

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY		
ACADEMIC UNIT	DEPARTMENT OF STATISTICS		
LEVEL OF STUDIES	1st Cycle (UNDERGRADUATE)		
COURSE CODE	6113	SEMESTER	8 th
COURSE TITLE	Non-Parametric Statistics		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
Lectures		4	7
Workshops			
Labs		2	
COURSE TYPE	Elective – Scientific Field		
PREREQUISITE COURSES:	Linear Algebra, Estimation – Hypothesis Testing, Linear Models, Generalized Linear Models		
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/non-parametric-statistics-8-ects		

(2) LEARNING OUTCOMES

Learning outcomes
At the end of the course the student will be able to: Understand the non-parametric methods described and their properties. Apply these methods in real data analysis and correctly interpret the results.
General Competences
• Search, analysis and synthesis of data and information, using the necessary technologies • Autonomous work • Promotion of free, creative and inductive thinking

(3) SYLLABUS

Empirical distribution function, empirical process, Kolmogorov –Smirnov and similar tests. Statistics based on functional of the empirical distribution. Jackknife and Bootstrap: general principles, examples, parametric bootstrap, estimating parameter variance and bootstrap confidence intervals. Nonparametric tests

based on ranks and concepts of robustness and asymptotic relative efficiency. Nonparametric density estimation, histograms, Nadaraya-Watson and LOESS estimator: bias, variance, tradeoff between them and bandwidth choice: plug in and cross-validation methods. Nonparametric regression: smoothing techniques. Estimator based on kernels (Nadaraya-Watson), asymptotic development of bias and variance, bandwidth choice, local polynomial regression and splines, variance estimation and confidence intervals. Generalized additive models and regression trees.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face		
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	In Teaching	Yes	Teaching with slides
	In labs	Yes	Application Lab using R
	In communicating with the students	Yes	eclass
TEACHING METHODS	Activity		Semester workload
	Lectures		52
	Tutorial		26
	Assignment		70
	Self Study		77
	Course Total		175
STUDENT PERFORMANCE EVALUATION	Written examination at the end of the semester Bonus based on delivering assignments. Information is available at eclass		

(5) ATTACHED BIBLIOGRAPHY

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