

## ■ CC44 - Statistics I

### GENERAL

<b>SCHOOL</b>	EXACT SCIENCES		
<b>DEPARTMENT</b>	MATHEMATICS		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	CC44	<b>SEMESTER</b>	D
<b>COURSE TITLE</b>	STATISTICS I		
<b>INDEPENDENT TEACHING ACTIVITIES</b>	<b>WEEKLY TEACHING HOURS</b>	<b>ECTS</b>	
Lectures	5	7	
<b>COURSE TYPE</b>	Scientific Field		
<b>PREREQUISITE COURSES</b>	-		
<b>LANGUAGE OF TEACHING AND EXAMINATIONS</b>	Greek/English		
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	YES		
<b>COURSE WEBSITE (URL)</b>	<a href="http://eclass.uowm.gr/">http://eclass.uowm.gr/</a>		

### LEARNING OUTCOMES

<b>Learning Outcomes</b>
<p>With this course, the students:</p> <ul style="list-style-type: none"> <li>• will consolidate the basic notions of Statistics,</li> <li>• will be able to process and analyze a data set,</li> <li>• will be evaluate the results of a survey.</li> </ul>
<b>General Competencies</b>
<ul style="list-style-type: none"> <li>• Application of knowledge in practice</li> <li>• Search for, analysis and synthesis of data and information, by use of the necessary</li> </ul>

- technology.
- Decision making.

## CONTENT OF THE COURSE

Population, sample. Types of variables, frequency distribution, grouping data. Graphs (bar charts, histograms, pie charts, stem and leaf plot, boxplot, time series chart, variance chart). Measures of location and dispersion, calculations from simple or grouped frequency tables. Use of R programming language for data representation. Sampling distributions, distribution of random variable sums, the central limit theorem and its consequences in statistics. Point and interval estimators, unbiasedness and efficiency. Unbiased minimum variance estimators, moment and maximum likelihood methods. Confidence intervals and hypothesis testing for one and two samples (independent or paired) for the mean value and the variance. Confidence intervals and hypothesis tests for proportions.  $\chi^2$  test (goodness of fit, independence and homogeneity). Simple linear regression and correlation. Non-parametric tests (runs test, randomization test, Kolmogorov-Smirnov test, Mann-Whitney test, Wilcoxon test, McNemar test, Kruskal-Wallis test, Friedman test, median test), Spearman correlation coefficient.

## TEACHING AND LEARNING METHODS - EVALUATION

<b>TEACHING METHOD</b>	In the classroom.	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b>	Use of e-class. Communication through face-to-face discussions and e-mails.	
<b>TEACHING ORGANIZATION</b>	<b>Activity</b>	<b>Semester Workload</b>
	Lectures	65 hours
	Projects	35 hours
	Individual Study	75 hours
	Course Total (25 hours per ECTS)	175 hours
<b>STUDENT EVALUATION</b>	Projects 20%. Written final examination 80%.	

## **RECOMMENDED BIBLIOGRAPHY**

1. Kolyva-Mahera F., Mpora-Senta E., Mpratsas H., Statistics, Ziti Publications, 2018 (Greek).
2. Papaioannou T., Loukas S. B., Introduction to Statistics, Stamouli Publications, 2002 (Greek).
3. Kounias E., Kolyva-Mahera F., Mpagiatis K., Mpora-Senta E., Introduction to Statistics, Kyriakidis bros Publications, 2016 (Greek).
4. Damianou C., Koutras M., Introduction to Statistics, Vol. I, Tsiotras Athanasios Publications, 2021 (Greek).