COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Financial and Management Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΓΕ0172	**SEMESTER**	6
COURSE TITLE	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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).	3	5

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Prescribed Core Module
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek.
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	http://www.fme.aegean.gr/en/c/data-analysis

(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*

At the end of the course, students are able to

- Understand the data analysis process.
- Have a working knowledge of different data analysis tools and visualization techniques.
- Have an understanding of various statistical data analysis models.
- Have a working knowledge of some of the more significant current research in

the area of data analysis.
- Be able to effectively apply a number of data analysis algorithms to solve data analysis problems from various problem domains.
- Be familiar with several successful applications of data analysis.

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…*
	…….

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Adapting to new situations
- Decision-making
- Working independently
- Working in an interdisciplinary environment
- Production of new research ideas

(3) SYLLABUS

- Introduction to Data Analysis
- Data Collection, Cleaning and Exploration
- Data Visualization
- Introduction to Statistical Models for Data Analysis
- Regression
- Linear Discriminant Analysis and Classification
- Bayesian Modeling
- High-Dimensional Data
- Spectral methods (PCA/SVD)
- Clustering
- Case Study: Recommender Systems
- Case Study: Business Analytics
- Case Study: Social Network Analysis

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in communication with students	
TEACHING METHODS *The manner and methods of teaching are*	***Activity***	***Semester workload***

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*	Lectures: 39 hours (1.56 ECTS) Personal study: 83 hours (3.32 ECTS) End of semester exam: 3 hours (0.12 ECTS) Course total: *125 hours (5 ECTS)*
STUDENT PERFORMANCE EVALUATION *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.*	*Language of evaluation:* Greek. *Method of evaluation:* Final Project 30% Final Exams 70%

(5) ATTACHED BIBLIOGRAPHY

1) Principal Reference:

I. Papadimitriou, Data Analysis, (in Greek)

2) Additional References:

T. E. Mpehrakis, Multidimensional Data Analysis, (in Greek)