

CS 300 – Data Structures

Spring 2022-2023

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.

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)

We may have to revise the course plan according to the countrywide reassessment to be made regarding higher education. This is expected to happen at the beginning of April. The content to be delivered is certain but the method of course delivery, the number and dates of exams, and some other details are subject to change.

Instructor

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Teaching Assistants

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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: Monday 09:40 – 10:30 (will be broadcast via zoom online in University Center G030)
Tuesday 12:40 – 14:30 (will be broadcast via zoom online in University Center G030)

Recitations: Section A1: Thursday 08:40 – 10:30 **ONLY online**
~~Section A2: Thursday 08:40 – 10:30 online (goto A1)~~
Section B1: Thursday 16:40 – 18:30 **ONLY in-person in FENS G015**
Section B2: Thursday 16:40 – 18:30 **ONLY online**

Office Hours: See SUCourse+ for schedule

Homework

There will be 6 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

Final (48%): TBD

Homeworks (52% total): 6 homework will be assigned (Hw1 &Hw2: 8% and others 9%)

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.