

CSC226: Algorithms and Data Structures II

Course Dates

CRN(s):	Section A01 CRN: 30197 Section A02 CRN: 30198
Term:	2023
Course Start:	2023-05-03
Course End:	2023-08-18
Withdrawal with 100% reduction of tuition fees:	2023-05-15
Withdrawal with 50% reduction of tuition fees:	2023-06-04
Last day for withdrawal (no fees returned):	2023-06-28

Scheduled Meeting Times (M=Mon, T=Tue, W=Wed, R=Thu, F=Fri)

Section:	Location:	Classes Start:	Classes End:	Days of week:	Hours of day:	Instructor:
A01	DTB A110	2023-05-03	2023-07-28	MR	10:00-11:20	Venkatesh Srinivasan
A02	DTB A110	2023-05-03	2023-07-28	MR	10:00-11:20	Venkatesh Srinivasan
B01	ECS 242	2023-05-15	2023-07-28	W	10:30-11:20	
B02	ECS 242	2023-05-15	2023-07-28	W	11:30-12:20	
B03	ECS 242	2023-05-15	2023-07-28	W	13:30-14:20	
B04	ECS 242	2023-05-15	2023-07-28	W	14:30-15:20	

Instructor(s)

Name: Venkatesh Srinivasan
Office: ECS 626
Phone: (250) 472-5731
Email: srinivas at uvic dot ca

Office Hours: Comments
Fri 10:00am-12:00pm

Course Overview

This course is the continuation of Algorithms and Data Structures I (CSC 225). Students will learn a variety of important data structures, algorithms and algorithm design techniques. Relevant mathematical concepts are an integral part of this course.

Topics include:

Advanced techniques for design, analysis, and implementation of algorithms and data structures.

Algorithmic design paradigms: greedy, divide-and-conquer, dynamic programming, randomization.

Advanced Analysis techniques: amortized analysis, expected run time.

Advanced data structures: hashing, disjoint sets.

Advanced graph algorithms: network flows, connectivity, minimum spanning trees, shortest paths.

Mathematical tools: graphs and digraphs, graph properties, planar graphs, networks, discrete probability.

Course Delivery

This offering of Algorithms and Data Structures II is a fully face-to-face (i.e., not online) offering.

The university and the Faculty of Engineering and Computer Science has strong mandate to support Equity, Diversity and Inclusion <https://www.uvic.ca/engineering/about/equity/index.php> We as a teaching team will do what we can to create a positive, safe and supportive environment for you to participate in all components of this course offering. I appreciate all feedback from you and ask that you feel free to message me on CourseSpaces to voice concerns or to arrange a time to discuss virtually in-person.

Strict monitoring of academic integrity will be performed in this course for any work submitted for marks. See course component descriptions and Course Policies and Guidelines below for details on academic integrity expectations. Substantiated academic integrity violations will be referred to the Department's Academic Integrity Committee which will determine penalty and ensure a record of the violation is kept with the university.

Course Objectives And Learning Outcomes

Students will learn the skills required for advanced algorithm design, and should be able to apply these same or similar approaches to new situations.

Further, students should be able to implement, in major programming languages, the studied algorithms and their data structures in a manner that preserves the time and space complexity of these algorithm and data structures. That said, the problem sets in this course will not necessarily involve any programming, and so students are expected to reinforce their understanding via self-directed programming.

Textbooks

Optional:	Algorithm Design and Applications
	Goodrich and Tamassia
	Wiley, 2015
Optional:	Algorithms (Fourth Edition)
	Sedgewick and Wayne
	Addison-Wesley, 2011
Optional:	Introduction to Algorithms (3rd Edition)
	Cormen, Leiserson, Rivest, and Stein
	MIT Press, 2009

Consult the course page on Brightspace for more resources.

Assignments

In this course there will be 4 assignments. Each assignment is worth 7.5% for a total of 30%. Typically, you will have 10-14 days to solve an assignment.

Students are encouraged to work together and discuss homework. However, all solutions must be written individually **from scratch** and all programming must be done individually. No sharing of writing or of code is allowed.

Exams

There will be three midterm exams. The first midterm exam is worth 22.5% and will take place on **Monday, May 29**. The second midterm exam is worth 22.5% and will take place on **Monday, June 26**. The third midterm exam is worth 15% and will take place on **Thursday, July 27**.

Labs

The 10 lab sessions will be used for various activities throughout the semester. These include further explanation of hard concepts taught in the class, help with assignments, preparation for exams and some programming exercises. Attending the lab sessions is crucial to doing well in this course. Labs activities are worth 10% of the course.

Term Schedule

This schedule is subject to change.

Assignments	Weight	Assigned Date	Due Date
Assignment 1	7.5%	May 11	May 25
Assignment 2	7.5%	June 5	June 19

Assignments	Weight	Assigned Date	Due Date
Assignment 3	7.5%	June 29	July 10
Assignment 4	7.5%	July 10	July 20
Exams	Weight	Date	
Midterm 1	22.5%	May 29	
Midterm 2	22.5%	June 26	
Midterm 3	15%	July 27	

Grading

Coursework	Nominal Weight (out of 100%)
Assignments	30%
Lab activities	10%
Midterm Exams	60%

Policy On Electronics in The Classroom

The use of electronics is discouraged. This includes laptops, tablets, cellphones, and smart watches. Any use of electronics should only be for purposes that are directly related to the current lecture, and not for email, social media, working on problem sets, etc.

Grading System

The University of Victoria follows a percentage grading system in which the instructor will submit grades in percentages. The University will use the following Senate approved standardized grading scale to assign letter grades. Both the percentage mark and the letter grade will be recorded on the academic record and transcripts.

F	D	C	C+	B-	B	B+	A-	A	A+
0-49	50-59	60-64	65-69	70-72	73-76	77-79	80-84	85-89	90-100

Grades	Description
A+, A, A-	Exceptional, outstanding or excellent performance. Normally achieved by a minority of students. These grades indicate a student who is <i>self-initiating</i> , <i>exceeds expectation</i> and has an <i>insightful</i> grasp of the subject matter.
B+, B, B-	Very good, good or solid performance. Normally achieved by the largest number of students. These grades indicate a <i>good</i> grasp of the subject matter or <i>excellent grasp in one area balanced with satisfactory grasp in the other areas</i> .
C+, C	Satisfactory, or minimally satisfactory . These grades indicate a <i>satisfactory performance and knowledge</i> of the subject matter.
D	Marginal Performance . A student receiving this grade demonstrated a <i>superficial grasp</i> of the subject matter.
F	Unsatisfactory performance . Wrote final examination and completed course requirements; no supplemental.

Posting of Grades

Typically marks for assignments, examinations, and provisional final grades, are made available through a Learning Management System (LMS) like Brightspace, where each student will be able to view only their own grades. Sometimes numerical marks/grades may be posted publicly to the entire class. In that case, full student numbers or names will not be included with the posted information.

Course Experience Survey (CES)

I value your feedback on this course. Towards the end of term you will have the opportunity to complete a confidential course experience survey (CES) regarding your learning experience. The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey, you will receive an email inviting you to do so. If you do not receive an email invitation, you can go directly to the [CES site](#)

You will need to use your UVic NetLink ID to access the survey, which can be done on your laptop, tablet or mobile device. I will remind you closer to the time, but please be thinking about this important activity, especially the

following three questions, during the course.

- What strengths did your instructor demonstrate that helped you learn in this course?
- Please provide specific suggestions as to how the instructor could have helped you learn more effectively.
- Please provide specific suggestions as to how this course could be improved.

Csc Student Groups

The Computer Science Course Union (<https://onlineacademiccommunity.uvic.ca/cscu/>) serves all students who are either in a computer science program or taking a class in computer science. Please sign yourself up on their mailing list if you would like to be informed about their social events and services.

The Engineering Students' Society (ESS) serves all students registered in an Engineering degree program, including Software Engineering (BSEng). For information on ESS activities, events and services navigate to <http://www.engr.uvic.ca/~ess>.

Course Policies And Guidelines

Late Assignments: No late assignments will be accepted unless prior arrangements have been made with the instructor **at least 48 hours before** the assignment due date. **Coursework Mark Appeals:** All marks must be appealed **within 7 days** of the mark being posted. **Attendance:** We expect students attend all lectures and labs. It is entirely the students' responsibility to recover any information or announcements presented in lectures from which they were absent. **Electronic devices in labs and lectures:** No unauthorized *audio* or *video* recording of lectures is permitted. **Electronic devices in midterms and exams:** Calculators are only permitted for examinations and tests if explicitly authorized and the type of calculator permitted may be restricted. No other electronic devices (e.g. cell phones, pagers, PDA, etc.) may be used during examinations or tests *unless explicitly authorized*. **Plagiarism:** Submitted work may be checked using plagiarism detection software. Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the link given below for the UVic policy on academic integrity. Note that the university policy includes the statement that "A largely or fully plagiarized assignment should result in a grade of F for the course."

The Faculty of Engineering and Computer Science Standards for Professional Behaviour are at <https://www.uvic.ca/ecs/assets/docs/student-forms/professional-behaviour.pdf> U.Vic guidelines and policy concerning fraud and academic integrity are at <http://web.uvic.ca/calendar/undergrad/info/regulations/academic-integrity.html> **U. Vic Privacy Policy:** If any student has concerns about their private information being stored or accessed outside of Canada, they are required to inform the course instructor about their concerns before the end of second week of classes.

Equality

This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the [Centre for Accessible Learning](#) located in the Campus Services Building.

The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

Copyright Statement

All course content and materials are made available by instructors for educational purposes and for the exclusive use of students registered in their class. The material is protected under copyright law, even if not marked with a ©. Any further use or distribution of materials to others requires the written permission of the instructor, except under fair dealing or another exception in the Copyright Act. Violations may result in disciplinary action under the Resolution of Non-Academic Misconduct Allegations policy (AC1300).