COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering
ACADEMIC UNIT	Department of Naval Architecture
LEVEL OF STUDIES	Undergraduate
COURSE CODE	NAOME1243

COURSE CODE	NAOME1243	**SEMESTER**	7th
COURSE TITLE	OBJECT ORIENTED PROGRAMMING AND APPLICATIONS		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS (ECTS)**
Lectures	3	4

COURSE TYPE *general background, specialbackground, specialised general knowledge,skillsdevelopment*	Special background
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/NA227/

(2) COURSE GOALS / LEARNING OUTCOMES

The focus of this course is the introduction of students in the concepts of object oriented programming through the use of Python language. This course will further explore the field of big data analytics from multiple sources. A basic goal of this course is the use of advanced libraries for solving complex problems and problems that require machine learning techniques. The course also introduces students in techniques for performance measuring of different algorithms as well as formal documentation of programs.

After fulfilling the requirements of this course students shall be able to:

- Understand the principles of object-oriented programming (Classes, Objects, Methods etc.)
- Design and implement simple object-oriented programs in Python
- Understand the structure and develop programs with an object-oriented approach
- Combine modules to perform scientific computations
- Identify modules and interfacing techniques with filesystems (eg. xls,txt) and databases (SQL, MongoDB) for input and output of data as well as interfacing with external devices.
- Understand the basic machine learning algorithms, their strengths and weaknesses
- Develop programs with the use of modules (eg. Tensorflow) for solving machine learning problems.
- Support the developed programs through appropriate documentation

(3) COURSE CONTENT / SYLLABUS

- UML diagrams
- Classes, Objects, Attributes, Methods
- Encapsulation, Inheritance, Polymorphism
- Exception handling
- Modules for Scientific computations
- Introduction to dashboards
- Interfaces with filesystems, external data sources and databases
- Modules for handling and analysis of data
- Modules for machine learning
- Algorithm Performance
- Documentation

(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	• Use of ICT methodologies in teaching. • Learners support through email, and the asynchronous electronic platform (e-class) • Lectures available on the course webpage (e-class)

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	Workload (hours)
	Lectures	26
	Exercises	13
	Homework assignments (problem solving with code development in Python programming language)	26
	Study of Lectures	52
	Course total	*117*

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*	i) Written final examination (60%). ii) Problem solving / code development in Python (40%).

(5) ATTACHED BIBLIOGRAPHY

1. Καρολίδης Δ.Α., 2016, Μαθαίνετε εύκολα Python, Εκδόσεις Άβακας.
2. Guttag, J., 2015, Υπολογισμοί και προγραμματισμός με την Python, Εκδόσεις Κλειδάριθμος.
3. Καλαφατούδης Σ. κ.α. 2018, Προγραμματισμός με την Python, Εκδόσεις Νέων Τεχνολογιών
4. Μαγκούτης Κ., 2016, Εισαγωγή στον αντικειμενοστραφή προγραμματισμό με Python, [ηλεκτρ. βιβλ.] Αθήνα: Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: https://repository.kallipos.gr/handle/11419/1708