CS301 – Algorithms
2023-2024 Spring
Syllabus
Version 3

Lectures : Wednesday   16:40-17:30   @ FENS G077
              Friday   14:40-16:30   @ FENS G077

Recitations : Wednesday 18:40-19:30   @ FASS G062 & UC G030

Instructor
Name   : Hüsnü Yenigün
Office Hours : Monday 09:40-10:30, Monday 19:40-20:30   @ Online

TAs
Name   : Atakan Saraçyakupoğlu
Office Hours : Tuesday 17:40-18:30, Thursday 14:40-15:30   @ Online

Name   : Ayşegül Rana Erdemli
Office Hours : Thursday 16:40-17:30, Thursday 19:40-20:30   @ Online

Name   : Baturay Yılmaz
Office Hours : Tuesday 18:40-20:30   @ Online & FENS L068

Name   : Mohammad Yusaf Azimi   @ Online
Office Hours : Thursday 15:40-16:30, Thursday 17:40-18:30

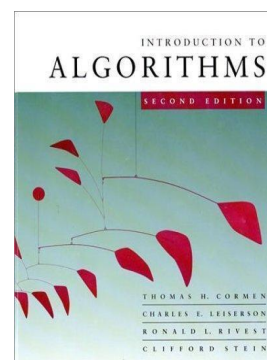## LAs
Name   : Hasan Berkay Kürkçü
Office Hours : Wednesday 19:40-20:30, Thursday 11:40-12:30   @ Online

Name   : Yasin Albayrak
Office Hours : Monday 11.40-13.30   @ Online

Textbook
Introduction to Algorithms
Thomas H. Cormen,
Charles E. Leiserson,
Ronald L. Rivest
Clifford Stein

Grading

- Midterm (30%) Date: Sunday April 21, 2024 12:15-14:15
- Final (40%) Date: TBA [within the finals' week] <<<<<<< **MUST SCORE AT LEAST 30**
- Homeworks (15%) 4-5 homeworks
- Project (15%) group project
- Make-up Date: TBA [after the final exam]

o Policy: If you miss the midterm or final exam (but not both), and if you have a valid excuse (e.g. a medical condition, an official university event participation, etc.), then you can take the make-up exam. The make-up exam grade is used as the grade of the exam you missed. Hence it has to be at least 30, if it is substituting the final exam. The make-up exam may be an oral exam, or may have an oral part (to be decided at the end of the semester).

Tentative Outline

Week 01: Introduction, Algorithm Design Techniques, Growth of Functions

Week 02: Background, Recurrences, Substitution Method, Iteration Method, Master Method, Lower Bounds, Sorting in Linear Time

Week 03: Stability of Sorting Algorithms, Radix Sort, Medians and Order Statistics, Dynamic Sets on Binary Search Trees

Week 04: Dynamic Sets, on Binary Search Trees, Red-Black Trees

Week 05: Augmenting Data Structures, Dynamic Programming

Week 06: Dynamic Programming, Greedy Algorithms

Week 07: Amortized Analysis, Graphs

Week 08: Minimum Spanning Tree, Shortest Path Problems

Week 09: NP-Completeness, Test Design (Functional and Performance Tests)

Week 10: Approximation Algorithms, Flow Networks

Week 11: Maximum Bipartite Matching, Sorting Networks

Week 12: Computational Geometry

Week 13: Randomized Algorithms

Week 14: coNP and PSPACE Complexity Classes