DATA STRUCTURES AND ALGORITHMS
CSCE 3110.021 – SUMMER 2014 10W

Instructor:	Dr. Mark Thompson
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Class Location/Time:	NTDP B157, TuTh 2:30 – 4:20 PM
Office Hours:	TuTh 11:30 – 12:30 PM TuTh 4:30 – 5:30 PM *or by appointment* *Every attempt will be made to answer e-mails within 24 hours.*
Textbook:	*Data Structures and Algorithm Analysis in C++, Fourth Edition*, Pearson, 2014. ISBN 978-0-13-284737-7. Supplements will be provided as needed.
Prerequisites:	CSCE 2100 and CSCE 2110 or CSCE 2050 and MATH 2000.
Blackboard	This course will use Blackboard, a Web-based course management system, to distribute course materials, communicate and collaborate online, post grades and submit assignments. You are responsible for checking the Blackboard course site regularly for class work and announcements.
Grader	Erwin Fernandez-Ordonez *Office:* NTDP F205 *Office Hours:* Fr 5:00 – 7:00 PM *E-mail:* ErwinFernandez-Ordonez@my.unt.edu *or by appt.*

Course Content

This 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, where as a number of class assignments will cover the programming aspects.

Topics

1. Time and Space Analysis (Asymptotic Notation)
2. Recursion and Recurrence Relations
3. Review of Basic Data Structures (Lists, Stacks, Queues)
4. Tree-Based Data Structure, including Heaps, BSTs, Union/Find Data Structures, AVL Trees
5. Hashing
6. Data Structures for Storing Graphs, Elementary Graph Algorithms (BFS, DFS), and their Applications
7. Algorithms for Solving Minimum Spanning Tree Problem (Prim's and Kruskal's) and their Implementations

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Learning Objectives

1. Understand dictionary/search data structures (lists, trees, and hash tables).
2. Understand graph representations (adjacency lists and matrices) and graph algorithms (BFS, DFS), and minimum spanning tree algorithms (Prim's and Kruskal's).
3. Understand time and space analysis of both iterative and recursive algorithms (asymptotic notation and recurrence relations) and be able to prove the correctness of a non-trivial algorithm.
4. Be able to translate high-level, abstract data structure descriptions into concrete code.
5. Understand how real-world problems map to abstract graph problems.
6. Be able to communicate clearly and precisely about the correctness and analysis of basic algorithms (both oral and written communication).

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, and combinatorics.

Tutoring

Should you miss a class session or not understand some of the material that was covered in class, I encourage you to stop by my office during my office hours (or make an appointment) to discuss any questions or concerns. If you are having difficulty completing an assignment on time and require additional assistance, you must contact the instructor *before* the due date.

Disability Statement

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 for 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.

Classroom Civility Statement

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. The Code of Student Conduct can be found at www.unt.edu/csrr.

Course Policies

- Class attendance is regarded as an obligation as well as a privilege. All students are therefore expected to attend each class meeting. *A student who misses class is still responsible to find out what was discussed and to learn the material that was covered and obtain the homework that was assigned on the missed day.* The instructor is not responsible for re-teaching material missed by a student who did not attend class. Therefore, each student is accountable for and will be evaluated on *all* material covered in this course, regardless of attendance. Students with more than two (2) unexcused absences may be dropped from the course or have their grade lowered by one letter grade. The instructor will have the final say as to whether or not an absence is excused.
- Late assignments will not be accepted. All assignments must be completed and submitted according to their specific directives.
- A make-up exam will be given at the discretion of the instructor when a student misses an exam with an excused absence. Unexcused absences on the date of the exam may result in a grade of 0 for the missed exam, so every effort should be made to attend class on the day of the scheduled exam.
- Usage of any unauthorized material for assignments and tests, including Internet resources, and the solutions to the assigned problems, without the permission of the instructor, is considered academic misconduct, and will not be tolerated.
- Usage of cell phones, earphones, and other electronic devices, including laptops and classroom computers, is not allowed in this class. Any student who uses an unauthorized device may lose one (1) point out of 100 and may be asked to leave the classroom. Students, however, may contact the instructor and request permission for the usage of laptops or other educational-related devices.

Grading Policy

Your course grade will be a weighted average according to the following:

Homework and Programs	40.0%
Exam 1	20.0%
Exam 2	20.0%
Final Exam	20.0%
Total	100.0%

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Tentative Class Schedule *(subject to change):*

Week	Date	Material Covered	Remarks
1	6/2 — 6/6	Intro, Alg Analysis	
2	6/9 — 6/13	Alg Analysis, Recur Relats, Lists, Stacks & Queues	HW1
3	6/16 — 6/20	Lists, Stacks & Queues	HW2
4	6/23 — 6/27	Trees	**Exam 1**
5	6/30 — 7/4	Trees	Prog1
6	7/7 — 7/11	Trees, Heaps	HW3
7	7/14 — 7/18	Hashing, Sorting	HW4
8	7/21 — 7/25	Graphs	**Exam 2**
9	7/28 — 8/1	Graphs	Prog2
10	8/4 — 8/8	Review	**Final Exam**