

Course Information

Course Number: CSCE222
Course Title: Discrete Structures for Computing
Credit Hours: 3

Section: 502
Time: Tue/Thr 12:45 P.M. to 2:00 P.M.
Location: ZACH 244

Instructor Details

Instructor: Dr. Dylan Shell
Office: PETR 315
Phone: (979) 845-2369
E-Mail: dshell@tamu.edu
Office Hours: Walk-ins: Wednesdays 2:00 P.M. to 3:00 P.M.,
Also: by appointment.

Course Webpage: <http://robotics.cs.tamu.edu/dshell/cs222>

Course Description

This course provides the mathematical foundations from discrete mathematics for analyzing computer algorithms, for both correctness and performance; introduction to models of computation, including finite state machines and Turing machines.

Course Pre- and co-requisites

Students must have completed MATH 151, or an equivalent course.

Course Objectives

At the end of the course, students will understand the basic principles of logic, proofs and sets. Students will be able to apply results from discrete mathematics to the analysis of algorithms. Students will be able to produce proofs by induction and apply counting/enumeration techniques. Students will have a basic understanding of models of computation.



Course Learning Outcomes

It is expected that successful participation in the course will allow the student to demonstrate:

- a basic understanding of logic and predicates;
- the application of basic techniques for formal proof;
- the ability to use these concepts in the analysis and design of algorithms;
- a basic understanding of classical models of computation.

Textbook and/or Resource Materials

Required:

Kenneth Rosen, *Discrete Mathematics and Its Applications*, 8th Ed., McGrawHill, 2019.
ISBN: 978-1-25-967651-2.

Grading Policy

- The grading scale is:
 - A 90-100
 - B 80-89
 - C 70-79
 - D 60-69
 - F 59 or below
- Grades will be based on:
 - 30% : Final examination
 - 25% : Midterm exam I
 - 25% : Midterm exam II
 - 20% : Homework

Late Work Policy

- The due dates for the homework appears below on this syllabus. Occasionally the instructor will permit a moderate extension to the deadlines, those extensions will apply to every student equally, and will be communicated in class and posted on the class website.
- For programming assignments and the communication project, we have a late policy with a discount of 33.3% per day. This is computed by the minute (not as a step-function at midnight) which works out to follow this rule (where t is in units of minutes late):

$$\text{AwardedScore} = \max(0, (4320 - t)/4320) \cdot \text{RawScoreAsIfNotLate}$$



- The discounting is linear and reaches zero after 3 days.
- The midterm and final exams, being examinations, are not permitted to be late; they will be in-person written examinations. Midterms will be taken during class.
- Standard university reasons for lateness shall be respected so long as the student communicates with the instructor as soon as possible—this means, specifically, it has been communicated before the deadline has passed and not *ex post facto* whenever feasible. (Note that job interviews and attendance of the career fair are, as per Student Rule 7, generally not excused absences.)

Course Schedule

Week-by-week topic breakdown (timeline is approximate, and intended for guidance only)

Date	Wk	Topic	Textbook Readings
8/20, 8/22	1	Course Introduction. Propositional and Predicate Logic	1.1-1.5
8/27, 8/29	2	Inference and Proofs	1.6-1.8
9/3, 9/5	3	Sets, Functions	2.1-2.3
9/10, 9/12	4	Algorithms and their complexity	3
9/17, 9/19	5	Sequences and sums,	2.4-2.5
9/24, 9/26	6	Proof by Induction	5.1-5.2
10/1, 10/3	7	1 st Oct: Midterm I	
10/8 , 10/10	8	Guest lecture	
10/15, 10/17	9	Recursive Functions	5.3-5.5
10/22, 10/24	10	Combinatorics, counting, and enumeration	6
10/29, 10/31	11	31 st Oct: Midterm II	
11/5, 11/7	12	Recurrences and their solution	8.1-8.3
11/12, 11/14	13	Relations	9
11/19, 11/21	14	Grammars and Languages	13.1-13.4
11/26, 11/28	15	Turing Machines	13.5
<i>Comprehensive Final Exam (Tuesday, Dec 10th, 8:00 A.M. - 10:00 A.M.)</i>			

University Writing Center

The University Writing Center (UWC) has trained peer consultants available to work with you on any kind of writing or speaking project, including research papers, lab reports, application essays, or creative writing, and at any stage of your process, whether you're deciding on a topic or reviewing your final draft. You can also get help with public speaking, presentations, and group projects. We can work with you in person at our Evans or BLCC locations or via Zoom or email. To schedule an appointment or to view our handouts, videos, or interactive learning modules, visit writingcenter.tamu.edu. If you have questions, need help making an appointment, or encounter difficulty accessing our services, call 979-458-1455 or email uwc@tamu.edu.

[Boilerplate required sections appear below.]

University Policies

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines. Please pay careful attention: an interview is only considered an excused absence in very particular circumstances, which tend to happen very rarely for CS jobs.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor. In cases where the decision is at the instructor's discretion, the likelihood of an accommodation/makeup is directly related to whether the student communicates with the instructor as soon as possible; requests for foreseeable absences that are made only after the absence will not be granted.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See [Student Rule 24](#).)

Academic Integrity Statement and Policy

“An Aggie does not lie, cheat or steal, or tolerate those who do.”

“Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one’s work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case” ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu. Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention -



including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, you will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.