CSE 211 - Data Structures (2021 Autumn)

1. Instructor:

Name: Doç. Dr. Mert Ozkaya
Office: Engineering Faculty, 1st Floor, Room No: A410
E-mail: mozkaya@cse.yeditepe.edu.tr
Office Hours: Please send e-mail first, I am not always at office due to the pandemic situations

2. TAs: To be announced

3. Lecture hours: Mondays [12:00-14:00], Tuesdays [13:00-13:50]

4. Lab hours: Section 1,2 Mondays [09:00-11:00], Section 3 Wednesdays [09:00-11:00]

5. Course Website: Check YOULEARN

6. Text Books

1. *(Required)* Frank M. Carrano and Timothy Henry, *Data Abstraction and Problem Solving with C++: Walls and Mirrors*, any edition, Pearson, 2013.
2. *(Recommended)* Harvey M. Deitel and Paul J. Deitel, *C++ How to Program*, any edition, Prentice Hall.
3. *(Recommended)* Adam Drozdek, *Data Structures and Algorithms in C++,* any edition, Cengage Learning

7. Course Aim & Objectives

Algorithms and data structures are the two important concepts that need to be understood by every students who study computer science. Indeed, programming can essentially be considered as the combination of algorithms with data structures. That is, in an algorithm, the steps of instructions that the computer needs to perform for solving a given problem are presented. The algorithms work on some data and modify the data to perform the necessary instructions. So, this course aims to teach students how to design algorithms to solve their problems and measuring the efficiency of the algorithms they design. The course also aims to teach students the list, stack, and queue data types and how to implement them in C++. Moreover, the course teaches the sorting and search algorithms and other data types including trees and graphs.

The course objectives:
- To learn how to design algorithms
- To learn the C++ language and their pointer concepts
- To learn how to measure and analyse the algorithm efficiency
- To learn the stack, linked list, queue, tree, and graph data structures
- To learn the sorting algorithms
- To learn the search algorithms
- To learn how to implement the data structures and sorting & search algorithms in C++
- To learn how to solve complex problems using the algorithms and data structures taught in the course

8. Lab Sessions

The course lectures are supported with 2-hours lab sessions. You may attend the lab sessions to ask questions about the assignments or any other exercises that you are working on.

The lab sessions are led by two teaching assistants (TAs) who will assist you performing the lab exercises.

Due to the pandemic situations this year, we do not force you to stay at the lab session to perform the course assignments. Instead, you could work on the assignments or any other exercises at home and attend the lab session only if you have questions that could be answered by the TAs. Although you are very welcome to use the lab sessions to work on the lab assignments too, we encourage the students to work from home and attend the lab sessions for asking questions only. Also, please leave the lab session once your questions have been answered – indeed, we may accept 20 students at a time due to the pandemic situations. Note that if you do not have any working computers at home, you may of course stay in the lab sessions – please let the TAs know in that case.

9. Assignments

In this course, you will be assigned with 5 different course assignments on different topics of the data structures course. Each assignment will require you to develop a small-scale software application in C++ by using a particular data structure. You will be given one week to perform and submit the course assignment online over YOULEARN. Note here that the course assignments will be announced over YOULEARN and you are required to submit over YOULEARN via a submission area provided.

Note that the course assignments are to be performed individually and it is not allowed to work in groups and get any kinds of support from each other. If we determine that any two assignments are similar at any sense, you will be punished according to the university regulations. That is, you may fail the course, be asked to leave campus for a particular period or even be dismissed from university.

10. Term Project

Besides the lab assignments, you will be given a term project that you are supposed to submit and demonstrate by the end of the term. In this term project, you will be given 1 month to complete a programming task that require you to apply the multiple topics that you will learn throughout the course.

11. Grading

NOTE: To pass the course, you **must** achieve 50% from the course overall. Also, you **must** achieve at least 50% of course assignments and term project.
Lastly, your final exam score **must** be at least 40/100.

Component	Weight
Assignment * 5	25% (5*5%)
Term Project	15%
Midterm	30%
Final	30%

12. Attendance Policy

You must attend at least 70% of the course lectures (i.e., at least 9 weeks). If you do not achieve to attend 9 weeks of lecture sessions at least, you will fail the course due to irregular attendance and not be permitted to enter the final exam.

Note that due to the pandemic situations, students are encouraged to attend the online sessions whenever possible although you are very welcome to attend the face-to-face sessions. Also note that you may attend the face-to-face sessions according to the faculty protocol (given below). If you attempt at attending the face-to-face despite the fact that you are not allowed according to the faculty protocol, you may be asked by the instructor to leave the classroom.

		Öğrenci Numarası 1,3,5,7,9 ile biten öğrencilerimiz	Öğrenci Numarası 0,2,4,6,8 ile biten öğrencilerimiz
1.Hafta	20.09.2021- 26.09.2021	Yüz yüze eğitim	Online Eğitim
2.Hafta	27.09.2021- 03.10.2021	Online Eğitim	Yüz yüze eğitim
3.Hafta	04.10.2021- 10.10.2021	Yüz yüze eğitim	Online Eğitim
4.Hafta	11.10.2021- 17.10.2021	Online Eğitim	Yüz yüze eğitim
5.Hafta	18.10.2021- 24.10.2021	Yüz yüze eğitim	Online Eğitim
6.Hafta	25.10.2021- 31.10.2021	Online Eğitim	Yüz yüze eğitim
7.Hafta	01.11.2021- 07.11.2021	Yüz yüze eğitim	Online Eğitim
8.Hafta	08.11.2021- 14.11.2021	Online Eğitim	Yüz yüze eğitim
9.Hafta	15.11.2021- 21.11.2021	Yüz yüze eğitim	Online Eğitim
10.Hafta	22.11.2021- 28.11.2021	Online Eğitim	Yüz yüze eğitim
11.Hafta	29.11.2021- 05.12.2021	Yüz yüze eğitim	Online Eğitim
12.Hafta	06.12.2021- 12.12.2021	Online Eğitim	Yüz yüze eğitim
13.Hafta	13.12.2021- 19.12.2021	Yüz yüze eğitim	Online Eğitim
14.Hafta	20.12.2021- 26.12.2021	Online Eğitim	Yüz yüze eğitim
15.Hafta	27.12.2021- 02.01.2022	Yüz yüze eğitim	Online Eğitim

13. Plagiarism Policy

Each project group must do their own individual work and do not interfere with the work of other project groups. Otherwise, this will be punished according to the university regulations.
If you wish to refer to any work that have been performed previously, you must cite them properly.

14. Late Submission Policy

Any submission deadline for the lab assessments and term project is treated with zero tolerance for late submission. So, any submissions that miss the deadline will be not considered.

Week	Subject	Deadlines
1	Introduction to C++ (Classes, Objects, and Control Statements)	C++ Exercise (no deadline)
2	Functions and Arrays in C++	C++ Exercise (no deadline)
3	Pointers in C++	C++ Exercise (no deadline)
4	Lists	Assignment 1
5	Algorithm Analysis	
6	Stacks	Assignment 2
7	Queues	
8	Sorting Algorithms	Assignment 3
9	Sorting Algorithms	• Midterm • Term Project Release
10	Graphs	Assignment 4
11	Trees	
12	Trees	Assignment 5
13	Heaps	
14	Hashing	