Department of Electrical and Computer Engineering

North South University

CSE 225: Data Structure and Algorithm

Course Outline-Summer-2021

Instructor: Professor Dr. Mostofa Kamal Nasir [MKN1]

Office: SAC 1196

Office Hour: RA - 7:00pm-9:00pm

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Course Content:

- Data representation in memory analysis of running time of algorithms
- Efficient Data Structure: Lists (Array, Link Lists), Stacks, Queues, Binary Search Trees, Heaps, Priority Queues, Graphs, Hash Tables.
- Efficient algorithms of Sorting and Searching
- Elementary tree and graph algorithms.

Text Book and Materials:

1. C++ plus data Structures, Fifth Edition by Nell Dale
2. Data Structures Schaum's Outline Series

Outcomes of the Course:

1. Students develop knowledge of basic data structures for storage and retrieval of ordered or unordered data using arrays linked lists, binary trees, heaps, graphs and hash tables.
2. Student develop knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion, deletion, searching and sorting of each data structure.
3. Students learn to analyze and compare algorithms for efficiency using Big-O notation.
4. Students implement projects requiring the implementation of the above data structures.

Marks Distribution:

Assessment Tools	Weightage (%)
Attendance	5
Class Performance	5
Assignment	10
Viva/Presentation	10
Quizzes	15
Midterm	25
Final Exam	30
Total(CSE-225)	80%
CSE (225L)	20%

Schedule:

Lecture	Topic
1	Data Structures Introduction
2	Types of Algorithm
3	Algorithm and Complexity
	Assignment on Algorithm
4	Programming with C++
5	Array
6	ADT Unsorted List
7	ADT Sorted List
8	Linked List
	[quiz]-01: Lec 1,2,3,5,6,7
9	ADT Stack
10	ADT Stack (Continued)
11	ADT Queue
12	ADT Queue (Continued)
	[quiz]-02:Lec 9,10,11,12
13	Binary Tree Traversing Algorithm
	Midterm Exam* Lecture:2-12
14	Heaps, Priority Queue
15	Huffman Coding
16	AVL Tree/ Red Black Tree
	Quiz:03 Lec:11,12,13,14,15
17	Graphs Shortest Path Algorithm
18	Graphs BFS
19	Graph DFS
20	MST
21	Sorting and Searching Algorithms
	Assignment/Project on Sorting and Searching
22	Hashing
	Quiz-04:16,17,18,19,20,21
23	Review Class
24	Final Exam: Lec:09-22

Lab: Lab Outline and Manuals will be provided separately

Grades

Letter grades indicating the quality of course work completed is interpreted as follows

Numerical Scores	Letter Grade	Grade Points Per Credit
93 and above	A Excellent	4.0
90 - 92	A-	3.7
87 - 89	B+	3.3
83 - 86	B Good	3.0
80 - 82	B-	2.7

77 - 79	C+	2.3
73 - 76	C Average	2.0
70 - 72	C-	1.7
67 - 69	D+	1.3
60 - 66	D Poor	1.0
Below 60	F* Failure	0.0
	I** Incomplete	0.0
	W** Withdrawal	0.0
	R** Retaken	0.0

. **** Class Performance and Attendance have high impact on your final grade**

Policy:

Exams and Quizzes: Exams and quizzes will be closed book and closed notes. No electronic devices except non-programmable calculators will be allowed during exams. Calculators cannot be shared with friends. There will be no makeup quizzes or exams. If you miss a quiz or exam, you will get zero for that. Final exam will be comprehensive.

Assignments: There will be several home works/ Assignments throughout the semester No late submission will be accepted. To be successful in the exam, you should solve home works problems independently, although you may discuss with your friends to understand a more comprehensive picture of the problems.

Class performance: Asking questions, taking part in discussions, sudden exams, and so on.
Class etiquette: Distracting others in class is violating others rights to be attentive. So, laptop, tablets, cell phones or any other devices cannot be turned on during class time. You have to share any talk with the whole class. Attendance will be counted at the beginning of the class and if you are late then no late attendance will be counted.

Grade dispute: If you dispute your grade on any homework, quiz or exam, you have one week time from the date that the graded paper was returned to you to request a change in the grade. After this time, no further change in grade will be considered.

General course administration: The class presentations will be interactive lectures. Instructor will provide lecture slides after the lecture sessions.

Academic Honesty: Any means of unauthorized assistance in preparing materials which a student submits as original work is deemed to be cheating and constitutes grounds for disciplinary action. Instructors are expected to use reasonably practical means of preventing and detecting cheating. Any student judged to have engaged in cheating might receive a reduced grade for the work in question, a failing grade in the course, or such other lesser penalty, as the instructor deems appropriate. Serious instances may be referred to the Disciplinary Committee in the Office of the Vice Chancellor.