04.10.2023

BLM3021 , Algorithm Analysis , Group 2

Professor M. Elif KARSLIGİL

Classroom: D-011

Lecture Hours: Wednesday, 14:00-15:50

Lab Hours: Wednesday, 16:00-17:50

Textbook:

Anany Levitin, "Introduction to Design & Analysis of Algorithms (3rd Edition)", Pearson, 2011

Supplementary Textbooks:

Steven Skiena, "The Algorithm Design Manual", 2010

Robert Sedgewick, Philippe Flajolet, "An Introduction to the Analysis of Algorithms (2nd Edition)", 2013

Tentative Schedule:

1. Introduction (Aims and Scope, Syllabus, Evaluation, Student Questions) (04.10.2022)
    a. Fundamentals for Algorithms
2. Fundamentals of the Analysis of Algorithms Efficiency, Asymptotic Analysis (11.10.2022)
    a. Algorithm Analysis, Complexities, Big OH, Big Theta, Big Omega, Orders of Growth
3. Analysis of Non-Recursive and Recursive Algorithms (18.10.2022)
    a. Basic Operation, Running Time, Backward Substitution, Recurrence Relation
    Hw1: Problem Solving – Remote Evaluation
4. Analysis of Divide and Conquer Algorithms - I (25.10.2022)
    a. Brute Force, Exhaustive Search, Decrease and Conquer (BS), Master Theorem
    Practice 1
5. Analysis of Divide and Conquer Algorithms – II (01.11.2022)
    a. Merge Sorting, QuickSort
    Hw2: Divide and Conquer – Remote Evaluation
    Lab 1 – HW 1 Solutions
6. Hashing Algorithms - I (08.11.2022)
    a. Hash Functions, Hash Collision
    Practice 2
7. Hashing Algorithms – II (15.11.2022)
    a. Universal Hashing, (Un)successful Search
    Lab 2 – HW 2 Solutions
8. Midterm – I (22.11.2022)
    a. Hw3: Hashing
9. Dynamic Programming – I (29.11.2022)
    a. RobotCoin Collection, Knapsack problems
    Practice 3

10. Dynamic Programming - II (06.12.2022)
    a. EditDistance, LongestCommon Subsequence problems
    Hw4: Dynamic Programming - – Remote Evaluation
    Lab 3 - HW 3 EVALUATION !!!!!!
11. Analysis of Graph Algorithms (13.12.2022)
    a. DFS and BFS Analysis, Topological Sorting
    Semester Project - Remote Evaluation
12. Midterm – II (20.12.2022)
13. Backtracking and Branch-and-Bound Algorithms (27.12.2022)
    a. State-Space Tree, n-Queen Problem, Assignment Problem
    Lab 4 - HW 4 Solutions
14. Space and Time Trade-Offs (P, NP) (03.01.2023)
    a. NP, NP-complete, NP-Hard
    SemesterProject Deadline on Monday

GRADING (could be revised)				
	Midterms	Assignment	Semester Project	Final
Number	2	4	1	1
Impact	36 %	16%	8%	40%