

CSS 343 B Wi 21: Data Structures, Algorithms, And Discrete Mathematics II

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Instructor: Dr. Yusuf Pisan, pisan@uw.edu UW1-260Q (425) 352-3741

Class: Tue/Thu 3:30-5:30 on [Zoom](https://washington.zoom.us/j/95014364371?pwd=T0FBdU53K2VSbTdrWG1kdVpvZHhoZz09) [_\(https://washington.zoom.us/j/95014364371?pwd=T0FBdU53K2VSbTdrWG1kdVpvZHhoZz09\)](https://washington.zoom.us/j/95014364371?pwd=T0FBdU53K2VSbTdrWG1kdVpvZHhoZz09) Meeting ID: 950 1436 4371 password: 343B

Office Hours: Monday 1-2pm and Thursday 9-10am. Signup via [Canvas Calendar](#)

Class Discord: [invite link](https://discord.gg/5mEm92e) [_\(https://discord.gg/5mEm92e\)](https://discord.gg/5mEm92e)

Course Description

This sequenced course integrates mathematical principles with detailed instruction in computer programming. Topics include development of algorithms; algorithm analysis; object-oriented programming; abstract data types including trees, priority queues, graphs, and tables; regular expressions and context-free grammars. Prerequisites: CSS 342 with a grade of 2.0 or better.

Learning Objectives

- An understanding of trees, balanced trees, heaps, hash tables and their uses
- An understanding of the graph data structure and associated algorithms
- Ability to design and implement a complex object-oriented problem (using inheritance)
- An understanding of the formal notation for a programming language

Course Goals

Refining and extending the concepts and skills introduced in CSS 342, students develop competencies associated with problem-solving, design, testing, and programming techniques. Topics include ADTs, data structures, related algorithms, and object-oriented design & programming. Formal automata theory as it applies to programming languages is introduced. Good software engineering and algorithm analysis techniques are used throughout.

As with most technical courses, besides ability and motivation, it takes time to learn and master the subject. No one succeeds without practice! Expect to spend an average of 15 hours a week outside of class time for this course; some of you may spend more time, some less time.

Textbooks

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Resetting the test student will clear all history for this student, allowing you to view the course as a brand new student.

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- [Cusack] Charles A. Cusack and David A. Santos, [Active Introduction to Discrete Mathematics and Algorithms](https://cusack.hope.edu/Notes/?Instructor=Books) [_ \(https://cusack.hope.edu/Notes/?Instructor=Books\)_](https://cusack.hope.edu/Notes/?Instructor=Books), Version 2.6.3, March 30, 2018.
- [Chen] William Chen, [Discrete Mathematics](http://www.williamchen-mathematics.info/Indmfolder/Indm.html) [_ \(http://www.williamchen-mathematics.info/Indmfolder/Indm.html\)](http://www.williamchen-mathematics.info/Indmfolder/Indm.html)
- [Rosen] Kenneth H. Rosen, Discrete Mathematics and Its Applications, Seventh Edition, , McGraw Hill, 2011.

Grading

- Exercises: 10%
- Projects: 40%
- Midterm: 25%
- Final: 25%

A scale of 90s (3.5-4.0), 80s (2.5-3.4), 70s (1.5-2.4), 60s (0.5-1.4) is a rough guide. A student who achieves 75% of the possible points will receive a 2.0 grade in this course. Students with 95% and above will receive a 4.0 grade. Scores in between will be interpolated.

Distance Learning

Owing to the UW response to COVID-19, this course will be delivered entirely online through the Canvas learning management system and Zoom (supplemented by other web resources). This means that you will need to put in more time on your own than in a conventional course. Of course, the benefit of this structure is that you do not need to be physically present at UW-Bothell.

This course is scheduled to run synchronously at your scheduled class time via Zoom. These Zoom class sessions will be recorded. The recording will capture the presenter's audio, video and computer screen. Student audio and video will be recorded if they share their computer audio and video during the recorded session. The recordings will only be accessible to students enrolled in the course to review materials. These recordings will not be shared with or accessible to the public. The University and Zoom have FERPA-compliant agreements in place to protect the security and privacy of UW Zoom accounts. Students who do not wish to be recorded should 1) change their Zoom screen name to hide any personal identifying information such as their name or UW netid, and 2) not share their computer audio or video during their Zoom sessions.

Policies

Pet Policy: If a pet enters the camera frame during class, we will pause our discussion for an introduction to that pet and admiration by all. All pets are welcome.

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For projects, you can work individually or in pairs. When working as a pair, all substantial work must be performed with both students present (virtually). You can submit one and only one project 24 hours late without any penalty (if working as a pair both people will need to use their one-time extension). If you are using your 24 hour extension, post a brief explanation to "Using Extension" assignment.

Other than when working in pairs, talking about code is OK, looking at each others code is not OK. Looking at references to understand how a functions gets used is OK; looking up assignment solutions is not OK. It is also not acceptable for your code or solutions to be publicly accessible on the web (for example, a public GitHub repository). Plagiarism will result in an assignment score of zero and a misconduct letter in your student record. Please be very careful to adhere to the student code of conduct: <http://www.washington.edu/cssc/for-students/student-code-of-conduct/> I will make allowances for exceptional circumstances such as sickness, bereavement and official university business. I will not make exceptions for work, other classes, personal obligations, etc.

Attendance: Attend all classes. You are responsible for all the material covered in class, as well as any announcements including change of due dates or assignment specifications. There will also be graded in-class group exercises to practice problem solving. If you miss a class, I expect you to make-up for it on your own by asking your friends, reviewing the textbook, lecture materials, etc.

Communication: We will use discord as an extension of the classroom. Use a meaningful nickname and act professionally. If your question can be answered publicly by me or by a classmate, post it to discord. Use the office hours for complex issues or topics you are struggling with.

Use your UW email rather than "Canvas Messaging" to communicate directly with me. "Canvas Submission Comments" should only be used to draw the grader's attention to a specific part of your submission.

Problems: If you are having difficulties, come and talk to me. If I don't know about it, I cannot help you. Small problems can be fixed easily early in the quarter, but might become impossible to fix later on.

Course Material: Lecture notes and other material will be posted to Canvas under "Files". See [List of Topics](#) for detailed list of topics and additional references.

See the [School of STEM Course Policies](https://www.uwb.edu/getattachment/stem/about/stem-policies/classroom-policies-stem-fc-1-12-17.pdf) [_ \(https://www.uwb.edu/getattachment/stem/about/stem-policies/classroom-policies-stem-fc-1-12-17.pdf\)](https://www.uwb.edu/getattachment/stem/about/stem-policies/classroom-policies-stem-fc-1-12-17.pdf), which covers:

- Academic Integrity
- Access and Accommodations
- Classroom Emergency Preparedness
- For Our Veterans
- Grade of Incomplete

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- Respect for Diversity
- Student Support Services
- Surviving Sexual and Relationship Violence
- Wonder How to Address Faculty?

Course Calendar

Week	Tuesday/Thursday	Notes
5 Jan 7 Jan	Introduction, C++ Review	See List of Topics for readings and additional references Multiple exercises due (email, discord, unix, github, ...)
12 Jan 14 Jan	Trees	SVG Project
19 Jan 21 Jan	Graphs	18 Jan, Martin Luther King Day BST Project
26 Jan 28 Jan	N-ary Trees	
2 Feb 4 Feb	Design Patterns	Graph Project
9 Feb 11 Feb	Review Midterm	
16 Feb 18 Feb	Hash Table	15 Feb, Presidents' Day LeetCode Project
23 Feb 25 Feb	Polymorphism	
2 Mar 4 Mar	Theory of Computation	Movies Design Project
9 Mar 11 Mar	Turing Machine	Movies Project
16 Mar 18 Mar	Final - 18 Mar	No classes during finals week
















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Date	Details
Mon Jan 4, 2021	<div><div></div><div>Office Hours (https://canvas.uw.edu/appointment_groups/8595)</div></div> <div>1pm to Mar 11 at 10am</div>
	<div><div></div><div>343 B (https://canvas.uw.edu/calendar?event_id=1780268&include_contexts=course_1444468)</div></div> <div>3:30pm to 5:30pm</div>
Tue Jan 5, 2021	<div><div></div><div>Zoom Profile Picture (https://canvas.uw.edu/courses/1444468/assignments/5964175)</div></div> <div>due by 3:30pm</div>
	<div><div></div><div>Using Extension (https://canvas.uw.edu/courses/1444468/assignments/5892661)</div></div> <div>due by 11:59pm</div>
	<div><div></div><div>Insertion Exercise (https://canvas.uw.edu/courses/1444468/assignments/5923079)</div></div> <div>due by 11:59pm</div>
Wed Jan 6, 2021	<div><div></div><div>PrintUtils Exercise (https://canvas.uw.edu/courses/1444468/assignments/5923139)</div></div> <div>due by 11:59pm</div>
	<div><div></div><div>Template Exercise (https://canvas.uw.edu/courses/1444468/assignments/5923076)</div></div> <div>due by 11:59pm</div>
Thu Jan 7, 2021	<div><div></div><div>343 B (https://canvas.uw.edu/calendar?event_id=1780269&include_contexts=course_1444468)</div></div> <div>3:30pm to 5:30pm</div>
	<div><div></div><div>Post on Discord (https://canvas.uw.edu/courses/1444468/assignments/5892656)</div></div> <div>due by 11:59pm</div>
	<div><div></div><div>Send Email (https://canvas.uw.edu/courses/1444468/assignments/5892659)</div></div> <div>due by 11:59pm</div>
Sun Jan 10, 2021	<div><div></div><div>50-Step Unix (https://canvas.uw.edu/courses/1444468/assignments/5892640)</div></div> <div>due by 11:59pm</div>
	<div><div></div><div>GitHub Setup (https://canvas.uw.edu/courses/1444468/assignments/5918097)</div></div> <div>due by 11:59pm</div>
	<div><div></div><div>Tree 1 Exercise</div></div>








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Tue Jan 12, 2021	 343 B (https://canvas.uw.edu/calendar?event_id=1780270&include_contexts=course_1444468)	3:30pm to 5:30pm
Thu Jan 14, 2021	 343 B (https://canvas.uw.edu/calendar?event_id=1780271&include_contexts=course_1444468)	3:30pm to 5:30pm
Sun Jan 17, 2021	 SVG Project (https://canvas.uw.edu/courses/1444468/assignments/5892641)	due by 11:59pm
Tue Jan 19, 2021	 343 B (https://canvas.uw.edu/calendar?event_id=1780272&include_contexts=course_1444468)	3:30pm to 5:30pm
Thu Jan 21, 2021	 343 B (https://canvas.uw.edu/calendar?event_id=1780273&include_contexts=course_1444468)	3:30pm to 5:30pm
Sun Jan 24, 2021	 BST Project (https://canvas.uw.edu/courses/1444468/assignments/5892642)	due by 11:59pm
Tue Jan 26, 2021	 343 B (https://canvas.uw.edu/calendar?event_id=1780274&include_contexts=course_1444468)	3:30pm to 5:30pm
Thu Jan 28, 2021	 343 B (https://canvas.uw.edu/calendar?event_id=1780275&include_contexts=course_1444468)	3:30pm to 5:30pm
Tue Feb 2, 2021	 343 B (https://canvas.uw.edu/calendar?event_id=1780276&include_contexts=course_1444468)	3:30pm to 5:30pm
Thu Feb 4, 2021	 343 B (https://canvas.uw.edu/calendar?event_id=1780277&include_contexts=course_1444468)	3:30pm to 5:30pm
Sun Feb 7, 2021	 Graph Project (https://canvas.uw.edu/courses/1444468/assignments/5892643)	due by 11:59pm

Date	Details	
Tue Feb 9, 2021	 343 B https://canvas.uw.edu/calendar?event_id=1780278&include_contexts=course_1444468	3:30pm to 5:30pm
Thu Feb 11, 2021	 343 B https://canvas.uw.edu/calendar?event_id=1780279&include_contexts=course_1444468	3:30pm to 5:30pm
	 Midterm https://canvas.uw.edu/courses/1444468/assignments/5892654	due by 5:45pm
Tue Feb 16, 2021	 343 B https://canvas.uw.edu/calendar?event_id=1780280&include_contexts=course_1444468	3:30pm to 5:30pm
Thu Feb 18, 2021	 343 B https://canvas.uw.edu/calendar?event_id=1780281&include_contexts=course_1444468	3:30pm to 5:30pm
Sun Feb 21, 2021	 LeetCode Project https://canvas.uw.edu/courses/1444468/assignments/5918078	due by 11:59pm
Tue Feb 23, 2021	 343 B https://canvas.uw.edu/calendar?event_id=1780282&include_contexts=course_1444468	3:30pm to 5:30pm
Thu Feb 25, 2021	 343 B https://canvas.uw.edu/calendar?event_id=1780283&include_contexts=course_1444468	3:30pm to 5:30pm
Tue Mar 2, 2021	 343 B https://canvas.uw.edu/calendar?event_id=1780284&include_contexts=course_1444468	3:30pm to 5:30pm
Thu Mar 4, 2021	 343 B https://canvas.uw.edu/calendar?event_id=1780285&include_contexts=course_1444468	3:30pm to 5:30pm
Sun Mar 7, 2021	 Movies Design Project https://canvas.uw.edu/courses/1444468/assignments/5892644	due by 11:59pm








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Thu Mar 11, 2021	 343 B (https://canvas.uw.edu/calendar?event_id=1780287&include_contexts=course_1444468)	3:30pm to 5:30pm
Sun Mar 14, 2021	 Movies Project (https://canvas.uw.edu/courses/1444468/assignments/5892645)	due by 11:59pm
Thu Mar 18, 2021	 Final (https://canvas.uw.edu/courses/1444468/assignments/5892646)	due by 5:45pm
	 Beyond The Classroom (https://canvas.uw.edu/courses/1444468/assignments/5948437)	