COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Technology		
ACADEMIC UNIT	Department of Environmental Sciences		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**AY105**	**SEMESTER**	**1st**
COURSE TITLE	**COMPUTER PROGRAMMING**		
INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**		**CREDITS**
Teaching Hours	4		5
COURSE TYPE	General background		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/ENV_U_105/		

(2) LEARNING OUTCOMES

Learning outcomes

The course is an introduction to basic programming concepts and principles.

Upon successful completion of the course, students will have acquired knowledge and skills and will be able to:

- Understand how the python programming language works, using libraries and debugging.
- Process automation through the development of scripts.
- Process data related to environmental applications.

General Competences

- Search for, analysis and synthesis of data and information, with the use of the necessary technology.
- Working independently.
- Respect for the natural environment.
- Criticism and self-criticism.
- Production of free, creative and inductive thinking.

(3) SYLLABUS

- Introduction to computers & programming languages. Computer Structure and Operating Systems. Files and folders management.
- Basic concepts in the operation of: Internet (video conferencing software), Word Processing Software, Spreadsheet & Presentation Software.
- Introduction to the Python programming language. Installation of the necessary software and familiarization with the working environment. Basic commands: Print, code comments (#), ways to insert and print comments.
- Data types: Simple (integers, reals, etc.) and complex (Lists, Tuples, sets, strings and dictionaries).
- Python shell commands.
- Variables: Description and use of variables (global, local, etc.).
- Python strings. Indexing, Cutting and printing, Formatting.
- Operators: Operator categories, priorities and operator usage.
- Repeating commands and executing commands under conditions (for...if, elif, else, while).
- Functions: function definition and call, function parameters, variable scope, recursion.
- Classes in Python: Introduction to object-oriented programming (inheritance, encapsulation and polymorphism).
- Python programming examples in environmental applications.

(4) TEACHING and LEARNING METHODS – EVALUATION

<table>
<tr><td>DELIVERY</td><td>Face-to-face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td><td>• Use of PowerPoint slides
• View material in video
• Communication with students via e-mail
• Use of asynchronous distance learning (e-class)</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>39</td></tr>
<tr><td>Laboratory practice</td><td>26</td></tr>
<tr><td>Study and analysis of bibliography</td><td>40</td></tr>
<tr><td>Essay writing</td><td>20</td></tr>
<tr><td>Course total
(25 hours workload per credit)</td><td>125</td></tr>
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<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>Students' performance is evaluated in the Greek language. The final grade is determined by:
• A written exam (at the end of the semester) that contributes 75% to the final grade, applying one or more of the following evaluation methods: Multiple choice questions, short-answer questions, problem solving.
• Students' participation in laboratory practice activities and the preparation and delivery of related written assignments (during the semester) that contributes 25% to the final grade.
Final Grade =75% Exam Grade + 25% Assignments Grade</td></tr>
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(5) ATTACHED BIBLIOGRAPHY

- Aggelidakis, N. (2015) *Introduction to Programming with Python*. OpenBook. Available at: http://aggelid.mysch.gr/pythonbook/INTRODUCTION_TO_COMPUTER_PROGRAMMING_WITH_PYTHON.pdf (in Greek)
- Kafes, M. (2017) *EXPLORING PYTHON,* (1st ed). Athens: Klidarithmos Publications (in Greek)
- Kalafatoudis, S. & Stamoulis, G., (2018) *Programming with Python*. Athens: NewTech-Pub. (in Greek)
- Karolidis, D. (2021) *Easy learning of PYTHON,* (3rd ed). Athens: Abakas Publications. (in Greek).
- Manis, G. (2015). *Introduction to Programming with the Help of the Python Language.* Kallipos, Open Academic Editions. Available at: https://dx.doi.org/10.57713/kallipos-749 (in Greek)