Term: Summer 2025 **Subject:** Computer Science (CSE) **Number:** 310

Course Title: Data Structures & Algorithms (CSE 434)

Course Session

Mode: ASU Online

Dates: 5/19/2025 - 7/11/2025 (C)

Instructor

Name: Bharatesh Chakravarthi, Ph.D.

Assistant Teaching Professor, CSE, SCAI

Office: BYENG M1-40 / Zoom Personal Meeting Room

Email: bharatesh@asu.edu

Office Hours: Wednesday, 8:00 - 9:00 AM, on Zoom

Students can meet the instructor by scheduling an appointment via email. Include [CSE310] at the start of the subject's line.

TA Office Hours

To be updated.

UGTA Office Hours

To be updated.

Course Prerequisite:

Being able to program in C++. These are taught in CSE220 and CSE240. Being able to perform mathematical proofs. These are taught in MAT243.

Course Description:

Advanced data structures and algorithms, including stacks, queues, trees (B, B+, AVL), and graphs. Searching for graphs, hashing, and sorting.

Course Objective and Learning Outcome:

Students who complete this course can

- Define data structures (types) such as heaps, balanced trees, and hash tables.
- Explain how to use a specific data structure in modeling a given problem (e.g., I can explain how to model a dictionary using balanced trees).
- Identify, construct, and clearly define a data structure that is useful for modeling a given problem.
- State some fundamental algorithms such as merge sort, topological sort, Prim's and Kruskal's algorithms, and algorithmic techniques such as dynamic programming and greedy algorithms.
- Use a specific algorithmic technique in solving a given problem (e.g., I can write a dynamic program that solves a shortest-path problem).
- Design an algorithm to solve a given problem
- Define the notions of worst-case/best-case/average-case running times of algorithms.
- Analyze and compare different asymptotic running times of algorithms.
- Analyze a given algorithm and determine its asymptotic running time.
- Combine fundamental data structures and algorithmic techniques in building a complete algorithmic solution to a given problem.
- Create several algorithmic solutions to a given problem and choose the best one among them according to given requirements on time and space complexity.

Textbooks

- Cormen, T. H., Leiserson, C. E., and Rivest, R. L., C. Stein, Introduction to Algorithms, The MIT Press, 4th edition.

Course Access

- Your ASU courses can be accessed by both my.asu.edu and https://asu.instructure.com

Help

For technical support, use the Help icon in the black global navigation menu in your Canvas course or call the ASU Help Desk at +1-(855) 278-5080. Representatives are available to assist you 24 hours a day, 7 days a week.

Course Plan CSE 310 (46426) – Data Structures and Algorithms Summer 2025 ASU Online						
Week (W)	**Start Date**	**Modules**	**Quiz (Q)**	**Homework (HW)**	**Project (P)**	**Exam (E)**
01	**May 19**	**Module 0, Module 1**	**Syllabus Quiz, Q1**			
02	**May 26**	**Module 2, Module 3**	**Q2, Q3**	**HW01**	**PJ01 Checkpoint 1**	
03	**June 02**	**Module 4, Module 5**	**Q4, Q5**	**HW02**	**PJ01 Due**	
04	**June 09**	**Module 6**			**PJ02 Checkpoint 1**	**E1**
05	**June 16**	**Module 7, Module 8**	**Q6, Q7**	**HW03**	**PJ02 Checkpoint 2** **PJ02 Due**	
06	**June 23**	**Module 9, Module 10**	**Q8, Q9**	**HW04**	**PJ03 Checkpoint 1 & 2**	
07	**June 30**	**Module 11, Module 12**		**HW05**	**PJ03 Due**	**E2**
08	**July 07 to 11**	**Module 13, Module 14, Module 15**	**Q10**	**HW06**		**E3**

Course Components Grading Policy:

Course Components	Weightage
Exam 01	15%
Exam 02	15%
Exam 03	20%
Programming Projects • Project 1 • Project 2 • Project 3	 5% 10% 10%
Written HomeWorks	20%
Quizzes	5%

There will be three exams to be taken on Canvas with Honorlock. All exams are closed-book exams, with a one-page cheat sheet allowed. The dates of the exams are shown on Canvas at the start of the semester. Exam 1 has a weight of 15%. Exam 2 has a weight of 15%. Final Exam has a weight of 20%.

There will be three programming projects. PJ01 has a weight of 5%. PJ02 has a weight of 10%. PJ03 has a weight of 10%. All projects should be your individual work. You need

to use the standard C++ programming language, compile (using the g++ compiler), and execute the programs on a Linux platform, such as general.asu.edu. Please note that general.asu.edu is not a website. You can use a secure shell to access this machine remotely. As such, you need to have some basic knowledge of the Linux operating system and know the bash shell. You also need to know a visual editor under Linux, such as Vim. Your project will be graded using an auto-grader on Gradescope, which compiles and executes your project on a Linux platform. To help the students with a weak programming background but who want to stay in this class and succeed in this class, PJ01 is designed with many useful C++ codes provided. You are advised to carefully study each statement in the provided code. If you do not do so, you may find future projects extremely difficult. This is why PJ01 only has a weight of 5%. Each project is given at least two weeks to work on. Therefore, no extension will be given. Also, each project has two checkpoints. The instructor will use these to see the progress and effort the student puts into a particular project.

There will be six written assignments, for a total weight of 20%. These should be your individual work. Each assignment is given at least one week to work on. Therefore, no extension will be granted in general.

There will be 10 quizzes, for a total weight of 5%. The two lowest-scored quizzes will be dropped. Therefore, there will be no makeup for missed quizzes.

Submitting Assignments
All assignments, unless otherwise announced, MUST be submitted to the designated area of Canvas. Do not submit an assignment via email.
Assignment due dates follow Arizona Standard Time. Click the following link to access the Time Converter to ensure you account for the difference in Time Zones. Note: Arizona does not observe daylight saving time.

Late or Missed Assignments
Notify the instructor **BEFORE** an assignment is due if an urgent situation arises and you are unable to submit the assignment on time.
Follow the appropriate University policies to request an accommodation for religious practices or to accommodate a missed assignment due to University-sanctioned activities.

Grade Appeals
Your grades will be posted on Canvas, available to you. Whenever the grade for a particular work is available, we will post an announcement. You will have 48 hours to challenge the grade in writing, by email to the instructor and copied to the TA. If you do not contact either the instructor or the TAs within 48 hours of the announcement, there will be no change to your grade for that particular work. This applies to all of your graded work.

Grading Policy

Grade	Percentage
A+	97%-100%
A	93%-96%
A-	90%-92%
B+	87%-89%
B	83%-86%
B-	80%-82%
C+	75%-79%
C	70%-74%
D	60%-69%
E	0%-59%

Communicating With the Instructor
ASU email is an official means of communication among students, faculty, and staff. Students are expected to read and act upon email and Canvas announcements in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly.

Academic Integrity and Copyright Laws

Academic Integrity

Students in this class must adhere to ASU's academic integrity policy, which can be found at https://provost.asu.edu/academic-integrity/policyLinks to an external site.). Students are responsible for reviewing this policy and understanding each of the areas in which academic dishonesty can occur. In addition, all engineering students are expected to adhere to both the ASU Academic Integrity Honor CodeLinks to an external site. and the Fulton Schools of Engineering Honor CodeLinks to an external site. All academic integrity violations will be reported to the Fulton Schools of Engineering Academic Integrity Office (AIO). The AIO maintains a record of all violations and has access to academic integrity violations committed in all other ASU colleges/schools.

All students in this class are subject to ASU's Academic Integrity Policy (available at http://provost.asu.edu/academicintegrityLinks to an external site.) and should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. All violations will be reported to the Dean's office, who maintain records of all offenses. Students are expected to abide by the FSE Honor Code (http://engineering.asu.edu/integrity/Links to an external site.).

All work submitted for the course cannot have been submitted for any other course or any previous section of this same course. Student academic integrity violations are reported to the Fulton Schools of Engineering Academic Integrity Office (AIO). Withdrawing from this course will not absolve you of responsibility for an academic integrity violation and any sanctions that are applied. The AIO maintains a record of all violations and has access to academic integrity violations committed in all other ASU college/schools.

Unless explicitly allowed by your instructor, the use of generative AI tools on any course assignment or exam will be considered academic dishonesty and a violation of the ASU Academic Integrity Policy. Students confirmed to be engaging in non-allowable use of generative AI will be sanctioned according to the academic integrity policy and FSE sanctioning guidelines.

Copyright

Course content, including lectures, are copyrighted materials and students may not share outside the class, upload to online websites not approved by the instructor, sell, or distribute course content or notes taken during the conduct of the course (see ACD 304–06Links to an external site., "Commercial Note Taking Services" and ABOR Policy 5-308 F.14 (Links to an external site.) Links to an external site. for more information). You must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work

unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.

Collaboration Policy: I believe that collaboration fosters a community of scholars and is healthy. You will likely learn just as much (or more) from your interaction with other students as you will from the TAs or me. Your classmates are a valuable resource; don't overlook them when you need help. They should be among the first people you turn to for help when you have a question. It may save you time, and they will probably learn something as well.

Unless otherwise instructed, feel free to discuss problem sets and projects with other students and exchange ideas about how to solve them. There is a thin line, however, between collaboration and plagiarizing the work of others, i.e., cheating. So that you do not cross that line, you are required to compose your unique solution to each problem and each assignment. You cannot use any code written by any of your classmates or find the code somewhere else. You can be penalized for helping someone else cheat, such as letting someone else copy your code.

Use of AI Tools: No Generative AI Use Permitted

In this course, all assignments must be completed by the student. Artificial Intelligence (AI), including ChatGPT and other related tools used for creating text, images, computer code, audio, or other media, is not permitted for use in any work in this class. Use of these generative AI tools will be considered a violation of the ASU Academic Integrity Policy, and students may be sanctioned for confirmed, non-allowable use in this course.

Some obvious acts of cheating are:

Turning in work/code done by someone else
Copying work/code done by someone else
Finding work/code somewhere and turning it in as your code

We have no problem failing you in this class for the semester and having the appropriate entries placed in your ASU student records. All instances of cheating will be handled by the Dean's office according to the ASU Student Academic Integrity Policy and the USI 104-01: Student Code of Conduct and Student Disciplinary Procedures. Links to an external site.

Policy against threatening behavior, per the Student Services Manual, SSM 104–02

Students, faculty, staff, and other individuals do not have an unqualified right of access to university grounds, property, or services. Interfering with the peaceful conduct of university-related business or activities or remaining on campus grounds after a request

to leave may be considered a crime. All incidents and allegations of violent or threatening conduct by an ASU student (whether on- or off-campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students.

Harassment and Sexual Discrimination

Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits discrimination, harassment, and retaliation by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

Title IX is a federal law that provides that no person be excluded based on sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex are prohibited. An individual who believes they have been subjected to sexual violence or harassed based on sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed based on sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqsLinks to an external site.

Mandated sexual harassment reporter: As an employee of the University, I am considered a mandated reporter and therefore obligated to report any information regarding alleged acts of sexual discrimination that I am informed of or have a reasonable basis to believe occurred.

ASU Counseling Services, https://eoss.asu.edu/counselingLinks to an external site., is available if you wish to discuss any concern confidentially and privately.

Syllabus changes: Any information in this syllabus (other than grading and absence policies) may be subject to change with reasonable advance notice.

How Long Students Should Wait for an Absent Instructor: In the event the instructor fails to indicate a time obligation, the time obligation will be 15 minutes for class sessions lasting 90 minutes or less, and 30 minutes for class sessions lasting more than 90 minutes. Students may be directed to wait longer by someone from the academic unit if they know the instructor will arrive shortly.