

Course Outline

CPSC 1160: Algorithms and Data Structures I

Course Format: Web Lectures and Exercises + Lab 2.0 h

Credits: 3.0

Transfer Credit: For information, visit bctransferguide.ca

Calendar Course Description:

Covers low-level operations, recursion, systematic software development, abstract data types, creation of libraries of reusable routines, sorting and searching algorithms, efficiency, algorithm analysis, pointers, arrays, dynamic memory management, linked lists, stacks, queues, introduction to hashing, binary trees and tree traversals, and advanced data manipulation. Object-oriented programming will be introduced.

Prerequisites:

A minimum grade of "C" in one of CPSC 1150 or 1155; and one of the following: a minimum 'B' grade in Principles of Mathematics 12 or Precalculus 12; or a minimum 'C' grade in MATH 1170; or a minimum 'C+' in Principles of Mathematics 12 or Precalculus 12 and a minimum 'C-' grade in Calculus 12; or MDT 85. Prerequisites are valid for only three years.

Learning Outcomes:

Upon successful completion of this course, a student is expected to develop a disciplined approach to designing, implementing, testing, and documenting complete programs using efficient algorithms and appropriate data structures. The student should be able to program in C++17 correctly and efficiently under time constraints. There is an emphasis on good software engineering principles.

Instructor: Ryan Zier-Vogel

Office: B019Q

Email: raziervogel@langara.ca

Website & Schedules: Wednesday 1030-1420 in Zoom

<https://langara.zoom.us/j/93307484960?pwd=bFF3VmtEelhDOFlobERyMFBaekFFQT09>

Meeting ID: 933 0748 4960 Passcode: 324704

Labs and midterms are designed to be done in 2 hours but you will have 4 hours to complete.

Office Hours: Tuesday/Thursday 1100-1500 in Zoom

(But will be around Monday and Friday as well try the zoom room anytime if I am available, I will have it opened. If you want, you can schedule a meeting as well.)

<https://langara.zoom.us/j/97761460774?pwd=S1dkcHpVaUxxLzdMMTg2MmpJdm05UT09>

Meeting ID: 977 6146 0774 Passcode: 633298

Textbook and Course Material:

Introduction to Programming with C++ by Y. Daniel Liang, 4rd edition, Pearson Education, Inc., 2018.

You have access to the Desire2Learn, D2L, site through “myLangara” at <http://www.langara.bc.ca>. Some course material and useful references will be posted in D2L but the class notes will not be posted online. The assignments are accessible only with D2L. You will find help with D2L at <http://iweb.langara.bc.ca/online-learner/how-to/d2l>

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.

Grading:

Letter Grade	Percentage
A+	90-100
A	85-89
A-	80-84
B+	76-79
B	72-75
B-	68-71
C+	64-67
C	60-63
C-	55-59
D	50-54
F	<50

Assessments and Weighting:

Assignments	40%
Labs	10%
Midterms	20%
Quizzes	10%
Final Exam	20%
Total	100%

If a student hands in all assignments, the lowest assignment grade will be dropped

In order to get a **C** or higher in a computer science course, a student **must** achieve at least an average of 50% in the exam component of the course which consists of the quizzes, midterms and final exam.

Lecture Schedule:

	DAY	TIME	PLACE	DURATION
Lecture	Posted Monday		WWW	
Quiz	Posted Monday		WWW	Due Tuesday (60 min most of the time)
Lab	Wednesday	1030/1230	WWW	115 minutes(Will have 230 mins)
AMA	Friday	TBA	WWW	As long as it takes

Detailed Course Schedule:

Week	Lecture Topic	Assignment and Midterm
week I	C++ review	
week II	Functions/Templates arrays/vectors	
week III	recursion bit shifting and other bit ops	Assgn #1 due
week IV	sorting	Assgn #2 due
week V	sorting complexity analysis	Assgn #3 due
week VI	struct	Midterm #1
week VII	objects and classes operator overloading	Assgn #4 due
week VIII	pointers dynamic memory	Assgn #5 due
week IX	“the big three” singly linked lists	Assgn #6 due
week X	recursive and iterative functions for linked lists	Assgn #7 due
week XI	stacks	Midterm #2
week XII	More linked lists queues	Assgn #8 due
week XIII	Extra Topics	Assgn #9 due

The lecture schedule is flexible, i.e. various topics may or may not be given on the dates shown above.

The dates are subject to change.

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 Policies:

<http://langara.ca/programs-and-courses/courses/CPSC/index.html>

Course Policies:

D2L is used for all assignments, labs, quizzes and lectures.

A student may be excused from a class, assignment, midterm, lab or quiz with a properly documented medical reason. Please inform the instructor if you are going to be missing a midterm.

The final exam is 2 hours long and it takes place during the Langara final exam period in April 2020.

No substitute midterms nor quizzes will be given, even with a valid medical reason.

Assignments and Labs:

- Although the exact due date and due time of an assignment will be specified on the assignment sheet available in D2L, most assignments will be due on Thursday evenings at 2359 with D2L.
- There is a 20% late penalty for submitting an assignment with D2L within 24 hours after the D2L due date and due time. Typically, this means that a late assignment may be submitted with D2L up to 2359 Friday.
- Assignments submitted 24 hours after the D2L due date and due time will not be marked. We recommend that you still submit with D2L your attempted solution for your own benefit.
- No assignments and no labs will be accepted via e-mail: use D2L.
- The sample solutions for assignments will not be made available online.
- There will be no “group assignments” for this course. Although you may and are encouraged to discuss the algorithms and your ideas with your classmates, you are to code individually. If you program individually, the resulting assignments will be different enough. Please, write your program on your own and do not get “inspired” by studying someone else’s final program and then trying to claim that your program just happens to be the same.
- Every lab exercise and every assignment that you submit must compile, link, and run in the Langara labs with the GNU C++ compiler and linker “g++” using the flags for C++ 17
 - pedantic
 - Wall
 - Wextra
 - std=c++17

Your might get zero if your program does not compile, link, or run in the Langara .

Plagiarism will not be tolerated

Plagiarism consists of falsely presenting another person’s work as your own. This includes copying another student’s work (with or without her/his permission) or copying material from a book, the Internet (including Wikipedia, freely available software, and software with a GNU GPL) or elsewhere (including the textbook and class) without acknowledging the source of the material. Plagiarism also includes having someone (including a tutor) write the program for you. In general, it is not an offense to use another person’s work but you must not claim it as your own. You are encouraged to discuss the course material with your classmates and collaborate with each other during data structure and algorithm design, but the work you submit must be your own. If you take someone else’s program, or part thereof, and change it a bit and submit this as your assignment or lab, you are cheating. Don’t do it.

If you submit plagiarized work, the Dean of Student Support Services is informed immediately.

<http://www.langara.bc.ca/student-services/student-conduct-and-judicial-affairs/pdfs/academic-misconduct-reference-guide-students.pdf> serves as a reference guide on Academic Conduct with the links to the official Langara policy (also given above).

Letting someone else use your work (such as your program or part of your program) as his or her own without proper acknowledgment is cheating too and you will be penalized.

The Langara library provides resources on what is plagiarism and how to avoid it. Please refer to <http://langara.ca/library/research-help/citing-help/avoid-plagiarism.html> as well as http://langara.ca/library/research-help/assignment-help/computer-science/_citing-code.html where more on plagiarism and citing of programs is explained.