COURSE OUTLINE

GENERAL

SCHOOL	School of Science		
ACADEMIC UNIT	Department of Mathematics		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	MAE633	**SEMESTER**	**6th**
COURSE TITLE	**Statistical Inference**		

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	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialised general knowledge
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English, reading Course)
COURSE WEBSITE (URL)	http://www.math.uoi.gr/~kzograf/SyllabousInferenceEnglish.pdf

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 aim of the course is to present and study techniques and methods of parametric statistical inference. In particular, the interest is mainly focused on the theoretical development of the field of parameter estimation (point and interval) and the development of statistical tests for testing statistical hypotheses. Moreover, this course aims to provide the necessary knowledge so as the students to be able to draw statistical conclusions on the basis of experimental data, by utilizing these

methods. At the end of the course students will have acquired the theoretical background of the parametric statistical inference methodologies.

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
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

Working independently
Decision-making
Production of free, creative and inductive thinking
Criticism and self-criticism

SYLLABUS

Point estimation; unbiased, sufficient and efficient estimators, unbiased estimators with minimum variance, the Cramer-Rao lower bound, Lehmann-Scheffe theory, asymptotic properties of estimators, methods of estimation (methods of maximum likelihood and moments). Interval estimation. Confidence intervals. Testing Statistical Hypothesis testing: the Neyman- Pearson lemma, simple and composite hypotheses, uniformly most powerful tests, likelihood ratio tests. Large sample tests. Applications.

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Classroom (face-to-face)
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	*Use of ICT in communication with students*
TEACHING METHODS *The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and*	

Activity	***Semester workload***
Lectures	39
Working independently	78
Exercises-Homework	33

analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. *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><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>150</td></tr></table>
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *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* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Final written exam in Greek (in case of Erasmus students in English) which includes resolving application problems.

ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

Books in English

Casella, G. and Berger, R. (2002). Statistical Inference. 2nd Edition. Duxbury Advanced Series.

Hogg, R. V., McKean, J. W. and Craig, A. T. (2005). Introduction to Mathematical Statistics. Pearson Education, Inc.

Mood, A., Graybill, F. and Boes, D. (1974). Introduction to the Theory of Statistics. McGrawHill.

Roussas, G. (2003). An Introduction to Probability and Statistical Inference. Academic Press.

Books in Greek

Ηλιόπουλος, Γ. (2006). Βασικές Μέθοδοι Εκτίμησης Παραμέτρων. Εκδόσεις Αθ. Σταμούλης.

Κουρούκλης, Σ. (2007). Στατιστική Ι. Πανεπιστήμιο Πατρών.

Παπαϊωάννου, Τ. και Φερεντίνος, Κ. (2000). Μαθηματική Στατιστική. Εκδόσεις Αθ. Σταμούλης.