

COURSE TITLE	BUSINESS ANALYTICS
COURSE CODE	01AD0503
COURSE CREDITS	5

Objective:

- 1 The primary objective of this course is to provide foundational knowledge of Business Analytics concepts and techniques. The course enables students to understand data-driven decision-making, statistical analysis, and analytical tools used in business environments. It focuses on applying analytical methods, data processing techniques, and visualization tools to solve real-world business problems and to develop intelligent, data-driven applications.

Course Outcomes: After completion of this course, student will be able to:

- 1 Apply business analytics techniques to solve real-world business problems and support data-driven decision-making
- 2 Analyze and preprocess data using statistical and computational methods.
- 3 Implement data visualization and reporting techniques for business insights
- 4 Understand and apply predictive and analytical models for business applications.

Pre-requisite of course: Students should have prior knowledge of: Basics of Computer Science, Programming fundamentals (preferably Python), Basic Statistics (mean, variance, probability), Basic Linear Algebra.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Introduction to Business Analytics: Definition and scope of Business Analytics, Types: Descriptive, Predictive, Prescriptive Analytics, Role of Analytics in Business Decision Making, Data-driven organizations, Business Intelligence vs Business Analytics, Data lifecycle and data sources, , Case studies (Retail, Banking, Healthcare)	8
2	Data Collection, Cleaning and Preprocessing: Data types: structured, semi-structured, unstructured, Data acquisition techniques, Data cleaning: missing values, Data transformation and normalization,, Feature engineering basics, Data integration and ETL concepts Introduction to tools: Excel, Python (Pandas)	8

Contents : Unit	Topics	Contact Hours
3	Statistical Analysis and Visualization: Descriptive statistics (mean, median, variance, skewness), Probability distributions, Correlation and regression basics, Hypothesis testing (t-test, chi-square), , Data visualization techniques, Tools: Python (Matplotlib, Seaborn), PowerBI basics.	10
4	Predictive Analytics & Machine Learning Clustering (K-Means), Classification (Decision Tree, Naïve Bayes, KNN), Regression models (Linear, Logistic), Model evaluation (Accuracy, Precision, Recall, F1-score), Overfitting and cross-validation, Introduction to AI-driven analytics.	10
5	Business Applications & Advanced Topics Analytics in: Marketing, Finance, Supply Chain, Dashboard design principles, Big Data Analytics, Ethical issues in analytics, Real-world case studies	10
Total Hours		46

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Practical 2 Handle missing values using mean/median/mode techniques.	2
2	Practical 3 Detect and remove outliers using boxplot and IQR method.	2
3	Practical 4 Perform data normalization and standardization.	2
4	Practical 5 Create visualizations: Bar chart , Histogram ,Scatter plot .	2
5	Practical 6 Compute descriptive statistics of a dataset.	2
6	Practical 7 Perform correlation analysis between variables.	2
7	Practical 8 Perform K-Means clustering on customer data.	2
8	Practical 9 Build a KNN & decision tree classifier.	2
9	Practical 10 Implement linear regression using a real dataset.	2
10	:Practical 11 Implement logistic regression for classification.	2
11	Practical 12 Evaluate model performance using confusion matrix	2
12	Practical 13 Create a dashboard using Power BI.	2

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
13	Practical 14 Perform customer segmentation using clustering.	2
14	Practical 15 Mini Project: Solve a real-world business problem (data ? model ? visualization)	2
Total Hours		28

Textbook :

- 1 Business Analytics: Data Analysis & Decision Making , S. Christian Albright, Wayne L. Winston., Cengage Learning , -

References:

- 1 Data Science for Business , Data Science for Business , Foster Provost, Tom Fawcett, O'Reilly , -
- 2 Python for Data Analysis, Python for Data Analysis, Wes McKinney, O'Reilly , -
- 3 Business Intelligence and Analytics: Systems for Decision Support , Business Intelligence and Analytics: Systems for Decision Support , Ramesh Sharda, Dursun Delen, Efraim Turban, Pearson , -

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
15.00	15.00	15.00	15.00	20.00	20.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- 4 Students will use resources like online videos, NPTEL course videos, e- courses, Virtual Laboratory

Supplementary Resources:

- 1 https://onlinecourses.nptel.ac.in/noc24_cs65/preview
- 2 <https://www.coursera.org/specializations/business-analytics>
- 3 <https://www.edx.org/learn/business-analysis>
- 4 <https://www.kaggle.com/learn/data-analytics>