Course program and reading list

Semester 1 Year 2026

School: Efi Arazi School of Computer Science M.Sc.

Data Structures and Algorithms for Data Science

Lecturer:

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Course No.:	Course Type :	Weekly Hours :	Credit:
3609	Lecture	3	0

Course Requirements :	Group Code :	Language:
Final Exam	261360901	English

Course Description

This class is intended for students in the Data Science M.Sc. program who did not take the classes on data structures and on algorithms in their undergraduate studies. Topics include asymptotic notation (big O, Theta, etc.), worst case analysis (including expected worst case and amortized worst case), data structures - lists, queues, stacks, heaps, binary search trees, and hash tables. Sorting algorithms and lower bound for sorting, graphs and basic algorithms for graphs - depth-first-search, breadth-first-

search, shortest paths, minimum spanning trees, the concepts of greedy algorithms, divide-and-conquer algorithm, dynamic programming. We will introduce and analyze a few randomized algorithms, and discuss NP-completeness and approximation algorithms. Homework include 5-6 theoretical problem set.

Course Goals

The goal of the class is to introduce the students to the way of thinking and to fundamental concepts in theoretical computer science.

Grading

Grade: 75% final exam, 25% homework.

Need to pass the exam in order to pass the course.

Reading List

Textbook (optional): Introduction to algorithms by Corman, Leiserson, Rivest and Stein