CSCE 3110.001 (Data Structures and Algorithms F2018.)

Textbook

Data Structures and Algorithm Analysis in C++. Mark Allen Weiss. 4th edition. Supplementary material will be provided online, when necessary.

Prerequisites

CSCE 2100 and 2110 or equivalent.

Instructor

Dr. Farhad Shahrokhi, Professor, Computer Science and Engineering, F276(DP) farhad@cs.unt.edu. Office Hours Tu, Thr: 1-2.

Course Content

The course is intended to emphasize the understanding of non-linear data structures, and elementary graph algorithms, throughout theoretical analysis, as well as experimentation. The lectures will emphasize the theoretical aspects, whereas, a number of class assignments will cover the programming aspects. Course contents and topics may slightly vary at the instructor’s discretion.

Students should have been exposed to the following topics

Object oriented design and abstract data types, C++ language features (including pointers, classes, templates), linear and binary searching, recursion, basic data structures (linked lists, stacks, queues, trees) basic sorting algorithms (insertion and merge sort), simple time analysis of algorithms, proof techniques (induction, contradiction), sets, relations, trees, graphs, sums, combinatorics.

Course Outcomes-Learning Objectives

1. Understand time complexity of algorithms.
2. Be able to solve recurrence relations.
3. Understand and be able to analyze the performance of data structures for searching, including balanced trees, hash tables, and priority queues.
4. 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.
5. Be able to code the above-listed algorithms.

Course Policies

• The polices are subject to change in the first 3 weeks of classes, if so the students will be notified.
• Grading Policy: Exam 1(20 percent), Exam 2(20 percent) Final(20 percent), Homework+programming assignments (40 percent). Students should anticipate about 6 homework sets and about about 5 programming assignments.
• Late assignments would not be accepted. All Programming assignments must be done on CSE machines. No make up exams would be given, unless a strong reason is provided.
• 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, 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/citation of the source, when applicable, is viewed as an academic misconduct.

• 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 classe without informing the instructor of valid reasons, and obtaining approval, will loose one point (out of 100 possible points.)

• Usage of cell phones, earphones, and other electronic devices, including laptops and classroom computers are not allowed in this class. Recording of lectures is not allowed. Any student who will use an unauthorized device will loose 1 point (out of 100) and may be asked leave the classroom. Students, however, can contact the instructor and request a permission for the usage of a laptop or tablet for taking notes or reading electronic book, only.

Acceptable Student Behavior

• Student behavior that interferes with an instructors 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.

Disabilities Accommodation

• If you believe you have a disability requiring accommodation, please contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.