COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF ENVIRONMENT & AGRICULTURAL ENGINEERING		
ACADEMIC UNIT	NATURAL RESOURCES MANAGEMENT &AGRICULTURAL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**2510**	**SEMESTER**	**7ο /9ο**
COURSE TITLE	IRRIGATION OF AGRICULTURAL CROPS AND LANDSCAPE		

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/ Laboratory exercises	2+2	4
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*	Special background, Skills development
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/courses/5147/

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 aim of the course is to provide the synthesis of knowledge related to the integrated approach on crop irrigation.

The general principles of irrigation, general methodologies for calculating crop water needs, general characteristics, advantages and disadvantages of irrigation systems are included. The specific requirements of crop groups for water, drought resistance, salinity and the selection of the appropriate irrigation system are analyzed. Simulation models that can be used (CROPWAT, AQUACROP) to evaluate and develop different irrigation scenarios are included and analyzed. Irrigation practices, the possibility and method of applying deficit irrigation, the use of alternative sources of irrigation water with the adaptation to the special characteristics of crops ensure the rational management of water and water resources protection and utilization as well.

Upon successful completion of the course students will be able to:

- Apply irrigation principles, calculate reference and crop evapotranspiration and crop water requirements as well as draw up an irrigation schedule using the software data

- Prepare a comprehensive irrigation study, adapted to the specific requirements of each crop and compare the irrigation programs drawn up using the software (CROPWAT, AQUACROP), for given climatic conditions and agricultural practices
- Calculate, with the use of the software, the water requirements at the regional level, depending on the applied crops and to propose different crop plans for better water management and saving.
- Assess the use of alternative sources of irrigation water and the techniques and measures they should apply, in relation to the characteristics of the crops to optimize yields, with the use of the software
- Elaborate alternative scenarios for implementing deficit irrigation, using the software, for various crops according to their special characteristics for saving irrigation water.

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
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Others…
…….

Search for, analysis and synthesis of data and information,
Decision-making
Working independently
Teamwork
Working in an interdisciplinary environment
Project planning and management
Respect for the natural environment

3. SYLLABUS

- Irrigation of crops - Calculation of plant water needs. Preparation of an irrigation program. Principles, design and selection of an irrigation system.
- Deficit irrigation. Drought resistance of crops. Critical stages.
- Utilization of alternative water sources (treated liquid waste, drainage water) Resistance of crops to salinity.
- FAO CLIMAWAT, FAO-CropWat and FAO-AquaCrop simulation models - development of irrigation needs, irrigation schedules, evaluation of irrigation practices, selection of optimal deficit irrigation technique.
- Irrigation studies and special requirements for:
  - Irrigation of field crops (maize, cotton, alfalfa, tobacco, sugar beet).
  - Irrigation of vegetables crops
  - Irrigation of orchards (citrus, olive, other fruit).
  - Irrigation of greenhouse crops.
  - Landscape Irrigation

The **laboratory exercises** include the application of methodologies and individual tasks for the preparation of irrigation studies, the creation of irrigation programs and the investigation of alternative application of deficit irrigation for the main crops using software (CLIMWAT, FAO-CROPWAT, FAO-AQUACROP).

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*	Use of ICT in teaching. Use of models. Communication with students directly in groups and by mail. Use the e-class of the course
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	26
Laboratory Work (use of models)	26
Project work	28
Autonomous study	16
Course total	***100 h***

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.*	Evaluation of theory (50%) -Final written examination Evaluation of Laboratory work (50%) Grade of assigned projects

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- *Allen, R. G., Pereira, L. S., Raes, D., & Smith, M. (1998). Crop evapotranspiration-Guidelines for computing crop water requirements-FAO Irrigation and drainage paper No 56. FAO, Rome,.*
- *Steduto, P., Hsiao, T. C., Fereres, E., & Raes, D. (2012). Crop yield response to water Irrigation and drainage paper. No 66. FAO, Rome*
- *FAO, Cropwat 8.0 for windows user guide. Rome, Italy ,2009.*
- *Irrigation of agricultural crops (1990) B.A., Stewart and D.R. Nielsen (editors). American Society of Agronomy, Crop Science Society of America, Soil Science Society of America Publishers, Madison, Wisconsin, U.S.A., 1218 pp*