



Course program and reading list

Semester 1 Year 2024

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

Computation and Randomness

Lecturer:

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Teaching Assistant:

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Course No.:	Course Type :	Weekly Hours :	Credit:
3966	Elective	3	3

Course Requirements :	Group Code :	Language:
Final Paper	241396601	Hebrew

Prerequisites

Prerequisite:

52 - Calculus I
53 - Calculus II
54 - Linear Algebra I
55 - Linear Algebra II
56 - Discrete Mathematics
59 - Data Structures
77 - Algorithms
417 - Introduction to Computer Science



Course Description

In this course, we will learn about randomized algorithms and probabilistic techniques.

The probabilistic techniques will include Chebychev's inequality, Chernoff's inequality, Martingales, Markov Chains, Lovasz Local Lemma, and the probabilistic method.

We will apply these techniques in analyzing random algorithms such as balls into bins, sorting algorithms, hashing, s-t connectivity.



Course Goals

Learning tools from probabilistic analysis and applying them in the context of randomized computation.



Grading

There will be 4 assignments and another one final assignment.

You are required to submit all assignments but only the final assignment will be graded.

Your grade in the final assignment will be the final grade in the course.



Tutor Office Hours

By zoom (TBA)



Reading List

We will cover chapters from the book: Probability and Computing by Mitzenmacher and Upfal.

We will also cover lectures from the course Randomness and Computation by Ronitt Rubinfeld:

<https://people.csail.mit.edu/ronitt/COURSE/S22/index.html>