Computing Science Course Outlines

CMPT 225 - E100 Data Structures and Programming

Instructor(s): Anne Lavergne

Calendar Objective/Description:
Introduction to a variety of practical and important data structures and methods for implementation and for experimental and analytical evaluation. Topics include: stacks, queues and lists; search trees; hash tables and algorithms; efficient sorting; object-oriented programming; time and space efficiency analysis; and experimental evaluation.

Instructor’s Objectives:
This course explores fundamental algorithms and data structures that can help in developing elegant and efficient solutions to complex problems. We will study their specification, analysis, implementation (in C++), experimental evaluation, and applications.

Platform: Linux (Ubuntu)
Language: C++

Prerequisites:
(MACM 101 and ((CMPT 125 and 127), CMPT 129 or CMPT 135)) or (ENSC 251 and ENSC 252). Quantitative

Topics:
- Object-oriented programming
- Abstract data types (ADTs)
- Data structures: lists, stacks, queues, trees, heaps, sets, hash tables, disk-bound data
- Algorithms: searching and sorting as well as time and space efficiency analysis of algorithms

Grading:
Grades for this course may be based on: classroom participation and weekly exercises, programming assignments; lab activities; in-class written midterm exam; written final exam. The exact details of the marking scheme will be given in the first week of the course.

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).

Reference Books:
Programming, Principles and Practice Using C++ (2nd ed), Bjarne Stroustrup, Addison Wesley, 2014, 9780321992789, Available online. Also, any good C++ reference is okay.

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).