

MATH 3355: Discrete Math (4 cr.)

Lecture Section 001 Syllabus
University of Minnesota Duluth
Fall 2021

Meets: Monday, Wednesday, and Friday 9:00 – 9:50, in Ed Endazhi-gikinoo'amaading 20
Thursday 9:00 – 9:50, in Ed Endazhi-gikinoo'amaading 36

Final Exam: Friday, December 17th 8:00 – 9:50

Instructor: Dr. Bryan Freyberg

Office: Solon Campus Center 162

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Phone: 218-726-6240 (only leave a voicemail if an emergency, follow-up with an email)

Office Hours: Monday 11:00 – 12:00, Wednesday, Thursday, and Friday 10:00 – 11:00 (in-person and Zoom)

Office hours also by appointment

Text: Discrete Mathematics and Its Applications, 8th ed. by Rosen, Kenneth H.

Note: Only textbook required. WebAssign not required.

Prerequisites: Grade of at least C- in Math 1297 or 1597

Lib Edu Req: Logic and Quantitative Reasoning Category, Student Learning Outcomes are the following:

1. Students will appropriately translate problems to symbolic systems.
2. Students will apply mathematical or logical reasoning to identify potential solutions.
3. Students will evaluate whether mathematical or logical reasoning and conclusions are valid.

Course Description: Introduction to mathematical logic, predicates and quantifiers, sets, proof techniques, recursion and mathematical induction, recursive algorithms, combinatorial counting techniques, basic number theory, and equivalence relations.

Online Resources: I will be using Canvas, an online class management system, for posting class notes, homework, solutions, handouts, and extra resources. Go to Canvas through the MyU link on the UMD web page. Your grades can be viewed on Canvas. When I need to communicate something outside of class, I will notify the class via Canvas announcement. **Make sure your settings allow Canvas announcement emails.**

What to Expect in Lecture:

I try to make prewritten outlines available ahead of time so you can use them during class (not required). These will be available on Canvas. The provided notes online are not a substitute for attending class. You should attend class if you are able. You do not need to bring your book to class, though you may find it helpful. **You are not allowed to make audio or video recordings of any lecture or portion of a lecture without prior permission from the instructor.**

Classes on Fridays will often be conducted in a workshop format. You will work with your peers on an in-depth problem or problem set relative to the current course material. The workshops will be due at the end of class, so you are strongly encouraged to study the material ahead of time so your group can work efficiently.

Grades: Your grades will be determined by a weighted total percent based on the following categories:

15% Homework

15% Quizzes and Workshops

45% Midterm Exams (3 at 15% each)

25% Comprehensive Final Exam

Note that points between categories are not designed to be equivalent (e.g. 1 exam point does not equal 1 quiz point). Your grade as a percent will be rounded to the nearest whole percent. Letter grades will be assigned according to the following percent categories.

A	93-100%	B+	87-89%	B-	80-82%	C	73-76%	D+	67-69%	F	below 60%
A-	90-92%	B	83-86%	C+	77-79%	C-	70-72%	D	60-66%		

- Homework:** There will be (roughly) weekly homework assignments including problems from the textbook. These problems provide the bulk of your learning opportunities in this class. I encourage you to ask questions about them during and outside of class. The lowest score from this category will be dropped from your grade.
- Quizzes:** There will occasionally be short quizzes given in class and announced ahead of time. The quiz material will reflect the content of the homework problems as well as problems discussed during lecture. Workshops will be scored in this category. The lowest score in this category will be dropped from your grade.
- Exams:** There will be three regular exams worth 15% of your grade each. The dates will be announced in class and on Canvas well ahead of time. The final exam is cumulative and comprises 25% of your overall grade.
- Expectations:** **You are responsible for all material and information presented or discussed in class.** You should attend every class. Check your UMD email and Canvas frequently for updates. I strive to provide a comfortable and safe learning environment for everyone. Please act respectful and in a professional manner. Here are some specifics. Please do not have side conversations with your classmates at inappropriate times (while another person is speaking to the group) or use your cell phone or laptop during class. Try to be on time whenever possible. If you have special circumstances for arriving late or leaving early, please let me know at an appropriate time so we understand your situation. For details see the information under the “Student Conduct Code” and “Teaching & Learning: Instructor and Student Responsibilities” headings. In extreme cases, you may be asked to leave a class and further action may be taken. Please let me or other university staff member know if you are uncomfortable in a class situation or have experienced an act of harassment.
- Late Work:** Only in extraordinary circumstances are late homework, quizzes, or workshops accepted. If this pertains to your situation, please speak with me as soon as you are able. If you plan on missing a class for a school-sponsored event or for an excused reason on an exam day, an appointment must be set up to take an alternative version of the exam **before you leave**. If you miss an exam for an unexcused reason, you may schedule a make-up within one week of the missed exam for 50% credit.
- If you have extreme medical or personal issues which cause you to miss many assessments, contact me and an advisor or counseling services to explore the options. Incomplete grades can only be given to students that were passing (before they got sick, etc.), have completed most of the course, and have a documented and university approved excuse.
- Schedule:** A **tentative** schedule for the course follows.
- Weeks 1 – 4:
Logic and proofs; Sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.7, and 1.8.
Exam 1 TBA
- Weeks 5 – 8:
Sets, functions, sequences, sums, and number theory; Sections 2.1, 2.2, 2.3, 2.4, 2.5.
Exam 2 TBA
- Weeks 10 – 14:
Induction, recursion, and counting; Sections 5.1, 5.2, 6.1, 6.2, 6.3, 6.4, and 6.5.
Exam 3 TBA
- Weeks 15 – 16:
Advanced counting techniques and relations; Sections 8.1, 8.2, 8.5, 8.6, 9.1, and 9.5.
- Tutoring:** Tutoring is available during my office hours and in the tutoring center located in the library.

Suggestions for Success:

1. Read the appropriate section(s) in your text **before** lecture. Read for **understanding**. Take notes when reading and write down questions you have.
2. Go to lecture. Do not allow yourself to be distracted during lecture. Did you get answers to the questions you wrote down while you were reading? If not, ask your instructor.
3. Take good lecture notes. Some students benefit more by not taking notes in class and instead waiting until immediately after class. Some do both. See what works for you.
4. Read the section in your book again after lecture. Write down answers to any questions you wrote before class.
5. Test yourself by doing the example problems. Are you getting some wrong? Consider going to office hours or trying the tutoring center (2nd floor of library). Are there other resources available to you? Check the course Canvas page.
6. Study every day, even if it's only for a short time. While you study, focus on **learning**. Learning is the best way to get a good grade. If instead you focus on how to do a certain type of problem or what you need to do to pass a quiz or exam, you will not learn as much and your grade will suffer.

University Policies:

Student Conduct Code:

Appropriate classroom conduct promotes an environment of academic achievement and integrity. Disruptive classroom behavior that substantially or repeatedly interrupts either the instructor's ability to teach, or student learning, is prohibited. Student are expected adhere to [Board of Regents Policy](#).

Teaching & Learning: Instructor and Student Responsibilities:

UMD is committed to providing a positive, safe, and inclusive place for all who study and work here. Instructors and students have mutual responsibility to insure that the environment in all of these settings supports teaching and learning, is respectful of the rights and freedoms of all members, and promotes a civil and open exchange of ideas. Reference the full policy [here](#).

Academic Integrity:

Academic dishonesty tarnishes UMD's reputation and discredits the accomplishments of students. Academic dishonesty is regarded as a serious offense by all members of the academic community. [UMD's Student Academic Integrity Policy](#)

Final Exams:

All 1xxx-5xxx courses offered for undergraduate credit should include a final graded component or end of term evaluation that assesses the level of student achievement of one or more course objectives. All final graded components are to be administered or due at the time and place according to the final exam schedule and not during the last week of class. Reference the full policy [here](#).

Excused Absences:

Students are expected to attend all scheduled class meetings. It is the responsibility of students to plan their schedules to avoid excessive conflict with course requirements. However, there are legitimate and verifiable circumstances that lead to excused student absence from the classroom. These are subpoenas, jury duty, military duty, religious observances, illness, bereavement, and NCAA varsity intercollegiate athletics. Find complete information [here](#).

Appropriate Student Use of Class Notes and Course Materials:

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Find additional information [here](#).

Students with Disabilities

It is the policy and practice of the University of Minnesota Duluth to create inclusive learning environments for all students, including students with disabilities. If there are aspects of this course that result in barriers to your inclusion or your ability to meet course requirements such as time limited exams, inaccessible web content, or the use of non-captioned videos, please notify the instructor as soon as possible. You are also encouraged to contact the Office of Disability Resources to discuss and arrange reasonable accommodations. Call [218-726-6130](tel:218-726-6130) or visit the [Disability Resources](#) web site for more information.

Sexual Harassment

"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. Reference the full policy [here](#).

Equity, Diversity, Equal Opportunity, and Affirmative Action

The University provides equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or

gender expression. [Equal Opportunity and Affirmative Action](#) and the [Office of Student Conduct & Conflict Resolution](#) are both available to all UMD employees, students, and participants in University-related activities [to discuss issues or concerns](#) regarding University policies or practices involving potential bias, discrimination, harassment or retaliation that an individual may have experienced or observed. Reference the full policy [here](#).

Mental Health and Stress Management

Feelings such as anxiety, anger, depression, low self-esteem, or tension are a normal part of being human and can affect anyone. Sometimes these feelings are temporary and can be eased by rest, relaxation, exercise, good nutrition and the support of trusted friends. At other times, stressors, relationships or past family experiences cannot be managed so easily and become overwhelming. If this happens, and you find it hard to function, you may want to seek professional help. Counseling Services are available at UMD Health Services to assist you. If you are in need of mental health support when Health Services is closed, or in case of an emergency, please contact The Birch Tree Center's Crisis line at 218-623-1800 or go to the emergency room/urgent care at either St. Luke's Hospital or St. Mary's Hospital. If an ambulance is needed, call 911. If the emergency is non-life-threatening and you do not have a means of transportation, call Campus Police at 218-726-7000). If you have needs that Counseling Services does not treat, they have a case manager who helps connect students to referrals as well as navigating issues with insurance. You can learn more about the broad range of confidential mental health services available on campus at [UMD Health Services](#).

Mask Requirement

As of August 3, 2021 the University of Minnesota requires all students, staff, and faculty to wear masks when indoors regardless of vaccination status. Visit the the [UMD Safe Campus webpage](#) for up-to-date COVID information.

Note: This document is subject to change. Check with the instructor to see if any changes have been announced or if a new version has been posted on Canvas. Last updated 8/26/2021