# COURSE OUTLINE

## 1. GENERAL

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|---|---|---|---|
| **SCHOOL** | AGRICULTURAL SCIENCES | | |
| **ACADEMIC UNIT** | AGRICULTURE | | |
| **LEVEL OF STUDIES** | UNDERGRADUATE | | |
| **COURSE CODE** | AGRI 506 | **SEMESTER OF STUDIES** | 5th |
| **COURSE TITLE** | AGRICULTURAL EXPERIMENTATION | | |

| **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 | 2 | |
| Laboratory exercises | 2 | |
| **Total** | 4 | 5 |
| *Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).* | | |

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| **COURSE TYPE** *general background, special background, specialised general knowledge, skills development* | Specialized general knowledge |
| **PREREQUISITE COURSES:** | Typically, there are no prerequisite courses. Students must have basic knowledge of Statistics. |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek. Teaching may be performed in English in case foreign students attend the course. |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | Yes (English) |
| **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 introducing the students to the concepts of Agricultural Experimentation and to experimental design and analysis.

By completing this course, the students are expected to have achieved the following skills and capabilities.:

- Demonstrate an understanding of designing an experiment, collecting, analyzing, and interpreting data.
- Being able to design and select the most appropriate methods for performing experiments
- Being able to analyze methods and models used in agricultural experimentation.
- Demonstrate the ability of analyzing the real data using different models and methods.

**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* |
| *Teamwork* | *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…* |
| | *…….* |

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

Searching, analysis and synthesis of facts and information, as well as using the necessary technologies
Decision making
Independent work
Working in an interdisciplinary environment
Project planning and management
Production of new research ideas
Promotion of free, creative and inductive thinking

## 3. SYLLABUS

1. An introduction to agricultural experimentation. Basic concepts and definitions.
2. The experimental plot. Size and shape of experimental plots and blocks. Heterogeneity of experimental field, examples.
3. Field experiments, greenhouse experiments, laboratory testing. Randomization – Replication - Field testing
4. Analysis of Variance, confidence intervals, Type I and II errors.
5. Single factor designs. Complete randomized design. Design, construction of an experiment, comparing means, Analysis of data extracting results. Examples.
6. Randomized Block Design. Design, construction of an experiment, comparing means, Analysis of data extracting results. Examples.
7. The Latin square design. Design, construction of an experiment, comparing means, Analysis of data extracting results. Examples.
8. Subsampling, anterior and posterior comparisons
9. Factorial designs. Pros and cons of factorial analysis. Test of assumptions. Examples.
10. Correlation analysis
11. Linear Regression Analysis
12. Split plot experiments: Design, construction of an experiment, comparing means, Analysis of data extracting results. Examples.
13. Data transformation.

## 4. TEACHING AND LEARNING METHODS - EVALUATION

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|---|---|
| **DELIVERY**<br>*Face-to-face, Distance learning, etc.* | Face to face lectures in the classroom and the field. |
| **USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES**<br>*Use of ICT in teaching, laboratory education, communication with students* | Use of Information and Communication Technologies (ICTs) (e.g. Microsoft PowerPoint) in teaching. The contents of the course of each chapter are uploaded on the internet, that the students can freely download using a password which is provided to them at the beginning of the course. |
| **TEACHING METHODS** | |

| ***Activity*** | ***Semester workload*** |
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|---|---|---|
| *The manner and methods of teaching are described in detail.*<br><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* | Lectures (2 contact hours per week x 13 weeks) | 26 |
| | Laboratory exercises (2 contact hours per week x 13 weeks) | 26 |
| | Reports - Projects | 13 |
| | Hours for private study of the student, preparation and attendance mid-term or/and final examinations. | 60 |
| | ***Total number of hours for the Course (25 hours of workload per ECTS credit)*** | ***125 hours (total student workload)*** |
| **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.* | Final mandatory written examination, full length questions and / or multiple-choice questions, as well as questions based on problems solving. Minimum pass grade= 5, scale 0-10.<br><br>All the above are taking place in Greek as well as in English for foreign students (e.g. ERASMUS students) if any. | |

## 5. ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

Alan G. Clewer and David H. Scarisbrick. PRACTICAL STATISTICS AND EXPERIMENTAL DESIGN FOR PLANT AND CROP SCIENCE. John Wiley & Sons, Ltd, 2001.
A. Reza Hoshmand: Experimental Research Design and Analysis. CRC Press 1994
Thomas M. Little, F. Jackson Hills. Agricultural Experimentation: Design and Analysis. Wiley, 1978.

- *Related academic journals:*

Annals of Biometry and Biostatistics