



## Course Syllabus

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS Credits</b>
MATH-101	Discrete Mathematics	6
<b>Prerequisites</b>	<b>Department</b>	<b>Semester</b>
MATH-180	Computer Science	Fall, Spring
<b>Type of Course</b>	<b>Field</b>	<b>Language of Instruction</b>
Required	Mathematics	English, Greek
<b>Level of Course</b>	<b>Lecturer(s)</b>	<b>Year of Study</b>
1 <sup>st</sup> Cycle	George Portides	1 <sup>st</sup>
<b>Mode of Delivery</b>	<b>Work Placement</b>	<b>Corequisites</b>
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
Haggarty R.	Discrete Mathematics for Computing	Pearson	2002	978-0201730470

**Recommended Textbooks / Readings:**

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