Data Structures and Algorithms
CSCE 3110

Course Information & Syllabus (Fall 2022)

Instructor : Dr. XUAN GUO
In-person Lectures: Mondays & Wednesdays 1:00 pm – 2:20 pm, NTDP K150
Office Hours: Mondays & Wednesdays 2:30 – 4:00 pm or by appointment
Office: NTDP F290
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E-mail: sharmilachowdarygannamani@my.unt.edu

Class Web Page: Canvas
Recommended Textbooks:

- Data Structures and Algorithm Analysis in C++, Mark A. Weiss. Pearson, 2013.
- Introduction to Algorithms. 3rd ed. Cormen, Thomas, Charles Leiserson, Ronald Rivest, and Clifford Stein. MIT Press, 2009

Prerequisites: CSCE 2100 and 2110 or equivalent. You need to know how to write C++ code and compile on your own, and basic knowledge of elementary data structures.

Course Objective: The course is intended to emphasize the understanding of non-linear data structures, and elementary graph algorithms, throughout the theoretical analysis, as well as experimentation. The lectures will emphasize the theoretical aspects, whereas assignments will cover both theory and programming aspects. Course contents and topics may slightly vary at the instructor's discretion.
Topics include:

- Time and Space analysis (Asymptotic notation)
- Recursion and Recurrence relations
- Review of Basic Data Structures (Lists, stacks, queues, etc.)
- Tree-based data structure, including heaps, BSTs, union/find data structures and AVL trees
- Hashing
- Data structures for storing graphs, elementary graph algorithms (breadth-first search, depth-first search) and their applications

- Algorithms for solving minimum spanning tree problem (Prim's and Kruskal's) and their implementations

You are expected to check https://canvas.unt.edu/ often for course material, homework assignments and grades.

ABET outcomes:

- Understand time complexity of algorithms.
- Be able to solve recurrence relations.
- Understand and be able to analyze the performance of data structures for searching, including balanced trees, hash tables, and priority queues.
- Apply graphs in the context of data structures, including different representations, and analyze the usage of different data structures in the implementation of elementary graph algorithms including depth-first search, breadth-first search, topological ordering, Prim's algorithm, and Kruskal's algorithm.
- Be able to code the above-listed algorithms

Grading:

Assignments (mixed with written and programming exercises)	30%
In-class Quizzes	20%
Mid-term Exam	20%
Final Exam	25%
Attendance	5%
Challenging Projects	10% (Bonus)

- There will be six homework assignments. Homework grade will be the average of the five highest-graded homework assignments. Homework assignments will include both written and programming exercises.
- Students should expect at least five in-class quizzes. Quiz grade will be the average of all quizzes after dropping the lowest-graded quiz.
- The mid-term exam will be during the class on TBD. The final exam will be on TBD.

Submission: All assignments, shall be turned in electronically using the Canvas. A late penalty of 10% will be applied to all late assignments for up to 3 calendar days. Assignments that are not turned in 3 days after the due date will not be accepted. All holidays and weekends will be counted as calendar days.

Attendance: Attendance may be taken on randomly selected days. Students are responsible for regular and punctual attendance. A student is responsible for requesting an excused absence in writing, providing satisfactory evidence to the faculty member to substantiate excused absence, and delivering the request personally 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 an assignment or examination missed. Any student who misses a class over two absences without informing the instructor of valid reasons, and obtaining approval, will lose one point (out of 5 possible points).

Plagiarism: Plagiarism of any kind will automatically result in a grade of F for the course.

Acceptable Student Behavior: Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Center for Student Rights and Responsibilities to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc.

Americans with Disabilities Act: We cooperate with the Office of Disability Accommodation to make reasonable accommodations for qualified students (cf. Americans with Disabilities Act and Section 504, Rehabilitation Act) with disabilities. If you have not registered with ODA, we encourage you to do so. If you have a disability for which you require accommodation, please discuss your needs with the instructor or submit a written Accommodation Request on or before the fourth-class day.