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
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Teaching and Learning Assistants
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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
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)