COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Computer Science		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	507SBOB	**SEMESTER**	5
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	2	5
Tutorial Exercises	2	
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*	Specialized general knowledge
PREREQUISITE COURSES:	Mathematics I, Mathematics II
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	

(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 purpose of the course is to introduce the student to the concept of the Signal and its processing in Systems. The student must know the types of Signals and Systems and the philosophy of each, as well as the basic processing that is done on the signals and in what way.

More specifically, they must be able to:

- To analyze a signal into its harmonic components using the Fourier transform.
- To realize and understand the importance of the frequency response of a system.
- To know and carry out the process of converting an analog signal into a digital one.
- To know the types and function of filters and be able to design them.

- To know and carry out the processing of Correlation and Convolution of signals.

To be able to carry out and study the above procedures with modern signal processing software (e.g., Matlab, Simulink, Mathematica, Octave, Python).

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…
…….

- Search, analysis and synthesis of data and information, using the necessary technologies
- Adaptation to new situations
- Decision making
- Autonomous work
- Teamwork
- Work in an international environment
- Promotion of free, creative and inductive thinking

(3) SYLLABUS

I. Signals & Systems
II. Fourier analysis
III. Systems frequency response
IV. Sampling
V. Filters
VI. Signal correlation
VII. Signal Convolution

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Website of the course with supporting and auxiliary material. Communication software with students through the e-class electronic platform to share course announcements, notes and exercises.
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*	
STUDENT PERFORMANCE	

Activity	***Semester workload***
Lectures	26x2=52
Tutorial Exercises: Selected, representative exercises are solved concerning different modules of the course.	26x2=52
Written Exams	2x1=2
Individual Study	150x0,2=30
Course total	***125***

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.*	**Theory** Final written exam (100%) which includes: • Theoretical test questions • Problem solving

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1) Teaching Notes for Theory and Laboratory.
2) Introduction to Signal and Systems Theory. S. Theodoridis, K. Berberidis, L. Kofidis. Typothito Publications - Giorgos Dardanos, Athens 2003.
3) Signals and systems for technologists. Panos Fotopoulos, Anastasia N. Veloni. Modern Publishing House, 2008.
4) Fourier Series (A self-contained Tutorial Module for learning the technique of Fourier series analysis). Graham S McDonald. http://www.cse.salford.ac.uk/physics/gsmcdonald/HTutorials/Fourier-series-tutorial.pdf
5) Electric-Circuits. Mahmood Nahvi, Joseph A. Edminister. Schaum's Outlines.
6) Mathematical Description of Continuous-Time Signals. M.J. Roberts. http://www.cse.unt.edu/~rakl/class3010/Chapter2.pdf
7) The Fourier Transform and its Applications (Lecture Notes). Brad Osgood. http://see.stanford.edu/see/courseinfo.aspx?coll=84d174c2-d74f-493d-92ae-c3f45c0ee091
8) Signals and Systems. Freddy Mudry. http://www.slideshare.net/mfoulah/cours-signaux-etsystemes
9) Signals and Systems. Guy Almouzni. http://ressource.electron.free.fr/bts/cours/SigsyPoly.pdf
10) Linear Control System Analysis & Design with Matlab. John J. D'Azzo and Constantine H. Houpis, Stuart N. Sheldon. Ed. Marcel Dekker inc, 2003.
11) Signals and Systems/Print version. http://en.wikibooks.org/wiki/Signals_and_Systems/Print_version
12) Signal Processing Blockset For Use with Simulink. User's Guide, The Mathworks.
13) Continuous and Discrete Time signals and systems. Margari Ath. Giola Publications, 2012.
14) Digital Signal Processing, Signals, Systems & Filters. Antoniou Andreas. Editions Giola, 2009.