

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY		
ACADEMIC UNIT	DEPARTMENT OF STATISTICS		
LEVEL OF STUDIES	1st Cycle (UNDERGRADUATE)		
COURSE CODE	6031	SEMESTER	2 nd
COURSE TITLE	Introduction to Probability and Statistics using R		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
Lectures		4	7,5
Workshops			
Labs		2	
COURSE TYPE	Compulsory - General Background		
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/introduction-probabilities-and-statistics-using-r-75-ects		

(2) LEARNING OUTCOMES

Learning outcomes
The student will be able to know and understand basic concepts about Statistics, to understand basic concepts of Probabilities, to be familiarized basic characteristics of Statistics and Probability through simulation, to have sufficient R knowledge in order to implement basic programs to solve basic statistical methodologies, to create and understand basic descriptive graphs, to be able to satisfactorily manage his data in order to extract from large volumes of data what is useful to him, to be able to understand in real data their basic characteristics.
General Competences
• Search, analysis and synthesis of data and information, using the necessary technologies • Decision making • Autonomous work • Teamwork • Project planning and management • Promotion of free, creative and inductive thinking

(3) SYLLABUS

This course aims to introduce students to basic principles of statistics and probability using R. These tasks include: Data collection. Reading and organizing data. Data management. The basic idea of simulation. Probability games using computer and R. Law of large numbers and other probability results. Introduction and comparison of distributions. Basic principles of

descriptive statistics. Describing data using the appropriate graphs and measures. Tabulating and presenting the data. Introduction to linear regression. Statistical terminology and the media, probabilities, inference. Case studies. Examples from everyday life.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face		
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	In Teaching	Yes	During lectures applications of the methods using computer programs are presented.
	In Labs	Yes	All labs are conducted in computers using appropriate software
	In communicating with the students	Yes	Virtual meetings via Microsoft Teams and email
TEACHING METHODS	Activity		Semester workload
	Lectures		52
	Studying and analyzing bibliography		12
	Tutorials		24
	Assignment		47.5
	Self-study		52
	Course Total		187.5
STUDENT PERFORMANCE EVALUATION	Written examination at the end of the semester: 100% The instructor may additionally conduct a supplementary oral examination of a selected sample of students, based on an appropriate sampling procedure, the outcome of which shall be taken into consideration in determining the final grade. Information is available at eclass.		

(5) ATTACHED BIBLIOGRAPHY

- Field, A., Miles, J., Field, A. (2019). Ανακαλύπτοντας την Στατιστική με τη Χρήση της R. Εκδόσεις Προπομπός.
- Μπατσίδης, Α., Οικονόμου, Π., Μαλεφάκη, Σ. (2026). Πιθανότητες και Στατιστική: Επιδιώκοντας τάξη στο χάος. Εκδόσεις Προπομπός.
- Δαμιανού, Χ., Κούτρας, Μ. (2003). Εισαγωγή στη Στατιστική Μέρος Ι. Εκδόσεις Συμμετρία.
- Verzani, J. (2016). Εισαγωγή στη Στατιστική με την R. Εκδόσεις Κλειδάριθμος ΕΠΕ.
- Gelman, A., Nolan, D. (2002). Teaching Statistics: A bag of tricks. Oxford University Press.
- Dalgaard, P. (2008). Introductory Statistics with R. Springer.

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- Crawley, M. J. (2014). Statistics: An Introduction Using R, 2nd Edition, Wiley.
- Δ. Φουσκάκης. (2013). Ανάλυση Δεδομένων με Χρήση της R . Εκδόσεις Τσότρας. Αθήνα.
- Crawley, M. J. (2014). Εισαγωγή στη Στατιστική Ανάλυση με την R (ελληνική μετάφραση). Εκδόσεις Broken Hill.
- Πετράκος, Γ. (2016). Εφαρμογές της Θεωρίας Πιθανοτήτων με τη Χρήση της R. Εκδόσεις Τσότρας.
- Matloff, M. (2023). Πιθανότητες και Στατιστική στην Επιστήμη των Δεδομένων: Μαθηματικά, Δεδομένα, και η Γλώσσα R. Εκδόσεις Κλειδάριθμος ΕΠΕ.
- Wickham, H., Grolemund, G. (2022). Προγραμματισμός σε R για την Επιστήμη των Δεδομένων. Εκδόσεις Κλειδάριθμος ΕΠΕ.