COURSE OUTLINE

(1) GENERAL

SCHOOL	Engineering		
ACADEMIC UNIT	Mechanical Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΟΠ0211	**SEMESTER**	1st
COURSE TITLE	Applied Statistics		

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**
Lectures	5	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, specialized general knowledge, skills development*	General background
PREREQUISITE COURSES:	N/A
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://www.mie.uth.gr/?page_id=17693&lang=en

(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 aim of the course is the understanding of basic principles of probability theory and statistical analysis and their application to problems in industrial production and management.

Upon successful completion of this course, the student will be able to:

- Define mathematical models for systems characterized by uncertainty
- Solve these models to evaluate the performance of the systems they describe
- Analyze data using statistical techniques and use the results of the analysis to make decisions

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

- Retrieving, analyzing and synthesizing data and information, with the use of necessary technologies
- Autonomous work
- Decision making
- Project design and management
- Exercising judgment and self-evaluation
- Promotion of free, innovative and inductive thinking

(3) SYLLABUS

Probability: concept of probability, conditional probability, multiplicative law, stochastic independence, Bayes rule. Random variables: discrete and continuous random variables, probability mass function, probability density function, moments (mean, variance), variable transformation, joint probability mass function, covariance, correlation coefficient. Random variable distributions: uniform, binomial, geometric, Poisson, normal, exponential. Statistical estimates: sampling, point estimates, properties and distributions of estimates, central limit theorem, confidence intervals.

(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 class web page
TEACHING METHODS *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	70
Homework	35
Autonomous work	45
Course total	*150*

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.*	I. Written final exams (70%) II. Homework (30%)

(5) **ATTACHED BIBLIOGRAPHY**

-Suggested bibliography:

- *Μπερτσεκάς Δ.Π., Τσιτσικλής, Γ.Ν., Εισαγωγή στις Πιθανότητες, Εκδόσεις Τζιόλα, 2010.*
- *Μπερτσεκάς Δ.Π., Τσιτσικλής, Γ.Ν., Εισαγωγή στις Πιθανότητες με Στοιχεία Στατιστικής, Εκδόσεις Τζιόλα, 2013.*
- *Παπούλης Α., Πιθανότητες, Τυχαίες Μεταβλητές και Στοχαστικές Διαδικασίες, Εκδόσεις Τζιόλα, 2002.*
- *Ross S., Βασικές Αρχές Θεωρίας Πιθανοτήτων, Εκδόσεις Κλειδάριθμος, 2011.*
- *Montgomery D.C., Runger G.C., Applied Statistics and Probability for Engineers, Wiley, 1994.*

-Related academic journals:

- *Advances in Applied Probability*
- *Journal of Applied Probability*
- *Probability in the Engineering and Informational Sciences*