North South University (NSU)
Department of Electrical and Computer Engineering
CSE 225: Data Structures and Algorithm
Course Outline
Spring 2022 (January 2023 ~ June, 2023)

Course Instructor: Dr. Mohammed Shafiul Alam Khan (SAK1)
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Class Days: Thursday and Saturday
(8:00 ~ 9:00 AM, 9:10 ~ 10:10 AM, and 10:20 AM ~ 11:20 PM)

Overview of the Course

In this course the following major topics will be covered.

- Data representation
- Efficient Data Structures: Array, List, Linked List, Stack, Queue, Tres, Binary Search Tree, Graphs etc.
- Analysis of running time of algorithms for different data structures
- Efficient algorithms of sorting and searching
- Elementary tree and graph algorithms

Learning Outcomes

1) Introduce the basic data structures for storage and retrieval of ordered or unordered data using array, linked list, stack, queue, binary tree, and graphs.
2) Introduce the concept of problem domain analysis and exploit the domain features to improve data structure efficiency.
3) Develop the concept of asymptotic analysis using Big-O techniques to compare different algorithmic solutions.

Course Plan by Content

Discussion Topic (Before Mid)	Discussion Topic (After Mid)
Introduction	Stack and Queue (Linked List)
Intro to C++	Programming with Recursion
Algorithm Analysis	Tree
Pointers	Binary Search Tree
Sorted and Unsorted List (Array)	Graph
Linear and Binary Search	Graph Searching (BFS, and DFS)
Linked List	Sorting Algorithms
Stack and Queue (Array)	

Lab Activities

Lab manual will be provided separately in Lab class.

Required Text and Materials

C++ Plus Data Structures, Fifth Edition by Nell Dale

Reference Text and Materials

- Data Structures and Algorithms in C++, Michael T. Goodrich, Roberto Tamassia, David Mount
- C++: The Complete Reference, Herbert Schildt
- Additional reading materials will be provided and uploaded in Piazza classroom by the instructor.

Assessment and Grading Policy

The components in evaluation are as follows [1].

Assessment Tools	Weightage (%)
Class Attendance	10%
Class Performance, Participation	5%
Assignments	10%
In Class Exams (Quizzes + Midterm)	30%
Final Exam	25%
Lab Work	20% [2]

[1] The weightage can vary up to +/- 5%

[2] This weightage will be filled from the converted marks obtained in CSE 225L

Final Grade will be calculated as per University rules which is as follows,

Numerical Scores	Letter Grade	Numerical Scores	Letter Grade	Numerical Scores	Letter Grade
93 and above	A	80 ~ 82	B-	67 ~ 69	D+
90 ~ 92	A-	77 ~ 79	C+	60 ~ 66	D
87 ~ 89	B+	73 ~ 76	C	Below 60	F
83 ~ 86	B	70 ~ 72	C-		

Class Policy

Exams and Quizzes: All exams and quizzes are declared exams. They will be closed book and closed notes. No electronic devices will be allowed during exams. **There will be no makeup quizzes or exams, except for those who have informed about the missed examination beforehand.** 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 homework problems independently, although you may discuss with your friends to understand a more comprehensive picture of the problems.

Class Performance: Students are required to attend all classes. **Recovering missed lecture content or assignment information is the responsibility of the student**. Office appointments will not be used to substitute for class attendance. Prior to class, reading assignments must be completed and **any other assignments must be submitted at the beginning of the class period**. Asking questions, participation in class activities, including discussion groups and in-class assignments, is a component of class performance. Failure to prepare and participate effectively will negatively impact the learning processes devised for the class.

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.

Grade Dispute: If you dispute your grade on any homework, quiz or exam, you have one-day 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 that 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.

Best of Luck!