

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Internal	Final Exam	Total
BCAMJ-402	Introduction to Data Science	Major	4	4	0	0	40	60	100

**Course Outcomes**

At the end of the course the student will be able to

CO1	Describe key concepts, processes and significance of data science.
CO2	Explain and identify sources, collect, clean, preprocess data, and perform basic data exploration.
CO3	Analyze data using statistical measures and visualizations in Excel and Python.
CO4	Explain the fundamental concepts and definitions of machine learning.
CO5	Apply data science tools and algorithms to solve practical problems.

**Detailed Syllabus  
Section-A**

**Unit 1: Introduction to Data Science:** Introduction, Definition & scope, key concepts, Data Science Process, Roles in Data Science, Data Science Life cycle, Role of data scientist, Data science challenges.

(08 Hrs.)

**Unit 2: Data Collection and Preparation:** Structured v/s unstructured Data, Data Sources, Methods for Data Collection Data Cleaning and Preprocessing Techniques, Introduction to Data Exploration.

(12 Hrs.)

**Unit 3: Introduction to Data Analysis:** Basics of Statistical Analysis, Descriptive Statistics: Mean, Median, Mode, Variance, Standard Deviation, Data Visualization: Charts, Graphs, and Plots, Introduction to Tools: Excel, Python (Pandas).

(10 Hrs.)

**Section-B**

**Unit 4: : Machine Learning:** Definition, Applications of machine learning in data science, Types of Machine learning ,supervised learning, semi supervised learning, un-supervised learning Linear regression, Decision tree classifier, Bayes - Naive bay.

(10 Hrs.)

**Unit 5: Data Science tools & Algorithms:** Introduction to data science tools, Linear Regression and Logistic Regression, K-nearest Algorithms, K means algorithm.

(08 Hrs.)

**Textbooks**

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Data Science from Scratch	Joel Grus	O'Reilly	2nd(2019)
2	Data Science for Beginners	Andrew Park	Eureka Online LTD	(2020)

**Reference Books**

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Fundamental of Data Science	Sanjeev J. Wagh, Manisha S. Bhende, Anuradha D. Thakare	CRC Press	1 <sup>st</sup> (2022)