

COURSE OUTLINE

Ημερομηνία: 4 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	6127
A5. Title of the Course	STATISTICAL AND MACHINE LEARNING METHODS

Lecturers

Name	Rank	Specialization
BOURAZAS KOSTAS	PhD Candidate	
PEDELI XANTHI-XANTHIPI	Assistant Professor	

B. TYPE OF COURSE

B1. Year of Study	4
B2. Semester	7th
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 https://www.dept.aueb.gr/el/stat-courses

C. INSTRUCTION

C1. Lectures Include:	Classroom lectures: Yes Distance learning lectures: No Seminars: No Laboratory exercises: Yes Field training exercise: No Literary analysis: Yes Tutorial: Yes Interactive teaching: No Educational visits: No Project: No Essays/reports: Yes Independent study: No 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: Yes 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

Knowledge of topics related to statistical inference, distribution theory and also linear algebra are very useful.

E. COURSE CONTENTS (Syllabus)

The notion of distance, properties of distance metrics. Different distances depending on the type of data. Statistical methods based on the notion of distance. Cluster analysis. Hierarchical clustering. K-Means algorithm and related variants. Applications. Critique on the methods and problems. Model Based clustering. Inference on model based clustering.

Methods to create classification rules. Discriminant analysis. Likelihood principle, Bayesian methods. Probability of wrong classification. K-nearest neighbor methods. Classification trees. Other methods for classifications.

Correspondence Analysis. Inertia. Geometric interpretations. Multivariate correspondence analysis. Burt and disjunctive Tables. Applications.

F. LEARNING OUTCOMES

Students at the end of the course will have a good understanding on various advanced multivariate statistical methods.

G. LITERATURE

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