COURSE OUTLINE

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
DEPARTMENT	AGRICULTURE		
LEVEL OF COURSE	UNDERGRADUATE		
COURSE CODE	AGRI_ EE2	**SEMESTER OF STUDIES**	8th
COURSE TITLE	IRRIGATION AND DRAINAGE USING INFORMATION AND COMMUNICATION TECHNOLOGIES		

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*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
Lectures	3	
Laboratory exercises	2	
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*	SPECIALISED GENERAL KNOWLEDGE, SKILLS DEVELOPMENT
PREREQUISITE COURSES:	Typically, there are not prerequisite courses.
TEACHING AND ASSESSMENT LANGUAGE:	Greek. Teaching may be however performed in English in case foreign students attend the course.
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBPAGE (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*

The course aims at the acquisition of essential knowledge considering the utilization of modern information and communication technologies in the science of irrigation and drainage.

Upon successful completion of the course the student will be able to understand:

1. the importance of information technology in agriculture
2. the basic building blocks of a network of wireless agrometeorological stations as well as its applications in agriculture
3. the principles of operation of sensors: a) soil water parameters, b) irrigation water volume, c) agrometeorological parameters, etc.
4. the need to make use of the available satellite data on the management of irrigation and drainage.

General Abilities

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

Generally, by the end of this course the student will, furthermore, have develop the following general abilities (from the list above):

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
Production of free, creative and inductive thinking
Working in an interdisciplinary environment
Respect for the natural environment
Production of new research ideas

3. SYLLABUS

1. Hydrological cycle - Water balance parameters.
2. Processes and mechanisms of irrigation water interaction with soil.
3. Principles of operation of measuring sensors: a) soil water parameters, b) irrigation water quantities, c) agrometeorological parameters
4. Data acquisition and recording systems.
5. Agrometeorological data management systems (Part I).
6. Agrometeorological data management systems (Part II).
7. Decision support systems for irrigation (Part I).
8. Decision support systems for irrigation (Part II).
9. Decision support systems for irrigation (Part III).
10. Decision support systems for irrigation (Part IV).
11. Implementation of software for the design of irrigation-drainage networks and irrigation planning (Part I).
12. Implementation of software for the design of irrigation-drainage networks and irrigation planning (Part II)
13. Implementation of software for the design of irrigation-drainage networks and irrigation planning (Part III).

Laboratory exercises

- **Laboratory exercise 1:** Indirect methods for determining soil moisture and pressure load of soil water. Reference methods. Automatic data recording and retrieval
- **Laboratory exercise 2:** Use of internet services and tools to retrieve weather information and soil parameters
- **Laboratory exercise 3:** Development of an application for retrieving information of hydraulic properties of soils in a geographic information system
- **Laboratory exercise 4:** Design of a daily dynamic irrigation program using agrometeorological data using spreadsheets
- **Laboratory exercise 5** Use of software for the design of irrigation/drainage systems and irrigation planning (Part I).
- **Laboratory exercise 6** Use of software for the design of irrigation/drainage systems and irrigation planning

(Part II)

- **Laboratory exercise 7:** Recapitulation – Exemplary solution of exercises

4. TEACHING AND LEARNING METHODS - EVALUATION

TEACHING METHOD *Face-to-face, Distance learning, etc.*	Lectures in class, in the laboratory and in the field (face to face)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES *Use of ICT in teaching, laboratory education, communication with students*	Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching. Direct communication with the students (face to face and by e-mail), Support of the learning process and uploading of the educational material to the electronic platform (e-class): https://eclass.upatras.gr
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 3 contact hours per week x 13 weeks)	39
Laboratory practice, fieldwork (2 contact hours per week x 7 weeks)	14
Hours for private study of the student / preparation of the teamwork case study and preparation for mid-term or/and final examination / Final examination	72
Total number of hours for the Course (25 hours of work-load per ECTS credit)	***125 hours (total student work-load)***

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. Optionally, two mid-term examinations with the final examination grade to be the mean mark. It is mandatory to obtain pass grade (≥5) in each examination. 2. Written examination after the end of the semester. Minimum passing grade: 5. **Evaluation of theoretical part (50%)** Written examination. It is mandatory to obtain pass grade (≥5). **Evaluation of the laboratory work (50%)** Written examination. It is mandatory to obtain pass grade (≥5). All the above are taking place in Greek as well as in English for foreign students (e.g. ERASMUS students) if any.

5. RECOMMENDED LITERATURE

1. FAO 56, 1998. Crop evapotranspiration - Guidelines for computing crop water requirements
2. Brase Terry 2009, Precision Agriculture, ISBN-10 : 140188105X