Computing Science Course Outlines 2022 Fall

CMPT 459 - D100 Special Topics Database Systs

Instructor(s): Martin Ester

SFU Burnaby

Calendar Objective/Description:
Special Topics Database Systs

Instructor's Objectives:
This course introduces Data Mining, an area that plays a key role in Big Data analytics. The goal of data mining is the efficient discovery of useful patterns in large datasets. This course focuses on fundamental data mining tasks and algorithms as well as key applications. It will prepare you both for developing your own data mining application and for starting your data mining research.

Students taking this course are expected to have taken an algorithms course and to have an understanding of basic statistics equivalent to an entry-level course. The programming assignments and the course project require programming in Python, and students are expected to be proficient with this programming language.

Prerequisites:
see go.sfu.ca

Topics:
- Introduction
- Data preprocessing: data cleaning, completion, transformation, normalization
- Classification: evaluation, decision trees, Bayesian classification, NN, SVM, ensemble methods
- Cluster analysis: partitioning, hierarchical, density-based methods, subspace clustering
- Outlier detection: probabilistic and distance-based methods, LOF, non-parametric methods
- Frequent pattern mining: association rules, Apriori, FP-growth, pattern summarization
- Impact of data mining
- Research issues: causal discovery, explainability, transfer learning

Grading:
Evaluation will be based on programming assignments, a course project, and (midterm and/or final) exams. Details to be discussed and finalized in the first week of classes.

Students must attain an overall passing grade on the weighted average of exams in the course in order to obtain a clear pass (C- or better).

Required Books:

Academic Honesty Statement::
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct
Policies (http://www.sfu.ca/policies/gazette/student.html).