

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY		
ACADEMIC UNIT	DEPARTMENT OF STATISTICS		
LEVEL OF STUDIES	1st Cycle (UNDERGRADUATE)		
COURSE CODE	6108	SEMESTER	8th
COURSE TITLE	CATEGORICAL DATA ANALYSIS		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
Lectures		4	8
Workshops			
Labs			
COURSE TYPE	Elective – Scientific Field		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	ENGLISH		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://www.dept.aueb.gr/en/stat/content/categorical-data-analysis-8-ects		

(2) LEARNING OUTCOMES

Learning outcomes
At the end of the course, students are expected to know how to quantify different dependency forms between two or more categorical data (knowledge), to control which form of dependency appears to apply to a particular set of data (aptitude), to fit logistic regression models and to interpret the results of their data fit (capability).
General Competences
<ul style="list-style-type: none"> • Search, analysis and synthesis of data and information, using the necessary technologies • Decision making • Autonomous work • Teamwork

(3) SYLLABUS

Types of categorical data. Contingency tables, joint, marginal and conditional probabilities, independence, comparison of proportions in 2x2 contingency tables (difference of proportions, relative risk, odds ratio), types of observational studies (retrospective, cross-sectional, prospective), odds ratio and other measures of correlation in LxJ tables. χ^2 test of independence, exact tests, partition of the statistical function χ^2 , test of independence for ordinal data, tests of linear trend for 2xL tables. Correlated data pairs, comparison of correlated proportions, Mc Nemar test for comparison of marginal proportions, measures of raters' agreement, odds ratio for agreement, kappa measure of agreement. Correlation in multidimensional contingency tables, conditional and marginal odds ratios, Simpson's paradox, partial-conditional independence, homogeneity, collapsibility, Cochran-Mantel-Haenszel tests. Logistic regression, interpretation of model parameters, inference in logistic regression, the case of categorical predictive variables, multiple logistic regression, model selection, test of goodness of fit. Models of logistic regression for polytomous variables.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	YES	
TEACHING METHODS	Activity	Semester workload
	Lectures	52
	Lab Exercise	10
	Studying and Analyzing Bibliography	52
	Assignment	60
	Self Study	26
	Course Total	200
STUDENT PERFORMANCE EVALUATION	<p>Written examination at the end of the semester: 80%</p> <p>Practical Exercises: 20%</p> <p>Information is available at eclass</p>	

(5) ATTACHED BIBLIOGRAPHY

- Agresti A., (2013). Categorical data analysis, Wiley
- Agresti A., (2007). An Introduction to Categorical Data Analysis, Wiley.
- Hosmer, D., Lemeshow, S. and Sturdivant, R. (2013) Applied Logistic Regression, Wiley
- Kateri, M. (2014). Contingency Table Analysis, Springer.

