

INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS																			
SCHOOL	SCHOOL OF SCIENCE																			
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS																			
COURSE LEVEL	UNDERGRADUATE																			
COURSE TITLE	Theory of Computation																			
COURSE CODE	K25	Semester	6	ECTS	6															
TEACHING HOURS per week	THEORY	3	SEMINAR.	1	LABORATORY															
COURSE TYPE	<p>Select one of the following and delete the rest Track Compulsory (EYM)</p> <table border="1"> <thead> <tr> <th>K</th> <th>E1</th> <th>E2</th> <th>E3</th> <th>E4</th> <th>E5</th> <th>E6</th> </tr> </thead> <tbody> <tr> <td>A</td> <td></td> <td>Y</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p><i>Fill the table as in the curriculum: Track (A-Computer Science, B- Computer Engineering) / Specialization Compulsory (Y) / Core Specialization (B)/ Elective Specialization (E)</i></p>						K	E1	E2	E3	E4	E5	E6	A		Y				
K	E1	E2	E3	E4	E5	E6														
A		Y																		
URL	https://di.uoa.gr/~prondo/toc.html																			
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	Recommended K17																			
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK																			
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO																			

COURSE CONTENT
The course covers basic and advanced techniques of the Theory of Computation that are needed in various branches of Theoretical Computer Science. Formal languages. Deterministic and non-deterministic automata. Regular languages. Context-free languages. Non-deterministic pushdown automata. Turing machines. Recursive languages. Recursively enumerable languages. The Church-Turing Thesis. Decidability and undecidability. Introduction to computational complexity.

STUDENT LEARNING OBJECTIVES
Teaching-Learning Goals-Expected Learning Outcomes

The goal of the class is for the student to acquire knowledge in the Theory of Computation that is necessary in computer science.

Upon successful completion of the course the student will be able to:

- Distinguish the different categories of formal languages.
- Accurately define automata for formal languages.
- Accurately define context-free grammars for formal languages.
- Prove that given problems are undecidable.
- Construct Turing machines for given recursive languages.

TEACHING AND LEARNING METHODS - ASSESSMENT		
TEACHING METHOD	In Class (Face to Face)	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process supported by the web-page of the course (Teaching material; Announcements; Task assignments; Outside links, etc) Email communication. There exists a possibility of lecture transmission.	
TEACHING ORGANIZATION <i>Describe in detail the way and methods of teaching:</i> 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. <i>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</i>	Activity	Student Workload (hours)
	Lectures	52
	Seminars	13
	Preparation for seminars	15
	Study and analysis of the literature	15
	Preparation for the next lecture	13
	Homework assignments	12
	Independent Study	30
	Total Course (25 hours of workload per unit of credit)	150
	Lectures are supported by transparencies. The board is also used extensively. An emphasis is placed both during the lectures and the seminars on problem solving. Homework assignments 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.

Assessment methods	Number	Percentage
Written examination	1	95%
Homeworks	2	5%

Evaluation by written examination and homework assignments.
Grade Feedback is available upon request.

LITERATURE AND STUDY MATERIALS / READING LIST

Basic textbooks in Greek: H. Lewis, Χ. Παπαδημητρίου. Elements of the Theory of Computation, Kritiki publishers.
M. Sipser, Introduction to the theory of computation, Crete University Press.

Additionally the students have access to transparencies by P. Rondogiannis, and recommended literature in English.