

INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS																			
SCHOOL	SCHOOL OF SCIENCE																			
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS																			
COURSE LEVEL	UNDERGRADUATE																			
COURSE TITLE	Electronics																			
COURSE CODE	K19	Semester	6	ECTS	6															
TEACHING HOURS per week	THEORY	3	SEMINAR.	1	LABORATORY															
COURSE TYPE	<p>Select one of the following and delete the rest Compulsory (YM) / Optional Lab (EP) / Track Compulsory (EYM) / Project / General education (ΓΠ) / Electives (ΠΜ)</p> <table border="1"> <thead> <tr> <th>K</th> <th>E1</th> <th>E2</th> <th>E3</th> <th>E4</th> <th>E5</th> <th>E6</th> </tr> </thead> <tbody> <tr> <td>B</td> <td></td> <td></td> <td></td> <td>Y</td> <td>E</td> <td></td> </tr> </tbody> </table> <p><i>Fill the table as in the curriculum: Track (A-Computer Science, B- Computer Engineering) / Specialization Compulsory (Y) / Core Specialization (B)/ Elective Specialization (E)</i></p>						K	E1	E2	E3	E4	E5	E6	B				Y	E	
K	E1	E2	E3	E4	E5	E6														
B				Y	E															
URL	https://eclass.uoa.gr/courses/D15/																			
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	Recommended K11ε																			
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK																			
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO																			

COURSE CONTENT
<p>Amplifiers, basic characteristics performance, typical models, frequency responsee. Operational amplifiers, revering and non reversing topologies, differential amplifiers, integrators, differentators. Introduction to semiconductors (doped semiconductors, pn junction, bias of a pn junction).Applications of a pn diode (semi, full rectifier, limiter). Special type of diodes (zener, varactor, photodiodes). Bipolar transistors, (structure of the transistor, basic functionality, characteristic curves and parameters, the transistor as an amplifier, as a switch, logic gates). Transistor bias circuits. Basic amplifier topologies (common emitter, common base, common collector). Bipolar small signal amplifiers (equivalent Ac small signal circuits) Frequency response of the amplifier.</p>

STUDENT LEARNING OBJECTIVES

Teaching-Learning Goals-Expected Learning Outcomes

To introduce the students to the basic topics of the Electronics covering the related areas at theoretical and applied level

Upon successful completion of the course the student will be able to:

- Explain the basic characteristics of the semiconductor material
- Explain the principle of operation of the semiconductor diodes and bipolar transistors
- Classify the different types of amplifiers regarding their operational characteristics
- Explain the principle of operation of the operational amplifiers
- Describe the topology of the different amplifying schemes and determine their structural parameters using operational amplifiers
- Design rectifying circuits and power supplies using semiconductor diodes
- Design different types of amplifiers using bipolar transistors

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD

In Class (Face to Face)

USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

Learning process supported by the e-class platform
(Discussions, Announcements, Task assignments)
Email communication

TEACHING ORGANIZATION

Describe in detail the way and methods of teaching:

*Enhanced Lectures,
Online Lectures,
Seminars,
Tutorial,
Laboratory,
Laboratory Exercise,
Study & analysis of literature,
Practice (Positioning),
Interactive teaching,
Developing a project,
Individual / group work
Telework (reference to tools) etc.*

Details of the student's study hours for each learning activity and hours of non-guided study are shown to ensure that the total workload at the semester corresponds to the ECTS

Activity	Student Workload (hours)
Lectures	39
Tutorial	13
Laboratory	
Teamwork in a case study	
Small individual exercises	40
Independent Study	48
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Total Course (25 hours of workload per unit of credit)	140

<p>ASSESSMENT OF STUDENTS <i>Description of the assessment process</i></p> <p><i>Assessment Methods, Formative or Concluding, Multiple Choice Test, Quick Response Questions, Test Development Questions, Problem Solving, Written Work, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Other / Other</i></p> <p><i>Fully defined evaluation criteria are mentioned and if and where they are accessible to students.</i></p>	<p>Describe explicitly methods, evaluation tools and provided feedback. The table below is supplemented accordingly.</p>		
	Assessment methods	Number	Percentage
	Written examination	1	85%
Progress			
Exercises	10	15%	
Laboratory			
Final work			

LITERATURE AND STUDY MATERIALS / READING LIST
Sedra/Smith, Microelectronic circuits, 7 th edition, Publisher Papatotiriou