

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	SCHOOL OF SCIENCE		
<b>ACADEMIC UNIT</b>	DEPARTMENT OF PHYSICS		
<b>LEVEL OF STUDIES</b>	GRADUATE		
<b>COURSE CODE</b>	<b>M422</b>	<b>SEMESTER</b>	<b>2</b>
<b>COURSE TITLE</b>	Electronics Design - Laboratory		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>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</i>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
	7	9	
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialized general knowledge, skills development</i>	General background, skills development		
<b>PREREQUISITE COURSES:</b>	-		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	GREEK		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	YES		
<b>COURSE WEBSITE (URL)</b>	<a href="http://www.telecomlab.gr/SHT/M422">www.telecomlab.gr/SHT/M422</a>		

## (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

The aim of the course is to acquire the necessary knowledge and skills in the analysis of linear circuits, filters and in the construction of Printed Circuit Boards (PCB). After completing the course, the student will be able to:

- Analyzes RC and RL circuits, first and second order.
- Analyzes and designs linear circuits and transmission lines.
- Analyzes and designs passive and active high frequency filters.
- Designs electronic circuits in a design software program and prints them on a PCB applying the relevant knowledge and skills.

### 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  
Adapting to new situations  
Decision-making  
Working independently  
Teamwork  
Working in an international environment  
Working in an interdisciplinary environment  
Production of new research ideas

Project planning and management  
Respect for difference and multiculturalism  
Respect for the natural environment  
Showing social, professional, and ethical responsibility and sensitivity to gender issues  
Criticism and self-criticism  
Production of free, creative, and inductive thinking  
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Others...  
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- 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

- a) Analysis and design of first and second order linear RC and RL circuits.
- b) Study and analysis of transmission lines.
- ⇒ Designing electronic circuits using program software and manufacturing a printed circuit board (PCB). Placing the electronic components and checking the correct operation of the board with the appropriate electronic signal generation and recording devices.

## (4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;"><b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i></p>	Face-to-face, lectures, lab courses, home-works	
<p style="text-align: center;"><b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<ul style="list-style-type: none"> <li>• Use of ICT in teaching.</li> <li>• Course website maintenance. Announcements and posting of teaching material (lecture slides and notes).</li> <li>• Use of email for information exchange and improved communication with students.</li> </ul>	
<p style="text-align: center;"><b>TEACHING METHODS</b></p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>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.</i></p> <p><i>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</i></p>	<b>Activity</b>	<b>Semester workload</b>
	Lectures (theory)	51
	Study & bibliography analysis	25
	Project	45
	Laboratory practice	40
	Report writing	30
	Self-Study	28
	Exams	6
	Course total	<b>225</b>
<p style="text-align: center;"><b>STUDENT PERFORMANCE EVALUATION</b></p> <p><i>Description of the evaluation procedure</i></p> <p><i>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.</i></p> <p><i>Specifically - defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p><b>METHODS OF EVALUATION:</b></p> <p>(i) The laboratory training is evaluated based on the quality of the construction and the corresponding report (25%).</p> <p>(ii) Final examination, which includes problem solving. The exam papers are evaluated based on the correctness and completeness of answers (75%).</p>	

## (5) ATTACHED BIBLIOGRAPHY

<p>Suggested bibliography:</p> <ul style="list-style-type: none"> <li>-Electronic Principles, 8th Edition; Albert Malvino and David Bates, McGraw Hill, 2016.</li> <li>-Electronic Devices and Circuits Theory, 10th Edition; Robert I. Boylestad and Louis Nashelsky; Prentice Hall, 2008.</li> <li>-Fundamentals of Electric Circuits, 6<sup>th</sup> Edition, Charles K. Alexander, Matthew N.O. Sadiku, McGraw Hill, 2016.</li> <li>-Χαριτάντης, "Ηλεκτρονικά-Γραμμικά κυκλώματα συνεχούς χρόνου", Πανεπιστημιακές Εκδόσεις Αράκυνθος, 2013</li> <li>-The Analysis and Design of Linear Circuits, Ninth Edition (Paperback). Thomas. Published by John Wiley &amp; Sons Inc, United States (2020).</li> <li>-Printed Circuits Handbook, Seventh Edition 7th Edition, Clyde Coombs , Happy Holden 2016</li> </ul>
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