COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF PHYSICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**53**	**SEMESTER**	**5**
COURSE TITLE	Analog Electronics		

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**
	5	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialised general knowledge
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in GREEK)
COURSE WEBSITE (URL)	

(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*

This course introduces students to the important concepts and basic skills of Analogue Electronics and related circuits

Upon successful completion of this course module students possess advanced knowledge, skills and competences in the subject of Analog Electronics that enable them to:

- Understand the basic characteristics, theory of operation and applications of semiconductor devices (e.g diodes BJT and FETs) and circuits
- Design and analyze simple electronic circuits with special focus on designing amplifiers with discrete components (like diodes, BJTs or FETs)
- Perform Analysis at AC of Amplifiers based on BJTs and FETs using weak signal models
- Design and construct analog circuits using appropriate test equipment and demonstrate basic skills on using electronic devices/circuits simulation programs to analyze and verify the experimental results obtained.
- Cooperate with fellow students as a team for the successful implementation of the laboratory exercises with the appropriate preparation of the procedures that must be followed, as well as the study of the relevant material for homework

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…*
	…….

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Team work
- Production of free, creative and inductive thinking

(3) SYLLABUS

Introduction
Semiconductor Materials: Ge, Si, and GaAs ,n-Type and p-Type Materials
Semiconductor Diode , Ideal versus Practical
Diode Equivalent Circuits
Zener Diodes, Light-Emitting Diodes
Half-Wave & Full-Wave Rectification
Clippers,Clampers ,Zener Diodes Light-Emitting Diodes, Voltage-Multiplier Circuits
Bipolar Junction Transistors
BJT, DC & AC Biasing – Analysis
Field Effect Transistors
FET DC & AC Biasing – Analysis
BJT and FET amplifiers
BJT and JFET Frequency Response
Operational Amplifiers
Filters, multistage amplifiers, practical applications
Feedback and Oscillator Amplifiers

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face lectures Real time practice	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of electronic presentation with multimedia content in class, • Student support through the course webpage and the • departmental e-learning platform, • Electronic communication of instructors and students, • through the course webpage and by e-mail, • Use of special circuit simulation software.	
TEACHING METHODS	***Activity***	***Semester workload***

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*	Lectures	20
	Exercises	10
	Laboratory experiments	20
	study and analysis of bibliography	97
	exams	3
	Course total	***150***
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.*	Course grade = Final exam (80%) + Homeworks (20%) Final exam is at the end of semester based on Theory Lectures. Homeworks are prepared weekly and report on the analysis of experimental data obtained on each laboratory course	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Electronic Devices and Circuit Theory (10th Edition) by Robert L. Boylestad & Louis Nashelsky, Tziolas publishing, (translated in Greek)
2. MALVINO, A.P., Electronic Principles, Tziolas publishing (translated in Greek)
3. Exercises on Analog Electronics, Laboratory manual (In Greek)