Syllabus CSCE 411/629

Course Information

Course Numbers:	CSCE 411-503, CSCE 629-603 (Klappenecker)
Course Titles:	Design and Analysis of Algorithms, Analysis of Algorithms
Time:	TR 11:10 am – 12:25 pm
Location:	Zach 310

Credit Hours: 3

Instructor Details

Instructor:	Andreas Klappenecker
Office:	PETR 418
E-Mail:	klappi at cse.tamu.edu
Office Hours:	WR 10:30 am – 11:30 am or by appointment, office hours will be held on zoom

Teaching Assistant:	Andrew Nemec
Office:	zoom
E-Mail:	nemeca at cse.tamu.edu
Office Hours:	WF 1:30pm – 3:30pm, office hours will be held on zoom

Course Description

The course focuses on the study of computer algorithms, in particular design paradigms of algorithms, the analysis of time and space requirements of algorithms, and the correctness of algorithms. Furthermore, the course studies NP-completeness and undecidability.

Course Prerequisites

CSCE 221 and CSCE 222

Course Learning Outcomes

At the end of the semester, you should:

- be familiar with fundamental algorithms and algorithmic techniques;
- given a particular application, be able to decide which algorithm is most suitable among a set of choices;
- be able to prove correctness and analyze running time and space complexity of a given algorithm;
- be able to design efficient algorithms for new situations using the techniques learned;
- be able to prove that a problem is NP-complete using reduction and understand the implications;
- understand the notion of undecidability, know that some problems are undecidable, and comprehend the implications.

Textbook and Resource Materials

Required textbook: Cormen, Leiserson, Rivest, Stein: *Introduction to Algorithms*, 3rd edition, The MIT Press, 2009.
Resources: https://canvas.tamu.edu/ (check daily for updates)

Grading Policy

Your grade will be based on the following components:

- exams 60%: There will be one midterm exam and one comprehensive final exam each worth 30%. The exams will be given in class.
- quizzes and exercises 10%: There will be online quizzes and exercises, each consisting of a few simple questions. Your lowest grade in this component will be dropped.
- homework 30%: These are essay style assignments, for which you are required to use the LaTeX typesetting system to type in your answers. All assignments can be found in canvas. Your lowest homework grade will be dropped.

Final grades will be assigned according to this scale:
A: 90 and above, B: [80,90), C: [70,80), D: [60,70), F: below 60
A slight curve might be applied if the course average is low.

Late Work Policy

- All assignments must be submitted on canvas.
- *No late submissions will be accepted.*
- E-mail submissions will not be accepted and will be ignored without notice.
- Work turned-in on time is eligible for partial credit.
- Work submitted by a student as makeup work for an excused absence is not considered late work and is exempted from the late work policy. (See Student Rule 7.)

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 re-grading the student needs to follow the guidelines below:

1. Regrading requests must be submitted to the Instructor within one week 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, accompanied by a reasonable amount of specific justification and documentation.

Course Schedule

The tentative course schedule is as follows:

Week 1 (1/18-)	Introduction, Review of Asymptotic Analysis
Week 2 (1/24-)	Lower Bounds
Week 3 (1/31-)	Divide and Conquer
Week 4 (2/7-)	Divide and Conquer
Week 5 (2/14-)	Greedy Algorithms
Week 6 (2/21-)	Dynamic Programming
Week 7 (2/28-)	Midterm (3/1), Amortized Analysis
Week 8 (3/7-)	Graph Algorithms
Week 9 (3/14-)	Spring Break
Week 10 (3/21-)	Graph Algorithms
Week 11 (3/28-)	Randomized Algorithms
Week 12 (4/4-)	Randomized Algorithms
Week 13 (4/11-)	NP completeness
Week 14 (4/18-)	NP completeness, Approximation Algorithms
Week 15 (4/25-)	Undecidability, Review

Exams

All exams will be given in class.
Midterm exam: Tuesday, March 1, in class
Final exam: Thursday, May 5, 3:00 pm – 5:00 pm, in our class room

Lectures and More

All course information will be given in class. Important messages will be posted in canvas. You should **check your course announcements, course material and due dates daily**. It is strongly recommended that you keep up with the course material and do not fall behind. Start working on assignments as soon as they are assigned.

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.

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.)

Academic Integrity Statement and Policy

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

All homework must be completed on your own, and written in your own words.

"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.

COVID Statement

To help protect Aggieland and stop the spread of COVID-19, Texas A&M University urges students to be vaccinated and to wear masks in classrooms and all other academic facilities on campus, including labs. Doing so exemplifies the Aggie Core Values of respect, leadership, integrity, and selfless service by putting community concerns above individual preferences. COVID-19 vaccines and masking – regardless of vaccination status – have been shown to be safe and effective at reducing spread to others, infection, hospitalization, and death.