CS 300 – Data Structures

Summer 2018

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 either "core" or "elective" course for all FENS programs.

Topics to be Covered

- Week 1_1: Overview and Introduction
- Week 1_2: Algorithm Complexity Analysis
- Week 2_1: Linear Data Structures 1 (Linked Lists)
- Week 2_2: Linear Data Structures 2 (Stacks, Queues)
- Week 3_1: Trees 1 (Tries, Binary Search Trees)
- Week 3_2: Trees 2 (AVL Trees, Tree Traversals)
- Week 4_1: Hash Tables
- Week 4_2: Heaps (Priority Queues)
- Week 5_1: Sorting 1 (Insertion Sort, Shell Sort)
- Week 5_2: Sorting 2 (Heap Sort, Merge Sort, Quick Sort)
- Week 6_1: Disjoint Sets
- Week 6_2: Graph Data Structures 1 (Representation)
- Week 7_1: Graph Data Structures 2 (Dept-First and Breadth-First Search)
- Week 7_2: Algorithm Design Techniques (Divide and Conquer, Greedy and Dynamic Programming)

Instructor

Gülşen Demiröz, Office: FENS L015, e-mail: gulsend@sabanciuniv.edu

Teaching Assistants

Baran Usta (Office Hours: Wednesday 09:40-12:30) and Omid Kazemy (Office Hours: Monday 18:00-21:00)

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.

Schedule

Lectures: Tuesday 12:40 – 15:30 and Wednesday 12:40 – 15:30 in FASS G049.
Recitations: Section A: Thursday 15:40 – 19:30 in FENS G032
Section B: Thursday 11:40 – 15:30 in FMAN G062
Office Hours: Tuesday 15:40-16:30 (Gülşen Demiröz)

Homework

There will be 4 programming homework. 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 you do it again, you will fail the class.

Grading Policy

Midterm 1 (30%): July 17 at 18:40-20:40 in FENS L045
Final Exam (34%): Scheduled by registrar between August 11-14
Lecture and Recitation Attendance (%4): %2 is left to the TA as "kanaat"
Homeworks (32% total): 4 homework will be assigned and they are not of equal weight

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.