**EECS 203: Discrete Mathematics**

Syllabus, Fall 2023

*Last updated: 8/25/23*

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## **1. Course Overview**

#### **Instructors**

* Prof. Greg Bodwin *(he)* - [bodwin@umich.edu](mailto:bodwin@umich.edu)
  + Lecture livestream: <https://umich.zoom.us/j/93036710719?pwd=d0MyVUlVOXh6ODJ6UlErY0M0cUxtdz09>
* Prof. Kim Diaz (*she*) - [kkhalsa@umich.edu](mailto:kkhalsa@umich.edu)
  + Lecture livestream: <https://umich.zoom.us/j/97410885365?pwd=R05zTksvajJmWTBJZVduNDNiTjlCQT09>

* Prof. Emily Graetz (*they*) - [graetzer@umich.edu](mailto:graetzer@umich.edu)
  + Lecture livestream: <https://umich.zoom.us/j/91309976442?pwd=RE1Td2V2b0F3NzY0SWMwNDE0UGlXZz09>

See our Canvas page for a complete list of instructors, including Instructional Assistants (IAs) and Graduate Student Instructors (GSIs) & check out our staff profiles!

#### **Course Description**

Discrete mathematics is often called the “language of computer science.” It is the backbone upon which all computational processes are built. In all likelihood, most of the mathematics you have studied so far concerns functions of real numbers and their derivatives, integrals, roots, etc. But there are other branches of mathematics that model real-world problems using very different objects. In discrete mathematics, we focus on operations on 1s and 0s (logic), modular arithmetic and number theory, set theory, functions and relations on sets, graphs, counting, discrete probability theory, and how these form the foundational language through which we formulate and solve real-world problems in computer science.

#### **Required Materials**

The official textbook for the course is “Discrete Mathematics” 8th Edition, by Ken Rosen. Alternatively, if you have access to the 7th edition, you will find most of the same material as in the 8th edition, but page numbers, example numbers, etc. will differ. An online version of the book is available from the University of Michigan library at the following link. Note that access is limited to 6 concurrent users at a time. There are also two print copies on reserve at the Art, Architecture, and Engineering Library in the Duderstadt Center.   
 Textbook: <https://search.lib.umich.edu/catalog/record/99187442213006381>.

#### **Canvas**

We will use Canvas as the main web portal for the course. There is one common Canvas site for all six lectures and 26 discussion sections. Here we will post lecture slides, lecture recordings, course calendar, assignments and solutions, grades, and course announcements. The Canvas calendar includes assignment due dates, exam dates, review session information, and more. Our course Canvas page will include links to all of the other websites and tools that we use (Piazza, Gradescope, Google Calendar for Office Hours, etc).

#### **Important Dates**

Mark your calendar for the course exam dates, listed below. More information on exams can be found in the [Exams section](#_2vf5ajll21w) of this syllabus.

| Exam 1 | **Wednesday, October 4** | **7:00 - 9:00 pm** |
| --- | --- | --- |
| Exam 2 | **Wednesday, November 8** | **7:00 - 9:00 pm** |
| Exam 3 | **Thursday, December 14** | **7:00 - 9:00 pm** |

### **Communication Outside of Class**

#### **Office Hours**

Office hours are a great way to get to know your instructors better and to ask any and all questions related to course content, homework, or anything else that might be on your mind. Many students report that actively engaging in office hours is the thing that benefited their understanding the most. A Google Calendar listing office hours can be found on both the Canvas homepage and a Piazza logistics page. This Calendar will always accurately reflect scheduled office hours, as these times may change during the course of the semester. You may go to any office hours you like and as many as you like.

***Remote office hours will be available***. See the office hours calendar for times.

#### **Piazza**

We will be using a class interaction tool called Piazza for questions and answers. You can access our Piazza page through the link on Canvas. You will be able to post questions, answer other people's questions, give or ask for clarification on answers, and see instructors' comments. You can even ask questions privately to the staff. When making a Piazza post, please search before asking to see if your question has already been asked and answered. Do not share answers to homework on Piazza.

#### **Admin Form**

Use the [Admin Form](https://docs.google.com/forms/d/e/1FAIpQLSf5ud0m7MT18__qJakZ6h9filmEVXPhsD69H-yQhCNflzGTtg/viewform?usp=sf_link) for any administrative issues for EECS 203 including personal (health, absence, VISA accommodations), technical, distance learning, homework, gradescope, or exams. Please provide as much relevant information as possible. In particular, we will use the information you provide should you become ill or have to quarantine for an extended period of time in consideration of final grades. Content-related questions should be addressed through Piazza.

## **2. Student Support and Well-Being**

#### **Inclusion Statement**

It is our intention that students from all backgrounds and perspectives will be well served by this course, and that the diversity that students bring to this class will be viewed as an asset. We welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, socioeconomic background, family education level, ability - and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class. Your suggestions are encouraged and appreciated.  
  
*Lived name/pronoun*  
We will gladly honor your request to address you by your preferred name or gender pronoun. You are welcome to advise us of this preference at any time during the semester, and we will make appropriate changes to our records.

#### **Accessibility and Disability Policy**

If you have any disability, as defined under the Americans with Disabilities Act, that might affect your ability to participate in class, or to turn in assignments on time or in the form required, please contact your instructor and the Office of Students with Disabilities at the start of the term so that arrangements can be made to accommodate you. The submission process for SSD VISA forms has changed, and instructors are now supposed to be able to get their students' VISA forms directly from the University. However, it is a new system, so to make sure that we do in fact have your accommodations on file, please complete the Extended Time Request form early in the semester. In order to allow time to provide appropriate accommodations for an exam, please complete the Extended Time Request Form by 2 weeks prior to the scheduled exam date. If you received your accommodation after that date, please update the form ASAP.

#### **Student Well-being**

As a student, you may experience a range of issues that can negatively impact your learning, such as anxiety, depression, interpersonal or sexual violence, difficulty eating or sleeping, loss/grief, and/or alcohol/drug problems. These mental health concerns or stressful events may lead to diminished academic performance and affect your ability to participate in day-to-day activities. In order to support you during such challenging times, the University of Michigan provides a number of confidential resources to all enrolled students, including:

* Counseling and Psychological Services (CAPS): 734-764-8312; [caps.umich.edu/contact](https://caps.umich.edu/)
* Sexual Assault Prevention and Awareness Center (SAPAC): 24-Hour Crisis Line: 734-936-3333; [sapac.umich.edu](https://sapac.umich.edu/)
* Psychiatric Emergency Services: 734-996-4747
* Services for Students with Disabilities (SSD): 734-763-3000; 734-615-4461 [TDD]; 734-996-6661 [VP]; [ssdoffice@umich.edu](mailto:ssdoffice@umich.edu)

Another resource available to you as a U-M student is **Wolverine Support Network**, a student organization offering free peer-facilitated weekly groups on campus. With 30+ groups per week, students are placed in a group at a time and location most convenient for them. Trained students lead groups to promote students’ well-being and build community in an accessible, confidential, and inclusive environment. To sign up for a group, go to UMICHWSN.ORG/JOIN, or email wsndirectors@umich.edu with any questions.

## **3. Course Components**

#### **Lectures**

There are five lecture sections, all of which meet on Tuesday/Thursday. We encourage you to attend the lecture section you are enrolled in, however you are allowed to attend a different lecture section if you would like. Meeting times and locations for all lectures can be found on the Lecture & Discussion calendar, linked on Canvas.

One of the lecture sections will be marked as “accelerated”. This section will cover the same material, but slightly faster, and will then use the remaining time (10-30 minutes per week) to talk about other CS topics. Students attending this section will have the same homework and exams, and the additional material is not testable nor is it direct practice of the testable content. This section is taught at the same time as an ordinary section, so you may freely switch between them in either direction if you feel your lecture section does not fit your learning style. For more information on this, please see the “Details for Special Sections” document available on our website.

Lecture section 006 does not have scheduled meetings. If you are enrolled in this section, we encourage you to attend other sections provided there is room in the lecture hall. As with any other students, if you miss an in-person lecture, we strongly recommend that you watch the lecture recording as soon as possible to avoid falling behind in the material.

#### **Discussions**

During discussions the course staff will go over concepts introduced in lecture and present additional examples. You will have the opportunity to ask questions and get clarification regarding concepts covered in the lectures. Discussions will also help prepare you to complete the Weekly Check-in (see below).

As with lectures, you are encouraged to attend the discussion section for which you are enrolled, but you can attend a different discussion if you need/want to, with the exception of the Focus on Fundamentals discussion sections.

***Focus on Fundamentals***discussion section attendance is required for those enrolled in those sections, and attendance is also limited to those enrolled in those sections. A description of the Focus on Fundamentals sections can be found on the LSA Course Guide. If you are enrolled in a Focus on Fundamentals discussion section, but cannot attend that time, please enroll in a different discussion. Similarly, if you are enrolled in a Focus on Fundamentals discussion but do not anticipate being able to attend the class each week in person, please enroll in a different discussion.

See the Canvas website for meeting times for other discussion sections.

#### **Attendance Policy**

We encourage you to attend the lecture section and discussion sections that you signed up for, but you may attend any section (with the exception of the Focus on Fundamentals discussion sections, which are open only to those enrolled in those sections).

**Attendance is not required in lecture, nor in discussion** (with the exception of Focus on Fundamentals discussions, where regular attendance is required). All lectures and (most, if not all) discussions will be recorded and available through Canvas a few hours later. While we encourage you to attend in-person, we understand that you may choose to learn from the recordings instead, including if you are uncomfortable with the University’s COVID policies and prefer not to attend class. Consistent with that policy, if you’re sick, we ask that you not attend in-person until you have recovered from your illness.

### **Exams**

There are three exams in this course which will be given ***in person*** from 7-9 pm on October 4, November 8, and December 14. The exams will be held in classrooms on north campus; exact locations will be announced closer to the exam dates. EECS 203 covers a lot of material. Anything that has appeared in lecture, discussion, or homework is fair game to appear on an exam, with the exception of lecture content labeled "bonus" material. Practice exams will be posted prior to each exam. In addition, discussions and additional exam review sessions will be provided during the week prior to the exam. While the material in the course is inherently cumulative, the three exams are not explicitly cumulative; each question will primarily test a concept introduced since the last exam.

### **Exam Conflicts**

It is the student’s responsibility to make sure they can attend the scheduled exams. **All** students, including students without exam conflicts, must complete the Exam Date Confirmation survey, due alongside homework 1, to confirm their availability for the scheduled exams or provide details about their conflict. See Canvas for a link to the survey.

*Exam 1 and Exam 2:* For the first two exams, there will typically be an alternate exam time offered for those with a conflict due to another academic requirement or religious holiday, or who are representing the University of Michigan in an athletic competition, performing arts performance, etc.

*Exam 3*: Exam 3 takes place during the Final Exam time slot for EECS 203, which is set by the Registrar. We have very little flexibility around Final Exam time slots, and thus alternate times for Exam 3 are rarely granted. Unfortunately, we generally cannot grant alternate exam requests for weddings, family travel plans, and the like. **If you have a conflict with the Final Exam date, please let us know right away. You must get approval from the Professors before the drop/add deadline for the semester**. This gives you time to either drop the course, or reschedule your conflict, should your conflict not be approved. Do not assume an alternate Final Exam will be granted!

### **Homework**

Homework (including both an individual and group component) will generally be assigned on Friday and will be due the following Thursday at 10 PM with a two-hour grace period (with no penalty) for late submissions up until 11:59 PM that same day. Homework solutions will be released early the next day (Friday). Homework assignments and solutions will be posted on our Canvas page. **After the grace period ends, no late homework will be accepted for any reason.**

*We cannot accept late homework nor offer homework extensions*. We understand that you may be unable to turn in some homeworks on time due to illness, deaths, or other family emergencies. **To accommodate these normal life events, we allow each student to drop 2 individual homework scores and 1 Groupwork score.** If you need to request an additional individual homework drop, please submit your request using the [Admin Form](https://docs.google.com/forms/d/e/1FAIpQLSf5ud0m7MT18__qJakZ6h9filmEVXPhsD69H-yQhCNflzGTtg/viewform?usp=sf_link), and be prepared to ***include documentation justifying 3 missed homeworks***.

#### **Getting your homework done on time: Start early and attend office hours**

Many students find it beneficial to start the homework early and work on it in bits and pieces throughout the week. Cramming at the last minute is discouraged. Even the most seasoned professors of discrete mathematics will get stumped once in a while on the simplest of problems and it pays to budget your time so that you can walk away from your homework, get other things done, and return later when your brain is once again fresh and able to think out of the box. For this reason, office hours and Piazza will be shut down starting at 8 PM on Thursdays so that you have the time to write up your solutions clearly and succinctly.

You are encouraged to look over the homework on Friday when it is posted, begin sketching out solutions for problems that look straightforward, and keep track of the problems that look much harder. Over the weekend, we ask you to work further through the problems so that office hours on Mondays/Tuesdays can be devoted to helping you “get started” on those problems that continue to stump you. On Thursday, we encourage you to submit your solutions even if some of them may be unfinished; the grading feedback you receive, even on partial solutions, is helpful in refining your understanding of the material and in preparing for the exams.

*Gradescope*

Homework is submitted by uploading your work to **Gradescope**. Please allow sufficient time to upload your assignment before the 10:00 pm deadline and make sure to match pages to assigned questions when you submit.

Your work should be submitted as a PDF document. You are encouraged to learn the math formatting tool LaTeX, which produces PDF files of beautifully formatted mathematics. We will provide LaTeX templates for each homework assignment to help you use this valuable tool. Handwritten homework, scanned to PDF, is acceptable, but must be clearly readable. You must ensure that each PDF file is relatively small (well under the 50MB limit).

**When submitting your homework on Gradescope, make sure you match each problem to a page (or pages)**. Matching pages ensures that the grader who is grading Problem 5, for example, will be shown the page(s) on which you solved Problem 5. If you do not match your pages for one or more problems, we will send you a courtesy email notifying you, and you will have 24 hours from the assignment due date to match your pages. After that point, the graders may start grading your assignment, at which point Gradescope will no longer allow you to match pages.

You will get a 0 on all problem(s) for which you fail to match pages. If you do not select pages for a problem, you **cannot** submit a regrade request. Your score for that problem will remain a 0. If this significantly impacts your grade on the assignment, remember that we do drop your lowest 2 homework grades. If you mark the wrong page for a problem (or forget to mark a second page for a problem), you **can** submit a regrade request to get points back for these problems (see below for details on submitting regrade requests), but in this case you will need to go through the full regrade process, listing the exact rubric items that you feel you deserve for each problem and the page number the problem is on.

*Honor Code applies to Homework*You are encouraged to study in groups and work on the homework problems together, but your individual homework submissions must be written *individually*. Directly copying homework solutions is a violation of the honor code.

### **Weekly Check-ins**

In addition to your homework, most weeks will also have a Weekly Check-in, which you will complete on our course Canvas site. The goal of the weekly check-in is just that: to be a basic check-in on your understanding of the week's content, and to provide you with immediate feedback.

Check-ins will be hosted as Canvas quizzes and will consist of a series of multiple-choice questions. You will have multiple attempts for each Check-in, and you will receive the highest score from any attempt. The questions on each Check-in will correspond directly to the problems covered in the week’s discussion, and may also contain review problems from previous weeks. If you attend discussion and feel fully comfortable with its concepts, the weekly check-in is intended to be straightforward.

To maximize the value the Check-in provides you, we suggest that you plan to complete the Check-in shortly after your discussion section each week. To simplify scheduling, Check-ins are due at the same time as homework, which is generally Thursday 10pm.

**To accommodate these normal life events, we allow each student to drop 1 weekly check-in quiz score.** Similar to homework, if you need to request an additional individual drop, please submit your request using the [Admin Form](https://docs.google.com/forms/d/e/1FAIpQLSf5ud0m7MT18__qJakZ6h9filmEVXPhsD69H-yQhCNflzGTtg/viewform?usp=sf_link), and be prepared to ***include documentation justifying 2 missed check-ins***.

### **ECoach**

EECS 203 offers U of M's ECoach, a free, personalized, web‐based coaching tool aimed at helping you do your best in this course. ECoach gives you strategies about the best ways to study, insider tips on course resources, feedback on your scores, and evidence‐based tools to boost your scores. Use of ECoach is totally optional – you can use it as much or as little as you want. At a few points during the semester, we will offer extra credit for important activities on ECoach.

* Introduction to ECoach [video](https://www.youtube.com/watch?v=sZDlT297jyw&feature=youtu.be)
* To sign up: <https://ecoach.ai.umich.edu/>.
* ECoach Feedback and Support: ecoach-support@umich.edu.

### **Grades**

Homework and other assignments are not curved, however we do curve exam scores (the distribution will be very close to the exam grade distribution from previous semesters). All assignment grades and [curved] exam scores will be posted on Canvas, and your overall grade is computed using the weights in the table below. Exam scores will not be curved down.

2% of your grade is given for completing various surveys on your experience in EECS 203 throughout the term. While we are hopeful that you will get full credit in this category, if you miss one or more surveys, your score in this category is still guaranteed to be at least your exam average.

| **Course component** | **% of course grade** |
| --- | --- |
| Individual Homework | 20 |
| Group Homework | 5 |
| Weekly Check-ins  (and attendance for  FoF students) | 10 |
| Exam 1 | 21 |
| Exam 2 | 21 |
| Exam 3 | 21 |
| Surveys | 2 |
| **Total** | **100** |

#### **Letter Grade Thresholds**

Your overall percentage in the course will determine your final course grade, according to the table below. We do not round scores to the nearest percentage.

| **Total (in percentages)** | **Letter Grade** |
| --- | --- |
| [93, 100] | A |
| [90, 93) | A- |
| [87, 90) | B+ |
| [83, 87) | B |
| [80, 83) | B- |
| [77, 80) | C+ |
| [73, 77) | C |
| [70, 73) | C- |
| [67, 70) | D+ |
| [63, 67) | D |
| [60, 63) | D- |
| [0, 60) | E |

## **4. Academic Policies**

#### **COVID-19 Policies and Procedures**

As they have throughout the past two years, policies around academic and public health are subject to change as this pandemic evolves. This course will follow all policies issued by the University, which are documented on the [Campus Blueprint's FAQ](https://campusblueprint.umich.edu/faqs/#vaccination). These policies may change over the course of the term, so please review the [Campus Blueprint's FAQ](https://campusblueprint.umich.edu/faqs/#vaccination) for the most up to date information.

#### **Regrade Policy & Procedures**

[For additional important information, including regrade templates, please refer to the document *Regrade Requests in EECS 203*, available on Canvas.]

Homework and Exams are eligible for regrades. Regrade requests are generally open for one week from the time the graded work is returned.

While we strive to be consistent in grading, inconsistencies and errors do occur and we rely on you to help correct these mistakes. At the same time, our time, like yours, is limited so we ask that you follow the steps below to make sure your request is handled appropriately. Failure to follow these steps may result in a dismissal of your request.

**If you think your work may have been misgraded:**

1. Read through your answer thoroughly and note which rubric items you did/didn't receive.
2. Read through the posted solution thoroughly and try to map your marked rubric to the differences between your answer and the posted solution.

**After you've read your answer, our solution, and the rubric**, if you feel that your answer was misgraded **according to the posted rubric**, then you are ready to submit a regrade request. If you do not understand the rubric, or believe you have an alternate correct solution, please speak to a staff member in office hours or on piazza.

1. All regrade requests are submitted via Gradescope.
2. Make sure you've done "the three things": read the posted solution, review your submission, and read the rubric items.
3. To make it as easy as possible for us to give you points back, start your regrade request with "I have read the posted solution, my answer, and the rubric items."
4. Continue your request by noting **which specific rubric items** you believe you should/shouldn’t have gotten and why. If you did not match pages in your original submission, also indicate which page your solution appears on for that problem.
5. Note that unsubstantiated regrade requests may be subject to an additional point deduction penalty. Also note that if you've read this far and completed the steps above in your regrade request, then you'll have a *substantiated* regrade request and, even if you don't end up earning points back, you won't get a penalty either.

#### **Collaboration Policy**

We encourage you to work with your classmates, discuss the material, form study groups, etc. However, when completing the individual homework, *your submitted assignment must be your own work*. Group homeworks are designed for collaboration and you should of course work together as a group on those problems. Group homeworks should also be submitted as a group: one person from your group will upload the assignment to Gradescope and tag the other members of your group.

## **5. Honor Code**

#### **What is the Honor Code?**

The Honor Code outlines certain standards of ethical conduct for persons associated with the College of Engineering at the University of Michigan. The Honor Code applies to all students in EECS 203, regardless of whether they are in CoE, LSA, or another School or College. The policies of the Honor Code apply to graduate and undergraduate students, faculty members, and administrators. Read about the UM Honor Code here: (<http://www.crlt.umich.edu/faculty/honor>). There is also an Engineering Honor Code: (also found at <http://www.crlt.umich.edu/faculty/honor>). In this class, as in many others at the University, you will be expected to include and sign the Honor Pledge on each assignment you submit. The Honor Pledge is as follows:

*I have neither given nor received unauthorized aid on this assignment, nor have I concealed any violations of the Honor Code.*

The Honor code is based on these tenets:

* Engineers must possess personal integrity both as students and as professionals. They must be honorable people to ensure safety, health, fairness, and the proper use of available resources in their undertakings.
* Students in the College of Engineering community are honorable and trustworthy persons.
* The students, faculty members, and administrators of the College of Engineering trust each other to uphold the principles of the Honor Code. They are jointly responsible for precautions against violations of its policies.
* It is dishonorable for students to receive credit for work that is not the result of their own efforts.

Among other things, the Honor Code forbids plagiarism. To plagiarize is to use another person's ideas, writings, etc. as one's own, without crediting the other person. Thus, you must credit specific information obtained from other sources, including web sites, e-mail or other written communications, conversations, articles, books, etc.