COURSE OUTLINE

1. GENERAL

SCHOOL	ENVIRONMENT AND AGRICULTURAL ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF NATURAL RESOURCES DEVELOPMENT AND AGRICULTURAL ENGINEERING		
LEVEL OF STUDIES	POSTGRADUATE		
COURSE CODE	630033	**SEMESTER**	B
COURSE TITLE	SPECIFIC TOPICS ON SOIL EVALUATION		

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 and practical exercises		5
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*	Scientific field
PREREQUISITE COURSES:	Soil science Soil genesis and soil taxonomy Soil mapping and soil survey Geographical Information Systems
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English language)
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/courses/PMS61111/

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*

The course aims at the acquisition of theoretical and practical knowledge, related to the basic principles and concepts of specific topics on soil evaluation, which refer to the evaluation of the Soil Mapping Units (SMUs) and soil profiles through different methodologies for assessing the agricultural suitability of soils or certain soil degradations.

Upon successful completion of the course, the postgraduate students will have:

- Understand the basic concepts used in the specific methodologies for soil evaluation.
- Understand the nature and purpose of different qualitative or quantitative soil specific evaluation topics.
- The ability to evaluate the agricultural suitability of the SMUs of a typical soil map or the qualitative characteristics of a soil profile of an agricultural land using existing data.
- The ability to assess the risks of water and mechanical erosion of soils.
- The ability to rapidly assess the quality of any soil in the field.
- The ability to interpret the results of different assessments in the context of a special-purpose soil study.

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
- Decision-making
- Working independently
- Team work
- Project planning and management
- Respect for the natural environment

3. SYLLABUS

Section 1: FAO land evaluation framework.
Land and soil resource relationship. Land suitability taxonomic system. Main stages of land evaluation methodology. Process of parallel and two-stage assessment. Methodology of parametric land index. Adaptation of the FAO land evaluation framework to cartographic soil data suitability assessment.

Section 2: Storie's Modified Index for soil suitability evaluation.
Qualitative assessment of the Storie's suitability evaluation of soils for agricultural use. Factors for calculating the Modified Storie Index (MSI). Scoring table of soil characteristics related to the factors used for MSI assessment. Classification of soils' agricultural value or their general suitability for agricultural use into classes according to the MSI.

Section 3: Evaluation of the soils' vulnerability to mechanical erosion due to cultivation.
The phenomenon of mechanical erosion of soils. Factors affecting mechanical erosion of soils. Evaluation methodology and equations for the assessment of mechanical erosion of soils. Consequences of mechanical erosion of soils and mitigation practices.

Section 4: Assessment of the soils' water erosion risk using the (R)USLE and PESERA methodologies.
The phenomenon of soils' water erosion. Factors and equations for the assessment of surface sheet and rill erosion of soils according to the (R)USLE methodology. Basic equations for the assessment of surface sheet and rill erosion of soils according to the PESERA methodology. Input data and extracted results of both (R)USLE and PESERA models.

Section 5: A methodology for rapid evaluation of agricultural soil quality in the field.
Conceptual approaches to soil quality over time. Indices used in rapid evaluation methodology assessing the impact of applied agricultural practices on soil quality. Guidelines for indices' scoring. Assessment of the overall soil quality based on the proposed methodology.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In classrooms.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in teaching, laboratory education, communication with students
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*	
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.*	The evaluation will be conducted in Greek, except in the case of Erasmus postgraduate students, for which will be in English. The grade is calculated 50% from the final written examination in multiple-choice and short-answer questions and 50% from the compilation and presentation of the technical report.

Activity	***Semester workload***
Lectures	48
Practical exercises and field work	35
Compilation of a technical report regarding practical exercises and fieldwork	42
Course total	***125***

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- *Alaoui, A. and Schwilch, G. (2016) Soil quality and agricultural management practices inventory at case study sites. iSQAPER Report 28 pp.*
  Department of Soil, Crop, & Atmospheric Sciences. August 1994, 58p.
- *FAO (1976). A Framework for Land Evaluation. FAO Soils Bulletin 32, FAO, Rome, 79p.*
- *FAO (1985). Guidelines: land evaluation for irrigated agriculture. FAO Soils Bulletin 55, FAO, Rome, 231p.*
- *Irvine B. and Kosmas C. (2007). PESERA User's Manual. PESERA Technical Report Deliverable 15, contract QLK5-CT- 1999-01323. Revised for the ENVASSO Project (Contract 022713) by R.J.A. Jones. European Commission FP 5 & 6 research projects, 133pp.*
- *Kirkby M. J., Irvine B. J., Jones R. J. A., Govers G. and PESERA team, 2008. The PESERA coarse scale erosion model for Europe. Model rationale and implementation. European Journal of Soil Science 59 (6), pp. 1293-1306*
- *Morgan, R.P.C. Soil Erosion and Conservation, 3rd edition. Blackwell Publishing, Oxford, 2005. 304 pp. ISBN 1-4051-1781-8.*
  Procedures of Land Evaluation55. Cornell University, College of Agriculture & Life Sciences.
- *Renard, K.G., Foster, G.R., Weesies, G.A., McCool, D.K., Yoder, D.C. (eds) (1997). Predicting Soil Erosion by Water: A guide to conservation planning with the Revised Universal Soil Loss Equation (RUSLE). U.S. Department of Agriculture, Agriculture Handbook 703.*
- *Rossiter, David. (1994). Lecture Notes: Land Evaluation Course Notes Part 1: Basic Concepts & Rossiter, David. (1996). A theoretical framework for land evaluation. Geoderma. 72. 165-190. 10.1016/0016-7061(96)00031-6.*
- *Storie R.E., 1978. Storie Index Soil Rating. Division of Agricultural Science, University of California. Available at: http://anrcatalog.ucanr.edu/pdf/3203.pdf*
- *Wischmeier, W. H., and Smith D. D. (1978). Predicting rainfall erosion losses. Agr. Handbk. 537. U. S. Dept. Agr., Washington, D.C.*