COURSE LAYOUT

1. GENERAL

SCHOOL	Environmental and Agricultural Engineering		
DEPARTMENT	Department of Natural Resources Management & Agricultural Engineering		
DEPARTMENTS (Teaching to)	Natural Resources, Geo-Environment, Geo-Informatics and Agricultural Engineering		
STUDY LEVEL	Postgraduate		
COURSE CODE	630308	**SEMESTER**	2nd
COURSE TITLE	Web-based Geographic Information Systems		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS**
Theory: Lectures	2	
Laboratory: Use of Software Tools	2	
Total	4	5

COURSE TYPE	Scientific Area
PREREQUISITES	
LANGUAGE	Greek
IS THE COURSE OFFERED for ERASMUS STUDENTS?	No
COURSE WEB PAGE	https://oeclass.aua.gr/eclass/courses/AOA241/

2. LEARNING OUTCOMES

Learning Outcomes

Upon successful completion of the course, the student:

- will understand the fundamentals of programming, algorithmic structures and software development techniques,
- will acquire programming skills in a high-level language environment (python),
- will understand the concept of web services and get to know the different technologies and standards related to them (Json, RESTful services),
- will gain the ability to use web services to access services offered on the internet and create related applications,
- will acquire the ability to create web services and learn how to make them available on the internet,
- will acquire the ability to integrate services into online geographic information systems (e.g. Google maps),
- will acquire the possibility of creating combined web services (mashup applications) with data and services drawn from services with the aim of creating online geographic applications.

General Competences

- Search, analysis and synthesis of data and information by use of the necessary technologies.
- Adaptation to new situations.
- Decision making.
- Individual work.
- Team work.
- Work in a multidisciplinary environment
- Development of judgment and self- jugment
- Advancement of free, creative and deductive thinking.

3. COURSE CONTENT

Theory

1. Algorithms and problem solving

2. Program development environment and introduction to structured programming with python
3. Programming and data structures in python
4. Built-in and User-Defined Functions and modules
5. File Management
6. Web service technologies (Json, RESTful services)
7. Using and creating web services in python
8. Creating combined web services (mashup applications)
9. Integration of web services into web-based geographic information systems

Laboratory
Training on all the above, hands on computer.

4. TEACHING and LEARNING METHODS - Evaluation

TEACHING METHOD	In Classroom and in Laboratory (face-to-face) or Distance Learning (if required). On the web page of the course there is posted educational material for asynchronous distance learning.
USE OF INFORMATICS and COMMUNICATION TECHNOLOGIES	Exploitation of Information and Communication Technologies in teaching, in laboratory training and in the communication with students. Use of dedicated software. Use of integrated e-learning system. Communication with students via open eclass platform and e-mail.
TEACHING ORGANISATION	*Activity* / *Work Load* Lectures: 26 hours Laboratory work: 26 hours Group and/ or individual projects: 25 hours Individual study: 48 hours ***Total contact hours and training***: ***125 hours***
STUDENTS EVALUATION	I. Final written examination: Code writing in a programming language on computer which concerns the solutions of problems of practical interest II. Weekly Laboratory exercises: Construction of simple programs concerning the study material of the week. III. Group or Individual Project. The evaluation concluded with an oral presentation. The final grade is the sum of the above individual evaluations. Rating Scale: 0-10 Minimum Grade: 5 The assessment criteria are explicitly defined and can be found on the eClass page of the lesson. Students can have access to their written examination and software records. If required, students' evaluation can also be realized remotely through the eClass platform for the written examination, and through video conferencing tools for presentation of projects or oral examinations.

5. BIBILIOGRAPHY

-Proposed literature:

1. Gastón C. Hillar, Building RESTful Python Web Services, 2016, Packt Publishing
2. S. Weerawarana, F. Curbera, F. Leymann, T. Storey και D. F. Ferguson (2008), Αρχιτεκτονική πλατφόρμας υπηρεσιών ιστού, Κλειδάριθμος (Κωδικός Βιβλίου στον Εύδοξο: 13613).

-Related scientific journals:

3. International Journal of Web Services Research (IJWSR)
4. *ISPRS* International *Journal of Geo-Information* Applied Computing and Informatics, Elsevier.
5. Journal of Bioinformatics and Computational Biology, Imperial College Press.