# COURSE OUTLINE

## 1. GENERAL

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|---|---|---|---|
| **SCHOOL** | Environment and Agricultural Engineering | | |
| **ACADEMIC UNIT** | Natural Resources Management and Agricultural Engineering | | |
| **LEVEL OF STUDIES** | Undergraduate | | |
| **COURSE CODE** | 2595 | **SEMESTER** | 9th |
| **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** |
|---|---|---|
| Theory | 3 | 3 |
| Laboratory | 2 | 2 |
| | | |
| TOTAL: | 5 | 5 |

| | |
|---|---|
| **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** | 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 the design of irrigation 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.

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

- 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.
- Understand the basic principles of applying deficit irrigation.
- Learn to select the appropriate type of irrigation system, perform its hydraulic design,

and conduct its 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…* |
| | *…….* |

- Search, analysis and synthesis of data and information with the use of the required technologies
- 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 – their 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.
- Cost-effectiveness of irrigation systems. Deficit irrigation

## 4. TEACHING and LEARNING METHODS - EVALUATION

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|---|---|
| **DELIVERY**<br>*Face-to-face, Distance learning, etc.* | The teaching methodology employed in the classroom, in the laboratory and in the field |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY**<br>*Use of ICT in teaching, laboratory education, communication with students* | Specialized software<br>e-class platform |
| **TEACHING METHODS**<br>*The manner and methods of teaching are described in detail.*<br>*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.*<br><br>*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 (hours)*** |
|---|---|
| Lectures | 39 |
| Practical exercises focusing on the application of methodologies and case study analysis in small teams of students. | 26 |
| Training work (Case study) | 20 |
| Study at home | 40 |
| TOTAL | 125 |

| | |
|---|---|
| **STUDENT PERFORMANCE EVALUATION**<br>*Description of the evaluation procedure*<br><br>*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*<br><br>*Specifically-defined evaluation criteria are given, and if and where they are accessible to students.* | I. Final written theory examination (50%) comprising:<br>- Multiple choice questions<br>- Open questions<br>- Problem solving<br><br>II. Laboratory Grade (50%)<br>-Final written examination on the subjects of laboratory exercises and laboratory assignments |

## 5. ATTACHED BIBLIOGRAPHY


- Terzidis G.A., Papazafeiriou Z.G. Agricultural Hydraulics, Ziti Publications, Thessaloniki 1997.
- Papamichail D.M., Bambatzimopoulos, Applied Agricultural Hydraulics, Ziti Publications, Thessaloniki 2014.


Relevant scientific journals:

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