

MAT 243 – Discrete Mathematical Structures for Computer Science

Instructor:	Instructor's email:
Office Hours:	Instructor's office:

ASU Catalog Description:

Logic, sets, functions, elementary number theory and combinatorics, recursive algorithms, and mathematical reasoning, including induction. Emphasizes proofs and connections to computer science.

Prerequisite:

Minimum sophomore standing; MAT 210, 251, 265, or 270 with a grade of C or better.

Required:

- **Access to Canvas.** This is the home base for the course for the following items and much more:
 - Announcements and assignments
 - Online quizzes and exams
 - Links to lecture videos and lecture notes
 - Grades

Textbook: The textbook for the class is *Discrete Mathematics and its Applications* by Kenneth Rosen (7th edition). The 8th edition of the book is also acceptable. This is a "soft" requirement, that is, it is recommended that you get the textbook and study it alongside the other course materials, but this recommendation will not be enforced. In particular, there will be no quiz or exam questions that ask you to enter word n on page m of the book.

Email: (*instructor's email*); when you email me, please include **MAT 243 Time and Days (of your section)** in the subject line. Only use email for private questions. Subject questions should be asked in the Discussion Board. Use only your official ASU email to contact me. This is not an arbitrary rule your instructor made up; it is a school rule and related to federal law (FERPA). Please, do not use the Canvas messaging system.

Special Dates:

Last day to drop a class without a grade of W: Sept 6, 2024

Course withdrawal deadline: No 6, 2024

Complete session withdrawal: Dec 6, 2024

Tentative schedule:

The instructor reserves the right to modify it (including the dates of the tests) to meet the needs of the class. It is the student responsibility to attend class regularly and to make note of any change.

<i>Week</i>	<i>Sections</i>	<i>Description of subjects/activities</i>
Week 0	1.1	Introductions Propositional Logic
Week 1	1.1-1.2 1.3 (Module 1)	Propositional Logic Applications of Propositional Logic Propositional Equivalences
Week 2 Labor Day	1.4 1.5 (Module 2)	Predicates and Quantifiers Nested Quantifiers
Week 3	1.6 (Module 3) Intro 1.7 (Module 4)	Rules of Inference (and Formal Proofs) Intro to proofs Review for test 1
Week 4	Logic Assessment (with Lockdown Browser) 1.7 (Module 4)	covers 1.1-1.6 (modules 1-3) Proofs
Week 5	1.7 (Module 4) 2.1 (Module 5)	Proofs Sets
Week 6	2.2 (Module 5) 2.3 (Module 6)	Set Operations Functions
Week 7	2.3 (Module 6) 2.4 (Module 6)	Functions Sequences and Summation
Week 8 Fall Break	2.4 (Module 6) (3.1) 3.2-3.3 (Module 7)	Sequences and Summation (Algorithms and) The Growth of Functions

Week 9	Test 2 In-Person (3.1) 3.2-3.3 (Module 7)	covers 1.7, 2.1, 2.2, 2.3, 2.4 (modules 4-6) (Algorithms and) The Growth of Functions
Week 10	4.1, 4.2, 4.3 (Modules 8-9-10)	Divisibility and Modular Arithmetic Integer Representation and Algorithms Primes & Greatest Common Divisor (& Euclid's Alg)
Week 11	5.1 (Module 11)	Mathematical Induction
Week 12 Veterans Day	Test 3 In-Person 5.3 (Module 12)	covers 3.2-3.3, 4.1, 4.2, 4.3, 5.1 (modules 7, 8, 9, 10, 11) Recursive definition and Structural Induction
Week 13	8.2 (Module 13) Proof Paper (Structural Induction) Lockdown Browser or In-Person	Solving Linear Recurrence Relations The Basics of Counting; The Pigeonhole Principle
Week 14 Thanksgiving	6.1, 6.2 (Module 14)	Permutations, Combinations Inclusion-Exclusion Principle
Week 15	6.3 (Module 14) 8.5 (Module 15) Review for Final	Inclusion-Exclusion Principle Relations (as time permits)
Week 16	FINAL EXAM In-Person	covers modules 1-2, 6, 7, 11-15 Day/time = function of class day/time

Scheduling your time and Studying Tips:

The average student can anticipate spending about 10 hours per week between class time and time spent individually to review, study, and complete assigned work. This aligns with ASU's expectations of 40 hours of work per credit hour and university accreditation agencies' definition of credit hours/units.

The class requires daily work, starting from the first day of class. Do not plan on being a "weekend warrior" or otherwise attempting to do all assigned work on 1-2 days per week. This is typically not enough time to absorb the material, complete the work, and properly process the information. In

addition to time set aside for completing homework and readings, I suggest you find time before or after each lecture to carefully look back over your recent notes and summarize for yourself what you just learned, and how it related to earlier topics or facts you had learned earlier in your academic career. Keep in mind the “big picture” goals of the course to be sure you don’t lose that while focusing on new specific details.

Due dates are like food expiration dates. Just like an expiration date is not a recommendation to delay consuming the food until that date, due dates are not the dates on which your instructor wants you to or recommends that you work the assignments. They are merely the latest dates by which you are allowed to finish assignments. Reading assignments should all be completed before you start the for-credit assignments of the same week, and all for credit assignments should be finished well before the due date.

If you rely on completing significant portions of for credit assignments on the due date, you risk not being able to get timely help if you run into difficulties. Discussions help is not instantaneous and may require several rounds of exchange between yourself, other students and the teacher. Additionally, help does not mean that someone else will do your thinking for you. It will come in the form of hints that help you understand the problem and stimulate your own thought process, rather than supply you with copy-ready solutions.

The teachers are aware that the specific additional resource that students who ask this question often have in mind is a fully worked out model problem that is identical to a challenging homework problem, except that a few numbers have been changed. Some homework assignments are indeed of this type, but not all. This is intentional, as routine problems that come down to symbol substitution cannot develop mathematical reasoning skills.

Attendance:

In-Person modality: classes will meet at the time and dates listed in the official ASU Schedule of Classes. **Your attendance is required.**

Participation:

Being in class is important, but being *engaged* during class is even more important. When you are in a lecture there will be time for listening to one another, reflecting, asking questions, discussing, and working together. All of these forms of participation are helpful in gaining understanding. **One practice I value is listening to your classmates.**

Third-Party website Statement:

Any (parts of) exams, assignments, reports, or solutions to these, from current or previous semesters, posted to any website not affiliated with ASU will result in academic integrity disciplinary actions against the students posting them and the students using them.

The contents of this course, including lectures and other instructional materials, are copyrighted materials. Students may not share outside the class, including uploading, selling or distributing course content or notes taken during the conduct of the course. Any recording of class sessions is authorized only for the use of students enrolled in this course during their enrollment in this course. Recordings and excerpts of recordings may not be distributed to others.

Academic Integrity

Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see <http://provost.asu.edu/academicintegrity>.

Asking for a higher grade than the one you have earned because you need a higher grade to maintain a scholarship, or to satisfy your own or someone else's expectations is a form of academic dishonesty.

Grade Components:

Edfinity Assignments	5%
Quizzes	10%
Written Homework Assignments	5%
Proof Paper on Structural Induction	5%
Practice Exams for the Logic Assessment, Test 2-3, and the Final	5%
Logic Assessment	5%
Tests (2)	40%
Final Exam	25%

Grading Scale:

A+ = [97,100];	A = [93,97];	A- = [90,93];	B+ = [87,90];	B = [83,87];	B- = [80,83];
C+ = [77,80];	C = [70,77];	D = [60,70];	E/EN/EU = [0,60]		

This table means just what it says. A grade of 89.9% is a B+, not an A-. A grade of 59.9% is a D, not a C. Please do not email me after the class is over and ask for the next higher grade because you feel that you are close. Granting such requests consistently and fairly would require me to keep lowering standards in such a way that everyone in the class would get an A+.

Do not ask for exam re-takes. These requests will not be granted. The essential pedagogical function of exams is to act as a strong inducement to progress through the course **on schedule**. Another purpose is to measure that progress against the expectations in the course schedule. Exams would cease to function in either capacity if an option existed to retake them later.

Failing grades (E, EN and EU grades):

The E grade is for students who participated in the class the full semester but did not earn enough credit to pass or attain the D grade.

The EN grade is for student who never once participated in the class. At the instructor's discretion, any student who has not attended class during the first week of classes *may* be administratively dropped from the course. However, students should be aware that non-attendance would NOT automatically result in being dropped from the course. Thus, a student should not assume they are no longer registered for a course simply because they did not attend class during the first week. It is the student's responsibility to be aware of their registration status.

The EU grade is for students who participated, but then stopped after a certain point and never resumed.

No Y-grade offered in this class. Do not ask to be assigned the grade of Y.

Course Withdrawal:

A student may withdraw from a course with a grade of **W** during the withdrawal period. The instructor's signature is not required. It is a student's responsibility to verify that they have in fact withdrawn from a class.

The Grade of Incomplete:

A grade of incomplete will be awarded only in the event that a documented emergency or illness prevents the student who is doing acceptable work from completing a **small** percentage of the course requirements. The guidelines in the current general ASU catalog regarding a grade of incomplete will be strictly followed.

Instructor-Initiated Drop:

The instructor reserves the right to have students who meet certain conditions administratively dropped from the class. The following conditions qualifies you for administrative removal from the class:

- no activity on Canvas by 11:59pm of 1st week of classes, or having missed all for-credit assignments that are due or past due at 11:59pm on the last day of the 1st week of classes.

However, students should be aware that non-attendance will NOT automatically result in being dropped from the course. Thus, a student should not assume they are no longer registered for a course simply because they did not attend class during the first week. It is the student's responsibility to be aware of their registration status.

ASSIGNMENTS

Edfinity

Online Homework will be submitted online via the internet using the homework system Edfinity. Edfinity contains questions pertaining to each topic, the due dates for which are listed in the Canvas Calendar and in the Edfinity system itself.

To enroll in our Edfinity section, please follow the steps below:

1. **Important:** Upgrade to the latest version of Google Chrome or Firefox on a Windows/Mac computer. Other browsers such as Safari may cause issues when you access Edfinity via Canvas.
2. Log into your Canvas course.
3. Click on the Edfinity link in the Course Navigation Menu (on the left side of Canvas) to launch into Edfinity - you will automatically be signed into Edfinity. You **should not** sign up directly on [edfinity.com](https://www.edfinity.com)
4. The first time you access Edfinity, you will be prompted to either pay using a debit/credit card (\$35) **OR** enter an access code. If you need to purchase through the Bookstore due to financial aid or scholarship, you can use this direct link: <https://www.bkstr.com/arizonastatestore/product/edfinity-with-office-hours-610030-1>
5. Please enroll directly on Edfinity. This guarantees you the best price available (\$35). If (and only if) you are on financial aid, purchase Edfinity access codes through the bookstore. Remember, enrolling on Edfinity is the most cost-effective option. There is a 2-week grace period during which you may drop the course and receive a refund.

Edfinity homework assignment: there will be about 1-2 weekly assignments. Edfinity questions are set to allow only a limited number of attempts. This is intentional, to discourage trial and error solutions, or worse, a purely combinatorial approach wherein you go through all combinations of answers on a multiple choice question until you find the right one, thereby reducing the homework to a guessing game.

Edfinity will give you 5% extra credit for items worked at least 24 hours before the due dates.

Edfinity allows late submissions with a late penalty of 10% for work done up to two days after the due date.

- Items worked on before the due date receive full credit.
- Items worked on within the late period receive 90 % partial credit (incurring a 10% late penalty).
- After the late period ends, the assignments are closed, scores are posted to the grade book, and no additional work is permitted.

Quizzes: **canvas quizzes or written quizzes** will be given frequently during lecture. They may include questions related to previously discussed topics from lecture, or related to reading that was to be completed since the last lecture. No make up quizzes are offered for missed classes but the lowest 2 or 3 quizzes will be dropped, depending on the number of quizzes your instructor assigns.

Written Homework: For each module, there is a written homework assignment. Please read and follow the [Written Homework Instructions](#).

Written Homework submitted 4 days or more after the due date will not be accepted.

In most cases, grader feedback will provide sufficient information for you to understand the mistakes you made. If you feel that your solution to a specific problem was incorrectly graded, or if you don't understand what you did wrong despite grader feedback, ask specifically clarification about this problem from your instructor.

You should always verify that you have submitted an electronic assignment correctly. Double-check that Canvas received and registered your upload, and that you uploaded the correct file, after submitting. If Canvas has no record of you completing an electronic assignment, or if what you uploaded is not a readable PDF file, your grade for the assignment will be zero.

The Canvas Quizzes and the Written Homework are set to allow late submissions with a late penalty of 5% per day. Don't ask for time extensions on them.

In this course, **all assignments must be completed by the student**. Artificial Intelligence (AI), including ChatGPT and other related tools used for creating of text, images, computer code, audio, or other media, are not permitted for use in any work in this class. Use of these generative AI tools will be considered a violation of the [ASU Academic Integrity Policy](#), and students may be sanctioned for confirmed, non-allowable use in this course.

In all assignments, in addition to accuracy of results, having good organization, showing all work, and using complete sentences and illustrative diagrams are all part of homework assignments done well. Although these are rarely part of the scoring in online assignments, I encourage you not to cheat yourself of the full process of organizing and analyzing your thoughts to save a few minutes of time. The thought process of completing homework is an important step in your overall comprehension of the course material. Your effort to organize your work for a clear and coherent presentation leads naturally to deeper, more readily accessible understandings of the ideas. An attitude toward homework of "get the answer, write it, and circle it" *contributes little to effective learning*. My demand that you strive to do this is for your benefit. Please take this seriously in order to obtain the maximum benefit of the provided learning opportunities.

Please follow the appropriate University policies to request an [accommodation for religious practices](#) or to accommodate a missed assignment [due to University-sanctioned activities](#).

Exams:

See more information about the Exams in [Information about Exams and Quizzes](#) in Canvas.

Make up Exam Policy:

Make up exams are given at the discretion of the instructor and only in the case of verified medical or other **documented emergencies**. Students must notify the instructor via email **before the exam has passed**. If the event is not an emergency, the instructor must be notified at least 24 hours before the exam period has begun to request a make-up. The instructor is **not** required to accommodate such requests.

Discussion Board

- **All questions related to classwork or class logistics should be posted to discussions. Homework, classwork, class logistics questions emailed directly to the instructor will not be answered and the student will be directed to the discussion. Only private issues should be directly emailed to the instructors.**
- When you post on discussions, always include identifying information for the problem in the subject line, such as: Edfinity HW 5. problem 7.
- Post your question in the corresponding topic folder.
- Please search for the number of the problem you seek help on to see if there is already an existing discussion. Do not start new discussions if one already exists on the same problem. Please read the existing discussion first.
- Please include work. You may also photograph your written work and insert the image **inline**. On **Edfinity** problems, include a screenshot of your version of the problem. Trim the image so it shows only the problem. **All pictures must be inline. Do not attach pictures as files.**
- Do not use discussions to ask questions such as "I have no idea how to solve this problem. Can you help me?". Try to identify what you don't understand and include your best attempt to solving the problem.
- Do not use discussions for personal messages. Those should be sent by email to the instructor directly. Subjects that make a message personal include grade discussions, illness and SAILS accommodations.
- Stay on topic. Do not use discussions for discussions not related to this class.
- Do not use discussions to link to or promote third-party forum sites not affiliated with ASU.
- Please do not expect immediate replies. Instructors usually check the Discussion Board daily. In the meantime, other students are encouraged to add feedback and commentary. Instructors may also deliberately stay in the background so as to promote student-led discussions.

Preferred Name:

The School of Mathematical and Statistical Sciences encourages faculty to address and refer to students by their preferred name and gender pronoun. If your preferred name is different than what appears on the class roster, or you would like to be addressed using a specific pronoun, please let your instructor know.

The syllabus is a statement of intent and serves as an implicit agreement between the instructor and the student. Every effort will be made to avoid changing the course schedule, but the possibility exists that unforeseen events will make syllabus changes necessary. Any changes will be announced via Canvas

Departmental and University Policies and Procedures

For semester deadlines related to enrollment, withdrawal or payments, see the academic calendar available at <http://students.asu.edu/academic-calendar>

Disability Resources

Students who feel they will need disability accommodations in this class but have not registered with the Students Accessibility and Inclusive Learning Services (SAILS) should contact SAILS immediately. The SAILS Tempe office is located on the first floor of the Matthews Center

Building. SAILS staff can also be reached at: (480) 965-1234 (V) or (480) 965-9000 (TTY). For additional information, visit: www.asu.edu/studentaffairs/ed/drc.

ASU Policy Against Threatening Behavior

Per [SSM 104-02](#), all incidents and allegations of violent or threatening conduct by an ASU student (whether on-or off campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students. If either office determines that the behavior poses or has posed a serious threat to personal safety or to the welfare of the campus, the student will not be permitted to return to campus or reside in any ASU residence hall until an appropriate threat assessment has been completed and, if necessary, conditions for return are imposed. ASU PD, the Office of the Dean of Students, and other appropriate offices will coordinate the assessment in light of the relevant circumstances.

Title IX

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling>, is available if you wish discuss any concerns confidentially and privately.

Student Conduct Statement

Students are required to adhere to the behavior standards of the Arizona Board of Regents Policy Manual [Code of Conduct](#), Academic Affairs Manual ACD 125 [Computer, Internet, and Electronic Communications](#), and the ASU Student [Academic Integrity Policy](#). Students are entitled to receive instruction free from interference by other members of the class. If a student is disruptive, an instructor may ask the student to stop the disruptive behavior and warn the student that such disruptive behavior can result in withdrawal from the course. An instructor may withdraw a student from a course when the student's behavior disrupts the educational process according to procedures of the Student Services Manual [SSM 201-10](#).

Academic Ethics

It's highly unethical to bring to your instructor's attention the possible impact of your grade on your future plans, including graduation, scholarships, jobs, etc. For the university's complete policy regarding ethics, including cheating, plagiarism and other forms of academic dishonesty, see the Student Academic Integrity Policy at the following web address:

<http://provost.asu.edu/academicintegrity>