COURSE OUTLINE

(1) GENERAL

SCHOOL	Polytechnic School		
ACADEMIC UNIT	Department of Financial and Management Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΓΕ0143	SEMESTER	2nd
COURSE TITLE	Probability / Probability Tutorials		

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
	6	4.5
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*	General Background
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/probabilities

(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 objective of the course is twofold. On one hand, to introduce student to basic underlying principles of the Probability Theory and on the other hand the deep understanding of its meanings and how they are applied in solving theoretical and practical problems. In addition, it is sought the acquisition of the prerequisite background for understanding subsequent courses of the study cycle, but also the linkage of the field of knowledge with acquired knowledge and concepts that have been encountered earlier in the study cycle.

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

- ✓ Describe the concepts of a random experiment, a sample space and an event
- ✓ Describe the classical and the axiomatic foundations of Probability Theory and use the main properties of probability measure
- ✓ Apply the basic enumeration principles and use the formulas for the number of

permutations and combinations of a set of objects
- ✓ Describe the concept of conditional probability and of the stochastic independence of events
- ✓ Solve probability problems using the total probability theorem, Bayes' formula and the multiplication rule
- ✓ Describe the concept of random variable, of distribution function, of probability mass function and of probability density function
- ✓ Recognize the most important special discrete and continuous distributions

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…
…….

- ✓ Analysis and synthesis of data and information
- ✓ Working independently
- ✓ Teamwork

(3) SYLLABUS

Sample spaces, events, probability, products and sample spaces, finite sample spaces, counting rules, conditional probability, the multiplication rule, the law of total probability and Bayes' rule, independence. *Discrete random variables*: Random variables, the probability distribution of a discrete random variable, functions of discrete random variables, the Bernoulli and Binomial distribution, the Geometric distribution, the Hypergeometric distribution, the negative Binomial distribution, the Poison distribution; *Continues random variables*: Probability density functions, functions of continues random variables, the uniform distribution, the exponential distribution, the normal distribution;

(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*	
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.*	

Activity	*Semester workload*
Lectures	39
Tutorials	39
Study and analysis of bibliography	57

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		
	Course total	***135***
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.*	Weekly assignments (25%) and final exam (75%)	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Koutras, M., *Introduction to probability. Theory and Applications*, Volume 1, Stamoulis, 2004
2. Koutras, M., *Introduction to probability. Theory and Applications*, V;olume 2, Stamoulis, 2004
3. Hoel, P., Port, S., Stone, C, *Introduction to probability theory*, Crete University Press, 2009
4. Ross, S., *A first course in probability*, Klidarithmos, 2011
5. Walpole Ronald E., Myers Raymond H., Myers Sharon L., Ye Keying, *Probability and Statistics*, Tziola, 2019
6. Montgomery Douglas- Runger C. George, *Applied probability and statistics for engineers*, Tziola, 2017
7. Papoulis Athanasios,Pillai S. Unnikrishna, *Probability, random variables and stochastic processes*, Tziola, 2019

- Related academic journals: