Program Specific Outcomes (PSOs)

B.Sc. (Mathematics, Statistics, and Data Science)

PSO1:
Apply mathematical, statistical, and computational principles to collect, analyze, and interpret data for solving real-world problems in business, science, and technology.

PSO2:
Develop data-driven solutions using programming, machine learning, and data visualization tools, while demonstrating analytical thinking, ethical responsibility, and effective communication for research and professional applications.

B.SC DATA SCIENCE-(CBCS) SEMESTER-I

Name of the Course	Fundamentals of Information Technology
Course Code	DSC-A

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand the basic concepts of data, types of data, and the role of computers in data processing, including representation of textual and numerical data.	Understand	L2
CO2	Describe the functioning of memory units and CPU, including different storage types and embedded processors, with the ability to identify their specifications.	Remember	L1
CO3	Explain the fundamentals of computer networks, input-output devices, and classification of software and programming languages used in various applications.	Apply	L3
CO4	Analyze key challenges in software development such as cost, quality, and schedule, and explain how these relate to software process models. Apply structured programming principles, coding standards, and software development practices to enhance code quality and maintainability.	Analyze	L4

B.SC DATA SCIENCE-(CBCS) SEMESTER-II

Name of the Course	Problem Solving and Python Programming
Course Code	DSC-B

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand fundamental computing concepts, problem-solving strategies, and algorithm design techniques using pseudocode and flowcharts.	Understand	L2
CO2	Implement Python programs using variables, operators, control flow constructs, and data input/output techniques.	Apply	L3
CO3	Analyze problems using user-defined functions, string operations, lists, tuples, and dictionaries effectively. Develop modular Python programs with file handling,	Analyze	L4
CO4	exception management, and sorting algorithms. Evaluate object-oriented and functional programming constructs like classes, inheritance, iterators, and generators	Evaluate	L5

B.SC DATA SCIENCE-(CBCS) SEMESTER-III

Name of the Course	Data Engineering with Python
Course Code	DSC-C

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand the data analysis sequence and apply file handling techniques including CSV, JSON, XML, and binary files using Python.	Remember	L1
CO2	Analyze and manipulate text data, including HTML and natural language text, using regular expressions and glob module.	Analyze	L4
CO3	Work with MySQL and MongoDB databases and perform efficient data storage and retrieval operations using Python.	Apply	L3
CO4	Create and manipulate NumPy arrays to handle large-scale numeric datasets with indexing, slicing, and broadcasting. Evaluate and visualize structured data using Pandas and Matplotlib for data analysis and reporting.	Evaluate, Create	L5,L6

B.SC DATA SCIENCE-(CBCS) SEMESTER-IV

Name of the Course	Machine Learning
Course Code	DSC-D

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level code
CO1	Understand key machine learning models like decision trees, k-NN, and k-means and formalize learning problems with inductive bias.	Understand	L2
CO2	Apply perceptron and linear models using optimization techniques like gradient descent and analyze feature selection strategies.	Apply	L3
CO3	Analyze probabilistic models and neural networks for classification and prediction tasks, including backpropagation and deep learning insights.	Analyze	L4
CO4	Evaluate clustering methods and their use in unsupervised learning through distance metrics, hierarchical clustering, and MST. Design solutions using association rule mining and the Apriori algorithm to extract knowledge from data.	Evaluate, Create	L5,L6

B.SC DATA SCIENCE-(CBCS) SEMESTER-V(A)

Name of the Course	Natural Language Processing
Course Code	DSE-A

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand fundamental NLP tasks like tokenization, tagging, and corpus access using Python and NLTK.	Understand	L2
CO2	Apply regular expressions and raw text processing techniques to normalize and tokenize text data.	Apply	L3
CO3	Analyze text classification methods, including supervised learning and deep learning approaches.	Analyze	L4
CO4	Evaluate information extraction techniques like chunking, NER, and relation extraction. Design and implement parsing systems using context-free grammar and sentence structure analysis.	Evaluate, Create	L5,L6

B.SC DATA SCIENCE-(CBCS) SEMESTER-V(B)

Name of the Course	NoSQL Data Bases
Course Code	DSE-A

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand the limitations of relational databases and explain the emergence of NoSQL.	Understand	L2
CO2	Apply aggregate data models and analyze their impact on database design.	Apply	L3
CO3	Analyze distribution models and consistency trade-offs in distributed NoSQL systems.	Analyze	L4
CO4	Evaluate the suitability of different NoSQL database types for various application needs. Design efficient data access models using appropriate NoSQL paradigms.	Evaluate, Create	L5,L6

B.SC DATA SCIENCE-(CBCS) SEMESTER-VI(A)

Name of the Course	Big Data
Course Code	DSE-B

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Describe the fundamentals of Big Data, types of data, and the benefits of Big Data Analytics.	Understand	L2
CO2	Apply knowledge of Hadoop ecosystem components like HDFS, MapReduce, HBase, Hive, and Pig.	Apply	L3
CO3	Analyze the architecture and operation of the Big Data Stack and MapReduce framework.	Analyze	L4
CO4	Evaluate traditional and NoSQL databases in the context of Big Data storage and processing. Design scalable Big Data solutions using appropriate technologies and database models.	Evaluate, Create	L5,L6

B.SC DATA SCIENCE-(CBCS) SEMESTER-VI(B)

Name of the Course	Deep Learning
Course Code	DSE-B

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level
CO1	Explain the foundational concepts of neural networks and understand various tensor data forms.	Understand
CO2	Perform tensor operations and interpret their geometric significance in deep learning models.	Apply
CO3	Analyze gradient-based optimization techniques and the backpropagation algorithm.	Analyze
CO4	Evaluate the structure and functionality of neural network layers, models, and optimizers. Build and experiment with deep learning models using Keras, including RNN, LSTM, and GRU.	Evaluate, Create