Department of Civil Engineering

Course Name:

Data Mining

Course Number: -	**Credit:** 3
Program: Graduate	**Course Type:** Technical Selective
Prerequisite: -	**Corequisite:** -

Course Description (Objectives):

The purpose of this course is to familiarize students with the concepts and methods of data mining and discovering patterns in large-scale data. It also focuses on data preprocessing, data warehousing, and the main domains of data mining.

Course Content (outline):

- Chapter 1: Introduction - Overview of data mining and its main models
- Chapter 2: Methods for data preprocessing
- Chapter 3: Introduction to data warehousing, data cubes, and analytical reporting
- Chapter 4: Map-Reduce model
- Chapter 5: Mining item sets in large-scale data
- Chapter 6: Mining data streams
- Chapter 7: Analysis of data networks
- Chapter 8: Data clustering algorithms
- Chapter 9: Dimensionality reduction algorithms
- Chapter 10: Machine learning algorithms for big data
- Chapter 11: Data mining in industry

References:

- J. Leskovec, A. Rajaraman, and J.D. Ullman. Mining of massive datasets. Cambridge University Press, 2014.
- J. Han, J. Pei, and M. Kamber. Data mining: Concepts and techniques. Elsevier, 2011.