

Course Information

Course Number: CSCE 411

Course Title: Design and Analysis of Algorithms

Section: 500

Time: 8/24/2022 to 12/14/2022, 9:35am-10:50am on Tuesdays/Thursdays

Location: 310 Zachary Building

Credit Hours: 3

Instructor Details

Instructor: Anxiao Jiang

Office: 425 PETR

Phone: 979-845-7983

E-Mail: ajiang@cse.tamu.edu

Office Hours: TBD and online

Course Description

The course covers fundamental techniques for analyzing and designing algorithms, including dynamic programming, greedy algorithms, amortized analysis, graph algorithms, maximum flow, linear programming, NP-completeness, approximation algorithms, and online algorithms.

Course Prerequisites

Data structures and programming.

Special Course Designation

N/A

Course Learning Outcomes

Upon finishing this class, students should be able to:

1. *Design efficient algorithms for various problems using fundamental algorithmic techniques*
2. *Analyze the time complexity of algorithms*
3. *Verify the correctness or optimality of algorithms*
4. *Analyze the computational complexity or NP-completeness of various problems*
5. *Design approximation algorithms for NP-complete problems.*

Textbook and/or Resource Materials

Recommended Textbook

- Introduction to Algorithms, Fourth Edition, By Thomas H. Corman, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, MIT Press.

Lecture videos and slides are available online.

Grading Policy

Ten to twelve homework assignments: 50%

Mini projects: 50%

Grading Scale: A = [90, 100], B = [80, 90), C = [70, 80), D = [60, 70), F = [0, 60)

Late Work Policy

With the exception of excused absences (see Student Rule 7), no homework or project submitted after the established deadline will be accepted.

Course Schedule

Week	Lecture Topics	Reading list	Notes and Assignments
1	Dynamic Programming	Chapter 14	TBD
2	Greedy Algorithms	Chapter 15	TBD
3	Amortized Analysis	Chapter 16	TBD
4	Elementary Graph Algorithms	Chapter 20	TBD
5	Minimum Spanning Tree	Chapter 21	TBD
6	Shortest Paths	Chapter 22	TBD
7	NP Completeness	Chapter 34	TBD
8	NP Completeness	Chapter 34	TBD
9	Approximation Algorithms	Chapter 35	TBD

10	Approximation Algorithms	Chapter 35	TBD
11	Maximum Flow	Chapter 24	TBD
12	Online Algorithms	Chapter 27	TBD
13	Linear Programming	Chapter 29	TBD
14	Linear Programming and Course Summary	Chapter 29	TBD

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.

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.”

“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, 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).

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 healthy 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.