COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY
ACADEMIC UNIT	DEPARTMENT OF STATISTICS
LEVEL OF STUDIES	1st Cycle (UNDERGRADUATE)
COURSE CODE	6136

COURSE CODE	6136		**SEMESTER**	6th
COURSE TITLE	**Multivariate Statistical Analysis**			

INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	CREDITS
Lectures	4	8
Workshops		
Labs	2	

COURSE TYPE	Elective – Scientific Field
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://www.dept.aueb.gr/en/stat/content/multivariate-statistical-analysis-8-ects

(2) LEARNING OUTCOMES

Learning outcomes
Upon completion of the course, the student will be able to: produce graphs and comprehend relations in his data, apply basic methods of multivariate data analysis, infer on multivariate data, use methods of dimension reduction.
General Competences
• Search, analysis and synthesis of data and information, using the necessary technologies • Adaptation to new situations • Decision-making • Autonomous work • Teamwork • Work in an interdisciplinary environment • Promotion of free, creative and inductive thinking

(3) SYLLABUS

Multivariate data, multivariate descriptive measures, covariance matrix, generalized variance. Plots for multivariate data. Multivariate distributions, basic properties and handling. Multivariate normal distribution. Properties. Estimation. Distributions resulting from the multivariate normal distribution. Principal components analysis, choosing principal components, principal components interpretation. Principal components analysis in sampling data. Factor analysis, the orthogonal factor model. Estimation. Model rotation, results interpretation, applications. The multivariate linear model, multivariate regression, multivariate analysis of variance. The concept of distance and its use in Statistics.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face		
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	YES		
TEACHING METHODS	*Activity*	*Semester workload*	
	Lectures	52	
	Tutorial	12	
	Project	80	
	Self Study	56	
	Course Total	*200*	
STUDENT PERFORMANCE EVALUATION .	Written examination at the end of the semester: 80% Written Assignment (Project): 20% Information is available at eclass		

(5) ATTACHED BIBLIOGRAPHY

- Σιάρδος Γ., Μέθοδοι Πολυμεταβλητής Στατιστικής Ανάλυσης, Εκδόσεις Σταμούλη Α.Ε., 2005.
- Everitt, Sidney B., Casella, Fienberg G., Olkin S., Ingram, An R and S-PLUS Companion to Multivariate Analysis, Springer-Verlag London Limited, 2005.
- Anderson, T. W. (1984). An Introduction to Multivariate Statistical Analysis, John Wiley & Sons, New York, 2nd edition.
- Bartholomew, D.J., Steele, F., Moustaki, I., Galbraith, J. (2011) Ανάλυση πολυμεταβλητών τεχνικών στις κοινωνικές επιστήμες, Εκδόσεις ΚΛΕΙΔΑΡΙΘΜΟΣ
- Basilevski, A. (1994). Statistical Factor Analysis and Related Methods. Theory and Applications. John Wiley & Sons.
- Chatfield, C. and Collins, A.J. (1992). Introduction to Multivariate Analysis.
- Jackson, J. (1991). A User's Guide to Principal Components, John Wiley & Sons, Inc., New York, NY.
- Krzanowski, W. J. (1988). Principles of Multivariate Analysis. Oxford University Press.
- Mardia, K. V., Kent, J. T. & Bibby, J. M. (1979). Multivariate Analysis. London: Academic Press.
- Καρλής, Δ. (2005). Πολυμεταβλητή Στατιστική Ανάλυση. Εκδόσεις Σταμούλη.