

COURSE OUTLINE

1. GENERAL

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|---|---|----------------------------|-----------------|
| SCHOOL | NATURAL SCIENCES | | |
| DEPARTMENT | MATHEMATICS | | |
| LEVEL OF COURSE | UNDERGRADUATE | | |
| COURSE CODE | MAT_ST438 | SEMESTER OF STUDIES | 8 th |
| COURSE TITLE | SAMPLING THEORY | | |
| 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> | TEACHING HOURS PER WEEK | ECTS CREDITS | |
| Lectures and Tutorials | 4 | 6 | |
| <i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i> | | | |
| COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i> | Elective course | | |
| PREREQUISITE COURSES: | <u>Recommended prerequisite knowledge:</u> PROBABILITY I, STATISTICAL INFERENCE I | | |
| TEACHING AND ASSESSMENT LANGUAGE: | Greek | | |
| THE COURSE IS OFFERED TO ERASMUS STUDENTS | No | | |
| COURSE WEBPAGE (URL) | | | |
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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

Upon successful completion of the course, the student will have gained understanding of the various sampling techniques from a well defined population. He should also know how important parameters (e.g. mean, variance, proportion) are estimated for each of these techniques. The student will be competent to choose and apply the appropriate sampling method for the underlying problem at hand. Finally, he will be able to choose the appropriate sample size so as to achieve a desirable accuracy.

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

Others...

- Decision making.
- Autonomous work.
- Team work.
- Work in an interdisciplinary environment.
- Promotion of free, productive and inductive thought.

3. COURSE CONTENT

Basic notions of sampling. Simple random sampling: estimation of the population mean, population total and a proportion. Confidence intervals for these parameters and choosing the appropriate sample size. Random sampling with replacement and estimation of parameters. Stratified random sampling: stratification principle, estimation of the population mean, population total and a proportion. Methods of choosing the sample size, proportional allocation of sample sizes and Neyman allocation. Systematic sampling. Ratio and regression estimators. Cluster sampling (one stage, two stage, etc.) and estimation of parameters. Unequal probability sampling, Horvitz-Thompson estimator.

4. TEACHING AND LEARNING METHODS - ASSESSMENT

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| TEACHING METHOD <i>Face-to-face, Distance learning, etc..</i> | Lectures (face to face) | |
| USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory education, communication with students</i> | Support of the course via the discussion forum of the Department of Mathematics. | |
| TEACHING ORGANIZATION <i>The manner and methods of teaching are described in detail.</i> <i>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> <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> | Activity | Semester workload |
| | Lectures | 26 |
| | Tutorials | 26 |
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| | Solving homework problems | 45 |
| | Personal study | 50 |
| | Final examination | 3 |
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5. RECOMMENDED LITERATURE

(in Greek)

- Δαμιανού Χαράλαμπος Χ., *Μεθοδολογία Δειγματοληψίας*. Εκδόσεις Σοφία, 2007.
- Φαρμάκης Νικόλαος, *Εισαγωγή στη Δειγματοληψία*. Εκδόσεις Αφοί Κυριακίδη, 2016.

(in English)

- Cochran William G. *Sampling Techniques*. 3rd ed., Wiley, 1977.