

Department of Computer Science and Engineering
Algorithms
CSCE 4110.501 - Fall 2025

Class Timings: Wednesday, 6:30 PM – 9:20 PM, Frisco Landing, FRLD 346

Instructor: Faridul Islam, Email: faridul.islam@unt.edu

Office Hours: Wednesday 8:00 AM to 10:00 AM and Friday 6:00 PM – 8:00 PM [by appointments].
Office hours will be online with Zoom, <https://unt.zoom.us/j/82454588018>

TA/IA:

- Fayeuddin Mohammed Khan, Email: fayeuddinmohammedkhan@my.unt.edu, Help Hours: Thursday 8:00 AM – 10:00 AM (Homework and Programming Assignments). Zoom, <https://unt.zoom.us/j/2352037443?pwd=7po9DbWrqimzCynmUm1OfVjYIH8vVI.1>

Course Webpage: All the course related material will be posted on the course webpage which is available through Canvas (<https://learn.unt.edu>).

Textbook: *Introduction to Algorithms*, by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stien, MIT Press, Third Edition. ISBN 9780262033848

Catalog Description: Time complexity of algorithms; algorithm design methodologies including divide and conquer, greedy, and dynamic programming; exposure to approximation algorithms for NP-hard problems; performance evaluation of algorithms.

Prerequisite(s): CSCE 3110.

Course Outcomes:

- Be able to analyze the time and space complexity of a nontrivial algorithm, using mathematical tools, and prove/justify the correctness
- Understand the Divide and Conquer, Greedy, and Dynamic Programming strategies for algorithmic design.
- Be familiar with the algorithms for Matrix Multiplication (Strassen's), Activity Selection, Knapsack, Shortest Paths (single source, and all pairs), Minimum Spanning Tree (Prim's and Kruskal's), Matrix Chain, and Longest Common Subsequence problems.
- Be exposed to approximation algorithms for solving NP-hard problems.
- Be able to determine and measure the efficiency of a given algorithm, in practice, through different possible implementations, and by testing on suitable data sets.
- Be able to communicate clearly and precisely in writing about the theoretical analysis of an algorithm and its efficiency in practice.

Grading:

Class Activity	5%
Homework	20%
Programming assignment	20%
Quiz	15%
Midterm Exam	20%
Final Exam	20%

Class Activity: There will be several class activities during the class session that will reinforce the concepts that we learned in the class. These class activities will be scheduled during the class timing.

Quizzes: There will be several pop quizzes given throughout the semester. The pop quizzes can be given any time during the class. These will be to reward students who consistently attend the class but will be more than just attendance points.

Exams: There will be a midterm exam and a final exam. The exams are closed books and closed internet. Mobiles phones are not allowed and browsing the internet is not allowed. Exams will include material from the modules, the readings, homework, etc. and should be taken individually NOT as a team.

**Note: Final exam time is based on the university registrar schedule for Fall 2025 Finals. So, no excuse will be accepted for any conflict. If students have any conflict, they need to contact the faculty to resolve their conflicts.*

Missing Classes, Assignments, or Exams: Attendance at all exams, quizzes, and class activities is mandatory. Throughout the semester, a student may miss classes, assignments, quizzes, or exams due to many reasons. Most of the reasons will not be accepted as an "excused" absence. Assignments, quizzes, or exams can be made-up only under extraordinary circumstances and only when notification is given to me before the assessment, quiz, or exam is administered. A no-show without prior notification and a verifiable excuse (appropriate official documentation) will result in a grade of zero (0) for that assignment, quiz, or exam.

Submission: All assignments, shall be turned in electronically using the Canvas. Any work turned in late for the 0-23 hours will receive a **50%** penalty and 24-48 hours will receive **75%** penalty, and it **will not be accepted after 48 hours**. According to department policy, we are unable to accept submissions via email.

Students are responsible for submitting the correct assignments (i.e., uploading the proper files) for each applicable assignment submission on Canvas. In certain cases, when an assignment is submitted on time but to an incorrect assignment location (e.g., submitting Homework 03 to the Homework 02 Dropbox on Canvas, or submitting the wrong files), the assignment will not be accepted and will receive a grade of **zero (0)** if the due date has passed. If you have any questions or concerns about your submission, please work with your instructor, TA, or Peer Mentor to ensure the correct file(s) are submitted.

Grade Dispute: It is the student's responsibility to check any given grade and make complaints within at most 7 calendar days after the grades are announced. Grades will be posted on Canvas throughout the semester to provide an ongoing assessment of student progress, but typically about 7-12 calendar days after the assignment was due. **Grading dispute should first go to the original grader (i.e., the TA or IA) who graded your assignment in 7 calendar days after grades posted, but if a resolution cannot be reached between the student and the original grader, the original grader will forward the case to the instructor who will have the final say on the grade.**

Supporting Your Success and Creating an Inclusive Learning Environment

Every student in this class should have the right to learn and engage within an environment of respect and courtesy from others. We will discuss our classroom's habits of engagement and I also encourage you to review UNT's student code of conduct so that we can all start with the same baseline civility understanding ([Code of Student Conduct](https://policy.unt.edu/policy/07-012)) (<https://policy.unt.edu/policy/07-012>).

Disability Services/Special Needs:

UNT follows all federal and state laws and regulations regarding discrimination including the Americans with Disability Act of 1990 (ADA). If you have a disability and need a reasonable accommodation for equal access to education or services, please contact the Office of Disability Accommodation. Please initiate this process and inform me during the first two weeks of class.

ADA accommodation statement:

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time; however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the [Office of Disability Access](https://studentaffairs.unt.edu/office-disability-access) website (<https://studentaffairs.unt.edu/office-disability-access>). You may also contact ODA by phone at (940) 565-4323.

Academic Dishonesty/Plagiarism:

Plagiarism of any kind will automatically result in a grade of F for the course. Academic Integrity Standards in this course are consistent with UNT policy: STUDENT STANDARDS OF ACADEMIC INTEGRITY (18.1.16), or other related/existing policies. The work that you turn in to be graded, including any underlying ideas, must be your own individual work. Usage of unauthorized material and sources, or depending on any unauthorized assistance, to answer homework problems, tests questions, writing reports, or carrying any type of assignment, etc., without the permission of the instructor, or without complete and accurate and complete attribution/citations of the source, when applicable, is viewed as an academic misconduct. If you have any doubts or if you have specific questions, feel free to ask the instructor.

Other Policies:

Students should refer to any other policies from University, College and/or Department.

Attendance and Participation

Research has shown that students who attend class are more likely to be successful. You should attend every class unless you have a university excused absence such as active military service, a religious holy day, or an official university function as stated in the [Student Attendance and Authorized Absences Policy \(PDF\)](https://policy.unt.edu/policy/06-039) (<https://policy.unt.edu/policy/06-039>). If you cannot attend a class due to an emergency, please let me know. Your safety and well-being are important to me.

Communication Expectations:

The best way to reach me outside of class/office hours is via email. During the week I will respond to your email within 24 hours. During the weekend, response time may be longer. This includes personal concerns or questions about the class or an assignment. The TA/IA and I strive to get your grades back between 1-1.5 weeks from the due date, though that is not always possible when the class is large. Communication is expected to be professional and respectful. Online Communication Tips: (<https://clear.unt.edu/online-communication-tips>) are available. When contacting either the instructor or TA/IAs please include "CSCE 4110.501" in the subject line.

Announcements:

Stay tuned and make sure to check Canvas frequently. Important announcements will be posted there.

Class Policies: Please note that portable phones, pagers, and late arrivals are disruptive to the instructor and to your peers. The use of cell phones, beepers, or communication devices is disruptive and is therefore absolutely prohibited during class and exams. Turn off your cell phone while in class and while taking exams. If I catch you using these devices in the class or during the exams, the penalty can range from a formal warning to an 'F' for the course and you will be asked to leave the class. Except in emergencies, students using such devices must leave the classroom for the remainder of the class period. I know that some of you may wish to take notes directly on your computer and I have no problem with that. If, however, you choose to access your email, search the web, play games, or instant messenger your friends during class, you will have 5% deducted from your final grade for each transgression. If I am late arriving to class, it will be because of circumstances beyond my control. You are expected to remain for 15 minutes past the scheduled class start time while I attempt to communicate my situation and relay instructions.

Student Perceptions of Teaching (SPOT): Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The short SPOT survey will be made available **at the end of the semester** to provide you with an opportunity to evaluate how this course is taught.

Assessing Your Work

Course Policies: You are expected to spend at least 10 hours per week for this course. Keep all your graded assignments, and tests for study and review. You should track your own progress on Canvas and be aware of current grades throughout the term. If you would like to look at the graded assignments, meet me during my office hours or setup an appointment. Final grading will be done as follows. **A:** $\geq 90\%$, **B:** $\geq 80\%$ and $< 90\%$, **C:** $\geq 70\%$ and $< 80\%$, **D:** $\geq 60\%$ and $< 70\%$ and **F:** $< 60\%$. Grades will be curved if necessary. Grades cannot be changed after they have been electronically entered into the university's system except for instructor error. Any extenuating circumstances that may adversely affect your grade must be brought to my attention before the final course grades are recorded. To be considered, such circumstances must be unusual, unavoidable, and verifiable.

Course Requirements/Schedule

Syllabus Revisions: This syllabus may be changed as the course progresses. Notice of such changes will be announced on Canvas.

Tentative Course Schedule:

Week	Lecture	Assignment
08/18 - 08/22	Introduction Algorithms in Computing (Ch1) Getting started with Algorithms (Ch2)	
08/25 - 08/29	Growth of Functions (Ch3) Some Sorting Algorithms (Ch6, Ch7)	HW1
09/01 - 09/05	Lower bound of sorting & counting sort (Ch8)	
09/08 - 09/12	Some Searching Algorithms (Ch12, Ch13)	HW2 & PA1
09/15 - 09/19	Divide and Conquer (Ch4)	
09/22 - 09/26	Divide and Conquer (cont.)	HW3 & PA2
09/29 - 10/03	Dynamic Programming (Ch15)	
10/06 - 10/10	Dynamic Programming (cont.) Review for the mid-term	HW4 & PA3
10/13 - 10/17	Mid-term Exam	
10/20 - 10/24	Greedy Algorithms (Ch16)	HW5 & PA4
10/27 - 10/31	<u>Graph Algorithms – First part:</u> Elementary Graph Algorithms (Ch22) Minimum Spanning Trees (Ch23)	
11/03 - 11/07	<u>Graph Algorithms – Second part:</u> Single-Source Shortest Paths (Ch24) All-Pairs Shortest Paths (Ch25)	HW6
11/10 - 11/14	NP-Completeness & Approximation Algorithms (Ch 34 & Ch35)	
11/17 - 11/21	NP-Completeness & Approximation Algorithms (Cont.)	
11/24 - 11/28	Thanksgiving Break - No classes	
12/01 - 12/05	Review for the final	
12/08 - 12/12	No Lecture	Final Exam