Machine Learning

Program: B.Tech in Computer Science
Semester: 5th Semester
Prerequisites: Linear Algebra, Python Programming
Credits: 3 Lecture Hours, 1 Tutorial, 2 Practical

Overall Aim

To enable students to understand and apply key machine learning algorithms and evaluate their performance in real-world applications.

Course Outcomes (COs)

CO1: Define supervised and unsupervised machine learning and explain their applications in diverse real-world scenarios.
CO2: Distinguish between various types of machine learning algorithms and explain their suitability for different problem domains.
CO3: Apply linear and logistic regression models to solve real-world prediction problems and interpret the results.
CO4: Analyze the performance of linear and logistic regression models using appropriate evaluation metrics.
CO5: Compare and contrast the performance of decision trees, k-NN, and SVM classifiers on given datasets.
CO6: Evaluate the effectiveness of different classification algorithms using appropriate evaluation metrics.
CO7: Apply k-means and hierarchical clustering algorithms to group data and interpret the resulting clusters.
CO8: Evaluate the quality of clustering results using appropriate metrics and justify the choice of clustering algorithm.
CO9: Design a model selection strategy considering the bias-variance trade-off and employing cross-validation techniques.
CO10: Evaluate the performance of different machine learning models and select the best model for a given task.

Program Outcomes (POs)

PO1: Apply knowledge of mathematics, science, and engineering to solve complex engineering problems.
PO2: Identify, formulate, and solve engineering problems using appropriate mathematical, scientific, and engineering principles.
PO3: Design and conduct experiments, as well as analyze and interpret data.
PO4: Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
PO5: Function effectively as an individual and as a member or leader in diverse teams.
PO6: Communicate effectively with a range of audiences.