

■ CC34 - Probability I

GENERAL

SCHOOL	EXACT SCIENCES		
DEPARTMENT	MATHEMATICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	CC34	SEMESTER	C
COURSE TITLE	PROBABILITY I		
INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	ECTS	
Lectures	5	8	
COURSE TYPE	Scientific Field		
PREREQUISITE COURSES	-		
LANGUAGE OF TEACHING AND EXAMINATIONS	Greek/English		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	http://eclass.uowm.gr/		

LEARNING OUTCOMES

Learning Outcomes
<p>Upon successful completion of the course, the students:</p> <ul style="list-style-type: none"> • will be able to use the basic rules of probability calculus, • will be familiarized with the notion of the univariate random variable, • will be able to gauge several parameters (mean value, covariance etc.) of probability distributions of discrete and continuous random variables, • will have consolidated the definitions of some basic univariate discrete and continuous probability distributions.
General Competencies

- Search for, analysis and synthesis of data and information, by use of the necessary technology.
- Decision making.
- Production of free, creative and inductive thinking, which is based on mathematical processes.

CONTENT OF THE COURSE

Random phenomena. Sample space- event space- event operations. Classical probability definition, statistical regularity, geometric probability, axiomatic definition.

Conditional probability. Total probability theorem- Bayes formula, independence.

Basic combinatorial analysis, Permutations, Combinations. Stirling formula. Discrete and continuous random variables. Probability distribution function. Properties of probability distribution function. Functions of random variables.

Mean value, variance, standard deviation, moments, probability generating functions, moment generating functions.

Basic univariate discrete probability distributions (uniform, Bernoulli, binomial, geometric, hyper-geometric, Poisson, negative binomial).

Basic univariate continuous probability distributions (uniform, exponential, normal, Gamma).

Multi-dimensional random variables- multi-dimensional probability distributions.

TEACHING AND LEARNING METHODS - EVALUATION

TEACHING METHOD	In the classroom.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Use of e-class. Communication through face-to-face discussions and e-mails.	
TEACHING ORGANIZATION	Activity	Semester Workload
	Lectures	65 hours
	Projects	45 hours
	Individual Study	90 hours
	Course Total (25 hours per ECTS)	200 hours
STUDENT EVALUATION	Projects 20%. Written final examination 80%.	

RECOMMENDED BIBLIOGRAPHY

1. Kounias E. and Moysiadis P., Probability theory I , Ziti Publications 1995. (Greek)
2. Haralampidis C. A., Probability theory and applications, S. Athanasopoulos Publications, 2009. (Greek)
3. BASIC PRINCIPLES OF PROBABILITY THEORY, SHELDON ROSS, Publications KLEIDARITMOS 2011.
4. Introduction to Probability Theory and Applications, Koutras M., TSIOTRAS Publications ATH. 2018.