Creation date: March 24, 2021
Revision date:

SAMPLE COURSE OUTLINE

Course Code, Number, and Title:

CPSC 2150: Algorithms and Data Structures II

Course Format:
[Course format may vary by instructor. The typical course format would be:]

Lecture 4.0 h + Seminar 0.0 h + Lab. 2.0 h

Credits: 3.0 **Transfer Credit:** For information, visit bctransferguide.ca

Course Description, Prerequisites, Corequisites:

Students build on the foundational concepts learned in CPSC 1160 and expand their skills to include non-linear data structures and hashing. Topics include algorithm analysis, non-comparative sorting, algorithmic paradigms (divide and conquer, greedy, heuristic, backtracking, and dynamic programming), binary search trees, balanced trees, tree traversals, priority queues and heaps, Huffman codes, graphs, and graph algorithms. Students implement solutions using an object-oriented programming language.

Prerequisite(s): A minimum "C" grade in CPSC 1160; or permission of department. CPSC 1181 is recommended. Prerequisites are valid for only three years.

Learning Outcomes:

Upon successful completion of this course, students will be able to…

- Apply recursion as a problem-solving technique for complex problems
- Compute the time complexity of a given algorithm
- Design and develop efficient recursive and non-recursive algorithms with respect to time and space complexity
- Design, analyze and implement non-comparative sorting algorithms (e.g. bucket sort, radix sort, counting sort)
- Design and implement generic non-linear data structures including trees, binary trees, binary search trees, balanced trees, heaps and graphs and the generic linear data structure, priority queue
- Choose abstract data types and appropriate algorithms (Huffman coding, expression trees, tree and graph traversals, minimum spanning trees, shortest path, cycle detection, and heap sort) to solve problems efficiently
- Analyze and implement algorithms using a variety of algorithmic paradigms such as greedy, divide and conquer, back tracking, dynamic programming and heuristics
- Design, analyze, use and implement hashing
- Find and use appropriate libraries, resources and documentation
- Use good software development principles (modularization, maintainability, documentation, memory management and testing)

Instructor(s): TBA
Office: TBA **Phone: (604) 323-XXXX**
Office Hours: TBA **Email: TBA**

Textbook and Course Materials:
[Textbook selection may vary by instructor. An example of texts and course materials for this course might be:]

For textbook information, visit https://mycampusstore.langara.bc.ca/buy_courselisting.asp?selTerm=3|8

Note: *This course may use an electronic (online) instructional resource that is located outside of Canada for mandatory graded class work. You may be required to enter personal information, such as your name and email address, to log in to this resource. This means that your personal information could be stored on servers located outside of Canada and may be accessed by U.S. authorities, subject to federal laws. Where possible, you may log in with an email pseudonym as long as you provide the pseudonym to me so I can identify you when reviewing your class work.*

Assessments and Weighting:
Final Exam 20%
Other Assessments 80%
[An example of other assessments might be:]

Best 9 out of 10 Assignments 45%
Two Code Reviews of the Assignments 10%
Labs 5%
Two Midterms 20%

Grading System:
Specific grading schemes will be detailed in each course section outline.

Information unavailable, please consult Department for details.

Topics Covered:
[Topics covered may vary by instructor. An example of topics covered might be:]

Information unavailable, please consult Department for details.

As a student at Langara, you are responsible for familiarizing yourself and complying with the following policies:

College Policies:

E1003 - Student Code of Conduct
F1004 - Code of Academic Conduct
E2008 - Academic Standing - Academic Probation and Academic Suspension

E2006 - Appeal of Final Grade
F1002 - Concerns about Instruction
E2011 - Withdrawal from Courses

Departmental/Course Policies:

Information unavailable, please consult Department for details.