

## COURSE OUTLINE

Ημερομηνία: 3 Νοε 2022

## A. INFORMATION FOR THE COURSE

A1. School	School of Science and Technology of Information
A2. Department	Department of Statistics
A3. Master Programme	
A4. Course Code	6113
A5. Title of the Course	NON-PARAMETRIC STATISTICS

## Lecturers

Name	Rank	Specialization
IOANNIDIS EVANGELOS	Assistant Professor	Statistics

## B. TYPE OF COURSE

B1. Year of Study	4
B2. Semester	8th
B3. Level of Course (if applicable)	1st Cycle
B4. Type of course	Elective
B5. Field	Scientific Field
B6. ECTS credits allocated (ECTS)	8.00
B7. Is the Course in the Syllabus?	Yes
B8. If yes, which is the reference Page?	29-68
B9. Is there a site for the course?	Yes <a href="https://www.dept.aueb.gr/el/stat-courses">https://www.dept.aueb.gr/el/stat-courses</a>

## C. INSTRUCTION

C1. Lectures Include:	Classroom lectures: Yes Distance learning lectures: No Seminars: No Laboratory exercises: No Field training exercise: No Literary analysis: No Tutorial: Yes Interactive teaching: No Educational visits: No Project: No Essays/reports: Yes Independent study: Yes Lectures given by scientists: No Internship: No
C2. Scheduled Hours for Lectures per week	4.00
C3. Scheduled Hours for Tutorials per week	
C4. Scheduled Hours for Workshops per week	2.00
C5. Scheduled Hours for Case Studies per week	
C6. Scheduled Hours for Other Activities per week	
C7. Scheduled Hours for Lectures per semester	52
C8. Scheduled Hours for Tutorials per semester	
C9. Scheduled Hours for Workshops per semester	26
C10. Scheduled Hours for Case Studies per semester	
C11. Scheduled Hours for Other Activities per semester	
C12. Mode of Delivery	Face to Face
C13. Student's Evaluation	Written examination at the end of the semester: Yes Oral examination: No Midterm exam: No Homework: No Project: Yes Public Presentation: No Laboratory exercises: No Practical exercises: No Exempt work: No

C14. Language of Instruction	Greek
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**D. PREREQUISITE COURSES**

Γραμμική Άλγεβρα, Εκτιμητική-Έλεγχοι Υποθέσεων, Γραμμικά Μοντέλα, Γενικευμένα Γραμμικά Μοντέλα

**E. COURSE CONTENTS (Syllabus)**

The empirical distribution function (ecdf), the Kolmogorov Smirnov and other related tests. Statistics based on functionals of the ecdf. The Jackknife and the Bootstrap: principles , examples,parametric bootstrap, bootstrap-based estimation of the variance of an estimator and confidence intervals. Non-parametric density estimation, histograms, Nadaraya-Watson estimator: bias, variance, trade of between them and bandwidth selection: plug in method and cross-validation. Non-parametric regression: smoothing techniques. Kernel smoothing estimator (Nadaraya-Watson), asymptotic expansion of bias and variance, bandwidth selection, local polynomial regression and splines, estimating the variance and confidence bands. Generalized additive models and regression trees. Non parametric rank tests. The notions of robustness and asymptotic relative efficiency.

**F. LEARNING OUTCOMES**

Understand the methods of non-parametric statistics described in the syllabus, as well as their properties. Be able to apply them in the analysis of real data and correctly interpret the results.

**G. LITERATURE**

G1. Use of Multiple Literature	Yes
G2. Recommended or required reading	Yes