CSCE 221 Syllabus

Polsley - Spring 2022

TEXAS A&M UNIVERSITY

Course Information

Course Number:	*CSCE 221*			
Course Title:	*Data Structures and Algorithms*			
Section:	*513-516*			
Credit Hours:	*4*			
Space and Time:	***Lecture***			
	All Sections:	310 ZACH	MWF	12:40 PM - 1:30 PM
	Labs			
	513:	584 ZACH	MW	8:00 AM - 8:50 AM
	514:	584 ZACH	MW	9:10 AM - 10:00 AM
	515:	584 ZACH	MW	10:20 AM - 11:10 AM
	516:	584 ZACH	MW	11:30 AM - 12:20 PM

Instructor Details

Instructor:	*Seth Polsley*			
Office:	*EABC 112C*			
E-Mail:	*spolsley@tamu.edu*			
Office Hours:	In Person:	112 EABC	MF	2:00 PM - 3:30 PM
	Online:	calendly.com/spolsley		By Appointment

Teaching Assistant:	Pedro Figueiredo		
Email:	*pedrofigueiredo@tamu.edu*		
Office Hours:	Online:	calendly.com/pedrofigueiredo	By Appointment

Course Description

From the CSCE Course Catalog:

> *Specification and implementation of basic abstract data types and their associated algorithms including stacks, queues, lists, sorting and selection, searching, graphs, and hashing; performance tradeoffs of different implementations and asymptotic analysis of running time and memory usage; includes the execution of student programs written in C++.*

Data Structures and Algorithms is one of the core CS classes because it covers fundamentals of storing and processing data while introducing design and analysis of algorithms. Many coding interviews, programming tests, and future classes will depend on material from this class.

Course Prerequisites

Pre-requisites:

CSCE 121 (Introduction to Program Design and Concepts) or
CSCE 113 (Intermediate Programming & Design)

Co-requisites:

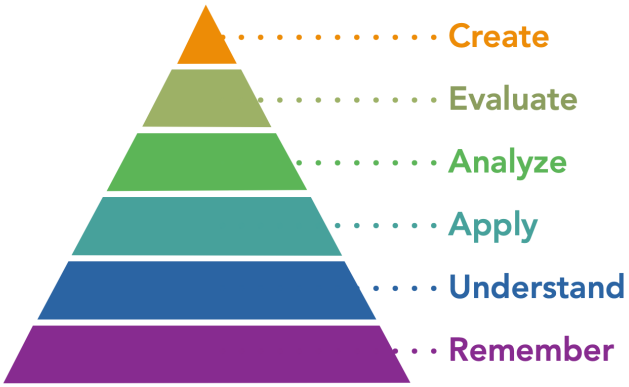
CSCE 222 / ECEN 222 (Discrete Structures for Computing) or
MATH 302 (Discrete Mathematics)

Course Learning Outcomes

This course details key concepts in Computer Science, aligning closely with the two tightly-integrated fields in the title: “Data Structures” and “Algorithms.” Accordingly, the content and expected outcomes are structured along these paths.

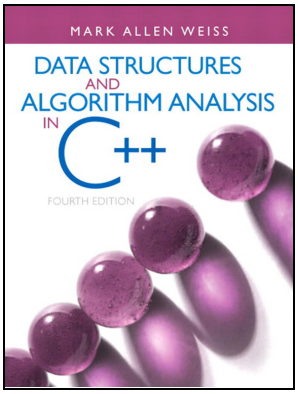
By the end of this course, you should be able to:

- ***Describe basic abstract data types and associated algorithms for lists, stacks, queues, trees, graphs, hash tables, and other similar structures.***
- ***Apply Big-O asymptotic notation to evaluate and select efficient algorithms for a given problem with respect to time and memory usage.***
- ***Define and analyze algorithmic complexity especially in regards to time and memory efficiency***
- ***Design and implement different data structures according to resource requirements in the C++ programming language.***



Bloom’s Taxonomy of Learning

Textbook and Resources



Textbook

Recommended textbook:
Data Structures and Algorithm Analysis in C++ by Mark Weiss, 4th Ed.

While this book is widely used in the field, there are many other C++ guides and websites that you may find helpful to consult as well.

Canvas

Canvas will contain class materials, assignment descriptions, and grades. You can access the course on Canvas through your Howdy portal.

Piazza

Piazza will be used for Q&A, announcements, and as a forum for other questions in the class. Piazza is preferred over email so that others can benefit from seeing the answers to your questions. You can also ask private questions to the instructor and TA. You can self-enroll by visiting the link below and using the specified access code if you wish; alternatively, you will be auto-enrolled by the end of the add/drop period.

http://piazza.com/tamu/spring2022/csce221polsley (access code: 88266112)

Mimir

Lab and programming assignments will be submitted through Mimir. Mimir is an auto-grading system which can give you more direct feedback while allowing the instructor and TA flexibility to review manual portions of the assignments. You can self-enroll by visiting the link below and using the specified access code, or you may visit the direct enrollment link. Alternatively, you will be auto-enrolled by the end of the add/drop period.

https://class.mimir.io/courses/72895125-fa9c-4b89-9bb7-a906c41c2e6a/ (access code: 4c322d38c7)

Mimir Direct Enrollment

Gradescope

Some assignments, such as quizzes and exams, will be graded on Gradescope where there are better options for submitting online and handling print exams than Canvas. Your account will be automatically created, which you can activate through the sidebar in Canvas under "Gradescope".

https://www.gradescope.com/courses/353083

Grading

Scale

This class will use a standard A, B, C, etc. scale for final grades; depending on the distribution, a curve may be applied. The instructor reserves the right to raise grades near a borderline to the next highest letter, based largely on the student's perceived effort and participation.

A	B	C	D	F
90 - 100%	80 - 89%	70 - 79%	60 - 69%	< 60%

Components

Description	Percentage	Category
Class Participation	5%	25% Activities
Labs	10%	
Quizzes	10%	
Homeworks (4)	10%	40% Assignments
Programming Assignments (5)	30%	
Exams (2)	20%	35% Exams
Final Exam	15%	

The class is primarily structured according to a formative approach, using a collection of activities worth comparatively few points that accumulate over the course of the semester. In general, assume each component is individual, although certain activities, such as labs, will be designed for groups.

- **Activities:**

  Class Participation consists of in-class exercises that will be given as a means of quick assessment, feedback, and practice, while serving as a measure of attendance. Lecture attendance is highly recommended, although not strictly required, but to provide flexibility, class participation is graded out of 80%. You can miss up to 20% of these exercises before the overall 5% will be affected, enabling you to miss some lectures and to feel less concerned about individual activities.

  Labs will be held on Mondays and Wednesdays before lecture. They will test concepts through applied problems and be guided by the TA with the help of our grading platforms. Unless specified, lab attendance will be required to earn lab credit.

  Quizzes will typically be short and held in-class about once a week. Following the goal of formative assessment, individual quizzes are a low stakes way to evaluate concept understanding. The lowest quiz grade will be dropped, and it is possible to overwrite most quizzes scores with exam scores. For instance, if the second exam score is higher than the average score for quizzes between Exam 1 and 2, those quiz scores will be replaced by the second exam score.

- **Assignments:**

  Homeworks are take-home assignments that will not usually involve programming but will practice concepts related to the programming assignments and the overall course.

  Programming Assignments comprise the single largest portion of the course grade. These will require programming a solution to the given prompt and submitting your code and, if applicable, discussion of the results. Assignments will be graded on a number of factors: algorithm design, use of data structures and user-defined types, quality of implementation, organization, correctness, and other artifacts of submission such as a written report including results. Readability is also critical, so it is your responsibility to clearly comment your code.

- **Exams:**

  Two regular **Exams** and one **Final Exam** represent the summative portion of the course. Because this is a foundational class for the field, exams will include conceptual and applied problems.

Policies

- **Attendance:**

  The University views class attendance as the responsibility of an individual student. Attendance is important in this class as a means to keep current with the material, especially in labs, so students are encouraged to attend. Lab attendance will be evaluated based on your being present in the lab and submitting the lab work. Class attendance will be based on in-class activities and quizzes.

- **Absences and Make-up Work:**

  University rules related to excused/unexcused absences and make-up work are located in Student Rule 7: http://student-rules.tamu.edu/rule07. In general, you must notify the instructor at least a day prior to missing class, or within 2 days after if not possible, and provide documentation of excused absences within 3 days. Make-up work for excused absences cannot be accepted more than 30 days after the deadline. An unexcused absence on an exam will result in a zero.

  You may notify the instructor using the form located at tx.ag/221absence.

- **Late Submissions:**

  Typically, assignments are due at 11:59 PM on the day of the deadline. If an assignment accepts late work, submissions received after the deadline will be subject to a late penalty, which will be computed based on the number of days late. The penalty will be 15% every day, up to 4 days. After 4 days, late work will receive no credit.

  Additionally, you have a pool of 4 late days that you can use to extend an assignment an additional 24 hours without penalty. While the assignments are organized so that you have plenty of time to complete them, late days give you extra flexibility to handle unforeseen circumstances according to your own judgement.

  To use a late day from your pool, you must fill out the following form: tx.ag/221lateday. Be sure to specify the affected assignment. You are responsible for tracking your own late days! We will maintain this information and will only allow up to 4 to be used.

- **Accommodations:**

  The Division of Student Affairs has made a new portal available, Disability Accommodation Portal (AIM), which you can use to request and send accommodation letters. Please also visit calendly.com/spolsley to book an appointment with me. I want to make the class as accessible as possible, and I would like to talk with you to discuss the best plan for meeting your needs.

Course Schedule

Week	Topic(s)
1	Introduction and Review
2	Arrays, Vectors, Linked Lists, Stacks and Queues
3	Searching and Sorting
4	Algorithmic Analysis
5	Trees
6	**Exam 1 - Friday, Feb. 25**
7	Heaps
8	Special Trees
9	Hashing
10	Dictionaries and Maps
11	**Exam 2 - Friday, Apr. 8**
12	Graphs
13	Shortest Path
14	Spanning Trees
15	**Final Exam - Friday, May 6**

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 the Disability Resources office on your campus (resources listed below) 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.

Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu.

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 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.