

## CSCE 3110 – Data Structures Spring 2007

Instructor: Dr. Yan Huang  
Office: F251  
Office Hours: MW 01:15-02:15pm, 04:00-05:00pm  
Email: huangyan 'at' unt.edu

Class Meeting Time and Place: MW 02:30-03:50pm, Research Park B142  
Class Website: <http://www.cs.unt.edu/~huangyan/3110>  
Class Group Email Address: 3110SPR07 'at' yahoogroups.com

TA: TBD  
TA Office Hours: TBD  
TA Office: F205

Text Book: *Data Structures & Algorithm Analysis in C++*  
Mark Allen Weiss

Recommended readings:  
*Fundamentals of Data Structures in C++*  
Ellis Horowitz, Sartaj Sahni , Dinesh Mehta

*Introduction to Algorithms*  
Cormen, Leiserson and Rivest and Stein

Course Objectives: This course provides an introduction to the design and analysis of fundamental data structures and algorithms. Basic data structures to be covered including arrays, lists, stacks, queues, trees, heaps, priority queues, hash tables, and graphs. Algorithms include searching, sorting, tree and graph traversal using the above data structures. Algorithm analysis techniques will be emphasized when using the data structures for designing efficient algorithms. The objectives of this course are:

- Understand graph representations and algorithms.
- Understand time and space analysis for both iterative and recursive algorithms and be able to prove the correctness 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).

A special emphasis is placed on programming and hands-on experience, meant to reinforce the theoretical aspects covered in lectures.

#### Grading Scheme:

Assignments: 40%  
 Project : 20%  
 Two exams : 35%  
 Class participation: 5%

Each assignment will specify the material to be turned in. All programming will be in C/C++, and must compile on a University Unix/Linux machine. No credit will be given for programs that do not compile.

Assignments are due before class on the due date. Assignments may be turned in up to 3 days late, with a penalty of 10% for each day late. No credit will be given after 3 days.

#### Academic Honesty:

Each program and homework assignment must be worked on individually. A submission carries with it an implicit statement that the submission is your own work. You may discuss the requirements and syntactical issues, but not solutions or designs. Violations may result in failure of the course.

#### Tentative Schedule:

Week 1 Introduction, Analysis tools  
 Week 2 Short overview C++, Analysis Tools (cont'd)  
 Week 3 Arrays and Lists  
 Week 4 Stacks and Queues  
 Week 5 Trees  
 Week 6 Trees. Search trees.  
 Week 7 Priority Queues / Heaps. Hashing. Dictionaries.  
 Week 8 Exam I, Sorting  
 Week 9 Sorting  
 Week 10 Sorting  
 Week 11 Graphs  
 Week 12 Graphs  
 Week 13 Exam II, Graphs  
 Week 14 Special topics: disk based data structures and algorithms  
 Week 15 Project presentations