

COURSE OUTLINE

1. GENERAL

SCHOOL	Environment and Agricultural Engineering		
ACADEMIC UNIT	Natural Resources Management and Agricultural Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	53	SEMESTER	7 th
COURSE TITLE	Irrigation and Drainage Systems		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>		WEEKLY TEACHING HOURS	CREDITS
	Theory	3	3
	Laboratory	2	2
	TOTAL:	5	5
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	special background, skills development		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

2. LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>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.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>The purpose of the course is the design of irrigation and drainage systems, taking into account theoretical knowledge from the movement of water in open and closed conduits, as well as the movement of water in porous media.</p> <p>Upon successful completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> • Understand the basic principles that affect the design of an irrigation network. • Design a surface irrigation system. • Calculate the appropriate diameters of the pipes in the irrigation line and the irrigation network in general. Choose the appropriate irrigation sprinkler. • Design a micro-irrigation system. • Have knowledge of the methods for calculating the equivalent depth of third-order drainage conduits in cases of both permanent and non-permanent drainage.

- Be able to calculate the hydraulic characteristics of a drainage system with pipe conduits or ditches.
- Be able to layout and calculate a drainage network.

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

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Others...

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- Search, analysis, and synthesis of data and information, with the use of the necessary technology
- Independent Work
- Teamwork
- Promotion of free, creative, and inductive thinking

3. SYLLABUS

- Surface irrigation systems (types of systems, irrigation phases, efficiency, uniformity, balances, design, improving irrigation efficiency).
- Sprinkler irrigation systems. Types of systems – description. Sprinklers. Irrigation uniformity – sprinkler tests – selection. Application network – calculations – arrangements. Transport network – calculations. Distribution of pressure head in the network. Irrigation units. Localized irrigation systems.
- Drip irrigation. System analysis. Applications. Design and management of irrigation systems. Distribution of pressure head in the network.
- Calculation of the equivalent depth of drainage conduits in permanent drainage (Dupuit-Forchheimer, Hooghoudt analysis).
- Calculation of the equivalent depth of drainage conduits in non-permanent drainage (Specific yield, derivation of Boussinesq equation, Glover's analysis).
- Drainage systems - networks (Factors affecting the design of a drainage system, types of drainage systems, design of drainage systems).

4. TEACHING and LEARNING METHODS - EVALUATION

<p>DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	<p>The teaching methodology employed in the classroom, in the laboratory and in the field</p>		
<p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>Specialized software e-class platform</p>		
<p>TEACHING METHODS <i>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.</i></p>	<p>Activity</p>	<p>Semester workload (hours)</p>	
	<p>Lectures</p>	<p>65</p>	
	<p>Practical exercises focusing on the application of</p>	<p>30</p>	

<p><i>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</i></p>	methodologies and case study analysis in small teams of students.		
	Preparation of a study (Case study)	10	
	Independent Study	10	
	TOTAL	125	
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>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</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	<p>I. Final written examination (50%) which includes: Theory questions (multiple choice and short answer) and problem-solving</p> <p>II. Final written examination (50%) on the subjects of laboratory exercises and laboratory assignments.</p>		

5. ATTACHED BIBLIOGRAPHY

- TERZIDIS G. and PAPAFAEIRIOU Z. AGRICULTURAL HYDRAULICS

Relevant scientific journals:

- Journal of Irrigation and Drainage Engineering (ASCE)
- Irrigation and Drainage (ICID)