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**	**2nd**
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. Basic ideas of numerical methods, integration, numerical optimiazation etc. Case studies. Examples from everyday life.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td><td>
<table>
<tr><td>In Teaching</td><td>Yes</td><td>During lectures applications of the methods using computer programs are presented.</td></tr>
<tr><td>In Labs</td><td>Yes</td><td>All labs are conducted in computers using appropriate software</td></tr>
<tr><td>In communicating with the students</td><td>Yes</td><td>Virtual meetings via Microsoft Teams and email</td></tr>
</table>
</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>52</td></tr>
<tr><td>Studying and analyzing bibliography</td><td>12</td></tr>
<tr><td>Tutorials</td><td>24</td></tr>
<tr><td>Assignment</td><td>47.5</td></tr>
<tr><td>Self-study</td><td>52</td></tr>
<tr><td>Course Total</td><td>187.5</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
.</td><td>Written examination at the end of the semester: 80%
Assignment: 20%

Information is available at eclass</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Αγγελής Β., Δημάκη Α., Στατιστική Τόμος Α, Εκδόσεις “σοφία”, 2010.
- Δαμιανού Χ., Κούτρας Μ., Εισαγωγή στη Στατιστική Μέρος Ι, Εκδόσεις Συμμετρία, 2003.
- VerzaniJ., Εισαγωγή στη Στατιστική με την R, Εκδόσεις Κλειδάριθμος ΕΠΕ, 2016.
- Gelman, A. Nolan, D. (2002) Teaching Statistics: A bag of tricks. Oxford University Press
- Dalgaard, P. (2008) Introductory Statistics with R. Springer

- Kerns, J. (2011) Introduction to Probability and Statistics Using R. Available at http://cran.r-project.org/web/packages/IPSUR/vignettes/IPSUR.pdf
- Horgan, J. (2008) Probability with R: An Introduction with Computer Science Applications. Wiley
- 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.