COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Environment		
ACADEMIC UNIT	Department of Environment		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	410Y	SEMESTER	2
COURSE TITLE	Computer programming		

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	3	
Laboratory exercises	3	
TOTAL	6	6
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*	General background
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (tutorials)
COURSE WEBSITE (URL)	https://www.env.aegean.gr/all_courses/computer-programming/

(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*

On satisfying the requirements of this course, students will have the knowledge and skills to:

- Knowledge: Identify data types and data bases. Data mining and analysis. Basic concepts, syntax and control structure in programming with the use of R.
- Skills: Write code for problem solving. Input data in the R-environment and produce numerical and graphical results.
- Capability development: combine data bases and computer programming to analyse questions related to environmental sciences.

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
Adapting to new situations
Working independently

(3) SYLLABUS

Theory	Laboratory
1. Introduction: computer structure, software, algorithms.	
2. Overview of the computer language R.	
3. Data types and basic operations.	Lab 1
4. Complex data structures.	Lab 2
5. Subsetting data.	Lab 3
6. Data input and output; working with files.	Lab 4
7. Data representation: Graphics with	Lab 5

	R.	
8.	Control structures: conditional.	Lab 6
9.	Control structures: loops.	Lab 7
10.	Functions.	Lab 8
11.	Vectorization and optimization.	
12.	Introduction to tidyverse.	
13.	Analysis of environmental data with the use of R.	

(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
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 practice	24
Laboratory assignments	35
Study	50
Course total	**148**

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.*	Language of evaluation: Greek Methods of evaluation: Partial written exams: 30% Laboratory assignments: 20% Final exams: 50%

(5) ATTACHED BIBLIOGRAPHY

- Νικολάου Χ. Ανάλυση δεδομένων με την R (2η έκδοση) (2023) Εκδόσεις Δισίγμα. ISBN: 9786182021545.
- Φουσκάκης Δ. (2013) Ανάλυση δεδομένων με χρήση της R. Εκδόσεις Τσότρας, ISBN: 978-618-80741-5-6.
- Lepš J, Šmilauer P (2021) Βιοστατιστική με την R. Εκδόσεις Ροπή. ISBN: 9786185289607