

Concepts and Techniques in Discrete Mathematics
MATH 5340
Fall 2017

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Time and Place of Class Meetings: Monday 5:30-8:20pm, PKH 311

Blackboard Site: elearn.uta.edu

What is this course? Discrete mathematics deals with discrete objects, formed of distinct and disconnected elements, such as the natural numbers, in contrast to objects that constitute a continuum, such as the set of real numbers. In this course, emphasis will be on solving problems and gaining an in-depth understanding of the material. Our goal will be to stretch and extend your mathematical knowledge. We will focus on the essential elements of discrete mathematics, as expressed in the Texas Essential Knowledge and Skills (TEKS). Thus, the list of topics which we will cover is more focused than you may find in a regular course on discrete math. The text will be supplemented by material and problems from mathematics research papers, historical essays and other articles, a text of integrated mathematics designed for secondary teachers, and other nifty stuff. And all along the way we will be connecting the mathematics with what discrete mathematics builds upon and what follows from it, with an eye toward where it fits in the high school mathematics curriculum.

Each class will be a combination of lecture and interactive work sessions. Activities will include working in groups on selected problems, presenting solutions on the board, and analyzing selected student solutions for correctness and clarity. You will be expected to be an active participant in the course.

Required text: *Discrete Mathematics: An Open Introduction* by Oscar Levin, second edition. This is an open textbook (licensed to be freely used and distributed.) You can access this book in three formats:

- 1) Download the pdf of the text directly from our course Blackboard page
- 2) Utilize the online interactive version of the text at <http://discretetext.oscarlevin.com/dmoi/> and/or
- 3) Purchase a print edition through Amazon (\$12.50) or CreateSpace eStore (\$12.50).

Supplementary materials from various sources to be handed out in class.

Homework: Each class you will be given a set of problems to help you prepare for three tests that will be given during the course (2 midterms and a final). Some of these problems will be worked on during class and others with classmates outside of class. You will also have three homework assignments to write up and hand in. For full credit, submitted homework must be neat and clearly legible, handed in on time, and all steps and justifications that cannot be done easily in a standard reader's head must be included (you may think of the standard reader as a being a random classmate.)

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Exams: There will be two in-class midterm exams (approximately an hour and twenty minutes each) and one take-home comprehensive final exam. The final exam will be handed out the last week of class.

Missed classes: If you must miss a class in which homework is due, just make sure it gets to me before the due date. No late homework please, and no make-up exams. One lowest homework or midterm exam score will be dropped.

Grades:

Midterms and Homework: 70% (Best 4 of 3 HW and 2 midterm scores)
Final exam 30%

A total score of 90% or above guarantees an A, 80% or above a B, and 70% or above a C, etc.

Course outline:

- Unit 1: Functions on Discrete Sets, Orders of Infinity
- Unit 2: Counting
- Unit 3: Sequences and Recursion
- Unit 4: Graph theory
- Unit 5: Divisibility Properties of Integers, Diophantine Equations
- Unit 6: Modular Arithmetic and Applications
- Interspersed throughout: logic and techniques of mathematical proof

Course schedule: This schedule may be adjusted to meet the educational needs of the students enrolled in this course.

Date	Sections studied
August 28	
September 4	Labor Day holiday – no class
September 11	
September 18	
September 25	
October 2	First HW set due
October 9	Exam 1
October 16	
October 23	
October 30	Second HW set due
November 6	
November 13	Exam 2
November 20	
November 27	Third HW set due
December 4	
December 11	Final Exam due

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University Policies and Information:

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University. Additional information is available at <https://www.uta.edu/conduct/>.

Attendance Policy: At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I have established the attendance policy outlined in the expectations above. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session.

The last day to drop classes is November 1.

It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and

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Section 504 of the Rehabilitation Act. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of **a letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Non-Discrimination Policy: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.*

Title IX Policy: The University of Texas at Arlington (“University”) is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.*

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

Student Feedback Survey: At the end of each term, students enrolled in face-to-face and online classes categorized as “lecture,” “seminar,” or “laboratory” are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback via the SFS database is aggregated with that of other students enrolled in the course. Students’ anonymity will be protected to the extent that the law allows. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <http://www.uta.edu/sfs>.

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Final Review Week: for semester-long courses, a period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include [tutoring](#), [major-based learning centers](#), developmental education, [advising and mentoring](#), personal counseling, and [federally funded programs](#). For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at <http://www.uta.edu/universitycollege/resources/index.php>.

Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

The IDEAS Center (2nd Floor of Central Library) offers **free** tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email IDEAS@uta.edu or call (817) 272-6593.

The Library's 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation. <http://library.uta.edu/academic-plaza>

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Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, [which is located in the stairwell to the right when you exit the classroom](#). When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

You are encouraged to subscribe to the MavAlert system that will send information in case of an emergency. Anyone can subscribe at <https://mavalert.uta.edu/> or <https://mavalert.uta.edu/register.php>

Emergency Phone Numbers:

In case of an on-campus emergency, call the UT Arlington Police Department at

817-272-3003 (non-campus phone)
2-3003 (campus phone)

You may also dial 911.

Non-emergency number 817-272-3381