# 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
  **Office Hours**: Thursday 15:40-16:30, Thursday 17:40-18:30 @ Online

#### 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 ]
  - 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