INVERTIS UNIVERSITY BAREILLY

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BBA in Business Analytics CURRICULUM 2026

Program Proposed:

BBA in Business Analytics | 3-Year Program | 6 Semesters

Academic Year 2026 – 2027

CREDIT FRAMEWORK & EVALUATION SCHEME

Credit Structure | Delivery Model | Evaluation Norms

Category	Explanation	L	T	P	CA	EE	Credit Norm
UF University Faculty	Core subjects delivered by University Faculty. Foundation business and management subjects.	3	1	0	30	70	4 Credits / 100 Marks
IP Industry Professional	Delivered by Industry Professionals. Analytics, AI, FinTech and technology subjects.	3	1	0	30	70	4 Credits / 100 Marks
IE Industry Elective	Students select one industry domain paper from the approved list.	3	1	0	30	70	4 Credits / 100 Marks
CA Split (all subjects)	CA = CA1 (mid-sem test 15 marks) + CA2 (project/assignment 15 marks). For IC Lab: CA1=10, CA2=20.						No change to total marks
SEC Skill Enhancement	Practical tools and software skills. Higher CA weightage.	3	1	0	50	50	4 Credits / 100 Marks
AECC (Theory) Ability Enhancement	Compulsory life skills: ethics, environment. All students.	1	1	0	15	35	2 Credits / 50 Marks
AECC (Project/Viva) Ability Enhancement	Internship, project, viva. Assessed entirely by examiner.	0	0	4	0	100	4 Credits / 100 Marks
AC Analytics/Lab Course	Subjects with practical component. 2L+1T+2P per week.	2	1	2	30	70	4 Credits / 100 Marks

Notes:

1. UF (University Faculty) subjects are delivered by University Faculty foundation business, management and theory subjects. IP (Industry Professional) subjects are delivered by Industry Professionals and External Faculty Partners analytics, AI, FinTech and technology subjects. IE (Industry Elective) subjects allow students to choose one domain specialisation, delivered by Industry Professionals. AE (Ability Enhancement) subjects are mandatory milestones Human Values, Internship and Environmental Science.
2. All UF and IP subjects carry 30 marks CA and 70 marks EE, totalling 100 marks per subject and 4 credits.
3. CA (30 marks) is split into two components: CA1 = 15 marks (mid-semester written test) and CA2 = 15 marks (mini project / tool-based assignment / case submission). This ensures every subject has a formal project-based assessment component.
4. IC Skill and Lab subjects carry CA 50 + EE 50 = 100 marks. CA for SEC is split as: CA1 = 20 marks (practical test) and CA2 = 30 marks (live project / tool demonstration / case presentation).
5. AC (Lab / Analytics) subjects carry CA 30 + EE 70 = 100 marks. CA split: CA1 = 10 marks (lab test) and CA2 = 20 marks (lab project submission and demo).
6. AECC theory subjects (Environmental Science, Human Values) carry 15 CA + 35 EE = 50 marks and 2 credits, with 1 lecture + 1 tutorial per week.
7. AECC project subjects (Internship Viva, Research Project, Capstone) are assessed entirely by the examiner panel 100 marks, 4 credits.
8. IE (Industry Elective) subjects give students the ability to choose one industry domain from the approved list per program. Delivered by an Industry Professional. Each IE follows: 30 CA + 70 EE = 100 marks, 4 credits.
9. Grading is on a 10-point SGPA/CGPA scale. Minimum pass mark is 40% in each component separately.

BBA Business Analytics

3-Year Full Program | 6 Semesters | 132 Credits

PART A SCHEME OF INSTRUCTIONS

L = Lectures/week | T = Tutorial/week | P = Practical/week | CA = Continuous Assessment | EE = End Semester Exam

YEAR I

SEMESTER 1 Business & Quantitative Foundations

Course Code	Course Title	Category	L	T	P	CA	EE	Total	Credit
BBA-BA 101	Fundamentals of Management	UF	3	1	0	30	70	**100**	**4**
BBA-BA 102	Principles of Economics	UF	3	1	0	30	70	**100**	**4**
BBA-BA 103	Organizational Behavior	UF	3	1	0	30	70	**100**	**4**
BBA-BA 104	Introduction to Business Analytics	IP	3	1	0	30	70	**100**	**4**
BBA-BA 105	Introduction to Statistics	IP	3	1	0	30	70	**100**	**4**
BBA-BA 106	MS-Office & Digital Tools	IP	3	1	0	50	50	**100**	**4**
Total			**18**	**6**	**0**	**200**	**400**	**600**	**24**

SEMESTER 2 Data Thinking & Digital Business

Course Code	Course Title	Category	L	T	P	CA	EE	Total	Credit
BBA-BA 201	Business Mathematics	UF	3	1	0	30	70	**100**	**4**
BBA-BA 202	Financial Accounting	UF	3	1	0	30	70	**100**	**4**
BBA-BA 203	Microeconomics & Indian Economy	UF	3	1	0	30	70	**100**	**4**
BBA-BA 204	Python for Business Data	IP	3	1	0	30	70	**100**	**4**
BBA-BA 205	SQL & Data Management (Lab)	IP	2	1	2	30	70	**100**	**4**
BBA-BA 206	Enterprise Information Systems & Professional Communication	IP	2	1	2	30	70	**100**	**4**
Total			**16**	**6**	**4**	**180**	**420**	**600**	**24**

YEAR II

SEMESTER 3	Statistical Analysis & Visualisation								
Course Code	**Course Title**	**Category**	**L**	**T**	**P**	**CA**	**EE**	**Total**	**Credit**
BBA-BA 301	Probability & Inferential Statistics	UF	3	1	0	30	70	**100**	**4**
BBA-BA 302	Managerial Accounting	UF	3	1	0	30	70	**100**	**4**
BBA-BA 303	Operations Research & Optimization	UF	3	1	0	30	70	**100**	**4**
BBA-BA 304	HR Analytics & Research Methods	IP	3	1	0	30	70	**100**	**4**
BBA-BA 305	Marketing Analytics	IP	3	1	0	30	70	**100**	**4**
BBA-BA 306	Data Visualisation: Tableau/Power BI	IP	2	1	2	30	70	**100**	**4**
Total			**17**	**6**	**2**	**180**	**420**	**600**	**24**

SEMESTER 4	Predictive Analytics & Machine Learning								
Course Code	**Course Title**	**Category**	**L**	**T**	**P**	**CA**	**EE**	**Total**	**Credit**
BBA-BA 401	Predictive Modeling & Regression	IP	3	1	0	30	70	**100**	**4**
BBA-BA 402	Machine Learning for Business (Lab)	IP	2	1	2	30	70	**100**	**4**
BBA-BA 403	Business Intelligence Systems	UF	3	1	0	30	70	**100**	**4**
BBA-BA 404	Supply Chain & Operations Analytics	IP	3	1	0	30	70	**100**	**4**
BBA-BA 405	Financial Analytics & Risk Modeling	UF	3	1	0	30	70	**100**	**4**
BBA-BA 406	Digital Marketing & Analytics	IP	3	1	0	50	50	**100**	**4**
Total			**17**	**6**	**2**	**200**	**400**	**600**	**24**

SEMESTER 5	Advanced AI & Cloud Analytics								
Course Code	**Course Title**	**Category**	**L**	**T**	**P**	**CA**	**EE**	**Total**	**Credit**
BBA-BA 501	Applied Machine Learning for Business (Lab)	IP	2	1	2	30	70	**100**	**4**
BBA-BA 502	Natural Language Processing (Lab)	IP	2	1	2	30	70	**100**	**4**
BBA-BA 503	Big Data & Cloud Analytics	IP	3	1	0	30	70	**100**	**4**
BBA-BA 504	Strategic Management	UF	3	1	0	30	70	**100**	**4**
BBA-BA 505	AI Ethics & Data Governance	IP	3	1	0	30	70	**100**	**4**
BBA-BA 506	Industry Elective	IE	3	1	0	30	70	**100**	**4**
BBA-BA 595	Summer Internship Report & Viva	AE	0	0	0	0	100	**100**	**4**
Total			**10**	**5**	**4**	**150**	**450**	**600**	**28**

SEMESTER 6	Generative AI, Strategy & Capstone								
Course Code	**Course Title**	**Category**	**L**	**T**	**P**	**CA**	**EE**	**Total**	**Credit**
BBA-BA 601	Generative AI for Business (Lab)	IP	3	1	2	30	70	**100**	**4**
BBA-BA 602	Environmental Science	AE	1	1	0	15	35	**50**	**2**
BBA-BA 603	Human Values & Business Ethics	AE	1	1	0	15	35	**50**	**2**
Total			**5**	**3**	**2**	**60**	**140**	**200**	**8**

PART B DETAILED SYLLABUS

Each subject carries 5 teaching units. One unit = approximately 9 lecture hours + 3 tutorial hours (for a 3-1-0 subject) over an 18-week semester.

BBA-BA 101 | Fundamentals of Management	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Introduction to Management: definition, nature, scope, importance; management as a science, art and profession; evolution of management thought classical, neo-classical and modern approaches; Fayol's 14 principles
Unit 2	Planning: nature and importance; types of plans; planning process; Management by Objectives (MBO); barriers to planning; decision-making rational, bounded rationality, intuitive; decision-making process
Unit 3	Organising: principles of organisation; types of organisation structures line, line and staff, functional, matrix; departmentation; span of control; authority, responsibility, accountability, delegation; centralisation vs decentralisation
Unit 4	Staffing and Directing: HR planning; recruitment and selection overview; leadership styles autocratic, democratic, laissez-faire; motivation Maslow's hierarchy, Herzberg's two-factor theory, McGregor's Theory X and Y
Unit 5	Controlling and Coordination: process of control; types of control; techniques budgetary control, MIS, PERT/CPM overview; coordination meaning, principles, methods; management of contemporary digital and remote teams

BBA-BA 102 | Principles of Economics	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Introduction to Economics: scarcity and choice; opportunity cost; micro vs macro economics; basic economic problems; circular flow of income; production possibility frontier
Unit 2	Demand and Supply: law of demand; determinants of demand; elasticity of demand price, income, cross; consumer surplus; law of supply; market equilibrium; price controls
Unit 3	Production and Cost Theory: production function; law of variable proportions; returns to scale; isoquants; producer equilibrium; short-run and long-run costs; economies and diseconomies of scale
Unit 4	Market Structures: perfect competition equilibrium, long-run; monopoly pricing and output decisions; monopolistic competition; oligopoly kinked demand curve, game theory basics; price discrimination
Unit 5	National Income and Macroeconomics: concepts GDP, GNP, NNP, NI; methods of measurement; business cycle; inflation types, causes, effects; unemployment; overview of fiscal and monetary policy

BBA-BA 103 | Organizational Behavior	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Introduction to OB: concept, scope and importance; contributing disciplines; models of OB; individual behaviour in organisations; personality theories and determinants; perception process and errors
Unit 2	Attitudes and Values: attitude components, formation, change; cognitive dissonance; values types, importance; job satisfaction; organisational commitment; employee engagement
Unit 3	Motivation: content theories Maslow, Alderfer ERG, McClelland; process theories Vroom's expectancy, Adams' equity; reinforcement theory; application in workplace motivation and incentive design
Unit 4	Group Dynamics and Teams: group formation and development; group norms, roles and cohesiveness; team types and team building; inter-group conflict sources and resolution strategies; negotiation
Unit 5	Leadership and Organisational Culture: leadership theories trait, behavioural, situational, path-goal, transformational; organisational culture types, formation and change; managing organisational change; Lewin's change model

BBA-BA 104 | Introduction to Business Analytics	
Category: IP | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	What is Business Analytics: definition and scope; descriptive, predictive and prescriptive analytics; data-driven vs intuition-driven decisions; analytics maturity model; roles data analyst, data scientist, business analyst
Unit 2	Data Fundamentals: structured vs unstructured data; data types nominal, ordinal, interval, ratio; data collection methods; primary vs secondary data; data quality accuracy, completeness, consistency; data lifecycle
Unit 3	Introduction to Analytical Tools: Excel for data analysis formulas, pivot tables, charts; SQL overview SELECT queries; Python overview Pandas basics; Tableau connecting data and creating a simple dashboard
Unit 4	Business Applications of Analytics: analytics in finance fraud detection, credit scoring; analytics in HR attrition prediction; analytics in supply chain demand forecasting; analytics in marketing campaign measurement; case studies
Unit 5	Analytics Project Framework: defining a business problem; data-to-insight pipeline; exploratory data analysis; communicating findings executive summary, data story; ethical use of data; introduction to data governance

BBA-BA 105 | Introduction to Statistics	
Category: IP | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Data and Presentation: types of data primary and secondary, qualitative and quantitative; data collection methods; frequency distribution; graphical presentation bar diagram, pie chart, histogram, frequency polygon, ogive
Unit 2	Measures of Central Tendency: arithmetic mean simple and weighted; median; mode; geometric mean; harmonic mean; properties; choice of appropriate average; partition values quartiles, deciles, percentiles
Unit 3	Measures of Dispersion: range; quartile deviation; mean deviation; standard deviation; variance; coefficient of variation; Lorenz curve; skewness Karl Pearson and Bowley's coefficient
Unit 4	Correlation and Regression: meaning and types of correlation; scatter diagram; Karl Pearson's coefficient of correlation; Spearman's rank correlation; simple linear regression equation derivation; least squares method; standard error of estimate
Unit 5	Probability and Probability Distributions: basic concepts experiment, sample space, event; classical and empirical probability; addition and multiplication theorems; Bayes' theorem; binomial distribution; normal distribution and its properties

BBA-BA 106 | MS-Office & Digital Tools	
Category: IP | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	MS Word for Business: advanced text formatting; styles and themes; table design; mail merge for reports and letters; references and citations; track changes and comments; professional report preparation
Unit 2	MS Excel for Data Analysis: advanced formulas IF, VLOOKUP, XLOOKUP, INDEX-MATCH; pivot tables and pivot charts; data validation; conditional formatting; what-if analysis goal seek, data tables, scenario manager
Unit 3	MS PowerPoint for Presentations: slide design principles; master slides; transitions and animations; embedding charts and data; professional business presentation techniques; design for business pitches
Unit 4	Google Workspace and Cloud Tools: Google Docs collaboration, comments, version history; Google Sheets IMPORTRANGE, data sharing; Google Forms for surveys; Google Drive organising team files
Unit 5	Digital Productivity Tools: professional email writing; virtual meeting etiquette Zoom, Google Meet; Notion for note-taking; Trello/Jira basics for task management; digital time management techniques

BBA-BA 201 | Business Mathematics	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Sets, Relations and Functions: set operations union, intersection, complement; Venn diagrams; Cartesian product; types of relations; types of functions one-one, onto, bijective; domain and range
Unit 2	Matrices and Determinants: types of matrices; matrix operations addition, multiplication; determinants; cofactors; adjoint; inverse of a matrix; solving systems of linear equations using Cramer's rule and matrix inversion method
Unit 3	Differential Calculus: concept of limit and continuity; derivative first principles; rules product, quotient, chain; derivatives of standard functions; higher order derivatives; applications in business marginal analysis, maxima and minima
Unit 4	Integral Calculus: indefinite integration standard forms; rules of integration; definite integrals; area under a curve; consumer and producer surplus calculation using integration
Unit 5	Mathematics of Finance: simple interest and compound interest; effective rate of interest; annuities present value and future value; EMI calculation; sinking funds; net present value basics

BBA-BA 202 | Financial Accounting	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Accounting Fundamentals: meaning, objectives and importance; basic accounting concepts and conventions; GAAP; double-entry system; accounting equation; journal entries; ledger posting; trial balance
Unit 2	Final Accounts: trading account; profit and loss account; balance sheet; adjustment entries depreciation, outstanding expenses, prepaid expenses, accrued income, income received in advance; closing entries
Unit 3	Bank Reconciliation and Bills of Exchange: reasons for difference between cash book and pass book; preparation of BRS; bills of exchange definition, types, discounting; accommodation bills; dishonour of bill
Unit 4	Depreciation and Provisions: concept and causes of depreciation; methods straight line method, written down value method; accounting treatment; provisions vs reserves; types of reserves
Unit 5	Partnership Accounts: features of partnership; goodwill meaning and methods of valuation; admission of partner; retirement and death of partner; dissolution of partnership firm; piecemeal distribution

BBA-BA 203 | Microeconomics & Indian Economy	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Consumer Theory: utility analysis; indifference curve approach; consumer equilibrium; income and substitution effects; revealed preference theory; consumer demand and its derivation
Unit 2	Production Theory: isoquants and isocost lines; producer equilibrium; expansion path; homogeneous production functions; Cobb-Douglas production function; technological change
Unit 3	Market Failure and Externalities: concept of market failure; public goods characteristics and provision; externalities positive and negative; Coase theorem; government intervention; regulation and taxation
Unit 4	Indian Economy Overview: structural features; role of planning; LPG reforms 1991; sectoral composition agriculture, industry, services; role of public and private sector; MSME sector
Unit 5	Contemporary Issues in Indian Economy: inflation trends; unemployment types and trends; digital economy India Stack, UPI, digital payments; Make in India; startup ecosystem; India's global trade position

BBA-BA 204 | Python for Business Data	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Python Basics: Python environment setup Anaconda, Jupyter Notebook; syntax; variables; data types int, float, str, bool; operators; input/output; control structures if-elif-else; for and while loops; functions and modules
Unit 2	Data Structures: lists operations, slicing, comprehensions; tuples; dictionaries; sets; nested data structures; file handling reading and writing text and CSV files; exception handling; lambda functions
Unit 3	NumPy and Pandas: NumPy arrays creation, operations, indexing; Pandas Series and DataFrame; loading data from CSV/Excel; data inspection; data cleaning missing values, duplicates, dtype conversion
Unit 4	Data Analysis with Pandas: groupby and aggregation; merging and joining DataFrames; pivot tables; time series basics; descriptive statistics; filtering and sorting; apply and lambda functions
Unit 5	Data Visualisation: Matplotlib line, bar, scatter, histogram, pie charts; Seaborn heatmap, boxplot, pairplot; customising charts; business chart creation; saving figures; brief introduction to Plotly

BBA-BA 205 | SQL & Data Management (Lab)	
Category: IP | L-T-P: 2-1-2 | Credits: 4 Credits	
Unit 1	Database Fundamentals: RDBMS concepts; entity-relationship (ER) diagrams; normalisation 1NF, 2NF, 3NF; keys primary, foreign, candidate, composite; referential integrity; database design principles
Unit 2	SQL Basics DDL and DML: CREATE, ALTER, DROP, TRUNCATE; INSERT, UPDATE, DELETE; SELECT statement; WHERE clause; ORDER BY; DISTINCT; LIMIT; arithmetic and comparison operators in SQL
Unit 3	Advanced SQL Queries: JOINs INNER, LEFT, RIGHT, FULL OUTER, SELF JOIN; subqueries correlated and non-correlated; GROUP BY; HAVING; aggregate functions COUNT, SUM, AVG, MAX, MIN; CASE statements
Unit 4	Views, Procedures and Indexes: creating and managing views; stored procedures; triggers BEFORE and AFTER; indexing for performance optimisation; transactions COMMIT, ROLLBACK, SAVEPOINT
Unit 5	Business Queries and Lab Practice: working with real business datasets sales, HR, customer databases; writing multi-table reporting queries; data export to Excel; MySQL Workbench and Python-SQL integration

BBA-BA 206 | Enterprise Information Systems & Professional Communication	
Category: IP | L-T-P: 2-1-2 | Credits: 4 Credits	
Unit 1	Enterprise Information Systems: role of information systems in organizations; Transaction Processing Systems (TPS); Management Information Systems (MIS); Decision Support Systems (DSS); Executive Information Systems (EIS); business process integration; digital transformation and enterprise data lifecycle.
Unit 2	Enterprise Applications: fundamentals of Enterprise Resource Planning (ERP); Customer Relationship Management (CRM); Supply Chain Management (SCM); Human Resource Management Systems (HRMS); overview of SAP, Salesforce, Oracle ERP, Zoho CRM; enterprise workflows and business process automation.
Unit 3	Business Productivity & Digital Collaboration: Microsoft 365 and Google Workspace for business; collaborative documentation; project management tools (Microsoft Teams, Trello, Notion); AI-powered productivity tools (Microsoft Copilot, ChatGPT, Gemini); document management; workplace cybersecurity and data privacy basics.
Unit 4	Professional & Workplace Communication: professional email writing; business reports and executive summaries; presentation skills; business storytelling and data storytelling; meeting management; stakeholder communication; business etiquette; communication in cross-functional and hybrid teams.
Unit 5	Workplace Readiness & Business Applications: requirement gathering; business documentation; case study analysis; resume and LinkedIn profile development; interview preparation; group discussions; business presentations; ethics and professionalism; enterprise system case studies across finance, marketing, HR, and operations.

BBA-BA 301 | Probability & Inferential Statistics	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Probability Theory: sample space; events mutually exclusive, exhaustive, independent; classical and empirical probability; conditional probability; multiplication theorem; Bayes' theorem and applications
Unit 2	Random Variables and Probability Distributions: discrete and continuous random variables; expected value and variance; binomial distribution properties and applications; Poisson distribution; uniform distribution
Unit 3	Normal Distribution and Sampling: normal distribution properties, standard normal curve, area tables; Central Limit Theorem statement and importance; sampling distributions mean and proportion; standard error
Unit 4	Estimation: point estimation properties of a good estimator; interval estimation; confidence intervals for population mean (known and unknown variance); confidence interval for proportion; determination of sample size
Unit 5	Hypothesis Testing: null and alternative hypotheses; Type I and Type II errors; level of significance; Z-test one sample and two sample; t-test one sample, two sample, paired; chi-square test for goodness of fit and independence; F-test and one-way ANOVA

BBA-BA 302 | Managerial Accounting	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Introduction and Cost Concepts: distinction between financial, cost and managerial accounting; cost classification by nature, function, behaviour; cost sheet preparation; elements of cost
Unit 2	Marginal Costing and CVP Analysis: marginal cost concept; contribution; break-even point algebraic and graphical; profit-volume ratio; margin of safety; key factor analysis; multi-product BEP
Unit 3	Standard Costing and Variance Analysis: standard cost concept and setting; material variances price and usage; labour variances rate and efficiency; overhead variances; variance investigation and reporting
Unit 4	Budgetary Control: meaning and objectives; types of budgets; master budget; flexible budget; zero-based budgeting (ZBB); budgetary control process; variance reporting; responsibility accounting
Unit 5	Management Decision Making: relevant costing; make or buy decisions; accept or reject decisions; product mix decisions; discontinuation decisions; pricing decisions cost-plus, marginal cost pricing

BBA-BA 303 | Operations Research & Optimization	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Introduction to Operations Research: history and scope of OR; characteristics of OR; OR methodology problem formulation, model building, solution, validation; types of OR models; role of computers in OR
Unit 2	Linear Programming: formulation of LP problems; graphical method two-variable problems; simplex method standard form, pivot operations; big-M method; sensitivity analysis objective function and right-hand side
Unit 3	Transportation and Assignment Problems: transportation problem northwest corner method, least cost method, Vogel's approximation method (VAM); optimality test MODI method; degeneracy; assignment problem Hungarian method; maximisation case
Unit 4	Network Analysis: network diagrams; CPM construction, critical path, float calculations; PERT three time estimates, probability of completion; project crashing cost-time tradeoff; resource levelling
Unit 5	Decision Theory and Simulation: decision environments certainty, risk, uncertainty; decision criteria minimax, maximin, Laplace, Hurwicz; decision tree analysis; expected monetary value; Monte Carlo simulation concept and steps

BBA-BA 304 | HR Analytics & Research Methods	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	HR Analytics Introduction: people analytics definition and scope; HR data sources HRIS, ATS, LMS, payroll; HR metrics and KPIs turnover rate, time-to-hire, cost-per-hire, engagement score; analytics maturity model for HR
Unit 2	Workforce Planning Analytics: headcount modelling; workforce segmentation; attrition prediction using regression and ML; succession planning analytics; workforce scenario modelling; skills gap analysis
Unit 3	Employee Experience Analytics: engagement survey design; Likert scale; eNPS (employee net promoter score); sentiment analysis on survey responses; 360-degree feedback data analysis; predictors of employee satisfaction
Unit 4	Research Methods: research design exploratory, descriptive, causal; qualitative methods interviews, focus groups, case study; quantitative methods surveys, experiments; sampling probability and non-probability methods; questionnaire design
Unit 5	Research Report Writing: literature review structure; citation styles APA; data presentation tables, charts, infographics; executive summary writing; recommendations format; research ethics informed consent, data anonymisation, IRB basics

BBA-BA 305 | Marketing Analytics	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Introduction to Marketing Analytics: role of data in marketing decision-making; marketing data ecosystem CRM, transactional, behavioural, social; analytics maturity framework; customer journey mapping; introduction to Google Analytics 4
Unit 2	Customer Analytics: customer segmentation demographic, psychographic, behavioural; RFM analysis recency, frequency, monetary; customer lifetime value (CLV) calculation; cohort analysis; customer acquisition cost (CAC)
Unit 3	Campaign and Attribution Analytics: A/B testing design, execution, statistical significance; conversion funnel analysis; multi-touch attribution models first click, last click, linear, time decay; marketing ROI calculation
Unit 4	Digital and Web Analytics: Google Analytics 4 setup and interface; sessions, users, pageviews, bounce rate; event tracking; UTM parameters; goal conversion tracking; social media analytics Facebook Insights, Instagram, LinkedIn
Unit 5	Predictive Marketing Analytics: churn prediction model; propensity modelling for cross-sell/up-sell; recommendation systems overview; marketing mix modelling; next best action (NBA); introduction to AI in marketing

BBA-BA 306 | Data Visualisation Tableau/Power BI	
Category: IP | L-T-P: 2-1-2 | Credits: 4 Credits	
Unit 1	Principles of Data Visualisation: visual perception and preattentive attributes; chart selection framework when to use bar, line, scatter, pie, heatmap; colour theory for data; dashboard design principles; accessibility in data visualisation
Unit 2	Tableau Fundamentals: Tableau Desktop interface; connecting to data sources; dimensions vs measures; creating basic charts; calculated fields; filters; sets; parameters; level of detail (LOD) expressions FIXED, INCLUDE, EXCLUDE
Unit 3	Tableau Dashboards and Stories: building interactive dashboards; dashboard actions; device designer; map visualisations; story points; publishing to Tableau Server and Tableau Public; Tableau Prep basics
Unit 4	Power BI Basics and Reporting: Power BI Desktop interface; Power Query for data transformation; data modelling relationships, star schema; DAX basics CALCULATE, SUMX, FILTER; creating reports and visuals; slicers; drill-through
Unit 5	Business Storytelling with Data: narrative structure for data presentations; insight-led storytelling; annotation and callouts; before-and-after chart redesign; executive dashboard design; KPI card design; presenting findings to management

BBA-BA 401 | Predictive Modeling & Regression	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Simple Linear Regression: ordinary least squares (OLS) estimation; assumptions of classical linear regression; interpretation of coefficients; R-squared and adjusted R-squared; standard error; residual analysis QQ plot, residual vs fitted
Unit 2	Multiple Linear Regression: model specification; multicollinearity VIF; heteroscedasticity Breusch-Pagan test; autocorrelation Durbin-Watson; variable selection forward, backward, stepwise; model diagnostics
Unit 3	Logistic Regression: binary and multinomial logistic regression; log-odds and odds ratio interpretation; logistic regression coefficients; model evaluation confusion matrix, accuracy, precision, recall, F1, AUC-ROC curve
Unit 4	Time Series Analysis: components of time series trend, seasonality, cyclical, irregular; stationarity ADF test; autocorrelation and partial autocorrelation functions (ACF/PACF); ARIMA model identification and estimation; forecasting with ARIMA
Unit 5	Model Evaluation and Business Application: train-test split; k-fold cross-validation; bias-variance tradeoff; overfitting and underfitting; model selection criteria AIC, BIC; deploying regression models in business decision-making

BBA-BA 402 | Machine Learning for Business (Lab)	
Category: IP | L-T-P: 2-1-2 | Credits: 4 Credits	
Unit 1	ML Fundamentals: supervised, unsupervised and reinforcement learning; ML workflow data collection, preprocessing, feature engineering, model training, evaluation, deployment; bias-variance tradeoff; overfitting; data preprocessing scaling, encoding
Unit 2	Classification Algorithms: decision tree CART, Gini, entropy; random forest bagging, feature importance; support vector machines kernel trick; k-nearest neighbours; Naive Bayes; model evaluation confusion matrix, precision, recall, F1, AUC-ROC
Unit 3	Regression and Ensemble Methods: linear and polynomial regression; gradient boosting GBM, XGBoost, LightGBM; stacking and blending; feature importance from ensemble models; hyperparameter tuning GridSearchCV, RandomSearch
Unit 4	Clustering and Dimensionality Reduction: k-means clustering elbow method, silhouette score; hierarchical clustering dendrogram; DBSCAN; principal component analysis (PCA); t-SNE for visualisation; business applications of clustering
Unit 5	ML in Business Applications: fraud detection model building and deployment; customer churn prediction; credit risk scoring; demand forecasting; Scikit-learn pipelines; model interpretation; introduction to MLflow for experiment tracking

BBA-BA 403 | Business Intelligence Systems	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	BI Fundamentals: history and evolution of BI; components of BI system; OLTP vs OLAP; differences between operational databases and data warehouses; BI architecture overview; ETL extract, transform, load process
Unit 2	Data Warehouse Design: data warehouse architecture; star schema fact and dimension tables; snowflake schema; slowly changing dimensions (SCD); data mart vs data warehouse; data lake concept; data quality in DW
Unit 3	OLAP and Multidimensional Analysis: cube structure; OLAP operations slice, dice, drill-down, roll-up, pivot; MDX query basics; KPI definition; balanced scorecard connection to BI; reporting vs analytics
Unit 4	BI Tools Overview: Microsoft Power BI detailed features; SAP Business Objects overview; Qlik Sense; Looker; Domo; comparative analysis of BI tools; selecting a BI tool for an organisation; BI governance
Unit 5	BI Project Design: requirements gathering and scope definition; dashboard design principles; KPI selection; user acceptance testing; BI deployment and maintenance; change management for BI adoption; BI ROI measurement

BBA-BA 404 | Supply Chain & Operations Analytics	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Supply Chain Overview: supply chain structure and key players; supply chain performance metrics OTIF, perfect order, cash-to-cash cycle; bullwhip effect causes and mitigation; SCOR model; supply chain strategy alignment
Unit 2	Demand Planning and Forecasting: qualitative forecasting methods; quantitative methods moving average, exponential smoothing, Holt-Winters; forecast accuracy metrics MAE, MAPE, RMSE; collaborative planning, forecasting and replenishment (CPFR); S&OP
Unit 3	Inventory Analytics: economic order quantity (EOQ) model; reorder point; safety stock calculation; ABC analysis; inventory turnover and days of supply; vendor-managed inventory (VMI); multi-echelon inventory
Unit 4	Logistics and Network Analytics: vehicle routing problem; facility location models centre of gravity, p-median; transportation optimisation; last-mile analytics; third-party logistics (3PL) performance measurement; reverse logistics
Unit 5	Digital Supply Chain: IoT in supply chain management; real-time tracking and visibility; predictive maintenance concepts; supply chain risk analytics disruption modelling; digital twin basics; case studies Amazon, Walmart, Flipkart

BBA-BA 405 | Financial Analytics & Risk Modeling	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Financial Data and Markets: financial statement analysis horizontal, vertical, ratio analysis; capital market data equity, debt, derivatives; Bloomberg Terminal orientation; acquiring financial data with Python,finance, Quandl
Unit 2	Risk Fundamentals: types of financial risk market, credit, operational, liquidity, reputational; risk management process; enterprise risk management (ERM) framework; risk appetite; risk-return tradeoff
Unit 3	Market Risk Models: value at risk (VaR) historical simulation, parametric (variance-covariance), Monte Carlo simulation; conditional VaR (CVaR); stress testing; backtesting VaR models; expected shortfall
Unit 4	Credit Risk Analytics: credit risk components probability of default (PD), loss given default (LGD), exposure at default (EAD); expected loss; credit scoring traditional scorecard; Basel III/IV overview; India RBI risk guidelines
Unit 5	Portfolio Analytics: portfolio theory Markowitz efficient frontier; Capital Asset Pricing Model (CAPM); Sharpe ratio; Jensen's alpha; Treynor ratio; factor models Fama-French three-factor; portfolio performance attribution; Python implementation

BBA-BA 406 | Digital Marketing & Analytics	
Category: IP | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Digital Marketing Overview: search engine optimisation (SEO) on-page, off-page, technical; search engine marketing (SEM) Google Ads; content marketing; email marketing; affiliate marketing; influencer marketing basics
Unit 2	Web Analytics with Google Analytics 4: GA4 setup; events and parameters; audiences; conversion tracking; funnel exploration; UTM parameters; Google Search Console integration; data export to BigQuery
Unit 3	Social Media Analytics: Facebook Business Manager; Instagram Insights; LinkedIn Campaign Manager; Twitter/X analytics; YouTube analytics; social listening tools; hashtag analysis; engagement rate calculation
Unit 4	Performance Marketing: Google Ads campaign structure, bidding strategies, ad extensions; Meta Ads audience targeting, creative formats; programmatic advertising basics; return on ad spend (ROAS); attribution models in paid media
Unit 5	Campaign Optimisation: A/B testing for ads and landing pages; landing page optimisation; marketing automation Mailchimp, HubSpot; CRM-marketing integration; reporting dashboard design; campaign performance review template

BBA-BA 501 | Applied Machine Learning for Business (Lab)	
Category: IP | L-T-P: 2-1-2 | Credits: 4 Credits	
Unit 1	Applied ML Foundations: supervised vs unsupervised learning; ML workflow for business data collection, preprocessing, feature engineering, model selection, evaluation; framing a business problem as an ML problem; tools overview Scikit-learn, Python
Unit 2	Classification for Business Decisions: logistic regression for managers odds ratio, interpretation; decision trees CART, visualisation, business rules; random forest ensemble concept, feature importance; model evaluation accuracy, precision, recall, F1; confusion matrix interpretation
Unit 3	Regression and Forecasting Applications: linear regression for sales and demand prediction; polynomial regression; gradient boosting XGBoost for business data; hyperparameter tuning basics; cross-validation; business forecasting with ML revenue, inventory, customer demand
Unit 4	Clustering and Customer Analytics: k-means clustering for customer segmentation; elbow method; silhouette score; hierarchical clustering; RFM segmentation with ML; market basket analysis Apriori algorithm; churn prediction model building end-to-end
Unit 5	ML in Business Lab and Case Studies: building a complete ML pipeline with Scikit-learn; credit risk scoring project; customer churn project; demand forecasting project; model presentation to non-technical stakeholders; intro to AutoML tools; ethical use of ML in business decisions

BBA-BA 502 | Natural Language Processing (Lab)	
Category: IP | L-T-P: 2-1-2 | Credits: 4 Credits	
Unit 1	NLP Fundamentals: NLP applications in business; text preprocessing pipeline tokenisation, stemming, lemmatisation, stop word removal; regular expressions; text normalisation; sentence segmentation; part-of-speech (POS) tagging
Unit 2	Text Representation: bag of words (BoW); TF-IDF computation and application; word embeddings Word2Vec (CBOW, Skip-gram), GloVe; sentence embeddings; contextual embeddings overview; vector space model
Unit 3	NLP Tasks and Models: text classification; named entity recognition (NER); sentiment analysis rule-based and ML-based; topic modelling Latent Dirichlet Allocation (LDA); question answering basics
Unit 4	Transformer Models: attention mechanism self-attention, multi-head attention; BERT architecture overview; fine-tuning BERT for classification; GPT overview; using HuggingFace Transformers library; model evaluation for NLP
Unit 5	Business Applications Lab: customer feedback sentiment analysis; chatbot intent classification; document classification for HR and legal; financial news analysis; building an NLP pipeline with spaCy and HuggingFace; demo and deployment

BBA-BA 503 | Big Data & Cloud Analytics	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Big Data Fundamentals: 5 Vs volume, velocity, variety, veracity, value; Hadoop ecosystem HDFS architecture; MapReduce programming model; Hive for SQL-on-Hadoop; HBase; ZooKeeper; business use cases for big data
Unit 2	Apache Spark: Spark architecture driver, executor, cluster manager; RDDs vs DataFrames; Spark SQL; Spark MLlib machine learning at scale; Spark Streaming basics; PySpark programming essentials
Unit 3	Cloud Computing Platforms: cloud service models IaaS, PaaS, SaaS; AWS for analytics S3, EC2, Lambda, Glue, Athena, EMR; Google Cloud Platform GCS, BigQuery, Dataflow, Vertex AI; Azure Synapse Analytics, Data Factory
Unit 4	Cloud Analytics Services and Pipelines: data pipeline design; ETL/ELT patterns; AWS Glue for data cataloguing; BigQuery for large-scale SQL analytics; real-time streaming with Kinesis and Pub/Sub; cloud cost management
Unit 5	Data Lake Architecture: data lake vs data warehouse vs data lakehouse; Delta Lake and Apache Iceberg; medallion architecture bronze, silver, gold layers; data governance in the cloud; security and access control; Databricks overview

BBA-BA 504 | Strategic Management	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	Strategic Management Overview: concept and importance; strategic intent vision, mission, goals, objectives; levels of strategy corporate, business, functional; strategic management process; strategic leadership
Unit 2	External Environmental Analysis: macro-environment analysis PESTEL framework; industry analysis Porter's Five Forces; competitive landscape mapping; industry life cycle; strategic group analysis; opportunities and threats identification
Unit 3	Internal Analysis: resource-based view (RBV); VRIO framework value, rarity, imitability, organisation; value chain analysis; core competencies; SWOT synthesis; McKinsey 7S framework
Unit 4	Strategy Formulation: generic competitive strategies cost leadership, differentiation, focus; Ansoff growth matrix; BCG portfolio matrix; corporate-level strategies diversification, vertical integration, alliances; blue ocean strategy
Unit 5	Strategy Implementation and AI: balanced scorecard four perspectives; OKRs; change management for strategy execution; digital transformation strategy; role of AI and data analytics in strategic planning; case studies Indian and global firms

BBA-BA 505 | AI Ethics & Data Governance	
Category: UF | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	AI Ethics Principles: fairness, accountability, transparency, explainability (FATE framework); bias in AI systems types: historical, representation, measurement, aggregation; case studies biased facial recognition, discriminatory hiring algorithms
Unit 2	Responsible AI Frameworks: IEEE Ethically Aligned Design; OECD AI Principles 2023; EU AI Act risk categories: unacceptable, high, limited, minimal; India Digital Personal Data Protection (DPDP) Act 2023 key provisions
Unit 3	Data Privacy and Security: GDPR basics lawful basis, data subject rights; data classification public, internal, confidential, sensitive; privacy by design principles; data encryption; pseudonymisation; access control; breach notification
Unit 4	Data Governance: data governance framework and operating model; data stewardship; data ownership; master data management (MDM); data catalogue tools: Apache Atlas, Collibra; data quality dimensions; data lineage
Unit 5	AI Governance in Business: model risk management (MRM) SR 11-7 guidelines; AI model audit process; algorithmic accountability; explainable AI (XAI) SHAP, LIME overview; AI ethics committee roles; responsible AI deployment checklist

BBA-BA 506 | Industry Elective	
Category: IE | L-T-P: 3-1-0 | Credits: 4 Credits	
Unit 1	About Industry Electives: students select one domain from the approved Industry Elective list. Each IE paper gives deep exposure to a specific industry sector using analytics. Available options Healthcare Analytics, Retail & E-commerce Analytics, Customer Intelligence, Sports Analytics, Sales Analytics & CRM
Unit 2	Option A Healthcare Analytics: health data ecosystem EMR, EHR, claims data; hospital KPI dashboards; patient readmission prediction; clinical trial data analysis; health informatics tools; regulatory compliance in health data; AI in diagnostics overview
Unit 3	Option B Retail & E-commerce Analytics: retail data ecosystem; market basket analysis association rules, Apriori; price optimisation models; customer segmentation for retail; e-commerce funnel analytics; demand forecasting for retail; supply chain analytics
Unit 4	Option C Sales Analytics & CRM: sales pipeline analytics; CRM data Salesforce, HubSpot; lead scoring models; territory planning analytics; sales forecasting; quota setting with data; win-loss analysis; B2B vs B2C sales analytics; sales performance dashboards
Unit 5	Option D Sports & Media Analytics: player performance data; sports statistics; audience analytics; media consumption data; content performance metrics; OTT analytics; sentiment analysis for brands; sponsorship ROI measurement

BBA-BA 595 | Summer Internship Report & Viva	
Category: AE | L-T-P: 0-0-0 | Credits: 4 Credits	
Unit 1	Internship Placement: minimum 8–10 weeks at a business analytics, data science, consulting, or technology organisation; internship must be in a role that involves real data work not administrative; internship letter and role description submitted to placement cell before joining; faculty supervisor assigned
Unit 2	Internship Contribution: student must contribute to at least one real deliverable during the internship a dashboard, analysis, report, or model; passive observation alone does not qualify; mid-internship check-in with faculty supervisor via email or call
Unit 3	Internship Documentation for Black Book: all internship work, learnings, tools used and deliverables are documented and added to the student's Black Book in the designated internship section; internship certificate from organisation is mandatory
Unit 4	Internship Report: minimum 3,000 words covering organisation profile, role and responsibilities, tools and technologies used, project contribution, key learnings, challenges, and what they would do differently; professionally formatted
Unit 5	Viva Voce: 15-minute presentation of internship experience + Q&A; panel includes faculty supervisor; assessed on quality of work done, tools mastered, professional growth demonstrated, and ability to connect internship learning to academic program; report quality (50%) + viva (50%)

BBA-BA 601 | Generative AI for Business (Lab)	
Category: IP | L-T-P: 2-1-2 | Credits: 4 Credits	
Unit 1	GenAI Foundations: large language models (LLMs) what they are and how they work; GPT, Claude, Gemini, Llama overview; tokens, context window, temperature, top-p; capabilities and limitations; business use case mapping
Unit 2	Prompt Engineering: zero-shot and few-shot prompting; chain-of-thought prompting; structured output prompting; system prompts; role-based prompting; prompt templates; prompt injection risks; iterative prompt refinement
Unit 3	Business Use Cases: GenAI in marketing copy generation, ad creation; customer support AI chatbots, ticket summarisation; business report generation; code generation with Copilot; data summarisation; meeting notes automation
Unit 4	Building with AI APIs: OpenAI API authentication, chat completions, embeddings; Anthropic Claude API basics; LangChain chains, prompts, output parsers; RAG (Retrieval Augmented Generation) introduction concept and architecture
Unit 5	AI Product Thinking and Lab: AI product lifecycle; responsible deployment checklist; evaluation of GenAI outputs hallucination, factual accuracy; business ROI measurement for GenAI; building a simple GenAI business tool with Streamlit

BBA-BA 602 | Environmental Science	
Category: AE | L-T-P: 1-1-0 | Credits: 2 Credits	
Unit 1	Ecosystems and Biodiversity: structure and function of ecosystems; food chains and food webs; energy flow; biogeochemical cycles; biodiversity levels, importance, hotspots; threats to biodiversity; conservation strategies in-situ and ex-situ
Unit 2	Environmental Pollution: types air, water, soil, noise, e-waste; sources and effects of each pollution type; control measures; solid waste management; plastic pollution; environmental impact assessment (EIA)
Unit 3	Sustainable Development and Green Finance: sustainable development goals (SDGs); concept of sustainability; green economy; green bonds; ESG investing; carbon footprint calculation; corporate sustainability reporting; climate risk in business and banking

BBA-BA 603 | Human Values & Business Ethics	
Category: AE | L-T-P: 1-1-0 | Credits: 2 Credits	
Unit 1	Human Values: meaning and classification of values; personal vs professional values; value formation; role of values in decision-making; value-based leadership and management
Unit 2	Business Ethics: meaning and importance; ethical theories utilitarian, deontological, virtue ethics; ethical decision-making framework; corporate social responsibility (CSR) concept and Indian context
Unit 3	Ethics in Practice: corporate governance principles; conflicts of interest; whistleblowing; ethical issues in marketing, finance, HR and technology; professional codes of conduct; digital ethics overview