INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS					
SCHOOL	SCHOOL OF SCIENCE					
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS					
COURSE LEVEL	UNDERGRADUATE					
COURSE TITLE	**Graph Theory**					
COURSE CODE	**ΘΠ10**		**Semester**	**8**	**ECTS**	**6**
TEACHING HOURS per week	**THEORY**	**3**	**SEMINAR.**	**1**	**LABORATORY**	
COURSE TYPE	**Select one of the following and delete the rest** Electives (ΠΜ) **K**: A-B; **E1**: Y; **E2**: ; **E3**: ; **E4**: ; **E5**: Y; **E6**: ; *Fill the table as in the curriculum:* Track (A-Computer Science, B- Computer Engineering) / Specialization Compulsory (Y) / Core Specialization (B)/ Elective Specialization (E)					
URL	https://eclass.uoa.gr/courses/DI412/					
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	K20α Mathematics for Computer Science					
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK					
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO					

COURSE CONTENT
Paths, trees. Vertex- and edge-separators, connectivity. Menger's Theorem. Matchings. Tutte's Theorem. Vertex Covers. Planarity, outer-planarity. Unique Embeddings. Whitney's Theorem. Pathwidth and Treewidth . Graph coloring. Brooks' Theorem. Mycielski's construction.

STUDENT LEARNING OBJECTIVES
Teaching-Learning Goals-Expected Learning Outcomes Upon successful completion of the course the student will be able to: • Solve basic graph problems.

- Model problem inputs using graphs and their properties.
- Express rigorously results on graphs.
- Write formal proofs on graphs.
- Classify graphs into one of the fundamental graph classes.

TEACHING AND LEARNING METHODS - ASSESSMENT	
TEACHING METHOD	In Class (Face to Face)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process supported by the e-class platform (Teaching material; Announcements; Task assignments; Outside links etc) Email communication. There exists a possibility of lecture transmission
TEACHING ORGANIZATION *Describe in detail the way and methods of teaching:* *Enhanced Lectures,* *Online Lectures,* *Seminars,* *Tutorial,* *Laboratory,* *Laboratory Exercise,* *Study & analysis of literature,* *Practice (Positioning),* *Interactive teaching,* *Developing a project,* *Individual / group work* *Telework (reference to tools) etc.* *Details of the student's study hours for each learning activity and hours of non-guided study are shown to ensure that the total workload at the semester corresponds to the ECTS*	<table><tr><th>Activity</th><th>Student Workload (hours)</th></tr><tr><td>Lectures</td><td>39</td></tr><tr><td>Seminary</td><td>13</td></tr><tr><td>Independent study and analysis of literature</td><td>70</td></tr><tr><td>Seminary preparation</td><td>13</td></tr><tr><td>Homeworks</td><td>15</td></tr><tr><td>Total Course (25 hours of workload per unit of credit)</td><td>150</td></tr></table> Extensive use of the blackboard. Emphasis is placed on examples and problem solving. Homeworks are individual or in groups of 2
ASSESSMENT OF STUDENTS *Description of the assessment process* *Assessment Methods, Formative or Concluding, Multiple Choice Test, Quick Response Questions, Test Development Questions, Problem Solving, Written Work, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Other / Other* *Fully defined evaluation criteria are mentioned and if and where they are accessible to students.*	Evaluation by written examination and homework assignments. Grade Feedback is available upon request. <table><tr><th>Assessment methods</th><th>Number</th><th>Percentage</th></tr><tr><td>Written examination</td><td>1</td><td>80%</td></tr><tr><td>Exercises</td><td>3-4</td><td>20%</td></tr></table>

LITERATURE AND STUDY MATERIALS / READING LIST
S. Kolliopoulos, Lecture Notes. Rheihnard Diestel. Graph Theory, 5th Edition, Springer, 2016. Douglas B. West. Introduction to Graph Theory, 2nd Edition, Pearson, 2001 K.H. Rosen. Διακριτά Μαθηματικά και Εφαρμογές τους. 7η Έκδοση, Εκδόσεις Τζιόλα, 2015 (greek edition of K. H.

Rosen's Discrete Mathematics and its applications.)