COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Science		
ACADEMIC UNIT	Physics		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**10YKO20**	**SEMESTER**	**2**
COURSE TITLE	**Computer Science**		

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)	2	
Laboratory practice	2	
		6

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Skills development
PREREQUISITE COURSES:	No
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes,in the English language for Erasmus students
COURSE WEBSITE (URL)	*https://eclass.uoa.gr/courses/PHYS101/*

(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*

In this course the students acquire the necessary knowledge in computer science and algorithms in order they design and create algorithms and codes which will help them to solve problems in mathematics and physics.

With the completion of the course the students are able to design algorithms to solve problems in mathematics and physics and to create the related computer programs in C language.

With the completion of the course the students are able to estimate the accuracy of the outcomes of the programs that they study, design and create.

With the completion of the course the students are able to develop algorithms and codes for solving problems in Physics.

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
Decision-making
Working independently
Analytical and synthetic thinking
New Technology skills
Learning C / Python programming language ...
Creativity
Information management
Problem solving

(3) SYLLABUS

- Operating systems. Algorithms. Program structure.
- Programming in C language.
- Controlling program flow, conditions, loops.
- Arrays, file processing, pointers, functions.
- Recursive sequences. Numerical Integration. Differentiation.
- Pseudorandom numbers. Applications.
- Introduction to Python.
- Laboratory exercises.

(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*	Yes Electronic communication with the students using ICT (Information and Communications Technology) Computer-aided lectures, use of Overhead Projectors, Eclass platform
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 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.*	Final written exams in Greek Open-ended questions, Problem solving Oral examination Laboratory reports

Activity	Semester workload
Lectures / exercises	26
Individual Study/Study and Analysis of bibliography / Preparation	70
Laboratory practice	26
InteractiveTeaching	28
CourseTotal	**150**

(5) ATTACHED BIBLIOGRAPHY

- Suggestedbibliography

- Εισαγωγή στον Προγραμματισμό με την C, Ν. Μισυρλής, ΕΚΔΟΣΕΙΣ ΕΚΠΑ, 2007, 68403081.
- C: Από την θεωρία στην εφαρμογή, Γ.Σ. Τσελίκης, Ν.Δ. Τσελίκας, 2016, 68383623
- C Για Επιστήμονες και Μηχανικούς. Μια ερμηνευτική προσέγγιση, Harry H. Cheng, ΕΚΔΟΣΕΙΣ Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε., 2012, 18548936

- Related academic journals:

- Journal of Computational Physics - Elsevier
- Applied Mathematics and Computation
- Mathematics and Computers in Simulation