

# Syllabus

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## Course Number

MAT 243

## Course Title

Discrete Mathematical Structures

## Credits

3

## Prerequisites

Minimum Sophomore standing; MAT 210, MAT 251, MAT 265, or MAT 270 with C or better

## Faculty

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## Catalog Description

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

## Course Overview

The course teaches you about logic, sets, functions, elementary number theory and combinatorics, recursion, and mathematical reasoning, including induction and proof writing. It emphasizes connections and applications to computer science.

**You are expected to spend about 2 1/2 hours EACH DAY on this class including weekends.**

## Learning Outcomes

Learning outcomes are individually described for each week.

## Time Zone (IMPORTANT!!!)

**This class runs on Arizona time. All due dates on Blackboard and Webwork are in Arizona time. Tests are also scheduled with ProctorU based on Arizona time.**

Here is where it gets a little complicated. Arizona time is technically MST, all year round. Arizona does NOT change to Daylight Saving Time. As a result, Arizona is in the same time zone as the Mountain states during the winter months and in the same time zone as the Pacific states during the summer months.

For the duration of this course, Arizona is in the same time zone as California.

## Course Topics, Schedule & Grading

Activities used for instruction and assessment of learning include: watching instructional videos, reading the textbook, webwork homework, written homework, two midterm tests, a final exam and a final paper that involves proof writing. Sections in the textbook (and a few external links to web content) that are assigned "supplemental reading" are for enrichment only. You will not be tested on their content.

Click on "Course Schedule" on the left to see the course schedule.

Grade	Percentage
A+	97-100%
A	93 – 96.99%
A-	90-92.99%
B+	87 - 89.99%
B	83 – 86.99%
B-	80 - 82.99%
C+	77 - 79.99%
C	70 – 76.99%
D	60 – 69%
E/F	Below 60%

## Grading

### Grading Procedure

Grades reflect your performance on assignments and adherence to deadlines. The following table gives the weights that will be used to calculate your final grade

Webwork Assignments	15%
Written Homework Assignments	15%
Test 1	20%
Test 2	20%
Final Exam	20%
midterm and final proof paper	10%

There will be no curving of test grades, the final exam grades or the final grade. Your final grade will be assigned based on the course credit you have earned during the period from the first day of class to the final exam, with weights assigned to grade components as given in the table above. Your opportunity to earn course credit ends with the final exam. You will not receive extra credit assignments (except one, see below) before or after the final exam to raise your grade to a more desirable one. The table of percentages is to be taken literally – a grade of 89.99% is a B+.

ASU FACULTY DO NOT HAVE THE POWER TO DROP STUDENTS FROM THEIR CLASSES AFTER THE FIRST WEEK OF CLASS. If you are registered for the class but do not work, you won't be dropped from the class. You will receive a failing grade.

If you receive an academic status report that says that you are failing the class, you must act on it. Contact your instructor to discuss your performance in the class.

**Extra credit opportunity: if you find mistakes in one of the following webwork assignments: Unit 5 Proofs, Unit 8 More On Functions, Unit 14 Induction, Unit 15 Linear Recurrence, then you will get 1% added to your final grade for each mistake you found, for up to 5% extra credit.**

**To claim this extra credit, you MUST report the mistake you found on piazza. Make the headline "Bug Report" and in the body, say which problem it is and what is wrong with it.**

**Only the first person who reports a mistake can get credit for it. If more than one person reports on the same problem, piazza post time will decide who gets credit.**

### **Studying for the class:**

While diligent and timely completion of the homework assignments is necessary to pass the class, it is not sufficient to gain conceptual understanding. To master the concepts, you must

- review and study the powerpoints and the textbook thoroughly with the goal of understanding the connections between the concepts. If you could explain it to someone else clearly, then you are "getting it".

- create your own lists (or perhaps 3x5 cards) of definitions, procedures and theorems and commit them to memory like you would do with vocabulary in any language. Writing helps to build active knowledge.

You must learn and study continuously throughout the duration of the class. Relying on "just in time" cramming for exams is an ineffective study technique and will virtually guarantee failure in the class.

Do not abuse help. Math learning happens when you struggle with a problem. If you ask for help at the slightest sign of difficulty and are presented with the solution, you learn very little.

I wrote a document titled "[University Math](#)" that expands on these points. It is generic, not specifically intended for MAT 243, but

pertinent.

## Webwork

You will submit homework online through WeBWorkK. Click on WebWork on the left side to find some useful information about WebWork and a direct link.

If you added the class late, you may not have been imported into the Webwork roster. In that case, it is your responsibility to notify your instructor of that fact. Failure or delay in doing so will not entitle you to time extensions, or to be exempt from homework assignments that you missed.

You will see all due dates when you log into webwork. There will be no reminders of these due dates. You are expected to be aware of them and to work on the assignments on an ongoing basis. There will be no time extensions for homework assignments.

Murphy's Law of online homework systems: something always happens on the evening of the due date. You should work on homework assignments continuously and finish well before the due date. Failing to do this will not entitle you to a time extension in case of a server breakdown, broken computer or personal emergency.

If you need help with the homework, don't email me. Ask on piazza. See "seeking help" below for some guidelines on how to ask questions about piazza.

There is no automated way to import WebWork grades into blackboard. The only way to do it is to manually - and painstakingly - export webwork grades into a spreadsheet, edit that spreadsheet to match the format required by Blackboard, synchronize student rosters (withdrawn or dropped students are auto-removed from the blackboard roster but not from the webwork roster) and then to import that spreadsheet into blackboard. It is not reasonable to ask me to do this busy work every week only for your convenience of seeing your course grades in one place. Please don't. You can get your own WebWork grade by clicking "grades" on the left side, adding the points you have received and dividing by the number of points you could have received.

I will pull and calculate final WebWork grades when the class is over, and import those into Blackboard.

## Written Homework: typed and in PDF

For each week, there is a written homework assignment. Do not post your answer as a text submission. Submit it as a PDF file and use "attach file" to submit it.

Your solution document must be a single **PDF** file. Not several, not doc, ods or docx, not a text field, not jpgs.

Your solution document must contain **your name as a header** on each page. Do **not** put in your student ID, class, or other identifying information.

Do not copy the question text to your solution document. **Just the answers please**, preceded by the question number.

You will get no credit if you violate formatting guidelines.

### Composing your written homework

You have several options for the written homework. By far the easiest option is to type it using MS Word. You will have to use the equation editor for some parts, but it is pretty much self explanatory.

A free alternative to MS Word that produces superior results for scientific documents is **LaTeX**. It is the standard software for serious scientific typesetting, but requires a greater learning investment. If you are thinking about pursuing graduate studies, you will be doing yourself a real favor by learning and mastering LaTeX now. It's either now or later.

There is a good free latex tutorial: <http://www.ctan.org/tex-archive/info/short/english/>

Under Windows, the standard LaTeX distribution is <http://miktex.org/>

**Typeset proper mathematical notation and avoid runaway equations. Use appropriate line breaks.**

### REALLY BAD FORMATTING:

$$5^3(k+1)+2*5^2(k+1)-5^{(k+1)}-2=25*5^3n+1+25*5^2k-5^{(k+1)}=20*5^{(3k+1)}+5*5^{(3k+1)}+20*5^{(2k)}+5*5^{(2k)}-5^{(k+1)}=20(5^{(3k}5$$

Actual example of a solution I received. Don't expect me to grade or even read a mess like that. I'm not a compiler.

### STILL BAD FORMATTING, BUT BETTER:

$$\begin{aligned} &5^3(k+1)+2*5^2(k+1)-5^{(k+1)}-2 \\ &=25*5^3n+1+25*5^2k-5^{(k+1)} \\ &=20*5^{(3k+1)}+5*5^{(3k+1)}+20*5^{(2k)}+5*5^{(2k)}-5^{(k+1)} \\ &=20(5^{(3k+1)}+5^{2k})+5(5^{(3k+1)}+5^{2k}+5^k)-5 \\ &=20(5^{(3k+1)}+5^{2k})+5^k-5 \end{aligned}$$

### GOOD FORMATTING:

$$\begin{aligned} &5^{3(k+1)} + 2 \cdot 5^{2(k+1)} - 5^{k+1} - 2 \\ &= 25 \cdot 5^{3n+1} + 25 \cdot 5^{2k} - 5^{k+1} \\ &= 20 \cdot 5^{3k+1} + 5 \cdot 5^{3k+1} + 20 \cdot 5^{2k} + 5 \cdot 5^{2k} - 5^{k+1} \\ &= 20(5^{3k+1} + 5^{2k}) + 5(5^{3k+1} + 5^{2k} + 5^k) - 5 \\ &= 20(5^{3k+1} + 5^{2k}) + 5^k - 5 \end{aligned}$$

(Just for the record: these equations are also wrong.)

### Testing and ProctorU

Two tests and one final exam will be administered through Webwork. The time limit is 2 hrs for each test. There are no test retakes or "corrections", and you won't get extra credit assignments to make up for a bad test.

The final exam is cumulative and can test any material covered in

the class.

Testing procedures are the same for online and icourse students. NO ON-CAMPUS PROCTORING IS OFFERED FOR ICOURSE STUDENTS.

All Students will take their tests during a 24 hour period from 12:00AM MST to 11:59PM MST on the day of the test. Test days are found in the course schedule.

You can start tests at any time during this 24-hour period, however, once you open the test, you only have the testing time given above, or less, if you open the test too close to the submission deadline.

You will be able to schedule your exams with proctorU (see below) to start as late as 21:00PM MST, but I urge you not to cut it this close. Check-in time can be 15 minutes or more, and has in isolated cases been 30 minutes. If you schedule your test to start at 22:30, you may have one hour or less of test taking time. **Don't cut it this close.**

All tests are closed-book, closed-web, closed-notes, etc. You don't get to use a calculator or electronic devices other than the computer on which you are taking the test.

There is no reason to panic, you won't need a calculator on the tests.

The only test taking aid permitted is up to four sheets of scratch paper (front and back).

**All exams are proctored. For that, you must sign up for ProctorU.**

ProctorU (proctoru.com) is an online proctoring service. Sign up for ProctorU and schedule your tests at your earliest convenience. The days are set for each exam, but you get to pick the time of day. The company recommends that you sign up for tests at least two weeks ahead of time, so you should not delay this.

ProctorU requires you to have a simple webcam. You will be watched and recorded as you take your exam. Naturally, you need to have a reliable connection that remains on for the duration of the test for that. A wireless hotel connection is not the best option.

**OTHER THAN THIS WEBCAM, YOU CANNOT USE ANY CAMERAS ON THE TESTS. In particular, you can't use a camera to take screenshots of your test. Doing this is considered cheating and grounds for academic dishonesty proceedings.**

ProctorU will require you to show picture ID before you start your test. If you can't show them picture ID, they won't let you start your test.

ProctorU also requires you to have a mirror (any reflective surface) so you can show them the edges of your monitor. That's how they verify that you don't have notes posted there.

There is a fee for each exam.

Proctor-U costs are : \$8.75 for up to 30 minutes. \$17.00 for up to an hour. \$22.50 for up to two hours, \$31.25 for up to three hours and \$40 for up to four hours.

**The following procedures have to be observed:**

1. Firefox is the recommended browser for webwork tests.
2. Each problem in the test contains a Preview Problem button. It is recommended you click on Preview Problem after you enter each answer so that it will be recorded in the log files (in case the internet goes down or there are other technical issues). The Grade Test button is located at the end of the test. You have two submissions available for each test. After clicking on Grade Test for your first submission, you will be able to see which questions are incorrect. **WRITE DOWN WHICH QUESTIONS ARE INCORRECT BEFORE YOU START WORKING ON FIXING THEM.** From this point on do not click Preview or Enter. Just finish answering the test and click Grade Test. \*\*
3. Do not log out or click on the Back button while taking the test.
4. While taking the test, do not leave the test website and open WeBWorK in another tab. If you do have webwork open in another window, you will be logged out from the test and all the answers you entered will disappear.
5. If you ignore these rules or simply fail to take the test during the 24hr window without a documented medical or personal emergency, I am under no obligation to give you a second chance. If I decide to do that, you will get a 20% grade penalty on the test. This means that I will subtract 20% from your percentage grade for that test.
6. Bathroom breaks during proctored tests are NOT permitted. Please plan ahead and go to the bathroom before you start your test.
7. Cell phones and any internet capable devices are not allowed during an exam (except for the computer you are working on). Accessing any such device for any reason will result in a score of 0 for that exam and possible further disciplinary action."
8. You are not allowed to use notes of any kind on the exams, nor can you take pictures of your exams. Attempting to take pictures of your exam is grounds for academic dishonesty proceedings.

\*\*While the phrase "two attempts" is a fitting description for the two submissions you have on each test, it is a really bad idea to use it with a ProctorU proctor, because it invariably creates the wrong idea. You start talking about "two attempts", and they think you're saying you're entitled to a second 2 hour testing window, where you take a brand new version of the test, which of course hasn't been scheduled, because it doesn't exist.

So the next thing you know, they'll be giving you all kinds of misleading information.. that you haven't paid for the second attempt, and that you have to pay for it, sending you into a panic of confusion because that's the first time you've heard that you needed to pay them double for the privilege of pressing a certain button on your test a second time.

All because you couldn't keep your mouth shut and had to confuse them with talk of "two attempts". ;) This has happened in several previous session exactly as I just described.

I created a note for ProctorU for each test to clarify that there are two graded submissions of each test, and still, I get emails like this one from confused ProctorU proctors:

"A test taker let one of our proctors know that he had two attempts to complete this exam, however, in our notes it looks like nothing is stated about the number of attempts each test taker should receive. We were hoping to confirm this with you if possible. "

I'm sharing this with you to ask your cooperation to avoid this and similar situations. **You don't need the proctor's permission to press the grade button, whether it's for the first or the second time.** Their job is to verify your identity, give you the password to let you start and then watch you, not to micromanage your test taking. Let sleeping dogs lie and **don't confuse them by volunteering details of testing mechanics that will provoke misunderstandings.**

## The midterm and final proof papers

You will receive two proof writing assignments that you should think of not as homeworks (where you can collaborate with each other and ask questions on Piazza) but as exams. You are expected to complete these assignments on your own, without help from others.

Each proof paper will be a timed assignment. It will only become available on the day it is due. Then you will have one hour to write each paper and turn it in.

The same formatting and submission rules apply as for the written homework assignments.

## Communicating With the Instructor and Seeking Help

This course uses Piazza for general questions about the course. Prior to posting a question, please check the syllabus, announcements, and existing posts. If you do not find an answer, post your question. You are encouraged to respond to the questions of your classmates.

When you ask homework related questions on piazza, make sure to mention the assignment and problem number in the subject line, and to include a full description of the problem you are working on as a courtesy. For webwork problems, a screenshot is best. Most importantly, you must be specific about the work you have done so far. Show your wrong / partial solution and indicate how you got it. Just saying "I can't figure it out", "it's not working", etc, is not helpful.

Email questions of a personal nature to your instructor or assigned TA. You can expect a response within 48 hours.

## Online Course



This is an online course. There are no face-to-face meetings. You can log into your course via MyASU or <https://my.asu.edu>.

## Email and Internet

ASU email is an [official means of communication](#) among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly.

***All instructor correspondence will be sent to your ASU email account.***

## Course Time Commitment

This three-credit course requires approximately 135 hours of work. Please expect to spend around 18 hours each week preparing for and actively participating in this course.

## Late or Missed Assignments

Notify the instructor **BEFORE** an assignment is due if an urgent situation arises and the assignment will not be submitted on time. Published assignment due dates (Arizona Mountain Standard time) are firm. Please follow the appropriate University policies to request an [accommodation for religious practices](#) or to accommodate a missed assignment [due to University-sanctioned activities](#).

## Submitting Assignments

All assignments, unless otherwise announced, **MUST** be submitted to the designated area of Blackboard. Do not submit an assignment via email.

## Drop and Add Dates/Withdrawals

This course adheres to a compressed schedule and may be part of a sequenced program, therefore, there is a limited timeline to [drop or add the course](#). Consult with your advisor and notify your instructor to add or drop this course. If you are considering a withdrawal, review the following ASU policies: [Withdrawal from Classes](#), [Medical/Compassionate Withdrawal](#), and a [Grade of Incomplete](#).

Withdrawal: A student may withdraw from a course with a grade of W during the withdrawal period. The instructor's signature is not required. A complete withdrawal must be done in person and that it involves withdrawing from all ASU classes, not just Math 265.

Students will not be withdrawn if they merely stop coming to class. It is a student's responsibility to verify whether they have in fact withdrawn from a class. The course withdrawal deadline for this class is **April 3rd, 2015**.

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 passing (70% or higher) 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.

## Grade Appeals

Grade disputes must first be addressed by discussing the situation with the instructor. If the dispute is not resolved with the instructor, the student may appeal to the department chair per the [University Policy for Student Appeal Procedures on Grades](#).

## Student Conduct and 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>. Additionally, required behavior standards are listed in the [Student Code of Conduct and Student Disciplinary Procedures](#), [Computer, Internet, and Electronic Communications policy](#), and outlined by the [Office of Student Rights & Responsibilities](#). Anyone in violation of these policies is subject to sanctions.

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.

[Students are entitled to receive instruction free from interference](#) by other members of the class. An instructor may withdraw a student from the course when the student's behavior disrupts the educational process per [Instructor Withdrawal of a Student for Disruptive Classroom Behavior](#).

Appropriate online behavior (also known as *netiquette*) is defined by the instructor and includes keeping course discussion posts focused on the assigned topics. Students must maintain a cordial atmosphere and use tact in expressing differences of opinion. Inappropriate discussion board posts may be deleted by the instructor.

The Office of Student Rights and Responsibilities accepts [incident reports](#) from students, faculty, staff, or other persons who believe that a student or a student organization may have violated the Student Code of Conduct.

The next paragraph clarifies what is considered appropriate behavior.

## Expectations of Students an Online Course

- Students will abide by the rules and the timelines that are explained in the course syllabus.
- Students will not engage in dishonest practices such as hiring outsiders to do work or sit in for exams, with penalties up to and including expulsion from the university.
- Students need to understand that "online" does not mean "unproctored", and that at least half of the grade comes from proctored assessments, through ProctorU or through an approved third-party testing center. Students also understand there will be fees associated with these proctoring services that they are responsible for.
- When working on unproctored components of the course,

they are bound by the same ethical rules of behavior regarding the use of unauthorized assistance.

- Students understand that they must purchase all required items as described in the syllabus.
- Students understanding that the course's timeline has certain assessments set for certain dates so as to maintain integrity for the course. Therefore, they cannot take exams or other proctored assessments early if the course does allow for that.
- Students understand that the content on the Course Shell (videos, powerpoints, etc.) is meant to help them develop conceptual understanding, and not necessarily meant to walk them step-by-step through every conceivable example. Related to this, students understand there will be homework problems that may not "look like" what was shown in the videos. It is expected that they will use this conceptual knowledge to determine a solution to such problems.

Regarding the instructor:

- Students understand that their instructor cannot answer all emails instantaneously. He or she may set aside a couple of hours per day to monitor emails, but to expect 24-hour service, 7 days a week is not reasonable.
- Students will not send aggressive, provocative, abusive, vulgar or profane emails to their instructor or to fellow students in any forum related to this course, for any reason or circumstance. Students understand that violating this rule will have consequences from immediate withdrawal from the course to more severe sanctions at the university to an including removal from my course of study or expulsion

Regarding Online Homework Systems:

- Students understand that they must pursue the homework in an online course as they would in a face-to-face course, meaning that they must engage with the material by watching the videos, taking notes, and working out problems on sheets of paper.
- Students agree not to "randomly guess" answers online and email their instructor over and over again when they don't get the right answer. Guessing should not be an integral part of this course. In any event, homework related questions should be posted on Piazza, not emailed to the instructor.
- Ultimately, students understand that an online course demands the exact same dedication as would be expended for a face-to-face course. Students will set aside regular time to attend to their studies in an online course, and play by the exact same rules and expectations. Online is not "easier" and that students should not abuse the online environment simply because there is no one watching them.

### **Prohibition of Commercial Note Taking Services**

In accordance with [ACD 304-06 Commercial Note Taking Services](#), written permission must be secured from the official instructor of the class in order to sell the instructor's oral communication in the form of notes. Notes must have the notetaker's name as well as the instructor's name, the course number, and the date.

### **Course Evaluation**

Students are expected to complete the course evaluation. The feedback provides valuable information to the instructor and the college and is used to improve student learning. Students are notified when the online evaluation form is available.

### Participation Verification for students on financial aid

Students who receive financial aid and need to maintain minimum GPAs and/or completion rates should be aware that since there is no physical class attendance in an online class, online instructors will certify last days attended/participated based on verifiable participation only, such as submitted assignments, exams taken, participation in online discussion such as piazza, or communicating with the instructor by email. Instructors cannot verify attendance or participation based on your assurances that you watched videos, read powerpoints, etc.

### Syllabus Disclaimer

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. Please remember to check your ASU email and the course site often.

### Accessibility Statement

In compliance with the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act as amended (ADAAA) of 2008, professional disability specialists and support staff at the Disability Resource Center (DRC) facilitate a comprehensive range of academic support services and accommodations for qualified students with disabilities.

[Qualified students with disabilities may be eligible to receive academic support services and accommodations.](#) Eligibility is based on qualifying disability documentation and assessment of individual need. Students who believe they have a current and essential need for disability accommodations are [responsible for requesting accommodations and providing qualifying documentation](#) to the DRC. Every effort is made to provide reasonable accommodations for qualified students with disabilities.

Qualified students who wish to request an accommodation for a disability should contact the DRC by going to <https://eoss.asu.edu/drc>, calling (480) 965-1234 or emailing DRC@asu.edu. To speak with a specific office, please use the following information:

**ASU Online and Downtown  
Phoenix Campus**  
University Center Building, Suite  
160  
602-496-4321 (Voice)

**Polytechnic Campus**  
480-727-1165 (Voice)

**West Campus**  
University Center Building  
(UCB), Room 130  
602-543-8145 (Voice)

**Tempe Campus**  
480-965-1234 (Voice)

## Computer Requirements

This course requires a computer with Internet access and the following:

- Web browsers ([Chrome](#), [Internet Explorer](#), [Mozilla Firefox](#), or [Safari](#))
- [Adobe Acrobat Reader](#) (free)
- [Adobe Flash Player](#) (free)
- Microphone (optional) and speaker

## Technical Support

This course uses Blackboard to deliver content. It can be accessed through MyASU at <http://my.asu.edu> or the Blackboard home page at <https://myasucourses.asu.edu>

To monitor the status of campus networks and services, visit the System Health Portal at <http://syshealth.asu.edu/>.

To contact the help desk call toll-free at 1-855-278-5080.

## Student Success

This is an online course. To be successful:

- check the course daily
- read announcements
- read and respond to course email messages as needed
- complete assignments by the due dates specified
- communicate regularly with your instructor and peers
- create a study and/or assignment schedule to stay on track

