



Course Syllabus

Course Code	Course Title	ECTS Credits
MATH-101	Discrete Mathematics	6
Prerequisites	Department	Semester
MATH-180	Computer Science	Fall, Spring
Type of Course	Field	Language of Instruction
Required	Mathematics	English, Greek
Level of Course	Lecturer(s)	Year of Study
1 st Cycle	George Portides	1 st
Mode of Delivery	Work Placement	Corequisites
Face to face	n/a	None

Course Objectives:

The main objectives of the course are to:

- Introduce concepts of mathematical logic for analyzing propositions and proving theorems.
- Use sets for solving applied problems, and use the properties of set operations algebraically.
- Work with relations and investigate their properties.
- Investigate functions as relations and their properties.
- Introduce basic concepts of graphs, digraphs and trees.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Analyze logical propositions via truth tables.
- Prove mathematical theorems using mathematical induction.
- Understand sets and perform operations and algebra on sets.
- Determine properties of relations, identify equivalence and partial order relations, sketch relations.
- Identify functions and determine their properties.
- Define graphs, digraphs and trees, and identify their main properties.
- Evaluate combinations and permutations on sets.

Course Content:

- Set theory, operations and algebra, switching circuits as an application.
- Relations and their properties, closure of relations, directed graphs, relation matrices, equivalence relations, partial order relations, Hasse diagrams.
- Functions, domain, codomain, range, the properties of one-to-one and onto, composite and inverse functions.
- Introduction to logic, quantifiers and conditional propositions, truth tables.
- Mathematical induction.
- Graphs, directed graphs and trees, basic concepts, properties and definitions.
- Combinations, permutations.

Learning Activities and Teaching Methods:

Lectures, Exercises and Tests

Assessment Methods:

One test and one Final Exam

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Applied Discrete Structures	Levasseur K. and Doerr A.	Lulu.com	2017	978-1105559297
Discrete Mathematics for Computing	Haggarty R.	Pearson	2002	978-0201730470

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Discrete Mathematics, 4 th edition	Dossey J., Albert O., Lawrence S. and Charles E.	Addison Wesley	2001	978-0321079121