

Data Structures and Algorithms

CSCE 3110

Spring 2016 Syllabus

Prerequisites

CSCE 2110 Computing Foundation II. You are required to have experience programming in C, C++, or Assembly Language.

Instructor

	Dr. Trac Nguyen
Office Location:	TBD
Office Hours:	W 4:30 PM – 5:30 PM (or by appointment)
Email:	TBD
Class Meeting Date & Time:	Wednesday 5:30 PM – 8:20 PM. (TBD)
Class Room:	DAL2 Room 303

Course Description

This course introduces concepts of computer storage structures; storage allocation and management; data sorting and searching techniques; data structures in programming languages.

Required Text

Lafore, Robert. *Data Structures & Algorithms in Java*. Second Edition. Sams Publishing. ISBN: 0-672-32453-9

Access to Learning Resources

UNT Dallas Library: phone: (972) 338-1616; <http://www.untdallas.edu/our-campus/library>
UNT Dallas Bookstore: phone: (972) 780-3652; e-mail: 1012mgr@fhcg.follett.com

Course Objective

This course discusses the fundamental of data structures and algorithms as used in computer programming. The course emphasizes the detail of different data structures as arrays, stacks, queues, linked lists, trees, hash tables, and graphs. The course introduces fundamental algorithms such as searching and sorting algorithms together with the techniques to manipulate the data in these structures. By the end of this course, the student will have

1. The ability to design, implement, and evaluate a computer-based system or program using a variety of data structures.

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- The ability to use current techniques, skills, and algorithms with a variety of data structures to solve a range of application problems

Course Outline

This schedule is subject to change by the instructor. Any changes to this schedule will be communicated in class.

TIMELINE	TOPIC
Week of 01/18/2016	Overview of Data Structures & Algorithms: Definitions; Object-oriented programming; A few notes on Java.
Week of 01/25/2016	Arrays: The basics of arrays in Java; Dividing a program into classes; Ordered arrays; Storing objects in Java; The Big O notation; Multidimensional arrays.
Week of 02/01/2016	Simple Sorting: Bubble sort; Selection sort; Insertion sort; Sorting objects.
Week of 02/08/2016	Exam 1
Week of 02/15/2016	Stacks and Queues: Stacks; Applications of stacks; Queues; Deques; Parsing arithmetic expressions.
Week of 02/22/2016	Linked Lists: Links; Simple linked lists; Finding and deleting specified links; Double-ended lists; Linked stacks and queues; Abstract data types; Sorted lists; Doubly linked lists.
Week of 02/29/2016	Recursion: Triangular numbers; Factorials; Recursive binary search; Mergesort; Quicksort.
Week of 03/07/2016	Exam 2
Week of 03/14/2016	<i>Spring Break – no class</i>
Week of 03/21/2016	Trees: Terminology; Binary Search Trees; Trees represented as arrays; An application of binary trees – Huffman codes.
Week of 03/28/2016	Trees: Red-Black tree, 2-3-4 tree
Week of 04/04/2016	Hash Tables: Terminology; Hash Tables and Hashing; Open Addressing; Separate Chaining; Hash Functions.
Week of 04/11/2016	Heaps: tree base heap; heap sort
Weeks of 04/18/2016 to 05/02/2016	Graphs: Terminology; Representing graphs in a program; Operations on graphs – DFS and BFS; Topological sorting with directed graphs; Application of weighted graphs – Dijkstra’s algorithm.

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Week of 05/09/2016	Final Exam
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Course Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

INPUT	PERCENTAGE	TOTAL
Assignments	Assignments on each topic with variable weights	25%
Exam 1	25%	25%
Exam 2	25%	25%
Final	25%	25%
		100%

Grade Determination

A = 90% or better

B = 80 – 89 %

C = 70 – 79 %

D = 60 – 69 %

F = less than 60%

University Policies and Procedures

Students with Disabilities (ADA Compliance):

The University of North Texas Dallas faculty is committed to complying with the Americans with Disabilities Act (ADA). Any student requesting academic accommodations based on a disability is required to register with Disability Services each semester. A letter of verification for approved accommodations can be obtained from this office. Please be sure the letter is delivered to me as early in the semester as possible. Grades assigned before an accommodation is requested will not be changed as accommodations are not retroactive. Disability Services is located in the Student Life Office in DAL2, Suite 200 and is open 8:30a.m. – 5:00 p.m., Monday through Friday. The phone number is (972) 338-1775.

Student Evaluation of Teaching Effectiveness Policy:

The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized 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. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation in this class.

Assignment Policy:

All assignments are due in class on the due dates stated on the assignments. No late assignments will be accepted. All assignments are to be done individually unless stated otherwise on the assignment.

Exam Policy:

Exams should be taken as scheduled. No makeup examinations will be allowed except for documented emergencies (See Student Handbook).

Academic Integrity:

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Academic integrity is a hallmark of higher education. You are expected to abide by the University's code of Academic Integrity policy. Any person suspected of academic dishonesty (i.e., cheating or plagiarism) will be handled in accordance with the University's policies and procedures. Refer to the Student Code of Academic Integrity [www.untDallas.edu/sites/default/files/page_level2/pdf/policy/7.002%20Code%20of%20Academic Integrity.pdf](http://www.untDallas.edu/sites/default/files/page_level2/pdf/policy/7.002%20Code%20of%20Academic%20Integrity.pdf) for complete provisions of this code.

Bad Weather Policy:

On those days that present severe weather and driving conditions, a decision may be made to close the campus. In case of inclement weather, call UNT Dallas Campuses main voicemail number (972) 780-3600 or search postings on the campus website www.unt.edu/dallas. Students are encouraged to update their Eagle Alert contact information, so they will receive this information automatically.

Attendance and Participation Policy:

The University attendance policy is in effect for this course. Class attendance and participation is mandatory because the class is designed as a shared learning experience and because essential information not in the textbook will be discussed in class. The dynamic and intensive nature of this course makes it impossible for students to make-up or to receive credit for missed classes. Attendance and participation in all class meetings is essential to the integration of course material and your ability to demonstrate proficiency. Students are responsible to notify the instructor if they are missing class and for what reason. Students are also responsible to make up any work covered in class. It is recommended that each student coordinate with a student colleague to obtain a copy of the class notes, if they are absent. Successfully completing this class is a function of many factors. Two such factors are class attendance and assignment completion.

Diversity/Tolerance Policy:

Students are encouraged to contribute their perspectives and insights to class discussions. However, offensive & inappropriate language (swearing) and remarks offensive to others of particular nationalities, ethnic groups, sexual preferences, religious groups, genders, or other ascribed statuses will not be tolerated. Disruptions which violate the Code of Student Conduct will be referred to the Office of Student Life as the instructor deems appropriate.

Cell Phones: *Cell Phone use (or ringing) in class is strictly prohibited.*