COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY
ACADEMIC UNIT	DEPARTMENT OF STATISTICS
LEVEL OF STUDIES	1st Cycle (UNDERGRADUATE)
COURSE CODE	9068 **SEMESTER** 2nd
COURSE TITLE	**STATISTICS II: INFERENCE AND REGRESSION**

INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	CREDITS
Lectures	3	6
Workshops	1	
Labs		

COURSE TYPE	Elective
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-courses

(2) LEARNING OUTCOMES

Learning outcomes
Through teaching the course the students will be familiar with: the basic principles of statistical inference – theory and practice around the concept of statistical correlation – theory and practical application of linear models.

General Competences
Adaptation to new situations Decision-making Promotion of free, creative, and inductive thinking

(3) SYLLABUS

Hypothesis Testing, statistical hypotheses, control function, hypothesis testing for population parameters such as mean values, ratios, variances, comparing parameters in two populations, statistical significance level, p-value, power of a test, determining

the sample size. Pearson & Spearman statistical correlation. Introduction to regression, simple linear model, statistical linear model, normal linear model, inference in the normal linear model (confidence/ prediction intervals and hypothesis testing), transformations, residuals and deviation diagnostics for the linear model hypotheses. Multiple linear model, choosing the optimal model, choosing a model with information criteria, AIC, BIC, Mallows Cp. One factor Analysis of Variance (ANOVA). Applications in R.

Prerequisite knowledge: Probability theory and Point/ Interval Estimation

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY		
TEACHING METHODS	**Activity**	**Semester workload**
	Class lectures	
	Lab Exercise	
	Interactive teaching	
	Written assignments	
	Course total	
STUDENT PERFORMANCE EVALUATION .	Written examination at the end of the semester Written assignments	

(5) ATTACHED BIBLIOGRAPHY

- Draper, Norman R. & Smith, Harry. Applied Regression Analysis, 3rd edition. NY: Wiley, 1998.
- Fox, John & Weisberg, Sanford. An R Companion to Applied Regression. LA: SAGE, 2019.
- Hastie, Trevor; Tibshirani, Robert; Friedman, Jerome. The Elements of Statistical Learning: Data Mining, Inference, and Prediction. NY: Springer,2017.
- Lehmann, E.L & Romano, P. Joseph. Testing Statistical Hypotheses. NY: Springer-Verlag, 2008.
- Montgomery, C. Douglas; Peck, Elisabeth; Vining, G. Geoffrey. Introduction to Linear Regression Analysis, 5th Edition. NY: Wiley, 2012.