Instructor: Bahareh Dorri
Office: E235F
Office Hours: 1:00 pm - 3:00 pm Mondays
Email: Bahareh.mokarram dorri@unt.edu
Class Time: 11:30 – 12:50pm Mondays & Wednesdays
Place: E265

Graders:
IA: Pavan Krishna Yarlagadda
Email: pavankrishnayarlagadda@my.unt.edu
Office: E247, Cubicle C
In-Person Office Hours: 12:00 pm - 2:00 pm Thursdays
Online Office Hours: 12:00 pm - 2:00 pm Tuesdays (link)

IA: Manideep Annarapu
Email: manideepannarapu@my.unt.edu
Office: E247, Cubicle D
In-Person Office Hours: 2:00 pm - 4:00 pm Wednesdays
Online Office Hours: 11:00 am - 1:00 pm Fridays (link)

Communication Expectations:

Connect with me through email and/or by attending office hours. You can call me Mrs. Dorri. I will strive to respond to your emails within 1 business day and make grades of each homework/exam within two weeks after the due date. Please write the course number in your email subject line. If you contact me and do not receive a response within two business days, please send a follow up email. A gentle nudge is always appreciated.

All course related announcements will be on Canvas. Please setup your notification settings to avoid missing any announcements. Please check CLEAR Online Communication Tips at https://clear.unt.edu/online-communication-tips.

For assistance with assignments or questions about grading of a particular assignment, you may also contact the IAs assigned to this directly via e-mail or their office hours.
Textbook


Course Description

The course will focus on design strategies, the mathematical analysis of the algorithms, and their proofs of correctness. Topics include 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.

Prerequisites

Students planning to enroll in this course should have taken course numbers 3110, 2100, 2110. They should have been exposed to the following:

1. Time and space analysis: asymptotic notation
2. Basic sorting algorithms: insertion, merge and heap sort
3. Data structures including trees, heaps, BSTs, union/find data structures, and graphs
4. Recurrence Relations and Proof techniques
5. Graphs: BFS, DFS, MST (Prim's and Kruskal's algorithms)
6. Mathematical structures: Sets, relations
7. Important mathematical manipulations: Sums, combinatorics

Learning Outcomes

By the end of this course, students will:

1. Be able to analyze the time and space complexity of a nontrivial algorithm, using mathematical tools, and prove/justify the correctness.
2. Be able to understand the Divide and Conquer, Greedy, and Dynamic Programming, and branch-and-bound strategies for algorithmic design.
3. Be familiar with the algorithms for Matrix Multiplication (Strassen's), Activity Selection, Knapsack, Shortest Paths (single source, and all pairs), Minimum Spanning Tree, Matrix Chain, and Longest Common Subsequence problems.
4. Be exposed to approximation algorithms for solving NP-hard problems.
5. Be able to determine and measure the efficiency of a given algorithm, in practice, through different possible implementations, and by testing on suitable datasets.

6. Be able to communicate clearly and precisely in writing about the theoretical analysis of an algorithm and its efficiency in practice.

Course outcomes are measurable achievements to be accomplished by the completion of a course. These outcomes are evaluated as part of our ABET accreditation process.

Grading

- Assignments/ Quizzes 40%
- Exam1 & Exam2 25%
- Final 20%
- In-class activities* 15%

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

* Students are expected and encouraged to attend classes. Students will be responsible for any missing class activities (such as quizzes, in-class assignments, etc.) or announcements. The absence reason could be anything including university sponsored events. Also, the student’s absence does not change the due date of any assignment.

Assignments: Assignments must be turned in on their due dates. Late submissions may be allowed up to 24 hours after the due date with a 20% penalty on the grade for that assignment. Submissions after the grace period will not be accepted!

We do not accept assignments submission by email.

Due to the *ad hoc* nature of the in-class assignments, they will be announced during class time. For most cases, no in-class assignment announcement will be made on Canvas. It is your responsibility to listen to class carefully to learn about these assignments. If you missed the class, please contact your classmates whether any in-class assignments were given in a class. Since in-class assignments will be discussed in the following class, no late submissions or make ups will be accepted unless you missed the class due to an excused absence.
Grades will be posted on Canvas throughout the semester to provide an ongoing assessment of student progress, but typically about 10-15 calendar days after the assignment was due. Grading discussion should first go to the IA graded your assignment in 5 calendar days after grades posted, but if a resolution cannot be reached between the student and the grader, then you should go to the instructor who will have the final decision on the grade. After 5 calendar days, barring an exceptional circumstance, grades will not be altered.

It is the student's responsibility to check any given grade and make complaints within at most two weeks after the grades are announced. Grades will not be changed afterwards. Make-ups must need the instructor's special permission. In most cases, they are not allowed.

The final exam is on Monday, May 6 at 10:30 am - 12:30 pm.

**Make-up Work Policy**

For most situations there will be no make-up work for any assessment in this course. However, in the event of an unavoidable absence for one of the reasons below, email me as soon as possible so we can work out a solution. The following events are grounds for make-up work: being a participant in a conference in which you are presenting; being in an athletic or other UNT associated event in which you are an active participant; a family emergency; a severe illness; military duty; or in certain cases and with some restrictions a religious event. Additionally, in the case of a missed assignment due to illness, make-up work will only be allowed by the instructor to receive further notification from the Dean of Students. Students are responsible for sending an email to the Dean of Students with a physical copy of a signed doctor’s note. See the UNT Attendance Policy for more information.

A student is responsible for requesting an excused absence in writing, providing satisfactory evidence to the Dean of Students (deanofstudents@unt.edu) to substantiate excused absence, and the Dean of Students will send the notification to the faculty member assigned to the course for which the student will be absent. When an absence is excused, the faculty member will provide a reasonable time after the absence for the student to complete the assignment.

**Academic Integrity**
Standards in this course are consistent with UNT policy: STUDENT STANDARDS OF ACADEMIC INTEGRITY (18.1.16), or other related/existing UNT 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, test questions, writing reports, or carrying any type of assignment, etc., without the permission of the instructor, or without complete and accurate and complete attribution/citation of the source, when applicable, is viewed as an academic misconduct.

**Assignment 1 Already RELEASED:** Please make sure to take the “Academic Integrity” quiz that is available on Canvas.
**Due Date: Second session of the class.**

**Cheating Policy:**
- Using information from a homework helper site (including AI based services like Chat GPT) is CHEATING
- Duplicating/nearly duplication answers from another student/another groups submission is CHEATING
- First Offence: 0 for the entire submission
- Second Offence: F for the course

**Disabilities Accommodation**

The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.

**Syllabus Revisions**

This syllabus may be modified as the course progresses should the instructor deem it necessary. Notice of changes to the syllabus shall be made through Canvas and/or in-class announcements.