COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF ENVIRONMENT AND AGRICULTURAL ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF NATURAL RESOURCES DEVELOPMENT AND AGRICULTURAL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**89**	**SEMESTER**	**7o**
COURSE TITLE	APPLICATIONS OF GEOGRAPHICAL INFORMATION SYSTEMS ON THE ENVIRONMENT		

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**
Theory: Lectures	3	
Laboratory: Use of Software Tools	2	
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 knowledge, Scientific Area, Skills development
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in Greek)
COURSE WEBSITE (URL)	http://openeclass.aua.gr

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*

It is the second course provided on Geographic Information Systems (GIS).
The syllabus of the course aims to solve basic environmental problems by using the capabilities of GIS. Methodologies for the analysis and processing of spatial (vector and grid) data are applied to address problems of primary production and management of natural resources.
Concepts and problems of land use planning and soil resource assessment, addressing threats of soil resource degradation (e.g. erosion risk), location of agricultural activities, land evaluation, pollution management, management of protected areas, hydrological analysis are some of the problems solved by using spatial information in a GIS environment.
Finally, the main objectives of the course are both the understanding by students, through study cases, of the great potential of GIS in dealing with environmental problems and their practical solution.

Upon successful completion of the course the student will be able to:
• understand the basic stages of spatial analysis, within a GIS environment, of an environmental problem.
• use of the tools and techniques of developing and managing a GIS and how it is used to analyze spatial data.
• implement basic and special procedures for spatial and descriptive data processing.
• apply basic models (e.g. multiobjective) to solve environmental issues.
• use the rules of thematic cartography to render the results of his work.

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…*
	…….

1. Search, Analysis and Synthesis of Data and Information, using the Necessary Tools and Technologies
2. Adapting to New Situations
3. Problem Solving Techniques
1. Decision-making
2. Autonomous Work
3. Teamwork
4. Project planning and management

5. Respect for the natural environment

3. SYLLABUS

i. Analysis and perception of space. ii. Methodology for visualizing geographical information by type and application. iii. Digital Terrain Models (DTMs), Digital Elevation Models (DEMs) iv. Multiobjective Spatial Models v. GIS applications for the siting of agricultural uses (e.g. viticulture). vi. Development of an GIS application to assess the risk of soil degradation (e.g. soil erosion risk assessment) vii. GIS application development: Location for landfills viii. Application development hydrological analysis in GIS: Calculation of surface runoff volume

4. TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>In classroom and in laboratory (face-to-face)</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Exploitation of Information and Communication Technologies in teaching, in laboratory training and in communication with students.
Use of dedicated software.
Use of integrated e-learning system.
Communication with students via open eclass platform and e-mail.</td></tr>
<tr><td>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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>26 hours</td></tr>
<tr><td>Laboratory work</td><td>39 hours</td></tr>
<tr><td>Individual study</td><td>60 hours</td></tr>
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<tr><td>Course total</td><td>125</td></tr>
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<tr><td>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.</td><td>Four written laboratory exercises (40%) of study cases (development of spatial data, their processing, modeling, calculations, cartography).
Oral examination (60%) on how to deal with and implement the study cases that each student (or group of students) faced.

Marking Scale: 0-10.
Minimum Passing Mark: 5.</td></tr>
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5. ATTACHED BIBLIOGRAPHY

Proposed literature:

1. GIS, Environmental Modeling and Engineering, Allan Brimicombe, ISBN 9780367577193Published June 30, 2020 by CRC Press