CSCE 5150: Analysis of Computer Algorithms

1. Timing and Access

Class Hours: Tuesday and Thursday 4:00-5:20
In Person Class: Discovery Park B155

2. Course Content. This is a graduate course on analysis of algorithms. Course will focus on analyzing algorithms, computing their complexity, different algorithmic techniques including divide and conquer, dynamic programming, greedy algorithms, randomized algorithms, branch and bound, approximate and heuristic algorithms for NP-complete problems.

3. Prerequisites. It is expected that the students have taken undergraduate courses in algorithms and data structures.

4. Evaluation

There will be one midterm and one final. Each will be worth 25%, **together making 50% of the total grade. Midterm will be held in class on October 13th. Finals will be held in finals week** according to university schedule. The exams have to be taken individually. You can bring a cheat sheet for the exams.

There will be 4 assignments. The time for each assignment will be approximately 10 days. Each assignment will be worth 9%, so together the **assignments will be 36% of the total grade**. Assignments can be done **in groups of two-three, but no more than three**. You are responsible for forming groups. You can submit one answer per group.

There will be at least seven, possibly more, in class quizzes. The quizzes will be held in class for the first 20 minutes. The quizzes have to taken individually, and will be open notes, open book and open internet. **Each quiz will be worth 2 points**. **The top seven scores will be used to make 14% of the total grade.** I will make announcements on Thursdays, in class and on canvas, whether there will be a quiz on the following Tuesday.

There will be interactive problem solving activities during the class. These can be done in groups and will not be graded. However, participating will help you do well in the exams.

5. **Grading scheme.** The highest score will be set to 100, and the scores of the rest of the class will be scaled based on the highest grade.

Two points will be deducted for each day (weekends included) of late submission of assignments. The passing marks in this class is 55 or lower. Anyone getting lower than 55 will get an F

6. **Plagiarism Policy.** Academic Integrity Standards in this course are consistent with UNT policy: STUDENT STANDARDS OF ACADEMIC INTEGRITY (18.1.16), or other related/existing UNT polices. The work that you turn in to be graded, must be your own 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/citation of the source, when applicable, is viewed as an academic misconduct.

Rules specific to this course. You can use any publicly available resource, including code snippets, so long as you cite the source. You **cannot use resources from sites that you or others have to pay to access** (such as Chegg etc.)

(i) Not citing the source is **CHEATING**
(ii) Using information from a pay to use homework helper site, such as Chegg, is **CHEATING**

(iii) Duplicating/nearly duplication answers from another student/another groups submission is **CHEATING**

First offence for plagiarism is 0 for the entire submission. The second offence is an F in the course. If multiple groups/students have duplicate answers then the penalty will apply to all groups and all students regardless of who did the actual work.

*Policy for working in groups***.** You can distribute the work among group members. However, if your name is in the submission you are responsible for the submission. This means

(i) you should be able to explain the algorithm/code/logic of the solution for all parts of the project even if you were not directly involved in implementing it

(ii) if any group member cheats, the entire group will be penalized

You can switch, merge or create new groups in course of the semester. The only constraint is that there can be **no more than 3** people per group.

7. Textbook

The materials in the lectures and associated links should be sufficient. You can also use materials available online. Books that we will use:

Introduction to Algorithms, by Thomas H. Cormen, Charles E. Leiserson, and Ronald L. Rivest.

Introduction to the Design and Analysis of Algorithms by Anany Levitin

Algorithms by Jeff Erickson

Advanced Algorithms and Data Structures by Marcello La Rocca

8. Instructor and TAs

Sanjukta Bhowmick
Email: Sanjukta.bhowmick@unt.edu

TA: Logan Widick. **Email:** loganwidick@my.unt.edu

IA: Chandralekha Chennamsetty **Email:** chandralekhachennamsetty@my.unt.edu

9. Office Hours:

Instructor Office Hours: Monday 12:30am -2:00 pm at F291.

TA Office Hours: Will be announced on CANVAS

We are also available to help outside office hours. If you have any questions or clarifications send email to the instructors as well as the TA and IA. We will respond with 24 hours. If you want to discuss the material outside the regular office hours, send us an email and we can schedule a meeting.

All information about the class, any changes in schedule, details about assignments, etc. will be posted on the announcements via CANVAS. Please check the announcements regularly.

10. Syllabus

Topic 1: Asymptotic Complexity
Topic 2: Advanced Data Structures
Topic 4: Bloom Filters and Hashing
Topic 4: Divide and Conquer
Topic 5: Dynamic Programming
Topic 6: Greedy Methods
Topic 7: Randomized Algorithms
Topic 8: NP problems and Approximate Algorithms
Topic 9: Branch and Bound Methods