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|---|---|---|---|---|---|---|
| **INSTITUTION** | NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS | | | | | |
| **SCHOOL** | SCHOOL OF SCIENCE | | | | | |
| **DEPARTMENT** | INFORMATICS AND TELECOMMUNICATIONS | | | | | |
| **COURSE LEVEL** | UNDERGRADUATE | | | | | |
| **COURSE TITLE** | **Signals and Systems** | | | | | |
| **COURSE CODE** | **K11** | | **Semester** | **3** | **ECTS** | **6** |
| **TEACHING HOURS per week** | **THEORY** | **3** | **SEMINAR.** | **1** | **LABORATORY** | **0** |
| **COURSE TYPE** | **Select one of the following and delete the rest**<br>Compulsory (YM)<br>**K** \| **E1** \| **E2** \| **E3** \| **E4** \| **E5** \| **E6**<br>*Fill the table as in the curriculum:* Track (A-Computer Science, B- Computer Engineering) / Specialization Compulsory (Y) / Core Specialization (B)/ Elective Specialization (E) | | | | | |
| **URL** | https://eclass.uoa.gr/courses/DI430/ | | | | | |
| **EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:** | Recommended K01 | | | | | |
| **TEACHING AND EXAMINATIONS LANGUAGE:** | GREEK | | | | | |
| **THE COURSE IS OFFERED TO ERASMUS STUDENTS** | NO | | | | | |

| **COURSE CONTENT** |
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| Basic classes of signals, spectrum representation of periodic and non-periodic signals, main classes of systems, convolution-based representation, state models, representation of systems with differential equations and finite difference equations, Fourier, Laplace and Z transforms, Bode diagrams, stability, sampling and quantisation. |

| **STUDENT LEARNING OBJECTIVES** |
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| Course objectives:<br>• To provide an overview of what is a signal and classify the various signals according to their main characteristics<br>• To provide an overview of what is a system and classify them according with the number and the kind of their inputs and outputs general as well as to describe their main characteristics |

- To familiarize students with the formulation, the mathematical tools and the applications of the Fourier transform for the analogue and the discrete signals
- To introduce the Fourier, Laplace and Z transforms and their main properties.

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

- Recognise, categorize and classify the signals and the systems
- Select and apply basic signal processing methodologies
- Specify, analyze and apply in practice appropriate systems and handling tools and signal transformation, such as the Fourier analysis and the Laplace or Z transformations

| **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 (Provision of educational content, Announcements, Discussions)<br>Email communication<br>Live transmission of lectures<br>Ability to track recorded lectures |
| **TEACHING ORGANIZATION**<br>*Describe in detail the way and methods of teaching:*<br>*Enhanced Lectures,*<br>*Online Lectures,*<br>*Seminars,*<br>*Tutorial,*<br>*Laboratory,*<br>*Laboratory Exercise,*<br>*Study & analysis of literature,*<br>*Practice (Positioning),*<br>*Interactive teaching,*<br>*Developing a project,*<br>*Individual / group work*<br>*Telework (reference to tools) etc.*<br><br>*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* | The theory is presented with power-point slides that are available in the e-class. More solution of more than 50 exercises are explained during the tutorials. |

| **Activity** | ***Student Workload*** *(hours)* |
|---|---|
| Lectures (attendance) | 39 |
| Tutorial (attendance) | 13 |
| Independent Study of exercises | 48 |
| Independent Study of theory | 50 |
| | |
| ***Total Course (25 hours of workload per unit of credit)*** | ***150*** |

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| **ASSESSMENT OF STUDENTS**<br>*Description of the assessment process*<br><br>*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*<br><br>*Fully defined evaluation criteria are mentioned and if and where they are accessible to students.* | The evaluation method is based on a written examination with exercises of variable difficulty. Students can access the errors on their written examinations and ask for a regrading.<br><br>**Assessment methods** / ***Number*** / ***Percentage***<br>Written examination / 1 / 100% |

**LITERATURE AND STUDY MATERIALS / READING LIST**


- S. Karabogias "Signals and Systems", University of Athens edition, 2009, ISBN 978-960-931517-3 (in Greek)
- N. Kalouptidis "Signals, Systems and Algorithms", DIAVLOS editions, 1993 (in Greek)
- S. Theodoridis, K. Berberidis, L. Kofidis "Introduction to Signals' and Systems' Theory" G. Dardanos & K. Dardanios editions, 2003 (in Greek)