## COURSE OUTLINE

### (1) GENERAL

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|---|---|---|---|
| **SCHOOL** | School of Agricultural Sciences | | |
| **ACADEMIC UNIT** | Biosystems & Agricultural Engineering | | |
| **LEVEL OF STUDIES** | UNDERGRADUATE | | |
| **COURSE CODE** | **BAE_707** | **SEMESTER** | **7th** |
| **COURSE TITLE** | **IRRIGATION AND DRAINAGE TECHNOLOGIES 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* | **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).* | | |

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| **COURSE TYPE** *general background, special background, specialised general knowledge, skills development* | Background and Scientific Area |
| **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*

This course aims to familiarize students with the irrigation methods estimating the needs of water in crops, in the context of the optimal management of soil resources. Emphasis is also given on understanding the soil-plant-atmosphere continuum and to the irrigation and drainage networks through the utilization of modern information and communication technologies.

After the successful completion of the course, students will be able to understand:

- the importance of IT in agriculture
- the basic structural elements of a wireless network as well as its applications in agriculture
- the need to utilize sensors for continuous recording of critical environmental parameters of plant growth
- the management of a climatic data system with a wireless communication network
- the need to adopt these technologies within the framework of precision farming principles.

**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?*

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|---|---|
| *Search for, analysis and synthesis of data and information, with the use of the necessary technology*<br>*Adapting to new situations*<br>*Decision-making*<br>*Working independently*<br>*Team work*<br>*Working in an international environment*<br>*Working in an interdisciplinary environment*<br>*Production of new research ideas* | *Project planning and management*<br>*Respect for difference and multiculturalism*<br>*Respect for the natural environment*<br>*Showing social, professional and ethical responsibility and sensitivity to gender issues*<br>*Criticism and self-criticism*<br>*Production of free, creative and inductive thinking*<br>*……*<br>*Others…*<br>*…….* |

At the end of this course the student will have further developed the following general skills:
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 new research ideas
Respect for the natural environment
Criticism and self-criticism
Production of free, creative and inductive thinking

## (3) SYLLABUS

- Introduction
- The structure, hierarchical organization and categories of computer systems.
- Data transmission networks.
- Basic network components.
- Wireless sensor network applications in agriculture.
- Climate data system management with wireless sensor network.
- Control of environmental factors of plant growth in the greenhouse and the field.
- Applications of IT in precision agriculture.
- Information and communication technologies in the agricultural environment.

Tutorial exercises
The tutorial exercises aim to familiarize students with concepts and methodologies that are analyzed in the theoretical part.

## (4) TEACHING and LEARNING METHODS - EVALUATION

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|---|---|
| **DELIVERY**<br>*Face-to-face, Distance learning, etc.* | Lectures in the amphitheatre and laboratory exercises both in the laboratory and in the field. |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY**<br>*Use of ICT in teaching, laboratory education, communication with students* | • Use of ICT (power point) in Teaching<br>• Use of ICT (power point) in Tutorial Training<br>• Use of ICT in Communication with students (Learning process support through the electronic platform e-class). |
| **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*** |
|---|---|
| Lectures | 39 |
| Tutorials | 20 |
| Writing short reports of laboratory exercises- Exams | 21 |
| Study hours and preparation for the laboratory exercises and the final examination | 45 |
| Course total | ***125*** |

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| **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.* | 1. The examination in the theory of the course is done with a comprehensive questioner or a multiple-choice questioner that focus on the understanding of the course giving weight to the student's critical ability.<br>3. Oral exams may take place in cases of students who have been exempted from the writing exams and always the same time and day as the writing exams.<br>4. The above are done in the Greek language. For foreign language students (eg Erasmus students) conducted in English |

## (5) ATTACHED BIBLIOGRAPHY (In Greek)

- Suggested bibliography:


11. Τσακνάκης Ι και Φλώρος Α, (2007). Εισαγωγή στις Τεχνολογίες της Πληροφορικής και των Επικοινωνιών. Αθήνα: Εκδόσεις Κλειδάριθμος. σελ.229
12. Sonka ST, Bauer ME, Cherry ET, Colburn JW, Heimlich RE, Joseph DA, Leboeuf JB, Lichtenberg E, Mortensen DA, Searcy SW, Ustin SL and SJ Ventura. (1997) Precision Agriculture in the 21st Century: Geospatial and information technologies in crop management. National Academy Press Washington.
13. Laudon, KC and Traver, CG, (2013). E-commerce. 9th Eds Pearson Prentice Hall.
14. Gelb E, and Offer A, (2005). ICT in agriculture: perspectives of technological innovation. Ebook composed under the auspices of and supported by the European Federation for Information Technologies in Agriculture, Food and the Environment (EFITA) and the Samuel Neaman Institute for Advanced Studies in Science and Technology.