INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS						
SCHOOL	SCHOOL OF SCIENCE						
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS						
COURSE LEVEL	UNDERGRADUATE						
COURSE TITLE	**Computer Architecture II**						
COURSE CODE	**K30**		**Semester**	**5**	**ECTS**	**6**	
TEACHING HOURS per week	**THEORY**	3	**SEMINAR.**	**1**	**LABORATORY**	**1**	
COURSE TYPE	**Select one of the following and delete the rest** Compulsory (YM) **K** / **E1** / **E2** / **E3** / **E4** / **E5** / **E6** B / / / B / Y / / *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/D52/						
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	K14 Computer Architecture I						
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK						
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO						

COURSE CONTENT
ISA of RISC architectures (review) Basics of pipelining, Pipelining in MIPS microprocessors. Datapath and control unit design for pipelined CPU. Data, control and structural hazards. Superscalar and out-of-order basics. Branch prediction.

Cache memories concept.

Caches architectures and algorithms.

Virtual memory.

Input/output devices.

Storage devices performance and reliability.

Microprocessor systems interfacing.

STUDENT LEARNING OBJECTIVES
Teaching-Learning Goals-Expected Learning Outcomes Introduction to advanced computer architecture topics including pipelining, caches and input/output and storage devices. Upon successful completion of the course the student will be able to: • Mention advanced techniques for performance improvement • Describe the concept and implementation details of pipelining • Use architectural simulators for pipelining • Explain the basics and the implementation of caches • Implement hardware and software techniques for caches performance improvement • Use architectural simulators for caches

TEACHING AND LEARNING METHODS - ASSESSMENT	
TEACHING METHOD	In Class with slides and whiteboard for examples and exercises of the course. In the PCs Lab using educational architectural simulators.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Electronic platform e-class (all tools employed: announcements, documents, assignments, groups of users, etc.) Email communication Live broadcasting of lectures Recording of lectures for offline study
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,*	

Activity	***Student Workload*** *(hours)*
Lectures	39
Tutorial	13
Laboratory	13
Lab preparation	11
Graded assignments	35
Independent Study	39

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*	***Total Course (25 hours of workload per unit of credit)*** | ***150***
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.*	Describe explicitly methods, evaluation tools and provided feedback. The table below is supplemented accordingly.

Assessment methods	***Number***	***Percentage***
Written examination	1	60%
Assignments (on simulators)	2	40% (20% each)

LITERATURE AND STUDY MATERIALS / READING LIST
"Computer Organization and Design: the Hardware/Software Interface", 4th Edition, D.A.Patterson, J.L.Hennessy, Elsevier/Morgan Kaufmann, 2010.