

COURSE OUTLINE

1. GENERAL

SCHOOL			
DEPARTMENT	DEPARTMENT OF PHYSICS		
LEVEL OF STUDIES	ISCED level 6 – Bachelor's or equivalent level		
COURSE CODE	SSE804-2023	SEMESTER	8th Semester
COURSE TITLE	Electronic Circuits and Digital Systems Laboratory		
TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.		TEACHING HOURS PER WEEK	ECTS CREDITS
		3	6.0
COURSE TYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area		
PREREQUISITES	None		
TEACHING & EXAMINATION LANGUAGE:	Greek		
COURSE OFFERED TO ERASMUS STUDENTS:	YES		
COURSE URL:	https://exams.emt.ihu.gr/courses/PHYSICS238/		

2. LEARNING OUTCOMES

Learning Outcomes Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course. The aim and objective of the course are: The consolidation in practice of the knowledge about specialized electronics topics, which have already been taught in the previous semester and the cultivation of the skills required for their implementation and experimental study. The main laboratory modules are: • Differential amplifier pair. • Circuits with operational amplifiers. • Oscillator circuits and multivibrator circuits. Upon successful completion of the course, the student will be able to: • Recognize and distinguish in practice basic electronic elements and circuits, as well as being able to understand their function. • To calculate characteristic sizes of electronic components, to polarize appropriately taking into account design faults and also to find the characteristics of an electronic component.
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- To be able to practically build an electronic circuit.
- Be able to use instruments and laboratory devices to take measurements from electronic circuits.
- To confirm the correct operation of an electronic circuit by combining experimental data with theoretical circuit analysis and the critical use of simulation programs.
- To learn and read data sheets of electronic components.
- Identify errors in simple electronic components and electronic circuits and be able to provide solutions for their repair.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use, Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Search, analysis and synthesis of data and information, ICT Use
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3. COURSE CONTENT

- Methodology and application of electronic circuit measurements.
- Diodes and electronic diode circuits.
- Bipolar Contact Transistors – BJTs (switch circuits and amplifier circuits).
- Field Effect Transistor – FET (characteristics and circuits)
- Operational amplifiers (characteristic and basic amplifier circuits).
- Elements of digital circuits (Boolean algebra, switching circuits, implementation of logic gates).

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	Use of ICT in Teaching Use of ICT in Communication with students

TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	<table border="1"> <thead> <tr> <th>Activity</th><th>Workload/semester</th></tr> </thead> <tbody> <tr> <td>Lectures</td><td>11</td></tr> <tr> <td>Laboratory Exercise</td><td>39</td></tr> <tr> <td>Writing project</td><td>80</td></tr> <tr> <td>Bibliographic research & analysis</td><td>20</td></tr> <tr> <td>Total</td><td>150</td></tr> </tbody> </table>	Activity	Workload/semester	Lectures	11	Laboratory Exercise	39	Writing project	80	Bibliographic research & analysis	20	Total	150
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STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	Student evaluation languages Greek English Method (Formative or Concluding) Formative Student evaluation methods <table> <tr> <td>Written Assignment</td><td>Rate 50</td></tr> <tr> <td>Laboratory Report</td><td>50</td></tr> </table>	Written Assignment	Rate 50	Laboratory Report	50								
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Laboratory Report	50												

5. Suggested Bibliography

- A. Brown, Vranesic, "Σχεδίαση Ψηφιακών Συστημάτων με τη Γλώσσα VHDL", ΕΚΔΟΣΕΙΣ Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε., 3η Έκδοση, 2011, ISBN: 978-960-418-340-1, Κωδικός Βιβλίου στον Εύδοξο: 18548944.
- B. Tokheim Roger, "Ψηφιακά Ηλεκτρονικά", ΕΚΔΟΣΕΙΣ Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε., 1η Έκδοση, 2018, ISBN: 978-960-418-735-5, Κωδικός Βιβλίου στον Εύδοξο: 68374023.
- Γ. Floyd Thomas L., "Ψηφιακά ηλεκτρονικά", ΣΤΕΛΛΑ ΠΑΡΙΚΟΥ & ΣΙΑ ΟΕ, 1η έκδ., 2007, ISBN: 978-960-411-646-1, Κωδικός Βιβλίου στον Εύδοξο: 14795.
- A. Thomas Floyd, "Digital Fundamentals", Pearson Group, 11th Ed., 2015, ISBN: 978-1292075983.
- B. John F. Wakerly, "Digital Design Principles & Practices", Pearson, 5th Ed., 2018, 978-0134460093

Eudoxus

Βιβλίο [320086]: ΕΡΓΑΣΤΗΡΙΑΚΟΣ ΟΔΗΓΟΣ ΚΑΙ ΑΣΚΗΣΕΙΣ ΗΛΕΚΤΡΟΝΙΚΗΣ, ΝΙΣΤΑΖΑΚΗΣ ΕΚΤΟΡΑΣ

Βιβλίο [77117449]: Εισαγωγικό Εργαστήριο Κυκλωμάτων και Ηλεκτρονικής, Τσιβίδης Γιάννης