AMERICAN UNIVERSITY
OF CYPRUS

Course Code CSC207	**Course Name** Algorithms and Complexity	**ECTS Credit** 7.5
Pre-Requisite CSM104 CSC201	**Course Type** Compulsory	**Language of Instruction** English
Year of Study 2nd /4th	**Level of Course** BSc/1st Cycle	**Mode of Delivery** On Campus

Course Objectives:

The course aims at introducing students to the basic concepts of algorithm analysis and complexity theory. An introductory approach to calculation models and basic problem classes is also made. Finally, the aim of the course is to apply theoretical techniques.

Learning Outcomes

Upon successful completion of the course, students will be able to:

- Understand the basic tools of analyzing algorithms
- Apply basic algorithmic techniques and strategies
- Analyze problems of algorithmic nature and classify them according to their difficulty
- Implement and implement Key algorithms for graphs
- Analyze existing algorithms with the main criterion for their effectiveness
- Choose the algorithm that will be the most appropriate for the "real" problem they have to deal with

Teaching Methodology:

Lectures 42 hours

Labs 30 hours

Course Content:

Basic concepts in algorithms and complexity theory. Calculation models and Touring engine. P-NP , NP-full-text classes. Flash: Functions and applications. Dynamic programming: Beginning of Bellman, applications. Basic algorithm analysis: sorting,searching, selection and merging. Graphs: basic concepts and problems: deep and wide crossing, exhaustive search. The problem of minimal cohesive tree, minimum path,maximum flow, minimal intersection, bilateral matching, finding a click of a specific size, coloring, etc. Introduction to guaranteed performance algorithms.

 Assessment Methods:

Final Exam

Mid-Term/Lab Exam

Assignments

Required Textbooks/Reading:

Title	Author(s)	Publisher	Year
	T.H. Commen, C.E. Leiserson R.L. Rivest, C. Stein		2016
			2010