

MIDDLE EAST TECHNICAL UNIVERSITY

Department of Computer Engineering

CEng 315 – Algorithms

Fall 2020-2021

Instructors: Asst.Prof. Dr. Ramazan Gökberk Cinbiş (Section 1), Prof. Dr. İsmail Hakkı Toroslu (Sections 2&3)

Teaching Assistants: Ezgi Ekiz, Ömer Ekmekçi

Lecture Hours (Sec 1& 2): Mondays & Wednesdays: 9:10-10:30 (2 x 35 minutes lectures & 10 minutes break)

Lecture Hours (Sec 3): Tuesday 15:40-17:00, Thursdays: 9:10-10:30 (2 x 35 minutes lectures & 10 minutes break)

Programming Exam Hours: see details below.

Outline

1. Introduction to Algorithms (1 week)
 - Algorithms, Analysis and Design (Chapters 1, 2)
2. Algorithm Analysis (2 weeks)
 - Growth of Functions (Chapter 3)
 - Summations (Chapter 3)
 - Recurrences (Chapter 4)
3. Sorting (2 weeks)
 - Comparison-Based Sorting (Chapter 7)
 - Sorting Algorithms in Linear Time (Chapter 8)
4. Dynamic Programming (2 week) (Chapter 15)
5. Graph Algorithms (4 weeks)
 - Elementary Graph Algorithms (BFS, DFS, Top. Sort, Strongly Con. Comp, etc.) (Chapters 22)
 - Minimum Spanning Trees (Chapter 23)
 - Single-Source Shortest Paths (Chapter 24)
 - All-Pairs Shortest Paths (Chapter 25)
 - Maximum Flow (Chapter 26)
6. String Processing (1 week)
 - String Matching (Chapter 32)
 - Huffman codes (Chapter 16.3)
7. NP-Completeness (2 week) (Chapter 34)

Textbook

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

Grading

9 Programming Exams (Weeks 3-7, 9-12)	20%
MT Exam (Week 8, Wednesday December 2 nd)	20%
Final Exam (TBA)	60%

Policy

- All three sections will be treated jointly. Officially announced department course program has tentatively been slightly modified because of online education. We may make further schedule / lecture hour changes throughout the semester.
- Lectures will be online (some live and some pre-recorded). Live lectures will typically be recorded & shared for offline access.
- Programming exam will be related to the most recently covered subject. They will be on **Thursdays from week 3 to week 12**, except week 8, **from 12:00 Noon to 11:59 PM**
- Out of 9 programming exams, the lowest 2 programming exams of each student will be ignored and the rest will be used in grading. You are expected to use this right to handle schedule conflicts between your other exams and CENG 315 programming exams. We may not grant any additional exemptions for exam conflicts, unless there is a truly extraordinary situation.
- Class attendance is not mandatory, but it is highly recommended. We may at times cover material that is not included in the textbook, and anything we cover in class could appear on an exam.
- We may make *oral exams* related to past assignments & written exams, to randomly chosen students. A student's grade may be updated according to his/her performance in the oral exam.
- Final exam will be comprehensive covering the whole material of the semester.