COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF ELECTRONICS ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	2604002	**SEMESTER**	4
COURSE TITLE	Signals, Systems & Circuits		

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 (ECTS)**
Lectures	4	7
Laboratory	0	
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*	Special Background Course
PREREQUISITE COURSES:	Electric Circuits II (2nd Semester)
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	http://filters.teipir.gr/HGD/CS/Main_CS.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*

Upon successful completion of this course module students possess advanced knowledge, skills and competences in the subject of Signals, Systems and Circuits that enable them to:

1. Understand and describe causal/non-causal, linear/non-linear, time variant/invariant, discrete/continuous time and other system categories.
2. Perform Fourier analysis of continuous time signals and systems with applications in electronic circuits.
3. Perform time and frequency domain analysis of analog systems, especially electronic circuits
4. Interpret the results of analysis of continuous time systems and circuits, so as to conclude on their characterization and classification.

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…*
	…….

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

(3) COURSE CONTENT

Lectures

Introduction

1. Systems and signals description and classification
2. Basic signals, the unit step and the impulse signals
3. Mathematical models of LTI systems
4. Time response of LTI systems to the complex exponential excitation.
5. LTI systems and Convolution
6. Circuit theory revisited (Basic circuit elements, the operational amplifier, integrators and differentiators, analog computers).
7. The Fourier series
8. The Fourier transform and its application in circuits
9. The Laplace Transform
10. Application of the Laplace Transform in LTI systems and circuits
11. System and circuit functions, pole-zero plots,
12. Frequency response and Bode plots.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face lectures
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of electronic presentation with multimedia content in class, • Student support through the course webpage and the departmental e-learning platform, • Electronic communication of instructors and students, through the course webpage and by e-mail, hot line 24/7 xstudentline@gmail.com and Facebook closed group

<table>
<tr><td></td><td>"Xstudentline".
• Use of special symbolic mathematics software.</td></tr>
<tr><td>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</td><td>Lectures, assignments, study.

<table><tr><th>Activity</th><th>Semester workload (hours)</th></tr><tr><td>Lectures</td><td>52</td></tr><tr><td>Study for lectures and homework assignments</td><td>104</td></tr><tr><td>Study and preparation for exam</td><td>54</td></tr><tr><td>Course Total</td><td>120</td></tr></table></td></tr>
<tr><td>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

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Student evaluation is performed in the language of instruction.

Final written exam on all taught material (80%)
Homework Assignments turned in during the semester (20%)

Final written exam includes development questions and problem solving questions. Students are provided with a concise mathematic formulae consultation list. 5 questions are typically given; 3 or 4 out of them have to be answered.</td></tr>
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(5) ATTACHED BIBLIOGRAPHY

1. H.G. Dimopoulos, Signals, Systems & Circuits (Basic textbook in Greek distributed to the students free of charge)
2. Athanasios Papoulis, Circuits and Systems - A Modern Approach, McGraw-Hill
3. E. Kudeki, D.C. Munson Jr, Analog Signals and Systems, Pearson Prentice Hall
4. C. L.Phillips, J. M. Parr, E. A. Riskin. Signals, Systems and Transforms, Prentice Hall
5. Chi-Tsong Chen, Signals and Systems, Oxford University Press
6. Alan V. Oppenheim, Alan S. Willsky, Signals and Systems, Prentice-Hall
7. William D. Stanley, Transform Circuit Analysis for Engineering and Technology, Prentice Hall
8. J.W.Nilsson, S.A. Riedel, Electric Circuits, Addison Wesley
9. R.C. Dorf, J.A. Svoboda, Introduction to Electric Circuits, John Wiley
10. C.A. Desoer, E.S. Kuh, Basic Circuit Theory, McGraw-Hill
11. Paul M. Chirlian, "Signals and Filters", Van Nostrand Reinhold