COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY		
ACADEMIC UNIT	DEPARTMENT OF STATISTICS		
LEVEL OF STUDIES	1st Cycle (UNDERGRADUATE)		
COURSE CODE	**6012**	**SEMESTER**	**3rd**
COURSE TITLE	**Estimation and Hypothesis Testing**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	4	8
Workshops		
Labs	2	

COURSE TYPE	Compulsory
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	https://www.dept.aueb.gr/en/stat/content/estimation-and-hypothesis-testing-8-ects

(2) LEARNING OUTCOMES

Learning outcomes
After successfully completing the course, students will be able to estimate unknown parameters using the appropriate methodology, to build confidence intervals that contain the unknown parameters with the desired probability and to carry out statistical tests regarding the specific problems.
General Competences
• Search, analysis and synthesis of data and information, using the necessary technologies • Adaptation to new situations • Decision-making • Generation of new research ideas • Project planning and management • Respect for diversity and multiculturalism • Respect for the natural environment • Demonstration of social, professional and ethical responsibility and sensitivity to gender issues • Exercise of criticism and self-criticism • Promotion of free, creative and inductive thinking

(3) SYLLABUS

Point estimation, properties of point estimators (consistency, unbiasedness, efficiency, sufficiency), point estimation methods (moment method, least squares, maximum likelihood). Sampling and sampling. Confidence intervals for means, rates, variances and their differences for normal and non-normal populations. Hypothesis testing, statistical hypotheses, hypothesis testing for parameters such as mean values, variations, comparing parameters in two different samples, statistical significance level, p-value, power of a test, sample size calculation.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	**YES**
TEACHING METHODS	
STUDENT PERFORMANCE EVALUATION	Written examination at the end of the semester. The instructor may additionally conduct a supplementary oral examination of a selected sample of students, based on an appropriate sampling procedure, the outcome of which shall be taken into consideration in determining the final grade. Information available at e-class.

Activity	*Semester workload*
Lectures	52
Studying and analyzing bibliography	20
Tutorials	26
Self Study	102
Course total	**200**

(5) ATTACHED BIBLIOGRAPHY

- Αγγελής Β., Δημάκη Α., Στατιστική Τόμος Α, Εκδόσεις "σοφία", 2012.
- Δαμιανού Χ., Κούτρας Μ., Εισαγωγή στη Στατιστική ΜΕΡΟΣ Ι, Εκδόσεις Τσιότρας, 2021.
- Πανάρετου Ι, Ξεκαλάκη Ε. Εισαγωγή στη Στατιστική Σκέψη Τόμος ΙΙ. Εκδόσεις Μπένου 2000
- Newbold, P., Carlson, W. and Thorne, B. 'Statistics for Business and Economics'. 7th edition Prentice-Hall 2009
- Freund, J. 'Mathematical Statistics with applications'. Pearson 2013
- Walpole, R., Myers, R. and Myers, S. 'Probability and Statistics'. 9th Edition Pearson 2016