TEXAS A&M UNIVERSITY

Course Syllabus Fall 2022

Course Information

Course Number: CSCE 222

Course Title: Discrete Structures for Computing

Section: 597 (Lectures are asynchronous online*)

Credit Hours: 3

* 100% online course through the Canvas platform `https://canvas.tamu.edu/`

Instructor

Name: Prof. Dr. Hyunyoung Lee

Office: PETR 419

Phone: 979 845 2490 (the best way to reach me is by e-mail)

E-mail: `hlee42@tamu.edu`

Office Hours: Wednesdays and Thursdays 10:30am–12noon, on Zoom (access via Canvas); other times by appointment (send email to make an appointment)

Teaching Assistants (TAs)

Information on the TAs' Zoom office hours and their email addresses are all available on Canvas.

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 Prerequisites

MATH 151

Course Learning Outcomes

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

Course Activities, Assessments, Grading Policy

- Two midterm exams (each for 50 minutes) and one comprehensive final exam (for 90 minutes): Each exam is worth 20% of your grade. All three exams will be done online and proctored using Zoom. The exam dates and times are as below. You will pick one time slot for each exam. More details will be available on Canvas.
  - Exam 1: Tuesday, September 27. Time 1: 1:00-1:50pm, Time 2: 6:00-6:50pm
  - Exam 2: Tuesday, November 1. Time 1: 1:00-1:50pm, Time 2: 6:00-6:50pm
  - Final Exam: Monday, December 12. Time 1: 10:30am-12:00noon, Time 2: 1:00-2:30pm

- Homework: There will be eight sets of problem solving homework, for which you are required to use the LaTeX typesetting system to type in your answers. All assignments will be announced in the Modules section in Canvas and must be submitted using the submission link on Canvas. One lowest homework grade will be dropped.
- Practice Quizzes: After watching a few video clips, you are required to take quiz on the contents discussed in the videos. One lowest practice quiz grade will be dropped.
- Mastery Quizzes: After studying a set of topics, you are required to take the mastery quiz on the topics. One lowest mastery quiz grade will be dropped.

Assessment Category		Weight
Exams	Exam 1	20%
	Exam 2	20%
	Final Exam	20%
Homework Assignments		20%
Quizzes	Practice Quizzes	10%
	Mastery Quizzes	10%

Final grades will be assigned according to this scale based on the weighted final average:

A: 90 and above, B: [80–90), C: [70–80), D: [60–70), F: below 60

The scale may be adjusted by the instructor to reflect score variations.

Textbook, Resource Materials, Course Technology

Lecture Notes and Resource Materials: Lectures will be based on the lecture notes on Discrete Structures written by Dr. Klappenecker and Dr. Lee (who is the instructor of this course). Chapters from the lecture notes will be available for your reading for free on Perusall according to the course schedule. You will find the link to the Perusall system in the navigation menu on Canvas.

Supplemental material for your own additional reading is Kenneth Rosen's *Discrete Mathematics and Its Applications* 7th or later edition, McGraw-Hill, but this is optional.

Canvas: This course will use the TAMU Canvas LMS (Learning Management System) as the virtual classroom. Within Canvas, you will find all course-related content and assessments (including but not limited to course materials, schedule, links to videos, activities, assignments, etc.). The recommended browsers for Canvas access are Google Chrome 98 and 99 or Firefox 97 and 98 (Extended Releases are not supported), Edge 98 and 99, and Safari 14 and 15 (Mac only). For additional information on supported browsers for Canvas, please visit
`https://community.canvaslms.com/t5/Canvas-Basics-Guide/tkb-p/basics` and click on the question "What are the browser and computer requirements for Canvas?"

Within Canvas, the course navigation menu is located on the left. The syllabus and course introductory materials can be found within the Home section. The course content is presented within Modules; once you are on the Modules page, you access each weekly module. All due dates are posted within the modules. If you have any questions about navigating the Canvas course website, please contact the instructor.

Technology Requirements:

- Reliable and frequent access to a computer and to the high-speed Internet.
- To attend virtual office hours and take the zoom proctored exams, students need to make sure they have setup TAMU Zoom (`https://tamu.zoom.us`) to run on their computer(s) and mobile devices. The zoom links for office hours are available in the Zoom section in Canvas. Please prepare external microphone and webcam when using Zoom if your device does not have those functionalities of decent quality. For the proctored online tests, students will need a second device with Zoom installed so the proctor can see the student, the student's computer screen (on which the student is taking the test) and the student's surroundings while the student is taking the test.
- Students will need the LaTeX typesetting system (installing it on their computer is strongly recommended). Students will need to type in their solutions for the homework problems using LaTeX. The system is freely available to download from the internet. For more information on LaTeX, visit `https://ctan.org/starter` or `https://people.engr.tamu.edu/hlee42/csce222/Getting-Started-with-LaTeX.pdf`.

Course Topics, Calendar of Activities, Major Exam Dates: *Tentative* schedule; please refer to the Modules page on Canvas for more details.

Week	Dates	Topics	Reading
1	8/24–8/26	Introduction; Knight's Tour	Ch. 1
2	8/29–9/2	Mathematical Arguments	Ch. 2
3	9/5–9/9	Mathematical Arguments (Cont.); Sets	Ch. 2, 3
4	9/12–9/16	Relations and Functions; Floor and Ceiling Functions	Ch. 3, 7
5	9/19–9/23	Equivalence Relations; Partial Orders	Ch. 5, 6
6	9/26–9/30	Proof by Induction; Exam 1 (Ch. 1–3, 5–7)	Ch. 4
7	10/3–10/7	Proof by Induction (Cont.)	
	10/10–10/11	Fall Break, no classes	
8	10/12–10/14	Asymptotic Analysis	Ch. 11
9	10/17–10/21	Run-time Complexity of Algorithms; Counting	Ch. 11, 12
10	10/24–10/28	Counting (Cont.)	Ch. 12
11	10/31–11/4	Generating Functions; Exam 2 (Ch. 4, 11, 12)	Ch. 13
12	11/7–11/11	Generating Functions (Cont.); Recurrence Relations	Ch. 13, 14
13	11/14–11/18	Recurrence Relations (Cont.)	Ch. 14
14	11/21–11/22	Models of Computation	Ch. 17
	11/23–11/25	11/23 Reading day, 11/24–25 Thanksgiving Holiday	
15	11/28–12/2	Models of Computation (Cont.)	Ch. 17
16	12/5–12/7		

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Course Policies

Course Conduct and Academic Integrity: Each assignment will be done individually. Note the following acceptable/unacceptable collaborations:

- Acceptable collaboration includes: (1) discussing the assigned problems to understand their meaning or (2) discussing possible approaches to assigned problems. However, you must explicitly acknowledge any help received from someone and reference every source you use, whether it is a person, a book, a paper, a solution set, a web page or whatever.
- Unacceptable collaboration includes: (1) copying (verbatim use) of someone else's solution, physical papers or computer files (including program files), either wholly or in part, however you have access to them, (2) submission of solutions that are jointly authored, or authored either wholly or in part by other individual, or (3) providing physical papers or computer files (including program files) of your (or third-party) solutions to other individuals.

In general, the strategy and approach of solutions may be discussed together but all *actual solutions must be constructed and written up by the student yourself*, and the final product must not be shared in any way even after the deadline has passed and even after the course is over. You should make sure all of your files are properly secured since you may be responsible if someone copies your files. Should questions arise during the course of working on a problem, immediately contact the instructor by email or by office hour visit.

On all assignments and examinations at Texas A&M University, the following Honor Pledge shall be preprinted and signed by the student: *"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."* In this online course, submitting any work online assumes that the student signed the above statement electronically.

Attendance Policy: Class attendance and course participation is mandatory. Attendance and course participation will be measured by watching the video lectures, reading the lecture notes on Perusall, participation in discussion forums, submitting assignments, taking quizzes and exams. Students should be logging into the Canvas course page to view videos and participate in the course everyday during the weekday. Medical reasons or other extenuating conditions beyond the control of the student must be properly documented. Discuss unusual circumstances *in advance* with the instructor when possible. For more information, see
`https://student-rules.tamu.edu/rule07`.

Submission of Work, Deadline Policy, and Late Submission Policy: All assignments must be submitted electronically using the submission link set up by the instructor on the Canvas course page by the due date and time specified in each assignment. E-mail submissions will not be accepted (they will be ignored without notice).

Late submission beyond the deadline will not be accepted in general, unless a university sanctioned excuse is provided *ahead of time*. At the beginning of every module, read the lesson plan for the module very carefully, and plan accordingly in advance. In case you have difficulties finishing an assignment contact the instructor *before* the deadline. Note that work turned-in on time is eligible for partial credit.

Regrading Policy: A student can request regrading of any graded material if the student believes that the points assigned are inconsistent with the quality and merits of the submitted work. To request regrading the student needs to follow the guidelines below:

1. Regrading requests must be submitted *to the instructor within 48 hours* after the graded item has been returned to the student. After this time limit no regrading requests will be honored.

2. Regrading requests must be in written form (via e-mail; make sure that you receive the confirmation response from the instructor or the TA). Your requests must be accompanied by a reasonable amount of specific justification and documentation.

Course Copyright Statement: The materials used within this course are copyrighted. These materials include, but are not limited to, the syllabi, quizzes, exams, homework problems, lecture notes, and handouts, course videos, etc. Because these materials are copyrighted, you do not have the right to copy or distribute these materials, unless permission is explicitly granted by the instructor.

Communication Expectations: The best way to contact the instructor (or the TA) for this course is via email (see contact information at the top of this syllabus or the Canvas homepage). Students should expect a response from the instructor or the TA no later than 24 hours after an email is sent.

Minimum Technical Skills: A participant of this course must be able to utilize a computer system and perform the following functions:

- Operate a Mac/PC computer system to manage files, install and execute computer programs such as the LaTeX typesetting system.
- Connect, configure and use peripherals such as a headset, webcam or microphone.
- Navigate through the web-based systems such as Canvas and Perusall and their pages using a browser (e.g. Chrome or Firefox).
- Be familiar with how web conferencing software (such as Zoom) operates.

Netiquette Expectations: Netiquette is network etiquette. Netiquette covers common online courtesy and respectful communication. TAMU Instructional Technology Services provides some general netiquette rules that students and faculty are expected to follow in this course. For more information on netiquette, please visit
`https://distance.tamu.edu/Student-Rules-and-Policies/Aggie-Honor-Code-and-Netiquette`

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 (`https://student-rules.tamu.edu/rule07/`) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

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.

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. `https://student-rules.tamu.edu/rule24/`)

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 `https://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules`).

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

Statement of Plagiarism: As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writing, etc. which belong to another. Plagiarism is one of the worst academic violations, for the plagiarist destroys trust among others. If you have any questions regarding plagiarism, please refer to Section 20.1.2.3.5 of the Texas A&M Honor System Rules, `https://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules`.

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 the Disability Resources office located in the Student Services Building or at (979) 845-1637 or visit `https://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 at `https://rules-saps.tamu.edu/PDFs/08.01.01.M1.pdf`):

- 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, a person who is subjected to the alleged conduct 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) (`https://caps.tamu.edu/`).

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 (`https://titleix.tamu.edu/`).

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 healthy self-care by utilizing available resources and services on your campus. Students who need someone to talk to can contact Counseling & Psychological Services (CAPS) or 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`.

Export Control Statement: United States export control laws regulate the release of goods and technologies that affect U.S. national security or foreign policy interests. Distance education students and course content MUST comply with these U.S. export control laws. If TAMU indicates that you are attempting to access course content from an IP address associated with a country currently subject to economic and trade sanction, your TAMU NetID account will be terminated and you will be contacted by the TAMU Export Control Office and the Office of Identity Management. For additional information visit,
`https://vpr.tamu.edu/initiate-research/export-controls`.

Getting Started: To get started within this course, you will need to:

- Read and study the syllabus in its entirety
- Login to the Canvas course website (`https://canvas.tamu.edu`)[1] to:
  - ensure that you have access and the correct plug-ins installed,
  - update your user profile,
  - spend some time becoming familiar with the course layout, and
  - check on the announcements section in case you missed any prior announcements. All email announcements will be sent via Canvas announcement and so they can all be found

[1]To log in to Canvas: (1) Go to `https://canvas.tamu.edu/` (2) Click the Login button (3) Use your TAMU NetID and password to log in. Once logged into Canvas, you will see a list of all courses for which you are enrolled in for the semester. To navigate to this course, click on the name of the course. If you have any problems logging into the course, please see the technology support section below.

on Canvas[2].

Course Support: In addition to contacting the instructor or TA for course content related questions, there is a variety of campus resources for course support.

Technology Support: For technological issues related to Canvas and software, contact the TAMU IT Help Desk Central (available 24 hours a day, 7 days a week, 365 days a year):

- Website: `https://it.tamu.edu/help/` (Online Chat is available; check on the webpage for walk-in hours)
- Phone: (979) 845-8300
- Email: helpdesk@tamu.edu

If your technical problems are unable to be resolved within 24 hours, please contact the instructor for additional assistance. *Technology issues are not an excuse for missing a course requirement – make sure your computer is configured correctly and address issues well in advance of deadlines.*

[2]Make sure that you set it in a way that whenever such announcements are made on Canvas, it is sent to your TAMU email and you check your email often at least twice a day, in the morning and in the evening.