CSCE 3110 – DATA STRUCTURES AND ALGORITHMS

Class Times:
Sections 1 & 4: MW 2:30 – 3:50pm, **Room:** NTDP D215
Sections 2 & 3: MW 4:00 – 5:20pm, **Room:** NTDP D215
Recitation Times:
Section 1: M 4:00-4:50pm, **Room:** NTDP B192
Section 2: W 5:30-6:20pm, **Room:** NTDP B158
Section 3: F 4:00-4:50pm, **Room:** NTDP B158
Section 4: M 12:30-1:20pm, **Room:** NTDP B192

Instructor: Marty O'Neill, Ph.D.
Office: NTDP F201E
Office Hours: Monday, Wednesday 1:30 – 2:30pm, others by appointment

TA: Theogene Bucuti
Grader: Madhu Gopal Thannir

Please communicate with Instructor, TA, and Grader through Blackboard.

In class code examples: http://students.cse.unt.edu/~martyo/3110sum2015/

Textbook: *Data Structures & Algorithm Analysis in C++, 4th edition, Weiss, Addison Wesley, ISBN 9780132847377*

Course Description: Computer storage structures; storage allocation and management; data sorting and searching techniques; data structures in programming languages.

Course Outcomes:
- Understand dictionary/search data structures (lists, trees, hash tables).
- Understand graph representations and algorithms.
- Understand time and space analysis for both iterative and recursive algorithms and be able to prove the correctness of a non-trivial algorithm.
- Be able to translate high-level, abstract data structure descriptions into concrete code.
- Understand how real-world problems map to abstract graph problems.
- Be able to communicate clearly and precisely about the correctness and analysis of basic algorithms (both oral and written communication).

Course Content and Topics: This course emphasizes the understanding of non-linear data structures and elementary graph algorithms through theoretical analysis and experimentation. The lectures will emphasis the theoretical aspects, whereas assignments will cover the programming aspects. Topics will include:
- Time and Space Analysis
- Recursion and Recurrence Relations
- Review of Basic Data Structures (lists, stacks, queues)
- Tree-based Data Structures (including heaps, BST, union/find data structures, AVL, etc.)
- Hashing
- Graph-based Data Structures and Elementary Algorithms (BFS, DFS, etc.) and their Applications
- Algorithms for Minimum Spanning Trees (Prim's and Kruskal's) and their Implementations

In addition to attending lectures and recitations, you will need to review material in the textbook. Topics/Material covered by homework, programming assignments, quizzes, and exams will be both from the lectures AND from the textbook.

Assignments: All homework assignments are due at the beginning of class on the due date. If you are absent on the day the assignment is due, you are still responsible for submitting the assignment on time. All programming assignments are due at 11:59pm on the due date and must be submitted using the **`project`** command on the CSE machines

(). *Late assignments, assignments submitted by email, and assignments submitted directly to a TA or Grader will not be graded unless approved by the instructor.* It is your responsibility to turn in assignments on time, even if you are not in class.

Programming assignments will consist of coding programs using C/C++. All programs submitted for grading must be submitted as a text file with the filename extension .cpp and compile and execute using the g++ compiler on the CSE machines. It is advised (but not required) that you compose your programs on the CSE machines using an editor such as emacs or vi. This will be discussed and demonstrated in class.

Exams: There will be three exams (two midterms and a final). **The first midterm exam is scheduled during normal classtime on Wednesday, September 23; and the second midterm exam is scheduled during normal classtime on Wednesday, October 28.** Check your final exam schedule as soon as possible. If there is a time conflict with another course, please contact the instructor.

Grading:

Breakdown		Grading Scale
Homework, Quizzes, Classwork:	25%	A: [90, 100)
Programming Assignments:	25%	B: [80, 90)
Midterm 1 (9/23/2015):	15%	C: [70, 80)
Midterm 2 (10/28/2015):	15%	D: [60, 70)
Final Exam:	20%	F: [0.0, 60)

Tentative Course Schedule:

Week #	Topic
1-2	Time and Space Analysis Techniques
2-3	Sorting Algorithms
4	Lists, Stacks, and Queues
5-6	Hashing
6-9	Trees
10-11	Priority Queues
12-15	Graphs

SETE: The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized undergraduate classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught.

ADA: UNT complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disability Act of 1990 (ADA). If you have a disability and need a reasonable accommodation for equal access to education or services, please contact the Office of Disability Accommodation.

Attendance: Attendance is not mandatory. However, any quizzes or exams missed cannot be made up, and you are still responsible for all material discussed in class. In case of verifiable emergencies, arrangements must be made with the instructor as soon as possible.

Academic Dishonesty: Academic Dishonesty will not be tolerated. Anyone found guilty of cheating or committing any other act of academic dishonesty on an exam or assignment will receive zero points for the entire unit of work and will receive a lowering of the grade for the course. Discussions of problems and assignments with your classmates are encouraged, however, sharing of solutions is not. If you need help with a concept in the course, you should ask the TA or the Instructor. Cheating includes, but is not limited to, all forms of plagiarism and misrepresentation. For more information, please see UNT Policy 18.1.16 *Student Standards of Academic Integrity*.