COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCE			
ACADEMIC UNIT	DEPARTMENT OF PHYSICS			
LEVEL OF STUDIES	GRADUATE			
COURSE CODE	**M421**	**SEMESTER**	**2**	
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**
Lectures / Labs / Tutorials			**3**	**5**
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*	General background			
PREREQUISITE COURSES:	-			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK			
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES			
COURSE WEBSITE (URL)	https://www.cs.uoi.gr/~tsiatouhas/MYY404-ELEC.htm			

(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 aims at introducing to students the fundamentals of analog electronic circuit analysis and design.

After successfully passing this course the students will be able to:

- Understand electronic devices (diodes, transistors)
- Understands basic electronic topologies
- Analyze electronic circuits
- Synthesize and design amplifier topologies
- Evaluates the performance characteristics of analog 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	*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…*
	…….

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

(3) SYLLABUS

Introduction to electronics. Amplifiers - Operational amplifiers. Semiconductors theory. The p-n junction - Diodes. Diode circuits (rectifier and limiting circuits). Field effect transistors transistors: a) physical structure and operation, b) current-voltage characteristics, c) DC operation - bias, d) small-signal equivalent circuit models. Single-stage transistor based amplifier topologies: biasing and operation. Differential amplifiers. Multi-stage amplifiers. Frequency response.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face, lectures, lab courses, home-works
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of ICT in teaching. • Course website maintenance. Announcements and posting of teaching material (lecture slides and notes). • Use of email for information exchange and improved communication with students. • Use of the ecourse application
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*	

Activity	*Semester workload*
Lectures	39
Exams	20
Problems solving	63
Study & bibliography analysis	3
Course total	**125**

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*	LANGUAGE OF EVALUATION: Greek METHODS OF EVALUATION (i) Final examination, which includes problem solving. The exam papers are evaluated based on the correctness and completeness of answers (90%). (ii) Home-works on problem solving. The home-

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	works are marked based on their correctness and completeness (10%). The evaluation procedure is accessible to students via the course website.

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Book [41963440]: MICROELECTRONIC CIRCUITS, Adel S. Sedra and Kenneth C. Smith, Oxford University Press, 2017.

Book [32997430]: MICROELECTRONICS, Richard Jaeger and Travis Blalock, McGraw-Hill, 2016.

Course slides.

- Related academic journals:

- Transactions on Circuits and Systems I & II (TCAS), IEEE.
- Journal of Solid-State Circuits (JSSC), IEEE.