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

Course Name: Project Management

Mode: Offline   **Credits: 5** (4L+1T)

Subject Code: BBA(BA)–501

Course Objectives: The objective of this course is to impart students the basic concepts of Project Management addressed with various insights of it in the undergraduate study of business analytics.
This course enlightens students with Processes, Cost & Formulation of Project Management Coupled with Project Scope, Tools and Scheduling. This course intends to enrich students with an assortment of Quality control, Analytics and emergent trends of Project Management, which in turn will facilitate students to originate, relate, appraise, and diversify from the realms of Academics into Applied Business Management especially in the horizons of Contemporary Professional Sphere.

Sl No.	Graduate attributes	Mapped Modules
CO1	Understand the concept of project management with its various basic dimensions.	M1, M2,M3
CO2	Develop comprehensive understanding of project management including scope, schedule, cost, and resources.	M1,M2, M3
CO3	Apply structured project management methodologies to deliver strategic business value.	M2, M3
CO4	Understand and apply project management tools for monitoring and control.	M2, M3, M4
CO5	Understand, Apply and Analyze Management of risk, quality, and communication across project stakeholders.	M2, M3, M4
CO6	Understand project team dynamics in demonstrating, coordinating and applying project organizational management.	M1,M2, M3,M4
CO7	Analyze and Apply different horizons of project management in managing and adapting emergent trends in project management.	M2, M3, M4

Learning Outcome/Skills:
This course is designed to build a static as well as a dynamic understanding on project management with its basic features, processes, scope along with its complexities, strategic clarity and emergent decision-making trends.
Though this course students will learn to identify, categorize, map, analyse different aspects of projects while managing risk, quality, stakeholders in dynamic emergent business environments.

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<u>**DETAILED SYLLABUS:**</u>

Module No.	Topics	No. of Recommended hours	Percentage of questions	Bloom's Level (applicable)
1	**Project Management: Introduction**	8	10%	**L1, L2**
	Concept of Project and Project Management; Project & Program; Project Management aspects, basic resources, issues and challenges; Project Roles; Project Success Criteria.			
2	**Project Management: Processes, Cost, Financial measures, Feasibility& Organizational Context**	18	32%	**L2, L3, L4, L5**
	Project Life Cycle, checkpoints; Project Cost Estimation and Capital Budgeting Measures – PI,EV,PV,ROI,NPV,PBP,IRR; Financial Management for Project Management; Social Cost-Benefit Analysis; Integration of Project Formulation: Project appraisals, feasibility study & analysis; Organizational Context in Project management; Developing the Project Team and related aspects; Conflict Management.			
3	**Project Management: Scope, Tools & Techniques, Scheduling & Risk Management**	18	32%	**L2, L3, L4, L5**
	Project Work Breakdown structure(functions, activities and tasks); Project Planning-Network Analysis, Sequencing Activities Critical Chain, Estimating Activity Durations ; Developing Project Schedule ; Critical Path Method (CPM) Program Evaluation and Review Technique (PERT) ; Gantt Charts ,Time-cost Trade off ; Crashing & Resource Allocation and Optimization; Project Risk Management.			
4	**Project Management: Quality control, Analytics and Emergent Contemporary Trends**	16	26%	**L2, L3, L4, L5**
	Project Management measuring, monitoring and tracking techniques; Quality planning, assurance and control; Quality Control; Quality Metrics; Continuous Improvement; Six Sigma Project MIS - principal features; Understanding MS Project Interface; Agile and Scrum Frameworks; AI Evolution and Agile Project Management.			

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Suggested Readings:

1. Prasanna Chandra: PROJECTS: Planning, Analysis, Selection, Financing, Implementation, and Review, McGraw-Hill Education
2. Sitangshu Khatua : Project Management and Appraisal : Oxford
3. Horold Kerzner : Project Management : A System Approach to Planning, Scheduling and Controlling: Wiley.
4. Dr. Raj Kumar Yadvendra, Gullybaba.com, Panel: MS-52 Project Management, Gullybaba Publishing House Pvt. Ltd.
5. Kalpesh Ashar: Project Management Essentials You Always Wanted To Know, Vibrant Publishers.
6. Project Management: Essential Managers, DK.
7. Erik Larson and Clifford Gray : Project Management: The Managerial Process, McGraw-Hill Education.

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Paper Name: Data Analytics Skills for Managers

Paper Code: BBA(BA) 502

Total Credit: 5 (4L+1T)

Total hours of lectures: 60 hours

Mode: Offline   **Credits: 5(4L+1T)**

Aim of the Course: This course outlines the methodologies and procedures necessary for students to apply specific statistical and data analysis techniques that are relevant to real-world business problems. In doing so, the course aims to develop students' ability to utilize data analytics skills effectively.

Course Objective: The course is designed to provide a basic knowledge on the importance, role and application of data analytics in business domain. The students will be able to identify three core types data analytical techniques i.e. exploratory, descriptive, and causal along with its nature and application, classify the application of appropriate analytical techniques in appropriate situation and outline the basic concepts of statistical quality control.Students will be prepared to function in roles such as strategic marketing analysts, advanced decision-makers, and professionals proficient in tools like statistical quality control and SPSS. The course emphasizes solving business problems by analyzing data, understanding key issues, and identifying the most efficient and appropriate decision-making strategies.

CO	Course Outcome	Mapped modules	Program Outcome
CO1	Understanding Data Analytics, its role and the skill sets needed for a data analyst, steps involved in data exploratory analysis	M1, M2, M3	PO2, PO3
CO2	Apply basic data analytics techniques like ANOVA, simple and multiple linear regression, logistic regression etc.	M3, M4, M5	PO1, PO2, PO3, PO4, PO5
CO3	Apply strategic marketing analytics techniques like clustering analysis etc.	M6	PO1, PO2, PO3, PO4, PO5, PO7
CO4	Apply quantitative techniques in Advanced Decision Making like Analytic Hierarchic Processing etc. and statistical quality control.	M7, M8	PO1, PO2, PO3, PO4, PO5, PO7
CO5	Analyse data using SPSS	M9	PO1, PO2, PO3, PO4, PO5

Module Number	Content	Total Hours	Percentage of questions	Bloom's Level
M1	Introduction to Data Analytics	5	10 %	L1, L2
M2	Data Collection and Data Pre-Processing	5	10 %	L1, L2, L3
M3	Exploratory Data Analytics and Descriptive Statistics	5	15 %	L1, L2, L3
M4	Correlation and Regression	9	15 %	L1, L2, L3, L4

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M5	Logistic Regression	5	5%	L1, L2, L3, L4
M6	Strategic Marketing Analytics	8	15%	L1, L2, L3, L4, L5
M7	Quantitative Techniques used in Advanced Decision Making	8	15%	L1, L2, L3, L4, L5
M8	Statistical Quality Control	5	5%	L1, L2, L3, L4, L5
M9	Introduction to SPSS Software	10	10%	L3, L4, L5
Total		60	100%	

Detailed Syllabus:

Sl.	Topic/Module	Hours
1.	**Module 1: Introduction to Data Analytics:** Definition, Role of data analytics in business, Tools used in data analytics, Application of analytics in business.	5
2.	**Module 2: Data Collection and Data Pre-Processing:** Data Collection Strategies, DataPre-Processing Overview, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization.	5
3.	**Module 3: Exploratory Data Analytics and Descriptive Statistics:** Stem and Leaf Diagram, Mean, Standard Deviation, Skewness and Kurtosis, ANOVA. Some useful plots: Box Plots, Pivot Table, Heat Map.	5
4.	**Module 4: Correlation and Regression:** Scatter Diagram, Karl Pearson's Correlation Coefficient, Rank Correlation, Correlation Coefficient for Bivariate Frequency Distribution, Simple and Multiple Regression: Introduction, Overview, Importance, Application of Least Square Method, Model Evaluation through Visualization: Residual Plot, Distribution Plot.	9
5.	**Module 5: Logistic Regression:** Discrete choice models, Logistic Regression, Logistic Model Interpretation, Logistic Model Diagnostics, Logistic Model Deployment.	5
6.	**Module 6: Strategic Marketing Analytics:** The STP framework, Value generation through STP framework, Managing the segmentation process, Segmentation in Real world: Cluster Analysis, Hierarchical and Non-Hierarchical, K Means Clustering, Prediction of Customer's segment membership: Discriminant Analysis (DA), Two-Group DA.	8
7.	**Module 7: Quantitative Techniques used in Advanced Decision Making:** Multi-Criteria Decision Making [MCDM], Analytic Hierarchic Processing [AHP], Using Excel Solver for Optimization Techniques.	8
8.	**Module 8: Statistical Quality Control:** Types of Inspection; Statistical Quality Control, Acceptance Sampling and Control Charts.	5
9.	**Module 9: Introduction to SPSS Software:** Data Entry, Descriptive Statistics Procedures, Cross Tabulation, Creating and editing graphs and charts. Introduction to Correlation and Regression (Linear, Multiple, Logistic) Analysis, Factor Analysis, Cluster Analysis, T-test, ANOVA.	10

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Suggested Readings:

1. Stephen G. Powell, Kenneth R. Baker: Management Science, The Art of Modeling with Spreadsheets, Wiley.

2. Nagraj Balakrishnan, Barry Render, Ralph M. Stair Jr: Managerial Decision Modeling with Spreadsheets, Prentice Hall.

3. N. D. Vohra: Quantitative Techniques in Management, Tata McGraw-Hill Education.

4. Eugene L. Grant, Richard S. Leavenworth : Statistical Quality Control, McGraw-Hill.

5. Dr. Anasse Bari, Mohamed Chaouchi: Predictive Analytics for Dummies, John Wiley & Sons.

6. R. N. Prasad, Seema Acharya: Fundamentals of Business Analytics, Wiley.

7. Kiran Pandya, Smruti Bulsari, Sanjay Sinha: SPSS in Simple Steps, Dreamtech Press (Kogent).

Lokesh Jasrai: Data Analysis using SPSS, Sage Publication

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Paper Code: BBA(BA)-601
Course Name : Supply Chain Management & Analytics

Mode: Offline   TotalCredit:4L(3L+1T)
Total hours of lectures: 50 hours

Course Objective:

1. This course will demonstrate primary differences between logistics and supply chain management.
2. Students will be familiar with the concepts, ,managing components of supply chain management.
3. Student will build an introductory understanding about tools and techniques useful in implementing supply chain management.
4. A preliminary level of understanding will be formulated among students regarding supply chain analytics.

Sl	Course Outcome	Mapped modules
1	Remembering	M1,M2, M3, M4,M5, M6, M7,M8
2	Understanding the course	M1,M2, M3, M4,M5, M6, M7,M8
3	Applying the general problem	M4, M6
4	Analyse the problems	M4, M5, M6
5	Evaluate the problems after analysing	M4, M5, M6
6	Create using the evaluation process	M7, M8

Module Number	Content	Total Hours	%age of questions	Bloom's Level (if applicable)	Remarks (If any)
M 1	Concept of logistics	8	5	L1,L2	
M 2	Integrated logistics	8	5	L1,L2	
M 3	Introduction to Supply Chain	7	15	L1,L2,	
M 4	Supply Chain Effectiveness	6	15	L1,L2,L3, L4,L5	
M 5	Sourcing strategy	6	15	L1,L2,L4, L5	
M 6	Demand Forecasting	7	15	L1,L2,L3, L4,L5	
M 7	Supply Chain Management from Indian Perspective	2	15	L1,L2,L6	
M 8	Introduction to Supply Chain Analytics	6	15	L1,L2,L6	
		50	**100**		

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Paper Code: BBA(BA)-601
Course Name : Supply Chain Management & Analytics

Mode: Offline   TotalCredit:4L(3L+1T)
Total hours of lectures: 60 hours

Sl.	Topic/Module	Hour
1.	Module1: 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.	8
2.	Module2:Integratedlogistics:Introduction,Objective,Concept of Integrated Logistics, Information flow, Inventory flow, Inventory Ownership, Measurement system, Barriers, Logistics Performance Cycle, Procurement Performance Cycle.	8
3.	Module3: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.	7
4.	Module4: Framework for Supply Chain Management, Supply Chain Effectiveness, Supply Chain Relationship, Building long-Term Relationship with Vendors.	6
5.	Module5:Sourcing strategy :Manufacturing management, Make or buy decision, Capacity management, Materials Management, Choice of sources, Procurement planning.	6
6.	Module6:Demand Forecasting: Introduction, Objective, Concept and Impact of Demand Forecasting, Forecasting Process and Techniques.	7
7.	Module7: Supply Chain Management from Indian Perspective.	2
8.	Module8: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.).	6

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Suggested Readings:

1. Sunil Chopra: Supply Chain Management, Pearson Prentice Hall.

2. Sunil Chopra, Peter Meindl, D.V. Kalra: Suppl yChain Management, Pearson.

3. Michael Hugos: Essentials of Supply Chain Management, Wiley.

4. Richard B, Ravi Shankar, F. Robert Jacobs: Operations and Supply Chain Management, McGraw Hill Education.

5. James Stevens: Supply Chain Management: Strategy, Operation & Planning for Logistics Management, Create space Independent Pub.

6. Ashley McDonough: Operations and Supply Chain Management Essentials You Always Wanted to Know, Vibrant Publishers.

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Paper name: Health care Analytics

Paper Code: BBA(BA) 602(C) Total

Credit: 5

Total hours of lectures: 60 hours

Course Outcome:

After completion of the course, the students will be able to

1. Illustrate the importance of Health Care Data as an Organizational Asset.

2. Outline various sources, types of organizational data and basic statistical tools to describe the data.

3. Identify various analytical techniques that can be applied on the healthcare data.

4. Demonstrate the concept of metrics and KPIs in Healthcare Analytics.

Sl.	Topic/Module	Hours
1.	**Module – 1**: Introduction to Quality Improvement and Data Analytics: Drivers for health care transformation ,quality initiatives that have shaped the national health care landscape , health care quality and value, the background and evolution of quality and performance improvement , the qualityimprovementframeworks,healthcaredataanalytics,howanalytics Can help transform health care.	10
2.	**Module 2**: Health Care Data as an Organizational Asset: data information, knowledge and wisdom hierarchy, data information, knowledge and wisdom hierarchy, sources of health care data, challenges HCO's face when using data for quality and performance improvement, organizational approach for Effective use of data analytics, role of data governance.	10
3.	**Module3**:Working with Data: information value chain, importance of data Context and relevance to business processes, common data types, basic	10

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	Statistical terms, common patterns or distributions in statistics, charts for Graphical representations.	
4.	**Module 4**: Data Analytics Tools and Techniques for Health Care: Data analytics terms, process steps of data analytics, role of the data analyst, analyze and interpret healthcare data effectively, key data warehouse concepts, basic introduction enterprise data architecture as seen in health Care organizations.	10
5.	**Module 5**: Using Data to Solve Problems: Define measures, metrics, and indicators, the purpose and use of Key Performance Indicators (KPI's), IHI Triple Aim to prioritize performance goals, the DMAIC problem-solving model and methodology.	10
6.	**Module 6:**Usingthe Data to Tell the Story: ways to effectively display data, select appropriate options for displaying information, Identify background information, determine what information stakeholders want and need to know, determine the best ways to communicate information with specific audiences	10

Suggested Readings:

1. Reddy & Aggarwal, Healthcare Data Analytics, Chapmanand Hall.
2. Vikas Kumar, Healthcare Analytics Made Simple: Techniques in healthcare computing using machine learning and Python, Packt Publishing
3. Maheshwari, Data Analytics, McGraw Hill India
4. Mohammed Alfan, Data Analytics, SKILLS TOSUCCEED
5. Ross.M., Mulner Edward,M. Rafalsky, Healthcare Analytics: Foundation & Frontires, Taylor & Francis Ltd
6. Trevor. L. Strome, Healthcare Analytics for Quality and Performance Improvement, John Wiley & Sons

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Paper name: Financial Analytics

Paper Code: BBA602 (A)

Total Credit: 4+1 = 5

Total hours of lectures:60 hours

Course Outcome:

After completion of the course, the students will be able to

1. Define the concept of advanced financial management and risk analysis
2. Interpret the analysis of financial data using different statistical tools.
3. articulatethefinancialservicesonthebasisofmachinelearningandartificial intelligence
4. illutratethemodelonoptimalportfolioselectionandRisk-ReturnTrade-off& Quadratic Utility

Module/Topics	Hours
Module1:IntroductiontoFinancialAnalytics: Analyticalthinking,Roleofa FinancialAnalyst,Newsanalytics(accessingnewsusingwebscrapping)andsentiment Analysis in finance, Data Driven Financial Decision, Decision making under uncertainty,	04
Module 2: Introduction to Analysis of Financial Data Using Statistical Tools: Statistical concepts; Probability, Normal, Lognormal distribution properties, Data visualization, Understanding data in finance, cleaning and pre-processing of data, Application of software on different forms of financial data set-Time Series and Cross Sectional Data	12
Module 3: Financial Modelling: Introduction to Basic Financial Functions in Excel, Discounted Cash flows, Annuity, PMT, PV, NPV, IRR, Meaning and purpose of financial modelling in decision-making and Assumptions and limitations in financial models	16
Module 4: Application of Data Science across Financial Services: Learn about Financial Data Analytics with respect to Data Science in Financial Services, Artificial IntelligenceandMachineLearninginFinancialServices,UsageofAIinAlgorithmic Stock Trading, Automated Robo-Advisors, Fraud Detection and Prevention.	12
Module5:OptimalPortfolioAllocation: CapitalAllocationLine(CAL)andOptimal	10

Portfolio, Lending and Borrowing on the CAL, analysis using indifference curves. CAPM-FeaturesofMarkowitzanalysis,expectedreturnsfromhistoricalaverages, Efficient frontier.	
Module6:Risk-ReturnTrade-off&QuadraticUtility:Concept of utility and investor behavior, trade-off between risk and return, decision making under uncertainty, Behavioral Finance and Investment Decisions, Optimal decision-making under uncertainty, etc.	6

References:

1. M.J.,&Hugen,D.L.FinancialanalyticswithR:buildingalaptoplaboratoryfor data science Bennett, Cambridge University Press.
2. Hilpisch, Y."O'Reilly Python for Finance: Analyze big financial data, Media, Inc.".
3. Consoli, S., Reforgiato Recupero, D., & S. Data Science for Economics and Finance. Methodologies and Applications, Springer Nature.
4. Aldridge,I., & Avellaneda, M. John Big data science in finance- Wiley &Sons.
5. Lukomnik, J., & Hawley, J. P Moving Beyond Modern Portfolio Theory- Investing that Matters,. :. Routledge.
6. Reilly,F.K.,&Brown,K.CInvestmentAnalysisandPortfolioManagement.,Cengage Learning.
7. Rees,M.John. Principles of financial modelling: model design and best practices using Excel and VBA. Wiley & Sons.

Paper Name: Data Structures and Algorithms
Paper Code: BBABA 603+ BBA BA 691
Total Credit: 5 (3L+2P)
Total hours of lectures: 60 hours

Mode: Offline

Aim of the Course: The aim is to achieve knowledge of the data structures and algorithms and how to apply it to real life business problems.

Course Objective:
After successful completion of this course, students will be able to:
1. Understand the concept of abstract data type such as stack, queue, linked list, and trees
2. Chose appropriate data structure to design algorithm to solve the problem.
3. Apply the knowledge of stack and queue to design algorithm
4. Design application using sorting, searching and the concept of tree.

CO	Course Outcome	Mapped modules
CO1	Understand the concept of algorithm and data structure	M1
CO2	Understand the concept of stack and queue and implement it	M2
CO3	Understand the concept of linked list and implement it	M3
CO4	Understand the concept of tree and implement it	M4
CO5	Understand the process of sorting and searching applied on stored data.	M5
CO6	Understand the concept of hashing	M6

Module Number	Content	Total Hours	Percentage of questions	Bloom's Level
M1	Introduction to Algorithms and Data Structures	4	10 %	L1
M2	Stack and Queue	15	25 %	L1, L2, L3
M3	Linked List	15	25 %	L1, L2, L3
M4	Tree	10	15 %	L1, L2, L3
M5	Sorting and Searching	10	15%	L1, L2, L3
M6	Hashing	6	10%	L1

Module No	Topic/Module	Hours
1.	**Introduction:** Basic idea of ADT and Data Structure, algorithm and its properties, concept of time and space complexity.	4
2.	**Stacks and Queues:**	15

	Basic idea of stack and queue, Types of Queues: Linear Queue, Circular Queue, Priority Queue along with implementation. Use of 'LifoQueue', 'Queue', 'PriorityQueue', 'deque' modules and library methods for implementation of Stack and Queue.	
3.	**Linked Lists:** Basic concept of various types of linked lists (Linear, Circular, Double),Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list.Implantation of linked list using 'llist' and 'structlinks' package Linked representation of Stack and Queue.	15
4.	**Trees:** Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree, B Tree, B+ Tree. Binary Tree Traversals, Insertion and Deletion in Binary Search Tree. Implementation of Binary Tree using 'bigtree' package.	10
5.	**Sorting and Searching:** Concept and Implementation of Bubble Sort, Selection Sort, Insertion Sort, Linear Search and Binary Search.	10
6.	**Hashing:** Concept of Hashing, Hash Function, Collision Resolution Techniques in Hashing - Separate Chaining, Open Addressing, Linear Probing, Quadratic Probing, Double Hashing, Rehashing, Extendible Hashing.	6

Suggested Readings:
1. Data Structure and Algorithmic Thinking with Python, Narasimha Karunmanchi, Career Monk Publications
2. Data Structures and Algorithms in Python, Michael T. Goodrich, R.Tamassia, Michael H. Goldwasser, WILEY
3. Python Data Structures and Algorithms, Dr. Basant Agarwal & Benjamin Baka, Packt
4. Data Structures and Algorithms Using Python, Rance D. Necaise, Wiley