■ CE83 - Statistics II

GENERAL

SCHOOL	EXACT SCIENCES
DEPARTMENT	MATHEMATICS
LEVEL OF STUDIES	UNDERGRADUATE
COURSE CODE	CE83	**SEMESTER**	H
COURSE TITLE	STATISTICS II

INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	ECTS
Lectures	4	6

COURSE TYPE	Scientific Field
PREREQUISITE COURSES	Statistics I
LANGUAGE OF TEACHING AND EXAMINATIONS	Greek/English
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://eclass.uowm.gr/

LEARNING OUTCOMES

Learning Outcomes
With this course, the students will be able to: • study theoretical and applied statistical problems, • handle several Statistical Functions for parameter estimation, • delve into the theoretical background of hypothesis testing, • apply the fundamental Naymann-Pearson lemma for the configuration of hypothesis tests, • consolidate the theoretical framework on which all statistical methodologies and techniques are established.

General Competencies
- Search for, analysis and synthesis of data and information, with the use of the necessary technology.   - Application of knowledge in practice.   - Decision making.

CONTENT OF THE COURSE

Estimation: Unbiased, efficient and consistent estimators. Exponential distribution family. Search for minimum variance estimators with Rao-Blackwell and Cramer-Rao methods. Estimation methods (maximum likelihood, moment method, Minimax and Bayes). Confidence Interval parameter estimates. Hypothesis testing: The fundamental Naymann-Pearson lemma. Simple and complex hypothesis testing, generalized likelihood ratio test.

TEACHING AND LEARNING METHODS - EVALUATION

TEACHING METHOD	In the classroom.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Powerpoint presentations. Use of e-class. Communication through face-to-face discussions via e-mails.
TEACHING ORGANIZATION	<table><tr><th>Activity</th><th>Semester Workload</th></tr><tr><td>Lectures</td><td>52 hours</td></tr><tr><td>Projects</td><td>26 hours</td></tr><tr><td>Individual Study</td><td>72 hours</td></tr><tr><td>Course Total (25 hours per ECTS)</td><td>150 hours</td></tr></table>
STUDENT EVALUATION	Projects 20%. Written final examination 80%.

RECOMMENDED BIBLIOGRAPHY

1. Iliopoulos G., Basic Methods of Parameter Estimation, Ath. Stamoulis Publications, 2006 (Greek).
2. Kourouklis S., Parametric statistical inference issues, Hellenic Academic EBooks-"Kallipos" repository, 2016 (Greek).

3. Papaioanou T. and Ferentinos K., Mathematical Statistics, Ath. Stamoulis Publications, 2000 (Greek).
4. Kolyva-Mahera F., Mathematical Statistics-Estimation, Ziti publications, 1998 (in Greek).
5. Kolyva-Mahera F. and Hatzopoulos S., Mathematical Statistics-Estimation, Hellenic Academic EBooks- "Kallipos" repository, 2016 (in Greek).
6. Rao, C. R. (2008). Linear Statistical Inference and its Applications, 2nd edition. Wiley Series on Probability and Statistics.
7. Rice, J. A.(1994). Mathematical Statistics and Data Analysis, 2nd edition. Duxbury Press.
8. Roussas, G. (2003). An Introduction to Probability and Statistical Inference. Academic Press. An imprint of Elsevier Science.