

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly known as West Bengal University of Technology)
Syllabus of BBA in Business Analytics
Effective from academic session 2023-2024

Paper Name: Business Intelligence with Data Visualization

Paper Code: BBABA 701+ BBA BA 791

Total Credit: 5 (4+1)

Total hours of lectures: 60 hours

Mode: Offline

Credits: 5(4 + 1)

Aim of the Course: The aim is to achieve knowledge in the field of Data Analytics and get acquainted with handling Microsoft PowerBI and Tableau tools.

Course Objective:

After successful completion of this course, students will be able to:

1. Understand the basic concept of business intelligence and its elements.
2. Understand the procedure for building BI project
3. Learn the methodologies of data visualization, dashboard design, report authoring
4. Understand the future of business intelligence

CO	Course Outcome	Mapped modules
CO1	Understand the basic concept of Business Intelligence	M1
CO2	Understand the concept of elements of Business Intelligence	M2
CO3	Understand the process of Building the BI Project	M3
CO4	Understand the process of Data Visualization and Dashboard Design	M4
CO5	Understand the process of Reporting Authoring	M5
CO6	Understand the Future of Business Intelligence	M6

Module Number	Content	Total Hours	Percentage of questions	Bloom's Level
M1	Introduction to Business Intelligence	10	10 %	L1
M2	Elements of Business Intelligence	10	20 %	L1, L2, L3
M3	Building the BI Project	10	20 %	L1, L2, L3, L4
M4	Data Visualization and Dashboard Design	10	20 %	L1, L2, L3, L4
M5	Reporting Authoring	10	20%	L1, L2, L3, L4
M6	Future of Business Intelligence	10	10%	L1

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Module No	Topic/Module	Hours
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.	06
2.	Elements of Business Intelligence: Reports & ad hoc queries; Analyse OLAP data; Dashboards & Scorecards development, Metadata Models; Automated tasks & events; Mobile & disconnected BI.	12
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.	12
4.	Data Visualization and Dashboard Design: Responsibilities of BI analysts, Importance of data visualization, types of basic and composite charts, dashboards.	12
5.	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.	12
6.	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.	06

BBA BA 791: Business Intelligence with Data Visualization (using Tableau and Power BI)

Module No	Topic/Module	Hours
1.	Tableau Laboratory Assignments: 1. Data Visualization using Chart and Graph Plots 2. Dashboard creation and Story-Telling 3. Grouping and Clustering 4. Regression 5. Working with Group and Sets	15
2.	Power BI Laboratory Assignments: 1. Prepare Environment and Data 2. Create Power BI report (Using Charts and Time Visualizations) 3. Create Power BI Dashboard 4. Add Visualizations using Natural Language 5. Embed Power BI report to Microsoft Teams 6. Enforce Security in Power BI	15

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Suggested Readings:

1. Vercellis Carlo: Business Intelligence, Wiley India Pvt. Ltd.
2. Ramesh Sharda, Dursun Delen, Efraim Turban: Business. Intelligence and Analytics: Systems for Decision Support, Pearson Education.
3. Irene Tobajas: Business Intelligence Essentials, Vibrant Publishers
4. Alan Murray: Power BI for Jobseekers, BPB Publications
5. Brett Powell: Mastering Microsoft Power BI, Packt Publishing Limited
6. Chandraish Sinha: Tableau for Job Seekers, BPB Publications

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Paper Name: Software Engineering
Paper Code: BBABA 702+ BBA BA 792
Total Credit: 5 (4+1)
Total hours of lectures: 60 hours

Mode: Offline

Credits: 5(4+1)

Aim of the Course: The aim is to achieve knowledge of software engineering practices and how to apply it in Software Development and IT Enterprises.

Course Objective:

After successful completion of this course, students will be able to:

5. Understand the basic concept of software engineering and requirements analysis.
6. Understand the procedure for cost estimation, project scheduling and risk management.
7. Learn the methodologies of software design and techniques of testing.
8. Learn the principles behind software quality management, configuration management and use of CASE Tools.

CO	Course Outcome	Mapped modules
CO1	Understand the basic concept of Software Engineering	M1
CO2	Understand the concept of Software Project Planning and Management	M2
CO3	Understand the concept of Software Design	M3
CO4	Understand the concept of Software Testing and Maintenance	M4
CO5	Understand the concept of Software Quality Assurance	M5
CO6	Understand the concept of Software Configuration Management and CASE	M6

Module Number	Content	Total Hours	Percentage of questions	Bloom's Level
M1	Introduction to Software Engineering	10	10 %	L1
M2	Software Project Planning and Management	15	25 %	L1, L2, L3, L4
M3	Software Design	10	20 %	L1, L2, L3
M4	Software Testing and Maintenance	10	20 %	L1, L2, L3
M5	Software Quality Assurance	10	20%	L1, L2, L3

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M6	Software Configuration Management and CASE	5	5%	L1
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Module No	Topic/Module	Hours
1.	Introduction to Software Engineering: Software as a product – generic and bespoke, Reasons for developing a new software, Software Development Life Cycle, SDLC Models – Waterfall, Prototype, Iterative Enhancement, RAD, Spiral. Introduction to Feasibility Study, Requirements Elicitation and Documentation.	10
2.	Software Project Planning and Management: Concept of 4Ps, Responsibility of a system analyst and project manager. Cost Estimation Techniques (COCOMO, Function Point Metric), Project Scheduling – Gantt Chart, PERT and CPM, Risk Analysis and Management (RMMM). Introduction to Context Diagram, Data Flow Diagram, Decision Tree, Decision Table.	15
3.	Software Design: Concept of Modularization, Top-Down and Bottom-Up approach of software design, Types of Coupling and Cohesion, Basic Idea of Interface Design, Database Design (Entity Relationship Diagram) and Test Case Design, Introduction to Structured Chart.	10
4.	Software Testing and Maintenance: Levels of Software Testing. Verification and Validation. Alpha, Beta and Acceptance Testing. White Box and Black Box Testing. Concept and computation of Cyclomatic Complexity. Introduction to Software Maintenance and its types. Reviews – Inspection, Formal Technical Review, Code Walkthrough.	10
5.	Software Quality Assurance: Concept of Software Quality, Activities under Software Quality Assurance, ISO certification (Quality Parameters, Procedure to obtain certification, ISO 9001, 9002, 9003), Introduction to SEI-CMM, Levels of Maturity. Mc Calls Quality Factors, Introduction to TQM. Introduction to Software Reliability Metrics.	10
6.	Software Configuration Management and CASE: Introduction to Software Configuration Management, Version Control, Change Management and CASE Tools.	5

Suggested Readings:

1. Software Engineering – K K Aggarwal, Yogesh Singh – New Age International
2. Software Engineering – Bharat Bhushan Aggarwal, Sumit Prakash Tayal – Firewall Media / Laxmi Publications
3. Software Engineering – Roger S Pressman – Mc Graw Hill (Edition 4 / 5)
4. Software Engineering – Rajiv Chopra – Dhanpat Rai Publications

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BBA BA 792: Software Engineering Lab using MS Project

Laboratory Experiments should cover areas of Project Scheduling (Gantt Chart, PERT, CPM), Resource Allocation, Relationship Creation etc.

Paper Name: Operation Research and Optimisation Technique

Paper Code: BBA BA 703

Total Credit: 3 (2L+1T)

Total hours of lectures: 40 hours

Mode: Offline

Credits: 3

Aim of the Course: The aim is to achieve knowledge of optimization techniques that can be applied in enterprise operation procedures.

Course Objective:

After successful completion of this course, students will be able to:

9. Understand the concept and application areas of Linear Programming Problem.
10. Understand the different categories of LPP used in day-to-day business areas like transportation, assignment, sequencing in production, operation and supply chain and logistics field.
11. Understand the project scheduling and inventory optimization.
12. Understand the business strategies and their profitability using game theory as well as decision making under uncertainty and risk.

CO	Course Outcome	Mapped modules
CO1	Understand the concept of Linear Programming Problem	M1
CO2	Understand the concept of Assignment, Transportation and Sequencing Problem	M2
CO3	Understand the concept of Games and Strategies	M3
CO4	Understand the concept of Network Scheduling using PERT CPM	M4
CO5	Understand the concept of Inventory Control	M5
CO6	Understand the concept of Decision Making under Uncertainty and Risk	M6

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Module Number	Content	Total Hours	Percentage of questions	Bloom's Level
M1	Introduction to Linear Programming Problem	10	25%	L1, L2, L3, L4
M2	Assignment, Transportation and Sequencing Problem	10	25%	L1, L2, L3, L4
M3	Games and Strategies	6	15%	L1, L2, L3, L4
M4	Network Scheduling using PERT CPM	6	15%	L1, L2, L3, L4
M5	Inventory Control	4	10%	L1, L2
M6	Decision Making under Uncertainty and Risk	4	10%	L1, L2

Module No	Topic/Module	Hours
1.	Introduction to Linear Programming Problem: Concept of Linear Programming Problem, Objective Function, Slack, Surplus and Artificial Variable, Problem Formulation. Solution of LPP using Graphical Method, Simplex Method. Concept of Duality, Solving LPP using Big-M Method. Basic Idea of Dynamic Programming Problem. Application Areas of LPP.	10
2.	Assignment, Transportation and Sequencing Problem: Solution of Balanced and Unbalanced Assignment Problem using Hungarian Method, Solution of Traveling Salesman Problem. Balanced and Unbalanced Transportation Problem Solving using North West Corner Rule, Row Minima, Column Minima, Matrix Minima and Vogel's Approximation Method, Optimality Test using MODI Method. Solution to Sequencing Problem using Johnson's Rule for 2 machines.	10
3.	Games and Strategies: Formulation of Problems and Strategies into Game Theory Problems, Concept of Two Person Zero Sum Game, Pure and Mixed Strategies, Solution using Saddle Point, Dominance Method and Graphical Method. Applications of Game Theory in Business.	6
4.	Network Scheduling using PERT CPM: Concept of Probabilistic and Deterministic Scheduling Techniques. PERT – Concept of Optimistic, Pessimistic, Most Likely Time, Expected Time, Float Time, Earliest and Latest Finish and Start Time, Standard Deviation and Variance computed using PERT Chart and calculating estimated project length. Concept of Critical Path Method and computing critical path to find estimated project length.	6
5.	Inventory Control: Concepts and benefits of inventory control, Different types of costs in inventory system, Formulation and solution of Economic order quantity (EOQ) model, Selective inventory control techniques (ABC Analysis and VED Analysis).	4
6.	Decision Making under Uncertainty and Risk: Decision theory: Risk and uncertainty in decision-making – minimax, maximin and regret criterion – Hurwicz and Laplace criteria in decision making – decision tree analysis.	4

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Paper Name: Linear Programming Problem Lab with MS Excel

Paper Code: BBA BA 793

Total Credit: 1

Total hours of lectures: 20 hours

Module No	Topic/Module	Hours
1.	Basic Concept of Solver Tool in MS Excel, Solving LPP using Simplex Method. Solving Assignment, Transportation and Sequencing Problems using Solver.	15
2.	Solving Problems on Game Theory – Pure Strategy, PERT Chart, EOQ.	15

Suggested Readings:

1. Operation Research – Kanti Swarup, P K Gupta, Man Mohan – Sultan Chand and Sons
2. Operation Research – S Kalavathy – Vikas Publishing House
3. Linear Programming and Theory of Games – P.M. Karak – New Central Book Agency
4. Management Science using Excel – Isaac Gottlieb – BPB Publications