COURSE OUTLINE

1. GENERAL

SCHOOL	Environment and Agricultural Engineering		
ACADEMIC UNIT	Natural Resources Management and Agricultural Engineering		
LEVEL OF STUDIES			
COURSE CODE	134	SEMESTER	8^{o}
COURSE TITLE	IRRIGATION AND 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 and Practical Exercises	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*	Scientific Area, Skills Development
PREREQUISITE COURSES:	SOIL PHYSICS
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
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*

The purpose of the course is to understand the basic principles that govern the application of water to the soil for the purpose of irrigating crops as well as the design of irrigation systems.

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

●Understand the physics of the horizontal infiltration phenomenon and calculate the moisture profiles that develop when water is applied to the soil by horizontal infiltration.
● Understand the physics of the vertical infiltration effect when applying a constant water load to the soil surface (flood irrigation), calculate the corresponding cumulative infiltration - time and infiltration rate - time relationships and apply the existing infiltration equations.
● Understand the physics of the phenomenon of vertical infiltration when applying water at a constant rate of precipitation to the soil surface (rainfall irrigation), calculate the corresponding cumulative infiltration - time and velocity relationships.
●Understand the basic principles that influence the design of an irrigation network.

●Design a surface irrigation system
●Calculate the appropriate diameters of the pipes of the irrigation line and the irrigation network in general. To choose the appropriate irrigation sprinkler.
●Design a micro-irrigation system.
● Learn to choose the appropriate type of irrigation system, to do its hydraulic design and economic analysis.

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…*
	…….

- Project planning and management
- Analyze and process project information
- Ability to work independently and as part of a team
- Work in a multidisciplinary environment

3. SYLLABUS

● Horizontal infiltration with a constant head
●Vertical infiltration with constant head on the infiltration surface, Infiltration equations
●Vertical infiltration with constant intensity of precipitation on the infiltration surface
●Irrigation system design and management.
●Surface irrigation systems (types of systems, irrigation phases, efficiency, uniformity, design, improvement of irrigation efficiency). The Two-Point Volume Balance Method.
●Sprinkler Irrigation Systems. Types of systems. Optimization of Irrigation Design and Management. Irrigation uniformity – sprinkler tests - selection. Irrigation Lateral Design. Mainline Design. Irrigation units.
● Micro irrigation systems. Types of systems - drops, micro-jets. Analysis of the system - equipment - hydraulic calculations. Applications.
●Two-dimensional and three-dimensional infiltration.
●Redistribution of soil water after irrigation.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In classroom and laboratory.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	**USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES.**
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.	I. Written final exam (50%) which includes: Short Answer Questions, Problem Solving. II. Final written exam (50%) on the subjects of the laboratory exercises

Activity	***Semester workload***
Lectures	39
Practical exercises that focus on the application of methodologies and analysis of case studies in smaller groups of students	26
Case study	45
Individual practice exercises	15
Total Course	**125**

5. ATTACHED BIBLIOGRAPHY

Irrigation and Drainage Engineering ISBN 978-3-319-05698-2
Peter Waller and Muluneh Yitayew

- Scientific journals:
Journal of irrigation and drainage engineering (ASCE)
Irrigation and Drainage ICID
Agricultural water management