hours)

Sl	Topic/Module	Hours
1	Module 1: Getting start with MS Project, Creating List, Setting Up Resources, Assigning Recourses to task, Formatting and Tracking on task, Reporting & Analyzing project information.	10
2.	Module 2: Integrating MS Project with other Programs, Advanced project Scheduling, Customization of Project, Managing Projects across your Enterprise Project server	10

Suggested Readings:

- Sitangshu Khatua : Project Management and Appraisal : Oxford
- Dr. Raj Kumar Yadendra Gullybaba.com Panel: MS-52 Project Management, Gullybaba Publishing House Pvt. Ltd.
- Horold Kerzner : Project Management : A System Approach to Planning, Scheduling and Controlling : Wiley.
- Erik Larson and Clifford Gray : Project Management: The Managerial Process, McGraw Hill Education.
- Project Management: Essential Managers, DK.
- Kalpesh Ashar: Project Management Essentials You Always Wanted To Know, Vibrant Publisher

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Elective II

Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 603A	E-Commerce & M-Commerce

Preamble	This course provides students with a basic understanding to the various concepts of E-Commerce & M-Commerce
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the meaning, components and architecture of Ecommerce.	Understanding	Conceptual
CO2	Describe the knowledge about the process flows in E-commerce transactions.	Analyzing	Conceptual
CO3	Apply the various aspects of risks and controls in Ecommerce.	Applying	Analytical
CO4	Gain a clear understanding of applicable laws and guidance governing E-Commerce.	Remembering	Conceptual
CO5	Discuss, interpret and apply the various Computing Technologies like Cloud Computing, Grid Computing, Mobile Computing, Green Computing and BYOD etc.	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A)-603 (A)
Paper Name: E-Commerce & M-Commerce
Total Credit: 4 (Total hours of lectures: 40 hours)

Sl.	Topic/Module	Hours
1.	Module 1: E-Business Framework: Definition of E-Business, Origin of E-Business, History of the Internet, E-Business Opportunities for Businesses, Working of E-Business, E-Business Vs the Traditional Business Mechanism, Advantages of E-Business, Disadvantages of E-Business, Main Goals of E-Business.	10
2.	Module 2: Network Infrastructure for E-Commerce – I: Local Area Network (LAN), Ethernet: IEEE 802.3: Local Area Network (LAN) Protocols, Wide Area Network (WAN), The Internet, TCP/IP Reference Model, Domain Names, Hyper Text Markup Language (HTML), Simple Exercises in HTML.	10
3.	Module 3: E-Business: Requirements and Architecture: Requirements of E-Business, Functions of E-Business, E-Business Framework Architecture, I-way or Information Highway. Business Models: Evolution of Internet Business Models, Business Models in Practice, Business Model: The Six Components.	5
4.	Module 4: Security in Electronic Business: Intranet and Extranet Security: Threats and Protection, Protection Methods, Data and Message Security, Firewalls. Encryption: Cryptography, Encryption, Digital Signature, Virtual Private Network.	5
5	Module 5: E-Marketing: Challenges of Traditional Marketing, Retailing in E-Business Space, Internet Marketing, Advertisement and Display on the Internet, E-Business for Service Industry. EDI, E-CRM and E-SCM: Electronic DataInterchange (EDI), E-CRM, E-SCM	5
6	Module 6: Mobile Commerce: Overview of M-Commerce - Wireless Application Protocol (WAP), Generations of Mobile Wireless Technology, Components of Mobile Commerce, Networking Standards for Mobiles.	5

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Paper Code: BBA (A) – 693A
Paper Name: E-Commerce & M-Commerce
Total Credit: 2 (Total Hours of Labs: 20 Hours)

Sl. No.	Topic/Module	Hours
1	Module 1 : Overview of HTML	5
2	Module 2 : HTML: Creating web pages using HTML tags, elements, basic and advanced text formatting, multimedia components, designing web pages, document layout, Lists, Tables, Hyperlinks, Working with frames, forms, controls etc.	15
	Total Hours	20

Suggested Readings:

- Joseph, P.T. (2005). E-Commerce an Indian Perspective (2e), New Delhi Prentice-Hall of India.
- Kaspersky, (2008). The Cybercrime Ecosystem Whitepaper, Kaspersky Lab
- O'Brien, J. (2004). Management Information Systems Managing Information Technology in The Business Enterprise, New Delhi Tata McGraw-Hill.
- Rayport, J. F. & Jaworski, B. J. (2002). Introduction to E-Commerce, New York McGraw-Hill Irwin.
- Stair, R. M. & Reynolds, G. W. (2001). Principles of Information Systems, 5e, Singapore Thomson Learning.
- Ramesh Bangia: Learning HTML, Khanna Book Publishing Company.

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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 603B	Web and Social Media Analytics

Preamble	This course provides students with a basic understanding to the various concepts of Web and Social Media Analytics
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand the concept Social Media Marketing Tools	Understanding	Conceptual
CO2	Explain concept of facebook, twitter, linkedIn , Youtube marketing	Analyzing	Conceptual
CO3	Define how to build brand awareness using social media	Applying	Analytical
CO4	Understand social media marketing strategy	Remembering	Conceptual
CO5	Apply methods how to schedule, manage &report social media campaigns	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) - 603B

Paper Name: Web and Social Media Analytics

Total Credit: 4 (Total Hours of Lectures: 40 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Web and social media (Web sites, web apps, mobile apps and social media). Usability, user experience, customer experience, customer sentiments, web marketing, conversion rates, ROI, brand reputation, competitive advantages. Web analytics and a Web analytics 2.0 framework (clickstream, multiple outcomes analysis, experimentation and testing, voice of customer, competitive intelligence, Insights)	8
2.	Module 2: Data (Structured data, unstructured data, metadata, Big Data and Linked Data). Lab testing and experiment design (selecting participants, within-subjects or between subjects study, counterbalancing, independent and dependent variable; A/B testing, multivariate testing, controlled experiments). Data analysis basics (types of data, metrics and data, descriptive statistics, comparing means, correlations, nonparametric tests, presenting data graphically)	8
3.	Module 3: Usability metrics (performance metrics, issues-based metrics, self-reported metrics) .Planning and performing a usability study (study goals, user goals, metrics and evaluation methods, participants, data collection, data analysis). Typical types of usability studies and their corresponding metrics (comparing alternative designs, comparing with competition, completing a task or transaction, evaluating the impact of subtle changes)	8
4.	Module 4: PULSE metrics (Page views, Uptime, Latency, Seven-day active users) on business and technical issues; HEART metrics (Happiness, Engagement, Adoption, Retention, and Task success) on user behaviour issues; On-site web analytics, off-site web analytics, the goal-signal-metric process	8
5.	Module 5: Social media analytics (what and why) Social media KPIs (reach and engagement) Performing social media analytics (business goal, KPIs, data gathering, analysis, measure and feedback)	8

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Paper Code: BBA (A) – 693B
Paper Name: Web & Social Media Analytics
Total Credit: 2 (Total Hours of Labs: 20 Hours)

Sl. No.	Topic/Module	Hours
1	Module 1 : Ready-made tools for Web and social media analytics (Key Google Analytics metrics, dashboard, social reports). Statistical programming language (R), its graphical development environment for data exploration and analysis, and its social media analysis packages (R, Google Trends, Twitter)	20
	Total Hours	20

Suggested Readings:

- Avinash Kaushik, Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity, John Wiley & Sons; Pap/Cdr edition (27 Oct 2009).
- Tom Tullis, Bill Albert, Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics, Morgan Kaufmann; 1 edition (28 April 2008).
- Jim Sterne, Social Media Metrics: How to Measure and Optimize Your Marketing Investment, John Wiley & Sons (16 April 2010).
- Brian Clifton, Advanced Web Metrics with Google Analytics, John Wiley & Sons; 3rd Edition edition (30 Mar 2012).

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Choice Based Credit System
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Programme	Paper Code	Title
BBA in Business and Data Analytics	BBA (A) – 603C	Hadoop Programming

Preamble	This course provides students with a basic understanding to the various concepts of Hadoop Programming
Expected Level of Output	Conceptual Level

Course Outcomes

Course Outcome	Description	Bloom's Taxonomy Level	Skill Mapping
On successful completion of the course, students will have the ability to			
CO1	Understand fundamentals of Big Data analytics .	Understanding	Conceptual
CO2	Explain Hadoop framework and Hadoop Distributed File system	Analyzing	Conceptual
CO3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data.	Applying	Analytical
CO4	Demonstrate the Map Reduce programming model to process the big data along with Hadoop tools	Remembering	Conceptual
CO5	Apply machine Learning algorithms for real world big data., web contents and Social Networks to provide analytics with relevant visualization tools.	Calculating & Evaluating	Analytical

PO – CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						
CO5						

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Paper Code: BBA (A) – 603C

Paper Name: Hadoop Programming

Total Credit: 4 (Total Hours of Lectures: 40 Hours)

Sl.	Topic/Module	Hours
1.	Module 1: Traditional enterprise solutions; Google’s solution; Hadoop Architecture; Map Reduce	8
2.	Module 2: What is BIG data; BIG data benefits; BIG data technologies; challenges of BIG data Management	8
3.	Module 3: Features of HDFS; HDFS Architecture;	8
4.	Module 4: The MapReduce algorithm; Applications; Hadoop streaming	8
5.	Module 5: Installing and Configuring Hadoop; Master and Slave servers	8

Paper Code: BBA (A) – 693C

Paper Name: Hadoop Programming

Total Credit: 2 (Total Hours of Labs: 20 Hours)

Sl. No.	Topic/ Module	Hours
1	Module 1: Apache Hadoop Setup Single Node, Apache Hadoop Setup Cluster, HDFS	12
2	Module 2: Map Reduce, YARN	8
	Total Hours	20

Suggested Readings:

- Hadoop: The Definitive Guide Author: Tom White Publisher: O’Reilly Media
- Hadoop in 24 Hours Author: Jeffrey Aven By: Sams Teach Yourself