

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF STATISTICS & ACTUARIAL – FINANCIAL MATHEMATICS		
LEVEL OF STUDIES	POSTGRADUATE PROGRAM Statistics & Actuarial – Financial Mathematics		
COURSE CODE	331-0105	SEMESTER	A
COURSE TITLE	APPLIED STATISTICS AND SIMULATION TECHNIQUES		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
		2	6
COURSE TYPE	SPECIALISED GENERAL KNOWLEDGE		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (In English)		
COURSE WEBSITE (URL)	http://www.samos.aegean.gr/samos_actuar/modules_eng.html		

(2) LEARNING OUTCOMES

Learning outcomes
After the successful completion of the course, students should be able to: <ul style="list-style-type: none">• Apply common basic statistic techniques in solving problems for a variety of disciplines such as Finance/Economics, Biostatistics/Epidemiology and Engineering.• Handle with ease the R programming language• Apply simulation methods for problem solving• Conduct successfully a statistical analysis (using R) as well as to interpret their findings.
General Competences
<ul style="list-style-type: none">• Search for, analysis and synthesis of data and information, with the use of the necessary technology• Decision-making• Working independently• Team work• Working in an interdisciplinary environment• Project planning and management• Respect for difference and multiculturalism• Showing social, professional and ethical responsibility and sensitivity to gender issues• Criticism and self-criticism Production of free, creative and inductive thinking

(3) SYLLABUS

1st Part: Introduction to R language. Basic operations and functionalities (numerical operators, defining and using objects, types of objects and data structures, simple and multiple graphs).
2nd Part: Descriptive statistics, probability distributions and random numbers, statistical inference (point estimation, confidence intervals), hypothesis testing, basic nonparametric tests.

3rd Part: Simulation techniques using R.

(4) TEACHING and LEARNING METHODS – EVALUATION

DELIVERY	Synchronous and Asynchronous E-Learning and Face-to-face learning.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	<ul style="list-style-type: none">• Communication with students via eclass educational platform and via e-mail.• Educational material stored and presented into eclass educational platform.	
TEACHING METHODS	Activity	Semester workload
	Lectures	24
	Problem solving – projects – Lab work	52
	Independent study	74
	Course total (25 per ECTS)	150
STUDENT PERFORMANCE EVALUATION	Student evaluation is done in Greek either through a written/oral examination which includes short-answer questions and problem solving or by preparing and presenting (possibly in English) a project. For students with disabilities, evaluation takes place via oral exams.	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography (in English and Greek)

1. Φουσκάκης Δ. (2013). Ανάλυση Δεδομένων με Χρήση της R. Εκδόσεις ΤΣΟΤΡΑΣ, Αθήνα. Κωδικός στον Εύδοξο 33134029.
2. Ντζούφρας Ι. Καρλής Δ. (2015). Εισαγωγή στον Προγραμματισμό και στη Στατιστική Ανάλυση με R. e-book, Αθήνα: Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών (Athens: Hellenic Academic Libraries link), <http://hdl.handle.net/11419/2601>.
3. Νικολάου Χ. (2019). Ανάλυση Δεδομένων με την R. Εκδόσεις Δίσιγμα,
4. Ugarte, M. D., Militino, A. F., & Arnholt, A. T. (2015). Probability and Statistics with R. CRC Press.
5. Kabacoff, R. I. (2010). R in Action. manning.
6. Crawley, M. J. (2012). The R book. John Wiley & Sons.

- Related academical journals

7. Journal of the Royal Statistical Society. Series C: Applied Statistics
8. Annals of Applied Statistics
9. Annals of Applied Statistics
10. Journal of Statistical Software
11. Journal of Statistical Software
12. The R Journal
13. Computational Statistics and Data Analysis