COURSE OUTLINE

1. GENERAL

SCHOOL	OF SCIENCES		
DEPARTMENT	OF PHYSICS		
LEVEL OF STUDIES	Level 6		
COURSE CODE	CHE807	**SEMESTER**	8ο
COURSE TITLE	DATA ANALYTICS		

TEACHING ACTIVITIES *If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
LECTURES	3	6
Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.		

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	Scientific Area, Skill Development
PREREQUISITES:	-
TEACHING & EXAMINATION LANGUAGE:	GREEK
COURSE OFFERED TO ERASMUS STUDENTS:	NO
COURSE URL:	https://eclass.emt.duth.gr/courses/PHYSICS224/

2. LEARNING OUTCOMES

Learning Outcomes

Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Aim of this course is to introduce students to the concepts and methods of data analysis and their application to real-world problems.

Upon successful completion of the course, students will have acquired the ability to:

- Understand the operation and use of modern data analysis methods.
- Analyze and extract knowledge from real data.
- Develop collaborations with other students to solve problems related to this course.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

- *Searching, analyzing, and synthesizing data and information, using the necessary technologies.*
- *Decision making.*

- *Promoting free, creative and inductive reasoning*
- *Application of knowledge in practice*
- *Autonomous work*

3. COURSE CONTENT

Introduction: definitions, data, examples. Probabilities and random variables: probability elements, distributions, distribution parameters, basic distributions. Statistical data: parameter estimation and hypothesis testing. Uncertainty and measurement error: systematic and random errors, propagation of error. Correlation and regression: correlation, simple and multiple regression, linear and nonlinear regression. Time series: basic characteristics of time series, correlation in time series.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Face to Face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	Use of ICT in Teaching Use of ICT in Communication with students
TEACHING ORGANIZATION *The ways and methods of teaching are described in detail.* *Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.* *The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.*	*Activity* / *Workload/semester* Lectures: 100 Tutorial: 40 Self study/Analysis of Bibliography/ Preparation: 10 Course total (25 hours / ECTS): **150**
STUDENT EVALUATION *Description of the evaluation process* *Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report,Clinical examination of a patient,Artistic interpretation, Other/Others* *Please indicate all relevant information about the course assessment and how students are informed*	**Student Assessment Languages** Greek **Methods (Formative or Concluding)** Concluding **Student Assessment Methods** — **Percentage** *Written final exam with problem solving* — 90% *Writing short assignments* — 10%

5. SUGGESTED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

- Εφαρμοσμένη Στατιστική, Μπόρα-Σέντα Ε. και Μωυσιάδης Χ., Εκδόσεις Ζήτη, Θεσσαλονίκη 1997.
- Computational Statistics Handbook with MATLAB, Martinez W.L. and Martinez A.R., Chapman and Hall, 2002.
- Exploratory Data Analysis with MATLAB, Martinez W.L. and Martinez A.R., Chapman and Hall, 2005.
- Statistical Techniques for Data Analysis, Taylor J.K. and Cihon C., Chapman and Hall, 2004.
- Making Sense of Data, A Practical Guide to Exploratory Data Analysis and Data Mining, Myatt G.J., Wiley-Interscience, 2007.
- Time Series Analysis, Forecasting and Control, Box G.E.P., Jenkins G.M. and Reinsel G.C., Prentice Hall, 1994.
- Hyperstat, βιβλίο στο διαδίκτυο (online Book): http://davidmlane.com/hyperstat/
- Concepts and Applications of Inferential Statistics, Lowry R., βιβλίο στο διαδίκτυο (online book): http://faculty.vassar.edu/lowry/webtext.html