Course program and reading list

Semester 1 Year 2021

School: Efi Arazi School of Computer Science B.Sc

Discrete Mathematics

Lecturer:

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Tutors:

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Course No.:	Course Type :	Weekly Hours :	Credit:
56	Lecture	5	5

Course Requirements :	Group Code :	Language:
Exam	211005603	English

Course Description

This is an introductory course in discrete mathematics oriented toward Computer Science. Topics taught in the course include:

- fundamental mathematical concepts (definitions, proofs, sets, relations, functions, order relations, proofs by induction),
- counting (permutations, combinations, the inclusion-exclusion principle),
- basic number theory and graph theory.

Course Goals

The goal of the course is that students will be able to explain and apply the basic methods of discrete (noncontinuous) mathematics in Computer Science, and use these methods in subsequent courses. One very important skill that students will be required to pick up during this course is that of writing clear, convincing, mathematical proofs. In particular, the mathematics in this course will not be just about calculation; but rather more about making (and clearly presenting) mathematically rigorous arguments and about learning to recognize faulty reasoning.

Grading

Grades for the course will be based on the following weighting:

1. Homework: 10%.
2. Final exam: 90%.

To pass the course you must get at least 60 in the final exam and at least 60 overall.

Homework: The homework grade is the average of the best n-2 homework problem sets you handed in, where n is the total number of problem sets we gave in the course.

Learning Outcomes

By the end of the course students should be able to:
1. Use logical notation to define and reason about fundamental mathematical concepts, such as sets, relations, functions, and integers.
2. Evaluate elementary mathematical arguments and identify fallacious reasoning (not just fallacious conclusions).
3. Synthesize induction hypotheses and induction proofs.
4. Calculate numbers of possible outcomes of elementary combinatorial processes, such as permutations and combinations.

Reading List

The course will have no textbook.
The course material is covered in the following online books:

Hebrew -
A book by Michal Parnas and Nati Linial:
http://www2.mta.ac.il/~michalp/discretemath.htm

English -
MIT course notes:
http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-fall-2010/readings/MIT6_042JF10_notes.pdf