

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Environment		
ACADEMIC UNIT	Department of Environment		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	406Y	SEMESTER	4
COURSE TITLE	Statistics		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS	CREDITS	
Lectures	4		
Laboratory exercises	2		
Total credits		5	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Compulsory		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	http://www.env.aegean.gr/studies/undergraduate-degree/curriculum/statistics/		

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment
Production of new research ideas	Others...

The course provides an introduction to statistical reasoning emphasizing its applications to Environmental Sciences. Course objectives are:

1. Understanding and use of basic statistical notions and the link to Basic Probability Theory
2. Description and analysis of quantitative data through the methods of descriptive statistics
3. Analysis and comprehension of the basic methods of inferential statistics and its applications
4. For the integrated use of the theoretical tools and methods examples are worked out in full with the use of SPSS

(3) SYLLABUS

Topics per week

Basic Probability Theory, sample spaces, discrete enumeration techniques, principles of combinatorial theory, conditional probability, theorems of Bayes and Bernoulli, main probability distributions, measures of central tendency, Central Limit Theorem and Laws of Large Numbers, Normal Distribution, approximation to the Binomial distribution, Descriptive Statistics, main descriptive measures, organizing aggregated data. Estimation methods, point and interval estimators, estimator attributes (likelihood, moment methods). Confidence intervals for means, ratio and variance of populations. Hypotheses testing, types of errors, significance levels, p-values, relating confidence intervals with hypothesis testing. χ^2 fit test, contingency tables, introduction to single factor analysis of variance, multiple analysis of variance with interaction. Correlation between variables, hypotheses tests for the correlation coefficient. Normality tests, with Kolmogoroff Smirnov. Linear regression, least square method, general linear model principles.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face to face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>		
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	52
	Laboratory exercises	26
	Study	52
Course total	130	
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	-1st mid-semester examination (40%) (optional) -2nd mid semester examination (50%) (optional) – (or) Written examination at the end of the semester (90%) – laboratorial SPSS exercises (10%)	

(4) ATTACHED BIBLIOGRAPHY

<p>- Suggested bibliography:</p> <p>+Murray R. Spiegel & Larry J. Stevens, (2000), «ΣΤΑΤΙΣΤΙΚΗ», Σειρά SCHAUM, Εκδόσεις Τζιόλα - Θεσσαλονίκη, 3η Έκδοση, ISBN set: 960-8050-12-X, σελίδες 671.</p> <p>+Κολυβά-Μάχαιρα/ Μπόρα-Σέντα, (1998), «ΣΤΑΤΙΣΤΙΚΗ ΘΕΩΡΙΑ ΑΣΚΗΣΕΙΣ», Εκδόσεις ΖΗΤΗ, ISBN:960431338X, σελίδες 495.</p> <p>+Ψώνος Π. Δημήτριος, (1999), «Στατιστική», Εκδόσεις ΖΗΤΗ, Έκδοση 2, ISBN: 9604315617, σελίδες 456.</p> <p>+Εγχειρίδια εκμάθησης του βασικού λογισμικού SPSS με ασκήσεις αυτοαξιολόγησης</p> <p>+Ρεντινώτης Σταμάτης, (2004), «ΣΤΑΤΙΣΤΙΚΗ ΑΠΟ ΘΕΩΡΙΑ ΣΤΗΝ ΠΡΑΞΗ SPSS 11.0», Εκδόσεις Νέων Τεχνολογιών, ISBN 9608105552, σελίδες 475.</p> <p>+Χόουιτ Ντένις - Κράμερ Ντάνκα, (2003), «ΣΤΑΤΙΣΤΙΚΗ ΜΕ ΤΟ SPSS 11 ΓΙΑ WINDOWS», Εκδόσεις Κλειδάριθμος, ISBN 9602096721, σελίδες 292.</p> <p>- Related academic journals:</p>
