
CSE 3318: Data Structures and Algorithms

Spring 2025

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course.

–Alexandra Stefan

Jump to: [Instructor Information](#) | [Course Information](#) | [Grading Information](#) | [University & Program Policies](#) | [Academic & Wellness Resources](#) | [Safety Information & Resources](#) | [Course Schedule](#)

Instructor Information

Instructor Name

Alexandra Stefan

Office Location

ERB 625

[View Campus Map](#)

Office Phone Number

817-2723785

Email Address

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Faculty Profile

[Alexandra Stefan](https://www.uta.edu/academics/faculty/profile?user=astefan) (https://www.uta.edu/academics/faculty/profile?user=astefan)

Office Hours

Mon,Wed 2:45-3:30pm, Tue,Thu 12:40-1:40pm or by appointment

Communication Guidelines

My preferred communication method is Microsoft Teams messages or UTA email (both are preferred over Canvas email)

I will respond to emails and voice messages within 24 hours or the following business day.

Course Information

Section Information

CSE 3318-001, CSE 3318-002

Course Delivery Method

This course is designated ON-CAMPUS, which means all lectures will be in person. Most lectures will be recorded via an online Microsoft Teams meeting for so students can use it to

review parts of the lecture as needed. However the class is not online. The delivery of the material will be geared towards the students attending in person and some lectures may fail to be recorded. Thus students should plan to attend all the lectures in person and only use the recording for review.

On days with bad weather lectures may be held online only via Microsoft Teams. The instructor will send a Canvas announcement as early as possible in such cases.

For a full definition of the course modalities, please visit the [Course Modalities page](#).

Time and Place of Class Meetings

CSE 3318-001 Tuesday, Thursday 9:30am - 10:50am, GACB 103

CSE 3318-002 Tuesday, Thursday 11am - 12:20pm, GACB 103

Time Zone

This course operates on Central Time. All times listed for class meeting times, exams, and assignment deadlines are in Central Time.

Description of Course Content

Design and analysis of algorithms with an emphasis on data structures. Approaches to analyzing lower bounds on problems and upper bounds on algorithms. Classical algorithm design techniques including algorithms for sorting, searching; other operations on data structures such as hash tables, trees, heaps, graphs, strings; and dynamic programming and greedy approaches to optimization problems.

Prerequisites

Intermediate Programming (CSE 1320) and *Discrete Structures* (CSE 2315)

Student Learning Outcomes

- Understand classic approaches to algorithm design (e.g. dynamic programming, greedy).
- Understand particular algorithms and data structures that have wide applicability.
- Be able to compare and choose the best algorithm that solves the problem under specific constraints (e.g. space or time limitation).
- Apply math skills to compute the worst-case, best-case and average-case for space and time complexity of specific algorithms (e.g. worst-case time complexity of insertion sort)
- Know what asymptotic notation means and be able to use the correct one to describe an algorithm's performance (e.g. use the correct notation for the lower-bound of space complexity).
- Be able to solve recurrences.
- Construct counterexamples (both the data and 'running' the algorithm on that data) that show that an algorithm does not have a certain property (e.g. to show that a specific sorting algorithm is not stable).
- Improve programming skills - especially on pointers, data structures, recursion, and graphs.
 - Code should not have memory errors. We will use Valgrind (already available on the Omega server and the VM) to check for these errors.

Textbooks and Other Course Materials

All the information needed for assignments and tests will be provided in slides and/or presented during lectures.

Optional textbook: Introduction to Algorithms, by Thomas H. Cormen, Charles E. Leiserson, Ronald E. Rivest, Clifford Stein, 3rd edition (CLRS). The 2nd edition is also fine.

Descriptions of major assignments and examinations

Lecture Quizzes – 15%

Review and Lecture-based quizzes (in Canvas) or activities. On average, one per week. Their purpose is to motivate studying the material covered each lecture and to review past material. Students can use any class material and discuss the answers for these quizzes with classmates. One lowest score Lecture Quiz (LQuiz) will be dropped.

Coding homework – 35%

Coding homework will be assigned roughly every week. And will be due in 6 or 7 days from the time it was posted.

Exams (2 midterms and the final exam) in person, on paper – 50%

All exams are required. Missing an exam results in grade 0. No exam score is dropped.

The final exam will be at the official date and time listed in the UTA Final Exam Schedule. The final exam cannot be skipped.

Expectations for Out-of-Class Study

Beyond the time required to attend each class meeting, students enrolled in this 3 credit-hour course should expect to spend at least an additional 12 hours per week of their own time in course-related activities, including reviewing class examples, reading required materials, completing assignments, preparing for exams, etc.

Technology Requirements

Microsoft Teams will be used to record the lectures and to allow students to attend the lecture online if needed. Students attending online do not receive credit for in class activities.

A Unix environment for developing and running C code, and the Valgrind memory checker. More information about these will be given in the second week of classes. The ability to use a debugger (gdb or a visual one) to debug code. An online IDE such as OnlineGDB (<https://www.onlinegdb.com/>) is an alternative until students set up their computers.

Visit the [UTA Libraries Technology page](#) for a list of items that can be checked out or used at the library (video camera, laptop, drawing tablet and more).

Recording of Classroom and Online Lectures

Faculty maintain the academic right to determine whether students are permitted to record classroom and online lectures. Recordings of classroom lectures, if permitted by the instructor or pursuant to an ADA accommodation, may only be used for academic purposes related to the specific course. They may not be used for commercial purposes or shared with non-course participants except in connection with a legal proceeding.

As the instructor of this course, I elect to allow recording of classroom or online lectures.

Other Requirements

Homework solutions will be graded on a Unix system. Students will need to be able to use the system and compile and run their C code on it to ensure same behavior as during grading. Familiarity with a C-debugger is required: students will need to, and should use a good debugger when coding. Students should frequently submit and run their code on the Unix system in order to fix bugs as they appear. Do NOT submit only at the end. There may be too many bugs at that point. Options for a Unix system: the omega server, the [VM from cse13xx](#), the Ubuntu on Windows App, CodeSpaces from GitHub or a Unix/Linux machine.

Grading Information

Graded Assignments & Values

Assignment Name	Value (pts or %)
Lecture Quizzes	15%
Coding Homework	35%
Exams (2 midterms, 1 final), all equal weight	50%
Total	100%

Students are expected to keep track of their performance throughout the semester which Canvas facilitates and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels; see “Student Support Services,” below.

Final Grade Calculation

Range (pts or %)	Letter Grade
90 - 100 (89.5 - 100)	A
80 - 90 (79.5 - 89.49)	B
70 - 80 (69.5 - 79.49)	C
60 - 70 (59.5 - 69.49)	D
0 - 60 (0 - 59.49)	F

Make-Up Exams & Late Work Policy

Make-up exams or any other additional work towards “improving one’s grade” will not be offered.

Some bonus points are available from early submission of coding homework and unused “remove late penalty” coupons. Students should do their best to earn those points.

Early submission bonus

Each Coding Assignment submitted 24 hours or more early, will receive 5 bonus points.

Each “remove penalty coupon” unused by the end of the semester receives 2 bonus points.

The bonus points are added to the sum of all Coding Homework score before dividing to compute the Average homework score.

Late Work

Each Coding Homework can be submitted up to 24 hours late (one day late). There will be a 2 point penalty for each missed deadline in 1 hour increments. No submission is accepted after 24 hours. In Canvas, each Coding Homework will have 2 dates: a **due date** and an **available date**. The available date will be 24 hours after the due date and is set so to allow for late submissions.

Each student has 6 “remove penalty coupons”. One such coupon can be used to remove the late penalty (up to 24 hours) for one homework.

Except for the Coding Homework, all other assessments must be completed on time. There is no late submission for them and no bonus for early completion.

Example

Assume a Coding Homework is due Wednesday at midnight (11:59pm). If submitted on:

- Tuesday or before that, it was submitted 24 hours or more early and it receives 5 bonus points if at least 25% of the homework is completed.
- Wednesday, it is on time.
- Thursday it is late and will receive 2 point penalty per missed deadline every hour.

Grades & Feedback Timeline

We aim to post grades within 1 week from the due date (for exams) and from the late submission date for coding assignments.

Grade Grievances

Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current [University Catalog Grades and Grading Policies](#).

University & Course Policies

UTA students are encouraged to review the institutional policies and informational sections below and reach out to the specific office with any questions. To view this institutional information, please visit the [Institutional Information](#) page (<https://resources.uta.edu/provost/course-related-info/institutional-policies.php>), which includes the following policies, among others:

- Drop Policy
- Disability Accommodations
- Title IX Policy
- Academic Integrity
- Student Feedback Survey
- Final Exam Schedule

Attendance

Attending class sessions is a critical predictor and indicator of student success. The University of Texas at Arlington does not recognize a single attendance policy but encourages faculty to establish class-specific policies on attendance. As the instructor of this section, I will not take attendance, but some lectures will have in class work that will be graded. Students that are not

in class during the activity will receive 0 for the work on that day. There is no make-up for missed classwork.

The U.S. Department of Education requires that UT Arlington have a mechanism in place to verify Federal Student Aid recipients' attendance in courses. UT Arlington instructors are expected to report the last date of attendance when submitting students' final course grades; specifically, when a student earns a course grade of F, instructors must report the last date a student attended their class. For on-campus classes, last date of attendance can be based on attendance rosters or on academic engagements—a test, participation in a class project or presentation, or Canvas-based activity. Online or distance education courses require regular and substantive online interaction and participation. Students must participate in online course activities in Canvas to demonstrate attendance; logging into an online class is not sufficient by itself to demonstrate attendance. The last date of attendance is reported to the U.S. Department of Education for federal financial aid recipients.

Academic Honesty

Students are expected to complete their coding assignments on their own.

Violations of Academic Honesty

The following are considered cheating or a violation of academic honesty. The case will be reported to Office of Community Standards and the student(s) will receive grade 0 in that assignment or exam.

- Copying or looking at an existing solution for the entire homework or a significant component of the homework, from anywhere (a classmate, a friend, the internet, an AI generated solution). This is not allowed in any form, not even for “inspiration” or “to get an idea” or “to help me get started”.
- Any use of Generative AI in developing a homework solution
- Working together with another student to develop a single program/solution unless group or pair collaboration was explicitly allowed for that assignment. All of the assignments are by default individual work, not group work.
- Copying and entire program or part of a program from another student.
- Posting your own solution to public websites or other repositories available to others.
- Giving your solution to another student or letting them look at it.
- During an exam: looking at another student's answers, exchanging information with another student, using a cheat sheet, looking at your phone, using headphones, using a smart watch or other electronic devices.

What is allowed?

You are allowed and encouraged to discuss with classmates the homework requirements, but not specific code for the homework solution. You can practice and review programming language concepts covered in class, programs covered in class, and other practice problems that are not part of the homework. For example, if a classmate does not know how to read user input for their homework, discuss another example, different from the homework that uses user input.

Generative AI Use in This Course

The use of Generative AI (GenAI) in course assignments and assessments must align with the guidelines established by the instructor. Unauthorized use of GenAI could result in breaches of academic integrity. Instructors bear the responsibility of clearly delineating the permissible uses

of GenAI in their courses, underscoring the importance of responsible and ethical application of these tools.

The [UTA Office of Community Standards](#) articulates the university's stance on [academic integrity and scholastic dishonesty](#). These standards extend to the use of GenAI. Unauthorized or unapproved use of GenAI in academic work falls within the scope of these policies and will be subject to the same disciplinary procedures.

As the instructor of this course, I have adopted the following policy on Student use of GenAI:
Prohibition of GenAI Use

Approach	Description
Prohibition of GenAI Use	In this course, the focus is on the development of independent critical thinking and the mastery of subject-specific content. To ensure that all submitted work accurately reflects personal understanding and original thought, the use of Generative AI (GenAI) tools in completing assignments or assessments is strictly prohibited. This policy supports our commitment to academic integrity and the direct measurement of each student's learning against the course's Student Learning Outcomes (SLOs). Any work found to be generated by AI will be subject to academic review.

Academic & Wellness Resources

Academic Success Center

The Academic Success Center (ASC) includes a variety of resources and services to help you maximize your learning and succeed as a student at the University of Texas at Arlington. ASC services include supplemental instruction, peer-led team learning, tutoring, mentoring, and TRIO SSS. Academic Success Center services are provided at no additional cost to UTA students. For additional information visit: [Academic Success Center](https://www.uta.edu/student-success/course-assistance) (https://www.uta.edu/student-success/course-assistance). To request disability accommodations for tutoring, please complete this [tutoring request form](https://www.uta.edu/student-success/course-assistance/tutoring/request) (https://www.uta.edu/student-success/course-assistance/tutoring/request).

The English Writing Center (411LIBR)

The Writing Center offers **FREE** tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at the [Writing Center](https://uta.mywconline.com) (https://uta.mywconline.com). Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see [Writing Center: OWL](http://www.uta.edu/owl) (http://www.uta.edu/owl) for detailed information on all our programs and services.

Academic Plaza

The Library's 2nd floor [Academic Plaza](http://library.uta.edu/academic-plaza) (http://library.uta.edu/academic-plaza) offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the [library's hours](https://library.uta.edu/hours) (https://library.uta.edu/hours) of operation.

UTA CARE Team

UT Arlington is committed to the safety, success, and well-being of our students. To support our community, UTA has created a CARE Team, which is a dedicated group of campus professionals responsible for helping students who could benefit from academic, emotional, or psychological support, as well as those presenting risk to the health or safety of the community. If you know of someone experiencing challenges, appearing distressed, needing resources, or causing a significant disruption to the UTA community, please submit a [CARE Referral](#) by visiting the [Behavior Intervention Team](https://www.uta.edu/student-affairs/dos/behavior-it) (<https://www.uta.edu/student-affairs/dos/behavior-it>) page. You may also submit a referral for yourself if you would like additional support.

NOTE: If a person's behavior poses an immediate threat to you or someone else, contact UTA Police at 817-272-3303 or dial 911. If you or someone you know needs to speak with a crisis counselor, please reach out to the [MAVS TALK 24-hour Crisis Line](https://www.uta.edu/student-affairs/caps/crisis) (<https://www.uta.edu/student-affairs/caps/crisis>) at 817-272-8255 or the [National Suicide and Crisis Lifeline](https://988lifeline.org/) (<https://988lifeline.org/>) at 988.

Student Services

Everything you need to make the most of your time as a student (and beyond) is all on campus. Below are a few resources to get you started.

- [Student Services Home](#)
- [Student Access and Resource \(SAR\) Center](#)
- [Military and Veteran Services](#)
- [Health Services](#)
- [Counseling and Psychological Services \(CAPS\)](#)
- [Activities and Organizations](#)
- [Recreation](#)

Librarian to Contact

Each academic unit has access to [Librarians by Academic Subject](https://libraries.uta.edu/research/librarians) (<https://libraries.uta.edu/research/librarians>) that can assist students with research projects, tutorials on plagiarism, and citation references, as well as support with databases and course reserves.

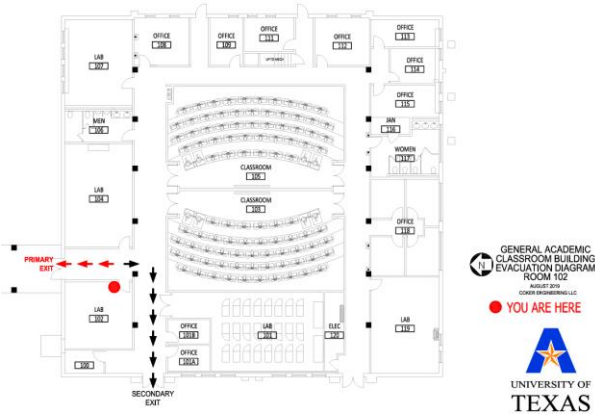
Safety Information & Resources

Face Covering Policy

Face coverings are not mandatory; all students and instructional staff are welcome to wear face coverings while they are on campus or in the classroom.

Emergency Exit Procedures

Should we experience an emergency event that requires evacuation of the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, do not take an elevator but use the stairwells instead. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities. On the map below **we are in 103, not 102.**



Course Schedule

Class Date(s)	Topic(s)
Week 1 01/14, 01/16	Introduction, Syllabus, Insertion sort, linear search, binary search
Week 2 01/21, 01/23	Time complexity
Week 3 01/28, 01/30	Growth of functions, Summations Count sort, Radix Sort, Bucket Sort
Week 4 02/04, 02/06	Count sort, Radix Sort, Bucket Sort
Week 5 02/11, 02/13	Mergesort, Quicksort
Week 6 02/18, 02/20	Recurrences - Tree method,
Week 7 02/25, 02/27	Recurrences - Master Theorem 02/27 - Midterm 1 – tentative date
Week 8 03/04, 03/06	Stacks, Queues Heaps
03/10 - 03/14	Spring break, no classes
Week 9 03/18, 03/20	Binary trees, BST (Binary Search Trees) Leetcode problem solving
Week 10 03/25, 03/27	2-3-4 Search Tree Hash Table
Week 11 04/01, 04/03	04/01 – Midterm 2 – tentative date Greedy Algorithm for Knapsack problem
Week 12 04/08, 04/10	Knapsack - Dynamic Programming (DP) Job Scheduling - Dynamic Programming (DP)
Week 13 04/15, 04/17	DP - Longest Increasing Subsequence (LIS), Longest Common Subsequence (LCS) Graphs
Week 14 04/22, 04/24	Shortest Paths Minimum Cost Spanning Tree
Week 15 04/29	Huffman Tree (Greedy Algorithm)
Finals 05/01	<u>05/01 - Final Exam, 11am-12:30pm section 001</u> , confirmed
Finals 05/06	<u>05/06 - Final Exam, 11am-12:30pm section 002</u> , confirmed

Important dates:

01/13 – First day of classes
 01/20 – No class. Martin Luther King Jr. Holiday
 01/29 – Census date
 03/10 – 03/14 – Spring break
 04/04 – Last day to Drop classes
 04/29 – Last day of classes
 04/30 – Student Study Day (no classes)

MavAlert System

The MavAlert system sends information to cell phones or email accounts of subscribed users in case of an emergency. Anyone can subscribe to MavAlerts at [Emergency Communication System](https://www.uta.edu/uta/emergency.php) (<https://www.uta.edu/uta/emergency.php>).

Emergency Phone Numbers

In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381