COURSE OUTLINE

1. GENERAL

SCHOOL	NATURAL SCIENCES
DEPARTMENT	MATHEMATICS
LEVEL OF COURSE	UNDERGRADUATE

COURSE CODE	MAT_ST437	**SEMESTER OF STUDIES**	8th

COURSE TITLE	INTRODUCTION TO DATA ANALYSIS

INDEPENDENT TEACHING ACTIVITIES *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*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
Lectures and Tutorials	4	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Elective course
PREREQUISITE COURSES:	Recommended prerequisite knowledge: LINEAR ALGEBRA I, PROBABILITY I and II, STATISTICAL INFERENCE I and II
TEACHING AND ASSESSMENT LANGUAGE:	Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No
COURSE WEBPAGE (URL)	https://eclass.math.upatras.gr/courses/MATHDEP248/

2. LEARNING OUTCOMES

Learning outcomes
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.   *Consult Appendix A*   • *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*   • *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning*   *and Appendix B*   • *Guidelines for writing Learning Outcomes*

The student, after successfully completing the course, will be in position to:

- Choose suitable descriptive statistics and graphs that concisely describe the data, as well as to interpret the information included in them.
- Apply basic methods of multivariate statistical analysis.
- Proceed in statistical inference regarding multivariate data.
- Interpret the output produced from the statistical analysis of data using statistical programs/packages.

General Abilities

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	*Others…*
Production of new research ideas	

- Search, analyze and synthesize data and information using the necessary technologies.
- Decision making.
- Working in an interdisciplinary environment.
- Autonomous work.
- Teamwork.

3. COURSE CONTENT

Introduction to multivariate statistical analysis. Random vectors. Joint moment generating function of random vector. Multivariate normal distributions. Estimation of multivariate normal distribution parameters. Methods and techniques of analysis of multidimensional statistical data. Principal Components Analysis. Data processing using statistical programs. Applications of statistical analysis methods in Social and Economic Sciences.

4. TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD *Face-to-face, Distance learning, etc..*	Lectures (face to face)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES *Use of ICT in teaching, laboratory education, communication with students*	Use of computers and statistical programs.

TEACHING ORGANIZATION

The manner and methods of teaching are described in detail.

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.

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

Activity	Semester workload
Lectures	39
Tutorials and Laboratory Exercises	26
Solving suggested exercises	35
Hours of personal study by the student	47
Final examination	3
Total number of hours for the Course (25 hours of work-load per ECTS credit)	**150**

STUDENT ASSESSEMNT

Description of the evaluation procedure

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

Specifically-defined evaluation criteria are given, and if and where they are accessible to students

Assessment Language: Greek
Assessment Language for Erasmus students: ---

Assessment methods: Written Final Course Examination (100%) including :
✓ Theory
✓ Exercises

Minimum passing grade: 5
Maximum passing grade: 10

5. RECOMMENDED LITERATURE

(*in Greek*)
- Καρλής Δημήτρης. *Πολυμεταβλητή Στατιστική Ανάλυση*. Εκδόσεις Σταμούλη, 2005.
- Καραπιστόλης Δημήτριος Ν. *Πολυδιάστατη Στατιστική Ανάλυση*. Εκδόσεις Αθανάσιος Αλτιντζής, 2011.
- Bartholomew David J., Steele Fiona, Moustaki Irini, Galbraith Jane I. *Ανάλυση Πολυμεταβλητών Τεχνικών στις Κοινωνικές Επιστήμες*. 2η Έκδοση, Εκδόσεις Κλειδάριθμος, 2011.
- Κουρούκλης Σταύρος και Αλεβίζος Φίλιππος. *Μια Εισαγωγή στην Πολυδιάστατη Ανάλυση*. Σημειώσεις μαθήματος, 2006.