COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
DEPARTMENT	DEPARTMENT OF CIVIL ENGINEERING		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	ΕΜΑ8ΕΠ	**SEMESTER**	1st Semester
COURSE TITLE			

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	3	7.5

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	None
TEACHING & EXAMINATION LANGUAGE:	Greek
COURSE OFFERED TO ERASMUS STUDENTS:	NO
COURSE URL:	https://eclass.duth.gr/courses/1021385/

2. LEARNING OUTCOMES

Learning Outcomes Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.
After successful completion of the course students will be able to: • Understand and program with Basic Algorithmic Structures in Python (Sequence-Selection-Repeat) • Understand Basic Data Structures and program with them •Understand the concept of Function and to program with functions in Python • Develop Python Programs in IDLE environment • Understand the basic principles of Object Oriented Programming (Objects, Classes, Inheritance, Encapsulation, Polymorphism, Operator Overloading) Page 30 of 67 • Understand GUI Programming • Understand Numpy & SciPy • Developing Programs to solve typical mathematical problems e.g., Calculating Integrals, Solving Differential Equations, Solving problems of Linear Algebra and many others.

General Skills Name the desirable general skills upon successful completion of the module Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Search, analysis and synthesis of data and information, ICT Use Autonomous work Teamwork Production of new research ideas Critical thinking Promoting free, creative and inductive reasoning	

3. COURSE CONTENT

1. General Features of Python 2. The IDLE Open Programming Environment 3. Variables and Operators - Classes - Basic Concepts of Object Oriented Programming 4. Control Statements and Iteration Statements 5. Data Structures - Lists 6. Functions 7. Solving Mathematical Problems with Python Code. 7a. Solving Differential Equations (Runge-Kutta) of order 1 (Euler) with Python 7b. Finding Derivatives and Integrals with Python 7c. Applications of Linear Algebra Solving Linear and Differential Equations with Python Solving Systems with Python 7d. Code development for developing models of Artificial Neural Networks and other Machine Learning algorithms with Python 7. Object Oriented Programming Features. 8. Classes and Objects 9. GUI Programming 10. Numpy & SciPy Libraries

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	Use of ICT in Teaching Use of ICT in Laboratory Education Use of ICT in Communication with students
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Writing project	81
Total	**120**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Student evaluation languages** Greek **Method (Formative or Concluding)** Formative **Student evaluation methods** **Rate**

5. Suggested Bibliography

Μάθετε Python εύκολα Δημήτριος Καρολίδης Εκδόσεις Άβακας

Eudoxus

Κωδικός Βιβλίου στον Εύδοξο: 133024656
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