# CS301 – Algorithms
## 2023-2024 Summer
### Syllabus

**Lectures**: Monday 09:40-11:30 @ FENS G077  
Tuesday 13:40-15:30 @ FENS G077  
Thursday 13:40-15:30 @ FENS G077

**Recitations**: Tuesday 15:40-17:30 @ FENS G077

**Instructor**
Name: Süha Orhun Mutluergil  
Office Hours: Monday 13:00-15:00 @ Online

**TAs**
Name: Alperen Doğan  
Office Hours: Thursday 15:40-17:30 @ Online

Name: Baran Deniz Karahan  
Office Hours: Wednesday 15:00-17:00 @ Online

Name: Emine Ayşe Sunar

**Textbook**
Introduction to Algorithms  
Thomas H. Cormen,  
Charles E. Leiserson,  
Ronald L. Rivest  
Clifford Stein
Grading
- Midterm (30%) Date: TBA
- Final (40%) Date: TBA <<<<<<<< MUST SCORE AT LEAST 30
- Homeworks (15%) 4-5 homeworks
- Project (15%) group project
- Make-up Date: TBA
- 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

**Week 12:** Sorting Networks

**Week 13:** Computational Geometry

**Week 14:** Randomized Algorithm