CMPT 128 - D100 Introduction to Computing Science and Programming for Engineers

Instructor(s): Ghassan Hamarneh

**Calendar Objective/Description:**
An introduction to computing science and computer programming, suitable for students wishing to major in Engineering Science or a related program. This course introduces basic computing science concepts, and fundamentals of object-oriented programming. Topics include: fundamental algorithms and problem solving; abstract data types and elementary data structures; basic object-oriented programming and software design; elements of empirical and theoretical algorithmics; computation and computability; specification and program correctness; and history of computing science. The course will use a programming language commonly used in Engineering Science.

**Instructor's Objectives:**
This course is a rigorous introduction to computing science and computer programming, suitable for engineering students. Students will learn fundamental concepts of computing science as well as develop basic skills in software development, with application to engineering problems.

**Prerequisites:**
BC Math 12 (or equivalent, or any of MATH 100, 150, 151, 154, or 157). Students with credit for CMPT 102, 120, 130 or 166 may not take this course for further credit. Students who have taken CMPT 125, 129, 135, or CMPT 200 or higher first may not then take this course for further credit. Quantitative/Breadth-Science

**Topics:**
- Computer Systems, Algorithms, Program design and development, Programming tools
- Basic data types, Representation of values of variables, Conversion between data types
- Variables, arithmetic, logical and relational operators, Input and Output,
- Functions, arguments, return values, scope,
- Control structures: decision and repetition structures
- 1D and 2D Arrays, structures, strings
- Dynamic memory allocation and pointers
- Recursion, Searching and Sorting, Analyzing and Comparing Algorithms (Big O)

**Grading:**
To be finalized during the first week. Preliminary: 30% Assignments and Lab Exercises, 30% in class/in lab quizzes and 40% Final Exam.

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:**
Intro to Computing Science & Programming for Engineers (custom textbook), Multiple, Pearson, 2017, 9781323688816, custom textbook
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).