

IHE 7510 – Data Mining

Course Description

Concepts, techniques, and applications of data mining. In addition, students will get hands-on data mining experience through projects.

Offered both face-to-face and online
Graduate level – 3 credit hours

Course Learning Objectives

Students enrolled in this course will learn to

- Understand the basics of data mining, also known as knowledge discovery in data bases (KDD), knowledge extraction, and information harvesting.
- Understand the concept of machine learning.
- Be able to effectively apply statistical techniques to classify data.
- Be able to effectively use classification schemes for descriptive and predictive applications.
- Understand and be able to apply data mining functions: characterization, discrimination, association, classification, linear and logistic regression, clustering, and trend/deviation analysis.
- Understand how to use common software packages to draw appropriate conclusions in an engineering context.

Course Learning Outcomes

Upon successful completion of this course, a student will:

- Understand the basics of data mining, also known as knowledge discovery in data bases (KDD), knowledge extraction, and information harvesting.
- Understand the concept of machine learning.
- Be able to effectively apply statistical techniques to classify data.
- Be able to effectively use classification schemes for descriptive and predictive applications.
- Understand and be able to apply data mining functions: characterization, discrimination, association, classification, linear and logistic regression, clustering, and trend/deviation analysis.
- Understand how to use common software packages to draw appropriate conclusions in an engineering context.

Tentative Weekly Schedule

Week 1	Perspective on Data Mining
	Introduction
Week 2	Data Quality & Preprocessing
	Measures of Similarity
Week 3	Classification
	Entropy and the Gini Index
Week 4	Naïve Bayesian Classifier
	Bayesian Networks
Week 5	Introduction to Weka
	Classification in Weka
Week 6	Bayesian Network Problems
	Model Comparison Problems
Week 7	Exam 1 Review
	Exam 1
Week 8	Introduction to Association Analysis
	Association Analysis Frequent Item Set Generation
Week 9	Association Analysis Rule Generation
	Introduction to Cluster Analysis
Week 10	K-Means Analysis
	DBScan
Week 11	Cluster Evaluation
	Anomaly Detection Overview
Week 12	Anomaly Detection Approaches
	Topic TBD
Week 13	Pre-Exam Review
	EXAM II
Week 14	Avoiding False Discoveries
	Semester Review
Week 15	Final Exam