COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF MATHEMATICS		
LEVEL OF STUDIES	UNDERGRADUATE PROGRAM		
COURSE CODE		**SEMESTER**	**H**
COURSE TITLE	ADVANCED PROGRAMMING LANGUAGES		
INSTRUCTORS	Andreas Papasalouros (Lecture), Nikolaos Papaloukas & Christos Tsagaris (Lab sessions)		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
	4	6

COURSE TYPE	Special background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://www.math.aegean.gr/index.php/en/academics/undergraduate-programs

(2) LEARNING OUTCOMES

Learning outcomes
The aim of this course is the introduction to object oriented and functional programming with the Python programming language. After the successful completion of the course, the students are expected to: Know the basic constructs elements of the Python programming language (data types, object and control and iteration structures, functions arrays and lists). Use and create modules and packages. Use the standard library of Python. Use the numpy numeric library and indicative elements of the scipy scientific library. Use the matplotlib data visualization toolkit. Understand the basic elements of object-oriented programming (class, object, attributes, methods). Create classes and methods. Understand basic elements of functional programming: recursion, lambda expressions, higher order functions. Implement programs applying functional programming techniques.
General Competences
Working independently. Team work. Working in an interdisciplinary environment.

(3) SYLLABUS

- Introduction to the Python programming language.
- Data types.
- Control and iteration structures.
- Basic data structures: Lists, sets and dictionaries.
- Modules and packages.
- Input/Output.
- Error and exception handling.
- Object oriented programming in Python.
- The Python standard library.
- Introduction to functional programming.
- Scientific computing in Python: Tools, libraries and selected applications.

TEACHING MATERIAL DISTRIBUTION	The teaching material of the course is uniformly distributed during the semester.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	• Use of ICT in teaching • Communication with students via e-mail • Uploading course material on moodle system.
TEACHING METHODS	
COURSE COMMITMENTS	Attending course and lab sessions is not obligatory.
STUDENT PERFORMANCE EVALUATION	Student's evaluation is done in Greek through a written examination which includes problem solving and laboratory work. For students with disabilities, evaluation takes place via oral exam.

Activity	***Semester workload***
Lectures	26
Laboratory practice	26
Independent study	98
Course total (25 per ECTS)	***150***

(5) ATTACHED BIBLIOGRAPHY

Lecture notes given during the semester.