CS 300 – Data Structures

Spring 2023-2024

3 credits, prerequisites: CS 204

Description

The objective of this course is to introduce fundamental techniques of algorithm analysis, to introduce common data structures, their properties and implementation and to apply C++ programming skills to implement solutions using common data structures to practical problems. It is a "required" course for the CS program as well as it is a "core" or "elective" course for all FENS programs.

Instructor

Gülşen Demiröz, Office: FENS G001C   E-mail: gulsen.demiroz@sabanciuniv.edu

Teaching and Learning Assistants

Bilgehan Çağıltay	Emine Ayşe Sunar	Sina Salehnia
Zobia Batool	Abdullah Cevizli	
Yiğit Karamanlı	Hagverdi İbrahimli	Sueda Şeker Arya Hassibi

Schedule

- **Lectures:**   Monday 16:40 – 17:30 (University Center G030)
                      Tuesday 12:40 – 14:30 (University Center G030)
- **Recitations:**   Section A1, A2: Thursday 08:40 – 10:30
                      Section B1, B2: Thursday 16:40 – 18:30
- **Office Hours:**   See SUCourse+ for schedule

Homework

There will be 4 homework assignments. They will be assigned and collected at **SUCourse**. Recitations will be used for clarification about the homework. Late penalty is 10% of full grade (only 1 late day is allowed). If the homework is not done by you, you will get **-100** (minus 100). If repeated, you fail.

Grading Policy

- Midterm (32%): Date To Be Determined
- Final (32%): Scheduled by Student Resources
- Homeworks (32% total): 4 homework will be assigned
- Recitation Attendance (4%): Graded by your TA

Makeup Policy

If you do miss an exam, you need to show a documented emergency situation (such as a medical report) and notify the instructor before or within 24 hours after the exam date. The instructor reserves the right as to when and how a makeup exam will be granted. The topics for the make-up exams are from everything that is covered in class at the time of the exam.

Textbook

Data Structures & Algorithm Analysis in C++, (2nd, 3rd, or 4th edition), Mark Allen Weiss, Pearson, 2014, ISBN 0-273-76938-3 (4th edition).
We may not stick to the textbook all the time, you are responsible for all material covered in class.

Topics to be Covered

- Week 1: Overview and Introduction
- Week 2: Algorithm Complexity Analysis
- Week 3: Linear Data Structures 1 (Linked Lists)
- Week 4: Linear Data Structures 2 (Stacks, Queues)
- Week 5: Trees 1 (Tries, Binary Search Trees)
- Week 6: Trees 2 (AVL Trees, Tree Traversals)
- Week 7: Hash Tables
- Week 8: Heaps (Priority Queues)
- Week 9: Midterm
- Week 10: Disjoint Sets
- Week 11: Sorting 1 (Insertion Sort, Shell Sort)
- Week 12: Sorting 2 (Heap Sort, Merge Sort, Quick Sort)
- Week 13: Graph Data Structures 1 (Representation)
- Week 14: Graph Data Structures 2 (Depth-First and Breadth-First Search)