COURSE OUTLINE

Ημερομηνία: 1 Νοε 2022

A. INFORMATION FOR THE COURSE

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A1. School	School of Science and Technology of Information
A2. Department	Department of Statistics
A3. Master Programme	
A4. Course Code	6176
A5. Title of the Course	GENERALIZED LINEAR MODELS

Lecturers

Name	Rank	Specialization
IOANNIDIS EVANGELOS	Assistant Professor	Statistics
VRONTOS IOANNIS	Associate Professor	Statistics

B. TYPE OF COURSE

B1. Year of Study	3
B2. Semester	5th
B3. Level of Course (if applicable)	1st Cycle
B4. Type of course	Core
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: 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

D. PREREQUISITE COURSES

Το μάθημα δεν έχει τυπικά προαπαιτούμενα, ωστόσο πρυποθέτει την εξοικείωση με τα εξής μαθήματα: Γραμμική Άλγεβρα, Εκτιμητική-Έλεγχοι Υποθέσεων, Γραμμικά Μοντέλα.

E. COURSE CONTENTS (Syllabus)

1. Theory of GLM
Covariance matrix and Wald test, Likelihood and maximum likelihood estimation (MLM), the scores and their distribution, Fisher information, properties of MLM estimates, likelihood ratio test, the exponential family of distributions, likelihood analysis of a generalized linear model (GLM), MLM estimation in a GLM, Newton-Raphson algorithm and its relation to weighted least squares, inference for coefficients, deviance from the saturated model, models with unknown φ, residuals.

2. Applications-examples
Binary data: link functions, coefficient interpretation, inference, sparse tables, overdispersion. One-way layout and simple regression, two- (and higher-) way layout, with and without interactions: parametrizations, design matrices, coefficient interpretation.
Poisson and log-linear models, Contingency tables: the polynomial and the product polynomial distribution, equivalence with log-linear, relation with logistic regression, independence, independence by groups, conditional independence, homogenous dependence.

F. LEARNING OUTCOMES

Understanding the models and the techniques of statistical data analysis introduced, as well as their properties, developing the ability of applying the models in real data analysis and interpreting the results and understanding to some extend theoretical issues arising.

G. LITERATURE

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