

| Course Type | Course Code | Name of the Course | L | T | P | Credits |
|-------------|-------------|--------------------|---|---|---|---------|
| DE | NCSD518 | Data Mining | 3 | 0 | 0 | 3 |

Course Objective

Understand the principles and techniques of data mining. Learn to preprocess and clean datasets for analysis. Explore various data mining algorithms and their applications. Develop critical thinking skills for interpreting and evaluating data mining results.

Learning Outcomes

These learning outcomes aim to equip students with the knowledge, skills, and competencies required to apply data mining techniques effectively in various domains and contribute to data-driven decision-making processes.

| Unit No. | Topics to be Covered | Lecture Hours | Learning Outcome |
|----------|---|---------------|--|
| 1 | Introduction to Data Mining <ul style="list-style-type: none"> · Definition and importance of data mining · Applications and examples · Data mining process and lifecycle · Major issues in data mining | 4 | Equip students with the knowledge, skills, and competencies from introduction concepts |
| 2 | Data Preprocessing <ul style="list-style-type: none"> · Data cleaning · Data integration · Data transformation · Data reduction | 3 | Equip students with the knowledge, skills, and competencies from Data Preprocessing |
| 3 | Data warehouse and OLAP Technology: <ul style="list-style-type: none"> · A multidimensional data model, · Data warehouse architecture; · OLAP operations | 3 | Understanding Data warehouse and OLAP |
| 4 | Association Rule Mining <ul style="list-style-type: none"> · Mining Frequent Patterns · Apriori algorithm · Market basket analysis · Evaluation metrics | 6 | Understanding Associations rules and related topics |
| 5 | Classification <ul style="list-style-type: none"> · Decision trees · Naive Bayes classifier · k-Nearest Neighbors (kNN) · Evaluation methods (e.g., accuracy, precision, recall) | 8 | Understanding classifications techniques |
| 6 | Clustering <ul style="list-style-type: none"> · K-means clustering · Hierarchical clustering · Evaluation metrics | 8 | Understanding clustering techniques |
| 7 | Anomaly Detection <ul style="list-style-type: none"> · Types of anomalies · Statistical methods · Machine learning approaches | 6 | Understanding anomaly detection techniques |
| 8 | Text Mining <ul style="list-style-type: none"> · Text preprocessing · Term frequency-inverse document frequency · Topic modeling | 4 | Understanding text mining techniques |
| | Total | 42 | |

Text Books:

1. Data Mining: Concepts and Techniques" by Jiawei Han, MichelineKamber, and Jian Pei
2. Introduction to Data Mining" by Pang-Ning Tan, Michael Steinbach, and Vipin Kumar

Reference Books:

1. "Pattern Recognition and Machine Learning" by Christopher M. Bishop
2. Data Mining: The Textbook, By Charu C. Aggarwal, Springer International