

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Science		
ACADEMIC UNIT	Physics		
LEVEL OF STUDIES	Undergraduate (postgraduate course offered to undergraduate students)		
COURSE CODE	10EK212	SEMESTER	8
COURSE TITLE	Computer Systems		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures (theory and exercises)		3	
Laboratory Practice		1	
			6
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised Knowledge		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes, in the English language for Erasmus students		
COURSE WEBSITE (URL)	https://eclass.uoa.gr/courses/PHYS302/		

(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

In this course the student acquires the necessary knowledge for the understanding of computer operating systems with respect to their architecture and organization as well as their efficient programming for utilizing computers in physics experiments or solving physics problems.

With the completion of the course the student is able to

Describe the basic architecture and organization of computer operating systems.
 Describe computing efficiency, algorithmic time complexity and parallelism of processes and threads.
 Explain the basic concepts of operating systems.
 Examine the various parameters that lead to improving the use of computers and digital computing boards in physics experiments and in computing techniques for problems in physics.
 Combine processes/threads and device drivers for the monitoring and data acquisition in physics experiments.
 Improve the efficiency of computing techniques for solving problems in physics.
 Evaluate the results of the computer solutions in physics problems.

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

The course aims at the following general competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
 Working independently /Team work
 Project planning and management
 Production of free, creative and inductive thinking
 Analytical and synthetic thinking /Critical thinking
 Time management
 Planning
 Taking initiative/responsibility
 New Technology skills
 Learning C / Matlab programming language ...
 Learning word/excel/ppt/ origin/spss
 Creativity/Determination/Communication skills
 Information management
 Meeting Deadlines and Keeping Schedules
 Flexibility / Adaptability
 Problem solving

(3) SYLLABUS

- Types of operating systems, their structure, processes and system calls, processes and threads, process communication, semaphores, mutex, monitors, low level scheduling.
- Memory management, segments, virtual memory and paging, page replacement techniques, page size, thrashing and implementation issues.
- Directories, input/output, device handlers, and I/O software design principles.
- Deadlocks: Recovery and avoidance, security and cryptography principles, multiprocessor systems.
- Implementation in C and C++ code of relative example applications.

(4) TEACHING and LEARNING METHODS - EVALUATION

<p>DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Face-to-face													
<p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>Yes</p> <p>Electronic communication with the students using ICT (Information and Communications Technology) Computer-aided lectures, use of Overhead Projectors, eclass platform</p>													
<p>TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>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.</i></p> <p><i>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</i></p>	<table border="1"> <thead> <tr> <th data-bbox="676 553 1011 591">Activity</th> <th data-bbox="1016 553 1337 591">Semester workload</th> </tr> </thead> <tbody> <tr> <td data-bbox="676 598 1011 658">Lectures/ exercises</td> <td data-bbox="1016 598 1337 658">40</td> </tr> <tr> <td data-bbox="676 665 1011 725">Laboratory Practice</td> <td data-bbox="1016 665 1337 725">30</td> </tr> <tr> <td data-bbox="676 732 1011 824">Individual Study/ Study and Analysis of bibliography / Preparation</td> <td data-bbox="1016 732 1337 824">50</td> </tr> <tr> <td data-bbox="676 831 1011 891">Writing reports/ essays</td> <td data-bbox="1016 831 1337 891">30</td> </tr> <tr> <td data-bbox="676 898 1011 954">Course Total</td> <td data-bbox="1016 898 1337 954">150</td> </tr> </tbody> </table>		Activity	Semester workload	Lectures/ exercises	40	Laboratory Practice	30	Individual Study/ Study and Analysis of bibliography / Preparation	50	Writing reports/ essays	30	Course Total	150
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<p>STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i></p> <p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Final written exams in Greek Mid-term written examination Writing essays</p>													

(5) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

- Modern Operating Systems, ANDREW S. TANENBAUM, KLEIDARITHMOS PUBLICATIONS LTD, 2018, Athens, Code: 13884
- Operating Systems, Silberschatz Abraham, Galvin Peter B. Gagne Greg, PARIKOY PUBLICATIONS, 2009, Αθήνα, Code: 14841