

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Informatics and Computer Science		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE		SEMESTER	8
COURSE TITLE	Graph theory and applications		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS	
Lectures	2		
Class exercises	1		
Lab exercises	1		
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).	4	5	
COURSE TYPE general background, special background, specialised general knowledge, skills development	Special Background, Skills development		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described. Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon successful completion of the course, the students will be familiar with the basic concepts and algorithms of graph theory and their applications

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology Adapting to new situations Decision-making Working independently Team work Working in an international environment Working in an interdisciplinary environment Production of new research ideas	Project planning and management Respect for difference and multiculturalism Respect for the natural environment Showing social, professional and ethical responsibility and sensitivity to gender issues Criticism and self-criticism Production of free, creative and inductive thinking Others...
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- Autonomous work
- Generating new research ideas
- Promotion of free, creative and inductive thinking

(3) SYLLABUS

Basic definitions, properties and theorems. Graphs as models of practical applications. Graph representations: adjacency and incidence matrices and their properties. Scriptural sequences. Routes, Paths and Cycles. Connectivity: bridges and intersections. Bipartite graphs. Euler circuit, necessary and sufficient conditions of existence, Hamilton circuit, Ore theorem. Isomorphisms, Homomorphisms and Automorphisms - graph classes and enumerations . Graph coloring. Flatness and Duality in graphs. Trees. Matchings. Independent sets and node covers. Directed graphs.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Lectures (live)	
Face-to-face, Distance learning, etc.		
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Eclass platform for communicating with the students and publishing slides, lecture notes and exercises with solutions.	
Use of ICT in teaching, laboratory education, communication with students		
TEACHING METHODS	Activity	Semester workload
The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.	Lectures	39
	Class exercises	26
	Home study	60
The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Course total	125
STUDENT PERFORMANCE EVALUATION	Final exam	
Description of the evaluation procedure		
Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other		
Specifically-defined evaluation criteria are given, and if and where they are accessible to students.		

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. D. B. West, Introduction to Graph Theory, Prentice Hall 1996.
2. R. Diestel, Graph Theory, Springer, 2006.
3. J. Bondy , I. Murty , Graph Theory with applications, Springer , 2008.

- Related academic journals:

- Journal of Graph Theory

- Combinatorica
- Journal of Combinatorial Theory