

MIDDLE EAST TECHNICAL UNIVERSITY

Department of Computer Engineering

CEng 315 – Algorithms

Fall 2017-2018

Instructor: Prof. Dr. İsmail Hakkı Toroslu (Sections 1&2), Asst.Prof. Dr. Ramazan Gokberk Cinbis (Section 3)

Teaching Assistants: Burak Kerim Akkus, Cemal Aker, Mehmet Celik

Class Hours: S1 - Tue: 9:15-10:30 (BMB3, 75 mins); Thr: 9:15-10:30 (BMB3, 75 mins)

S2 - Tue: 10:45-12:00 (BMB3, 75 mins); Thr: 13:45-15:00 (BMB4, 75 mins)

S3 - Tue: 11:40-13:30 (BMB4, 2 lecture hrs); Thr: 13:40-14:30 (BMB5, 1 lecture hr)

Outline

1. Introduction to Algorithms (1 week)
 - Algorithms, Analysis and Design (Section 1, 2)
2. Algorithm Analysis (2 weeks)
 - Growth of Functions (Section 3)
 - Summations (Section 3)
 - Recurrences (Section 4)
3. Sorting (2 weeks)
 - Comparison-Based Sorting (Section 7)
 - Sorting Algorithms in Linear Time (Section 8)
4. Searching (1 week)
 - Hashing (Section 11)
5. Graph Algorithms (4 weeks)
 - Elementary Graph Algorithms (BFS, DFS, Top. Sort, Strongly Con. Comp, etc.) (Section 22)
 - Minimum Spanning Trees (Section 23)
 - Single-Source Shortest Paths (Section 24)
 - All-Pairs Shortest Paths (Section 25)
 - Maximum Flow (Section 26)
6. String Processing (1 week)
 - String Matching (Section 32)
 - Huffman codes (Section 16.3)
7. NP-Completeness (1 week) (Section 34)

Textbook

Introduction to Algorithms by T. H. Cormen, C. E. Leiserson, R. L. Rivest, C. Stein, Mc Graw-Hill.

Grading

4 Programming Assignments (3 in lab, 1 take home)	30%
Mid Term Exam	30%
Final Exam	40%

Midterm: Nov 15, 17:40-19:40

Lab exams: Oct 26, 17:40-19:40 [Simple Algorithmic Problem]

Nov 16, 17:40-19:40 [Elementary Graph Algorithm Problem]

Dec 4-18, 17:40-19:40 [Take home prog. assignment: Advanced Graph Algorithm Problem]

Dec 28, 17:40-19:40 [String Processing Problem]

Policy

- Class attendance is not mandatory, but it is highly recommended. We may at times cover material that is not included in the text, and anything we cover in class could appear on an exam.
- The homework assignments that are designated as individual assignments must be completed individually. Copying from others, either from fellow students or off the internet is strictly forbidden and will surely constitute grounds for failure.