COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Agricultural Sciences		
ACADEMIC UNIT	Biosystems & Agricultural Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	BAE_500	**SEMESTER**	5th
COURSE TITLE	IRRIGATION SYSTEMS		

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	3	
Tutorials	2	
Laboratory	0	
TOTAL	**5**	**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*	Background (Fundamental Principles of Irrigation Systems) Skills Development (Experimental Irrigation Systems)
PREREQUISITE COURSES:	There are no prerequisite courses.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek .-For Erasmus students in English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	

(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*

Irrigation Systems aims at the acquisition of knowledge in irrigation as well as the design and operation of irrigation systems.

The syllabus of this course aims to understanding of:

1. Basic concepts of soil water movement, the mechanisms and theories that govern the distribution and storage of soil water
2. The procedures and methodologies for the study and estimation of soil parameters involved in the application of irrigation
3. Basic principles of irrigation water quality and the best practices during irrigation with water of poor quality
4. The different types of irrigation systems, their operating principles, the methodologies for the design and dimensioning of surface irrigation, sprinkler systems and micro-irrigation
5. The main parts, the operation, the advantages and the disadvantages of irrigation systems

By the end of this course the students will be able to:

1. To understand and handle topics related to the rational management and application of irrigation water, to detect problems in the design and application of irrigation
2. To identify soil properties required for the design and installation of irrigation systems

3. Have knowledge for the selection and installation of appropriate irrigation systems (irrigation with surface irrigation, sprinkler systems and micro-irrigation)
4. Design irrigation systems
5. Acquire necessary skills to continue their professional advance
6. Interact with interdisciplinary problems in the field of irrigation

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…*
	…….

The course will provide the foundations of Irrigation Systems, with a strong focus on developing a skill base necessary for the construction, analysis, and interpretation of experimental data, as well as a practical understanding and use of predictive models.

In general, upon completion of this course the student will have further developed the following general skills (from the list above):
Search, analysis and synthesis of data and information, using the necessary technologies
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Respect for the natural environment
Exercise criticism and self-criticism

(3) SYLLABUS

1. Introduction
2. Soil properties – Soil moisture - Infiltration
3. Evapotranspiration
4. Evapotranspiration
5. Simplified methods of evapotranspiration estimation
6. Crop water needs – Crop evapotranspiration
7. Crop water needs – Irrigation scheduling
8. Surface irrigation
9. Sprinkler irrigation
10. Micro-irrigation systems
11. Micro-irrigation
12. Quality of irrigation water
13. Precision irrigation

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face deliveries. Exercises in Irrigation Systems
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of ICT (power point) in Teaching • Use of ICT (power point) in Laboratory Training • Use of ICT in Communication with students (Learning process support through the electronic platform e-class).
TEACHING METHODS *The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements,*	

Activity	***Semester workload***
Lectures	39
Tutorials	26
Writing short reports of	13

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*	laboratory exercises	
	Final Exams	3
	Study hours and preparation for the laboratory exercises and the final examination	44
	Course total	**125**
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.* 1	1. The main assessment criteria focus on understanding and correlating the knowledge that students gain from the course with other knowledge. Particular emphasis is placed on whether they have developed the ability to apply this knowledge to crop selection and to assess the impact of these changes on the environment. Emphasis is also placed on demonstrating critical ability and justifying the choices they make in each problem. 2. Evaluation is dynamic. It mainly involves problem solving. is done orally or in writing or with a combination of the two, with or without pre-examination on the basic principles of the course, with or without exculpatory advances and with other test or inventive methods, depending on the composition of the dynamics and the needs of the audience. 3. The above are done in the Greek language. For foreign language students (eg Erasmus students) conducted in English	

5. RECOMMENDED LITERATURE

-Προτεινόμενη Βιβλιογραφία :

1. Δημήτριος Θ. Ουζούνης, Συστήματα αυτόματης άρδευσης Άρδευση με σταγόνες και μικροεκτοξευτήρες, Εκδ. 2002, ISBN: 9607013298

2. Αραπανζής κ.ά., Χρήση του Αρδευτικού Νερού – Κλιματική Αλλαγή, Εκδόσεις ΕΛΓΟ-ΔΗΜΗΤΡΑ, 2018

3. ΜΙΧΕΛΑΚΗΣ Ν. Συστήματα Αυτόματης ΄Αρδευσης -΄ Αρδευση με Σταγόνες, Εκδότης: ΕΚΔΟΤΙΚΗ ΑΓΡΟΤΕΧΝΙΚΗ ΕΑΕ. Κωδικός βιβλίου: 40349

4. Γ.Α. Τερζίδη και Ζ.Γ. Παπαζαφειρίου, 1997, “Γεωργική Υδραυλική”, Εκδόσεις Ζήτη Κωδικός Βιβλίου στον Εύδοξο: 11157

-Εκδόσεις Κάλλιπος

Σινάνης, Κ. 2015. Εργαστηριακές ασκήσεις διαχείρισης εδαφών. [ηλεκτρ. βιβλ.] Αθήνα: Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: http://hdl.handle.net/11419/4055