COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Science		
ACADEMIC UNIT	Physics		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**10YK201**	**SEMESTER**	**7**
COURSE TITLE	**SIGNALS AND SYSTEMS**		

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**
Lectures (theory and exercises)	3	6
Laboratory	1	

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	*Specialization Courses*
PREREQUISITE COURSES:	No
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes, in English for Erasmus students
COURSE WEBSITE (URL)	eclass URL: *https://eclass.uoa.gr/courses/PHYS251/*

(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 course provides the student with knowledge about signals carrying information (analog and digital) as well as their interaction with systems (primarily linear)

With the completion of the course the student is able to

Understand the Physics of signals and systems

Describe and handle different types of signals, in the time and frequency domain, as well as compute the output signal of a linear system when the input to the system is another signal

To explain the fundamental concepts of signals, their different descriptions (e.g., Fourier series), the operation of convolution between two signals, the corresponding description in the frequency domain, the perform the computation of the output of a linear system on the basis of these techniques, as well as the transformation from continuous to discrete time (sampling)

To be able to analyze and comprehend the nature of signals and systems, to judge which parameters are of particular importance, to compare the effectiveness of different computation techniques

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
Team work
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
……
Others…
…….

The course aims at the following general competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Working independently
Analytical and synthetic thinking
New Technology skills
Information management
Problem solving

(3) SYLLABUS

- Introduction to signals and systems
- Convolution
- Fourier analysis in the continuous time domain and applications
- Laplace transform: properties and applications
- Sampling
- Fourier analysis in the discrete time domain and applications
- z transform: properties and applications

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Yes

Electronic communication with the students using ICT (Information and Communications Technology)
Computer-aided lectures, use of Overhead Projectors, eclass platform</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>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>39</td></tr>
<tr><td>Laboratory</td><td>13</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Individual Study/Study and Analysis of bibliography / Preparation</td><td>72</td></tr>
<tr><td>Preparation for the Laboratory and writing report</td><td>26</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course Total</td><td>150</td></tr>
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<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>Final written exams
Open-ended questions, Problem solving
Oral grade for the Laboratory
Laboratory reports</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography

- Signals and Systems of Continuous and Discrete Time, Μάργαρης Αθανάσιος
- Signals and Systems, Oppenheim, Willsky, Nawab

- Related academic journals:

- Journal of Lightwave Technology
- IEEE Photonics
- IEEE Transactions on Signal Processing
- Elsevier Journal of the Franklin Institute
- Elsevier Signal Processing
- Elsevier Optics Communications
- Springer Circuits, Systems and Signal Processing Journal
- Springer Mathematics of Control, Signals and Systems
- IET Optoelectronics
- MDPI Electronics
- MDPI Computation