Course Outline

Data Structures CS-2001

Semester Fall-2024, Section-E & F

Instructor: Saira Karim
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Credit Hours: 3

Office Hours: Tuesday and Thursday 2:30-3:30 p.m.

Prerequisite Object Oriented Programming

Course Objectives:

CS2001 is a core Computer Science course with Object Oriented Programming as its prerequisite. The course learning outcomes of this course are:

- Demonstrate basic concepts of data structure and algorithms.
- Evaluate different data structures in terms of memory complexity and time requirement
- Design appropriate data structures to solve real world problems related to the program
- Determine bugs in programs and recognize required operations with data structures

Text Book:

Any one of these books is recommended as a text book:

- Mark Allen Weiss, *Data structures and algorithm analysis*, Pearson Education, 2007.
- Adam Drozdek, *Data structures and algorithms in C++*, Course technology, 2004.
- Nell Dale, *C++ Plus Data Structures*, 3rd Edition, Jones and Bartlett, 2003.
- Michael T. Goodrich, Roberto Tamassia and David M. Mount, Data structures and algorithms, 2nd Edition, John Wiley & Sons, 2011.

LECTURES	TOPICS
1	Introduction
2	Time Complexity Analysis and Asymptotic Bounds
5	Linked Lists Review of pointers Singly linked lists, doubly linked lists, circular lists and corresponding iterators
2	Stacks and Queues
MIDTERM 1	
2	Recursion
3	Trees Binary trees and their traversals Binary search trees (Insertion, Deletion and Search)
3	Height Balanced Binary Search Trees (AVL Trees)
2	Heaps and heap sort
MIDTERM 2	
1	Data compression and Huffman coding
2	Hashing Hash tables and hash functions Collision resolution
3	Graph data structure, Breadth first search and Depth first search
2	Advanced Topics

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Tentative Grading Scheme:

Assignments**(10 %)**

Quizzes**(10 %)**

Midterms**(30 %)**

Final Exam **(50 %)**

Homework**(0%)**

Important Instructions:

- Quizzes may be announced or surprise
- There will be no make up quiz
- Minimum requirement to pass this course is to obtain at least 50% marks.
- All assignments and course work must be done individually. **Plagiarism** in any work (Quiz, Assignment, Midterms, and Final Exam) from any source (chatGPT/Internet or a Student) will result in **F** grade.
- No Late assignment Submissions
- All the CS department's grading policies apply.