

CS1800 -- Discrete Structures
Fall 2022
Khoury College of Computer Sciences
<https://course.ccs.neu.edu/cs1800>

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Website	https://course.ccs.neu.edu/cs1800
Piazza	https://piazza.com/northeastern/fall2022/cs1800
Gradescope	https://www.gradescope.com/courses/378800 access code 74YR6G
Recitation Schedule	Attend your recitation in-person Work on problem sets with your classmates and instructor Complete and submit Quiz on Gradescope by Saturday 8pm ET
Homework Schedule	Released on Friday Due on Gradescope the following Friday 8pm ET
Lecture Instructors (CS1800)	Prof. Laney Strange (she/her) - Sections 1 and 2 Prof. Lucia Nunez (she/her) - Section 3
Recitation Instructors (CS1802)	Prof. Amor-Tijani (she/her) Prof. Park (he/him) Prof. Nunez (she/her) Prof. Pa Prof. Sundaram (he/him) Prof. Melder (they/them)

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Lecture + Recitation Details

Lectures (CS1800) and recitations (CS1802) are in-person and attendance is expected.

Piazza is a great place to ask follow-up questions after lecture or when you're working on homework. You can also ask lecture-related questions directly to Profs. Strange and Nunez so we can wrap them into the next lecture if appropriate. Please use this form to do so: <https://forms.gle/5Gz988jzgyAfMdoi9>

We don't want or expect anyone to come to class when they're sick, so we'll post supplementary videos each week that you can use to catch up on missed material. If you miss class for any reason, we recommend watching the videos for that week and stopping by professor office hours to get caught up. The videos were recorded in previous semesters and will **not** be identical to a lecture you miss -- examples will be different, and material is likely to be presented in a different order.

We have two exams this semester, and they will be administered remotely, but during your scheduled lecture. It is your responsibility to familiarize yourself with the schedule listed below and on our course website. You must take exams on the days indicated.

Office Hours

Instructor Office Hours

Instructor office hours are one-on-one. Set up an appointment via the links below. Any student is welcome in any office hours, regardless of which lecture or recitation you're officially signed up for. Some instructor office hours are in-person and some are on Zoom; please see details below.

Instructor (Time) & Location	Office Hours Details
Prof. Strange (TR 3:30-5:30pm) Meserve Hall 313 and Zoom .	Sign up for a one-on-one slot on calendly: https://bit.ly/3A7Y9lB Let me know when booking an appointment if you prefer in-person or Zoom. If the Tues and Thurs office hours get booked quickly, Laney will add an extra hour on Friday afternoon. Click the calendly link above for the most-updated schedule.
Prof. Nunez (M 1-3pm, W 12-1pm) Meserve Hall 335 and Zoom .	Sign up for a one-on-one slot on calendly: https://bit.ly/3I2PxhO Please select Zoom only if you are unable to come in person.

Prof. Park (T 10am-12pm) Zoom	Sign up for a one-on-one slot on calendly: https://bit.ly/3ADSK4l Let me know when booking an appointment if you prefer in-person or Zoom. If I am feeling ill in any way, I will do you the courtesy of cancelling any in-person meetings--please reciprocate!
Prof. Amor-Tijani (R 12-1pm) Zoom	Sign up for a one-on-one slot on calendly: https://bit.ly/3AZinOu
Prof. Sundaram (R 2:40-4:40pm) WVH 242	Drop-in to WVH 242 in-person, or coordinate a time over Zoom via email.
Prof. Pa (M 2-3pm) Zoom	Drop-in to Zoom link
Prof. Melder (W 2-4pm) Zoom	Drop-in to Zoom link

TA Office Hours

TA office hours will be held in person and online. The different locations will be indicated on the OH calendar on our course website.

For in-person office hours, please go to the room listed and write your name at the bottom of the list on the whiteboard. A TA will call your name when it's your turn, so please keep an ear out!

For online office hours, we will be using the queuing system in the Khoury Office Hours app. Have a question ready and add yourself to the queue. When a TA is available, they'll call you on Teams. To make this all work, you'll need:

- Microsoft Teams app (better than using it in a browser):
<https://www.microsoft.com/en-us/microsoft-teams/download-app>
- A Khoury account (separate from your Northeastern Husky account):
<https://my.khoury.northeastern.edu/account/apply>
- Access to the Office Hours app. Login from the admin portal (look for "Office Hours Login" on the left side of your screen): <https://admin.khoury.northeastern.edu/>
- To read the manual <https://info.khouryofficehours.com/c78a201f396642e3b3f7215a1a3283a6> and watch this helpful demo: <https://www.youtube.com/watch?v=9h8ZpSrKErs>.

For both in-person and online, it'll be important that you come to office hours having already made an attempt on the homework. TAs will be happy to help guide you on concepts and provide clarification on concepts. They cannot provide you with answers to problems.

Course Description

The purpose of this course is to understand and use (abstract) discrete structures that are backbones of computer science. We begin with mathematical notation, logic, and sets. We will then study proof techniques, combinatorics (counting), probability, asymptotic notation, recurrences, and the beginnings of graph theory. By the end of this course, you will have become familiar with a number of discrete structures that are used throughout computer science.

Recommended Textbook

- Discrete Structures by Harriet Fell and Javed A. Aslam. You can find the PDF [free online](#). We'll cite relevant readings each week, and we recommend reading them before or after lecture.

Discrete Structures Topics

The major topics within the course will be covered in roughly the following order.

Topics
Propositional Logic, Logical Equivalence
Representation of Numbers, Gates and Circuits
Sets, Set Operations
Counting; Product Rule + Sum Rule, Combinations + Permutations
Probabilities, Conditional Probabilities, and Expected Value
Graph Theory
Mathematical Induction
Sums and Sequences
Search and Sort
Asymptotic time complexity

Important Dates

The ordering of the topics listed above may change, but it's very unlikely that milestone dates for assignments, recitations, exams will change throughout the semester. Times listed are Eastern time zone.

Date	Milestone	Notes
Sep 7 (W)	First day of fall semester	Lecture #1 on Friday! No recitation this week
Sep 12 (M)	First recitations start!	Work through problems with instructor & Take quiz on gradescope
Sep 16 (F)	HW1 released	
Sep 17 (S)	Quiz 1 due 8pm	
Sep 23 (F)	HW1 due 8pm HW2 released	
Sep 24 (S)	Quiz 2 due 8pm	
Sep 30 (F)	HW2 due 8pm HW3 released	
Oct 1 (S)	Quiz 3 due 8pm	
Oct 7 (F)	HW3 due 8pm	No new HW this week
Oct 8 (S)	Quiz 4 due 8pm	
Oct 10 (M)	Indigenous People's Day	No recitation this week
Oct 14 (F)	Exam #1 HW4 out	Exam during Friday lecture
Oct 21 (F)	HW4 due 8pm HW5 released	
Oct 22 (S)	Quiz 5 due 8pm	
Oct 28 (F)	HW5 due 8pm HW6 released	
Oct 29 (S)	Quiz 6 due 8pm	
Nov 4 (F)	HW6 due 8pm	No new HW this week
Nov 5 (S)	Quiz 7 due 8pm	
Nov 8 (T)	Exam #2	Exam during Tuesday lecture No recitation this week

Nov 11 (F)	Veterans' Day HW7 released	No lecture Friday
Nov 18 (F)	HW7 due 8pm HW8 released	
Nov 19 (S)	Quiz 8 due 8pm	
Nov 23-25 (W-F)	Thanksgiving week!	No lecture Friday No recitation this week
Nov 29 (T)	HW8 due 8pm	Recitations DO happen this week, but no quiz
Dec 2 (F)	HW9 (second-chance) released	
Dec 6 (T)	Last class!!!!	
Dec 9 (F)	HW9 (second-chance) due 8pm	

Evaluation

Grades for CS1800 and CS1802 are merged. You will receive the same grade for both.

Factor	Number	Weight
Homework	8	45%
Exam #1	1	20%
Exam #2	1	20%
Recitation Quizzes (one dropped)	8	15%

All quizzes and homeworks have the same weight regardless of the number of points allocated. The percentage score of each is computed in your final average -- for example, if you get 9/11 on Quiz 1, and 9/10 on Quiz 2, then the average of those two is $(9/11 + 9/10) / 2 = (81.8\% + 90\%) / 2 = 85.9\%$.

Homeworks

Homework will be assigned regularly in the course. In general, the homework will be released on Friday and will be due the following Friday at 8pm eastern.

Your solutions must be typed or neatly hand-written. Begin each problem on a new page. When submitting your solution, you'll tag your pages with the specific homework problem they refer to. Failure to tag your pages upon submission will result in lost points on your homework.

You can submit homeworks up to 24 hours late with no penalty, and 24-48 hours late with a 5% penalty.

No other late submissions will be accepted. This policy exists for those times you're having a tough week, are feeling sick, or are falling behind in your work; we won't make any exceptions to this policy.

Draft rubrics will be released with each homework, ensuring transparency around what we'll be looking for when grading. The rubrics may change slightly when we grade the homeworks after submission, but we promise they won't change much. It is your responsibility to read the homework assignment itself and the accompanying rubric to make sure you've covered all required parts of every question.

Regrade Requests

Homeworks will be scored and returned to you, on Gradescope, within one week. After getting your homework back, you have the option to file a regrade request. under one of the following categories:

- **Clarity** -- you're not sure why points were taken off, even though you've read the rubric and your grader's comments.
- **Mistake** -- your grader mistakenly took points off.

When filing a regrade request, specify which category the request belongs in. You'll receive a response, and possibly an updated score, from your grader. After that, if you still have concerns or questions about your grade, email laneys@northeastern.edu.

The final assignment of the semester, Homework 9, will be a second-chance homework. You can use this homework to re-submit one of your earlier assignments, and we'll re-grade it. It's a chance to re-do a homework that didn't go as well as you'd hoped, or submit one where you'd missed the original deadline.

Your homework score will be the average of HW1-8.

Quizzes

You must be registered for the recitation, CS1802. Recitations are in-person and attendance is expected.

During Recitation, you'll work on a problem set to gain hands-on practice with recent lecture material and prepare for upcoming homework assignments. You'll also take a quiz and submit it on Gradescope, which will be evaluated as part of your grade in the course. You may submit the quiz up until Saturday at 8pm. (We've added a small buffer into Gradescope, so if you submit between 8-9pm we'll still accept your quiz submission with no penalty.)

We will drop your lowest quiz score and it won't count toward your final average.

Exams

There are two exams this semester, and they will be administered remotely, but during your scheduled lecture. You'll take and submit the exam on gradescope, similar to a homework.

Exam dates:

- **Exam #1:** Friday, October 14th
- **Exam #2:** Tuesday, November 8th

It is your responsibility to familiarize yourself with these dates and ensure you are available for exams and have a quiet space to take them. If you don't have access to an appropriate space to take the exam, we'll make the classroom available for a limited number of students (but be careful if you choose this option, because our classroom has small desks that make it hard to have a laptop and paper open at the same time).

The exams are designed to be completed in less time than we have designated for lecture, so that no one feels rushed. Take your time on the exam problems and ask any questions that come up.

If you have a DRC accommodation, make sure that you have emailed your letter to k.mclaughlin@northeastern.edu well before the first exam. If your accommodation is for extra time, we'll allocate that directly in gradescope. If it's for a distraction-free environment, you'll need to coordinate directly with the DRC to book a time to take the exam in their office.

Towards the end of the semester, we'll provide an opportunity for a second-chance exam question. You'll be able to re-do a single exam question from exam #1 or exam #2 for a limited number of points.

Piazza

Sign up for the course piazza page: <https://piazza.com/northeastern/fall2022/cs1800>

Piazza is here for you to ask clarifying questions on homework assignments, which the course staff is happy to answer. It is also used for discussions among students about the approach you might take to solving problems in the class.

Because this is a theory course, and solutions sometimes rely on one particular, specific insight, we have a few rules governing our Piazza page:

- You may not post solutions to problems.
- You may not post a single, simple insight that enabled you to solve a problem (e.g., "Use Cantor's diagonalization"), but you may post general approaches (e.g., "I thought this homework problem related to the class discussion on infinite binary sequences").
- You must be respectful of and courteous towards your fellow students and the teaching staff.

Violations of these rules will result in our closing the Piazza page.

In general, it's better to post on Piazza than to send an email to one instructor. You're much more likely to get a quick response, and then everyone else can benefit from your question -- trust us, other people are wondering too!

Attendance

Lectures and recitations are in-person and attendance is expected. We don't want or expect anyone to come to class when they're sick, though, so we'll post supplementary videos each week that you can use to

catch up on any missed material. If you miss class for any reason, we recommend watching the videos for that week and stopping by professor office hours to get caught up.

These supplementary videos were recorded in previous semesters. They will not use the same examples or cover material in the same order as we'll do in our lectures. We hope they're helpful for days when you need to miss class, but they will definitely NOT be an identical experience.

Academic Integrity

We expect that you might study with friends and work out solutions to problems together, but you must write up your own solutions, in your own words. Copying solutions from a classmate or online source is a violation of our academic integrity policy and will be referred to OSCCR.

Here are some concrete guidelines.

- Never look at someone else's homework solutions. Otherwise you might turn in overly similar work.
- If you produce a solution together on a whiteboard, don't simply copy it down afterwards. You must, on your own, write your own solution by hand.
- If someone explains an answer to you, do not write down their exact words; instead, on your own write up your solution afterwards.
- If you collaborate with (or get help from) any other student, then write their name on the first page of your assignment at the top.

If you have a question about what is considered a violation of this policy, please ask! The university's academic integrity policy discusses actions regarded as violations and consequences for students:

<http://www.northeastern.edu/osccr/academic-integrity>

Accessibility

Students who have disabilities who wish to receive academic services and/or accommodations should visit the Disability Resource Center at 20 Dodge Hall or call (617) 373-2675. If you have already done so, please provide your letter from the DRC to Kayla McLaughlin (k.mclaughlin@northeastern.edu) early in the semester so that we can arrange those accommodations.

Course Feedback

Your thoughts and concerns about this course are important. We invite you to give feedback throughout the term. You can reach out to any instructor or TA directly over email, or fill out our feedback form:

<https://forms.gle/VC5R7KCoaLnDQShW8>

You will also be asked to fill out a formal course evaluation at the middle and end of the term.