# COURSE OUTLINE

## 1. GENERAL

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|---|---|---|---|
| **SCHOOL** | AGRICULTURAL SCIENCES | | |
| **DEPARTMENT** | AGRICULTURE | | |
| **LEVEL OF COURSE** | UNDERGRADUATE | | |
| **COURSE CODE** | AGR_203 | **SEMESTER OF STUDIES** | 2nd |
| **COURSE TITLE** | Statistics | | |

| **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* | **TEACHING HOURS PER WEEK** | **ECTS CREDITS** |
|---|---|---|
| Lectures | 2 | 5 |
| Seminars | 2 | |
| Total | 4 | |
| *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, General Knowledge |
| **PREREQUISITE COURSES:** | Typically, there are not prerequisite courses. |
| **TEACHING AND ASSESSMENT LANGUAGE:** | Greek. Teaching may be however performed in English in case foreign students attend the course. |
| **THE COURSE IS OFFERED TO ERASMUS STUDENTS** | Yes |
| **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*

By the end of this course the students will be able to:

1. Distinguish between stochastic and conceptual phenomena or experiments.
2. Use basic tools of probability and basic rules and methods of enumeration.
3. Understand the practical value and the importance of probabilities in the understanding and interpretation of stochastic phenomena or experiments.
4. Describe and summarize the data collected from the observation of a phenomenon or from an experiment
5. Translate a research question to the appropriate hypothesis tests, given the data and the experimental protocols
6. Can apply case statistics and estimate confidence intervals in order to draw conclusions from experimental or sample data.

7. Identify the conditions required for the application of the desired statistical methods and the necessity to check those conditions.
8. Understand and interpret statistical significance correctly.
9. Select and apply the appropriate statistical inference methods required to complete a research task
10. Review and evaluate hypotheses and conclusions based on experimental or sample data.
11. Acknowledge of ethical and ethical issues related to the collection and use of data and publicizing the conclusions drawn from them

**General Abilities**

*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*

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

*Search for, analysis and synthesis of data and information, with the use of the necessary technology*
*Adapting to new situations*
*Decision-making*
*Working independently*
*Production of free, creative and inductive thinking*

## 3. SYLLABUS

1. Introduction, Concepts – Enumeration
2. Probability and conditional probability
3. Random variables
4. Special discrete distributions
5. Basic continuous distributions - Central limit theorem (Part I and II)
6. Descriptive statistics
7. Sampling distributions
8. Statistical assessment
9. Statistical tests
10. Analysis of variance (Part I and II)
11. $X^2$ test

## 4. TEACHING AND LEARNING METHODS - EVALUATION

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|---|---|
| **TEACHING METHOD**<br>*Face-to-face, Distance learning, etc.* | Lectures and problem-solving seminars. |
| **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. powerpoint) in teaching. Problem solving with the use of SPSS Statistics and spreadsheet software.<br>Direct communication with the students (face to face and by e-mail), Support of the learning process and uploading of the educational material to the electronic platform (e-class): https://eclass.upatras.gr |

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|---|---|
| *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* | <table><tr><th>***Activity***</th><th>***Semester workload***</th></tr><tr><td>Lectures and seminars (4 contact hours per week x 13 weeks)</td><td>52</td></tr><tr><td>Mid-term examinations (2 mid-term examinations x 2 contact hours each)</td><td>4</td></tr><tr><td>Hours for private study of the student and preparation for mid-term or/and final examination / Final examination</td><td>69</td></tr><tr><td>***Total number of hours for the Course (25 hours of work-load per ECTS credit)***</td><td>***125 hours (total student work-load)***</td></tr></table> |
| **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. Optionally, two mid-term examinations with the final examination grade to be the mean mark. It is mandatory to obtain pass grade (≥5) in each examination.<br>2. Written examination after the end of the semester. Minimum passing grade: 5.<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. RECOMMENDED LITERATURE

1. Hines, W.W. and Montgomery D.C., "Probability and Statistics in Engineering and Management Science", 3rd ed., John Wiley & Sons
2. Millard, S.P. and Neechal, N.K., "Environmental Statistics with S-Plus", CRC Press