COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING
ACADEMIC UNIT	DEPARTMENT OF FINANCIAL AND MANAGEMENT ENGINEERING
LEVEL OF STUDIES	UNDERGRADUATE

COURSE CODE	ΓΕ0175	SEMESTER	10

COURSE TITLE	Scientific Programming with the Python programming language

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
	3	5
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*	special background, specialized general knowledge, skills development	
PREREQUISITE COURSES:	-	

LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://eclass.aegean.gr/courses/TMOD169/

(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 scope of the course is the teaching of the Python programming language and the transfer of knowledge by both lectures and practical assignments. The course is aimed at undergraduate students that are interested in developing software applications which demand deep understanding and advanced programming techniques. The course includes problem solving methods that utilize most of the Python basic and advanced data types. The students will learn to develop software using python functions and/or Python objects and are expected to solve complex problems by writing correctly structured software that can be easily read and understood by other software engineers and computer scientists.

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	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Teamwork
- Working in an international environment
- Working in an interdisciplinary environment

(3) SYLLABUS

- Introduction to Python
- Algorithm Theory
- Sequences and Collections
    - Strings
    - Lists
    - Arrays
    - Tuples
    - Sets
    - Dictionaries
- Flow Control
    - If conditions
    - For loops
    - While loops
- Functions
- Basic Object Oriented Programming with Python
- Read/Write from/To file.
- JSON (JavaScript Object Notation)
- Algorithm Programming

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face lectures
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in teaching Laboratory education Communication with students

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*	Activity	Semester workload
	Lectures	39
	Laboratory Assignments	20
	Mid-Term exams	3
	Final Exams	3
	Self-study	20
	Course total	**85**

| **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. | (40%) Written final exams:
   -   Multiple Choice questionnaires
   -   Problem Solving

(40%) Written mid-term exams:
   -   Multiple Choice questionnaires
   -   Problem Solving

(20%) Student Assignments during the course |

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
«Το βιβλίο της Python, Γράφοντας κώδικα» Νικόλαος Σαμαράς, Κωνσταντίνος Τσιπλίδης (ΕΚΔΟΣΕΙΣ ΚΡΙΤΙΚΗ ΑΕ)