COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Science		
ACADEMIC UNIT	Physics		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**10YK203**	**SEMESTER**	**8**
COURSE TITLE	**Electronics, Computers, Teleco9mmunications and Control Laboratory**		

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**
Laboratory practice	4	6

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialized Knowledge
PREREQUISITE COURSES:	No
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://eclass.uoa.gr/courses/PHYS245/

(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 laboratory course the students are using the knowledge from the courses of the specific research area in order to study, design and implement complex systems concerning the signal's propagation and processing and the electronic physics, as well. Additionally, the university students are teaching basic principles of Physics at university students

With the completion of the course the students are able to understand each relative problem which should be solved and they choose the correct methodology in order to obtain the result.

With the completion of the course the students are able to design and implement the appropriate system, they can examine the accuracy of the measurements and they can identify the major factors which affect the results.

With the completion of the course the students are able to combine their theoretical knowledge in order to create systems with specific characteristics. They assess the obtained outcomes in order to judge the effectiveness of these systems in practice.

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…
…….

The course aims at the following general competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Production of free, creative and inductive thinking
Analytical and synthetic thinking
Critical thinking
Planning
New Technology skills
Learning C / Matlab programming language ...
Creativity
Communication skills
Information management
Meeting Deadlines and Keeping Schedules
Problem solving
Teaching skills

(3) SYLLABUS

- Introduction to simulation tools of telecommunication systems, Continuous and discrete signals, Fourier transform
- Convolution, Autocorrelation and heterocorrelation of signals
- Continuous time Fourier transform, Sampling
- Design, implementation and measurement of filters
- Field effect transistor, Timing circuits
- Signal processing: Execution time improvement with the use of parallelization and an FPGA implementation example
- Laboratory project and presentation (preparation, presentation and teaching of basic scientific principles in physics, by Physics Department students to other university students)

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Yes

Electronic communication with the students using ICT (Information and Communications Technology)
Computer-aided lectures, use of Overhead Projectors, eclass platform</td></tr>
<tr><td>TEACHING METHODS
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.

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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td></td><td></td></tr>
<tr><td>Individual Study/Study and Analysis of bibliography / Preparation</td><td>50</td></tr>
<tr><td>Laboratory practice</td><td>27</td></tr>
<tr><td>Writing reports/ essays and microteaching preparation</td><td>40</td></tr>
<tr><td>Microteaching</td><td>20</td></tr>
<tr><td>InteractiveTeaching</td><td>13</td></tr>
<tr><td></td><td></td></tr>
<tr><td>CourseTotal</td><td>150</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
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.</td><td>Open-ended questions, Problem solving
Oral examination
Writing essays
Microteaching preparation
Laboratory reports</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

- Εισαγωγή στην Ηλεκτρονική, Γ.Σ. Τόμπρας, Εκδ. ΔΙΑΥΛΟΣ, 2006, ΑΘΗΝΑ, 12173
- Σήματα και Συστήματα, Oppenheim, Willsky, Nawab, Εκδόσεις Γρηγόριος Χρ. Φουντας, Αθήνα, 2011, 12273250
- Σήματα και Συστήματα Συνεχούς και Διακριτού χρόνου, Μάργαρης Αθανάσιος, Εκδόσεις Α. Τζιόλα & Υιοί Α.Ε. Θεσσαλονίκη, 2011.
- Σημειώσεις, Ε. Νισταζάκης, Ι. Τίγκελης, Δ. Ρεΐσης
- Συστήματα Επικοινωνίας 5η Έκδοση, S. Haykin, M. Moher, Εκδόσεις Παπασωτηρίου και ΣΙΑ Ι.Κ.Ε., Αθήνα, 2010
- Εργαστηριακός οδηγός και ασκήσεις ηλεκτρονικής, Ε. Νισταζάκης, Εκδόσεις Κάλλιπος, Αθήνα, 2016

- *Related academic journals:*

- IEEE Communication Letters
- IEEE/OSA Journal of Lightwave Technology
- Elsevier, Journal of Optics & Laser Technology
- IEEE/OSA Journal of Optical Communications and Networking
- IET Optoelectronics
- Springer Circuits, Systems and Signal Processing Journal
- MDPI Applied Sciences
- MDPI Electronics