COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Science		
ACADEMIC UNIT	Physics		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**10EKA02**	**SEMESTER**	**6**
COURSE TITLE	**Introduction in Electronic Physics and Systems**		

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**
Lectures (theory and exercises)	5	7
Laboratory	1	

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialization Course
PREREQUISITE COURSES:	No
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes, in English for Erasmus students
COURSE WEBSITE (URL)	https://eclass.uoa.gr/courses/PHYS146/

(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 basic knowledge concerning Electronic Physics and the physical insight of electric and electronic systems and circuits' operation.

With the completion of the course the students should be able to solve problems concerning general circuit analysis as well as basic operation principles of voltage operational amplifiers.

With the completion of the course the students are able to understand and explain the basic concepts of Electronic Physics and apply them in simple electronic circuits.

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
Working independently
Production of new research ideas
Production of free, creative, and inductive thinking
Analytical and synthetic thinking
New Technology skills
Creativity
Information management
Problem solving

(3) SYLLABUS

- Introductory concepts of signals and systems. Circuit analysis and quadrupole theory.
- Time and frequency domain analysis of circuits. Introduction to operational amplifiers.
- Introduction to semiconductor physics. Diodes. The dipole transistor. The field effect transistor: Characteristics, operation, circuits.
- Basic principles of continuous and discrete time signals. Information signals transmission.
- Introduction to filters. Digital signals and circuits: Basic principles, operation.
- Analog to digital signal conversion: Methods, objectives, procedure.
- Laboratory experiments: Introduction to measuring devices in electronics, basic concepts and elements of electronic physics, electrical and electronic circuits. Signals and systems, introduction to operational amplifiers and their applications in physics. Basic concepts of semiconductors and semiconductor devices, elements from semiconductor physics, p-n junction and applications in physics. Bipolar junction and field effect transistors in linear and non-linear operation mode, and applications in physics.

(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>Lectures</td><td>39</td></tr>
<tr><td>Exercises</td><td>26</td></tr>
<tr><td>Laboratory</td><td>13</td></tr>
<tr><td>Individual Study/Study and Analysis of bibliography / Preparation</td><td>60</td></tr>
<tr><td>Preparation for the Laboratory and writing report</td><td>30</td></tr>
<tr><td></td><td></td></tr>
<tr><td>InteractiveTeaching</td><td>7</td></tr>
<tr><td></td><td></td></tr>
<tr><td>CourseTotal</td><td>175</td></tr>
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<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>Final written exams in Greek
Open-ended questions, Problem solving
Oral grade for the Laboratory
Laboratory reports</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography

- Εισαγωγή στην Ηλεκτρονική, Γ.Σ. Τόμπρας, Εκδ. ΔΙΑΥΛΟΣ, 2006, ΑΘΗΝΑ, 12173
- Ηλεκτρονικά, Γ. Χαριτάντης, Εκδ. Π. Δεμερτζή

- Related academic journals:

- Physical Review E
- Physics Letters A
- Electronics Letters
- Springer Circuits, Systems and Signal Processing Journal
- IET Optoelectronics
- MDPI Electronics