

SCHOOL	SCHOOL OF SCIENCE						
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS						
COURSE LEVEL	UNDERGRADUATE						
COURSE TITLE	Electronics Laboratory						
COURSE CODE	K19ε	Semester	6	ECTS	6		
TEACHING HOURS per week	THEORY		SEMINAR.	1	LABORATORY	3	
COURSE TYPE	Electives (ΠΜ)						
	K	E1	E2	E3	E4	E5	E6
	B				B	E	
URL	http://users.uoa.gr/~matakias/Links						
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	Circuits and Systems Laboratory K11e (ΕΡΓΑΣΤΗΡΙΟ ΚΥΚΛΩΜΑΤΩΝ ΚΑΙ ΣΥΣΤΗΜΑΤΩΝ K11ε)						
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK						
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO						

COURSE CONTENT
<p>The content of the Electronics Laboratory includes the followings:</p> <ul style="list-style-type: none"> (i) Building blocks of simple Analog Circuits and use of Laboratory Instruments such as oscilloscope and Function Generator (ii) Diode Circuits, Forward and Reverse bias of diode, Voltage Regulation with diodes, DC and AC analysis, Circuit simulation with spice, Circuit analysis with Load Line (iii) Zener diode, Voltage regulation with Zener, Linear Power Supply design, Transformers and Rectification, Circuit simulation with spice (iv) Common Emitter Bipolar Transistor Circuit, DC Analysis, Load-Line solution of BJT circuits, Operating Point of Single transistor Amplifier, Low Frequency Common Emitter Amplifier, Gain and Output Resistance (v)) DC Analysis of Common Source MOSFET Circuit, Load-Line solution of nMOS circuit, Operating Point of Single nMOS Transistor Amplifier, Low Frequency Amplifier with nMOS Transistor (vi) CMOS inverter with nMOS and pMOS transistors, Buffer circuit, DC analysis, Simulation with spice

STUDENT LEARNING OBJECTIVES

Teaching-Learning Goals-Expected Learning Outcomes

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

- Explain the basic principles in simple analog circuits
- Design, construct and test simple analog circuits with diodes in the laboratory.
- Build and undertake measurements of simple transistor amplifier circuits.
- Analyze and explain the DC and AC behavior and operation of simple diode or transistor circuit.
- Demonstrate understanding of circuit analysis for bipolar and MOS single transistor circuits.
- Interpret diode and transistor datasheets and use them to aid the design of circuits.
- Use SPICE Simulation Tools to find solutions to simple analog circuit related problems.

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 Use of the online course page: Course Description, Discussions Notes and Instructions, Announcements, Task assignments Email communication														
TEACHING ORGANIZATION <i>Describe in detail the way and methods of teaching:</i> 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. <i>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</i>	<table border="1"> <thead> <tr> <th>Activity</th> <th>Student Workload (hours)</th> </tr> </thead> <tbody> <tr> <td>Tutorial</td> <td>13</td> </tr> <tr> <td>Laboratory</td> <td>39</td> </tr> <tr> <td>Teamwork in a case study</td> <td>13</td> </tr> <tr> <td>Small individual exercises</td> <td>52</td> </tr> <tr> <td>Independent Study</td> <td>33</td> </tr> <tr> <td>Total Course (25 hours of workload per unit of credit)</td> <td>150</td> </tr> </tbody> </table>	Activity	Student Workload (hours)	Tutorial	13	Laboratory	39	Teamwork in a case study	13	Small individual exercises	52	Independent Study	33	Total Course (25 hours of workload per unit of credit)	150
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ASSESSMENT OF STUDENTS

Description of the assessment process

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

Fully defined evaluation criteria are mentioned and if and where they are accessible to students.

Describe explicitly methods, evaluation tools and provided feedback.

The table below is supplemented accordingly.

Assessment methods	Number	Percentage
Written examination	1	60%
Exercises	13	20%
Laboratory	13	20%

LITERATURE AND STUDY MATERIALS / READING LIST

1. Γιάννης Τσιβίδης, "Εισαγωγικό Εργαστήριο Κυκλωμάτων & Ηλεκτρονικής", εκδ. Παπασωτηρίου, Αθήνα 2018, ISBN:978-960-491-121-9 (Εύδοξος: 77117449).
 2. Make Electronics – Learning by Discovery, Charles Platt, Maker Media, Inc, 2009
 3. The Art of Electronics, Horowitz & Hill, Cambridge University Press; 2nd ed., 1989
 4. <http://www.allaboutcircuits.com>
- Lecture Notes and Work Sheets, <http://users.uoa.gr/~matakias/Links.html>