



**AMERICAN UNIVERSITY
OF CYPRUS**

| | | |
|---|--|---|
| Course Code CSM104 | Course Name Discrete Mathematics | ECTS Credit 5 |
| Pre-Requisite | Course Type Compulsory | Language of Instruction English |
| Year of Study 1 st / 1 st | Level of Course BSc/1st Cycle | Mode of Delivery On Campus |

Course Objectives:

This lesson provides a good knowledge of the basic principles of mathematical calculus, which is a powerful mathematical tool in engineering and science.

Learning Outcomes:

This course aims to introduce students to graph theory and computational theory. They also learn basic computer models (finite automata and Turing machines), what is an algorithm, and how the complexity of an algorithm that solves a problem is calculated. Finally, students are introduced into categorizing problems based on their solvability and the complexity of the algorithm that solves them.

Teaching Methodology:

Lectures 42 hours

Course Content

Definitions of various graph models.

Set top, edge, and path in a graph.

Graph consistency and permeability, capable of having Hamiltonian circuits, the problem of the traveling vendor.

Find the shortest path.

Trees.

Kuratowski's theorem and applications.

Coloring graph

Defining a computational problem.

Decision problems.

Standard languages and methods of matching a decision problem to a one-language string.

Basic computer models: Finite automatic and Turing machines. Complexity of algorithms.

Problem categorization (solution and complexity of algorithms).

Assessment Methods:

Final Exam.

Required Textbooks/Reading:

| Title | Author(s) | Publisher | Year |
|---|------------------|-------------------------------------|-------------|
| Elements of Discrete Mathematics | C. L. Liu | McGraw Hill Computer Science Series | |
| Introduction to the theory of computation | Michael Sipser | Cengage Learning | |