COURSE OUTLINE

Ημερομηνία: 8 Νοε 2022

A. INFORMATION FOR THE COURSE

A1. School	School of Science and Technology of Information
A2. Department	Department of Statistics
A3. Master Programme	
A4. Course Code	6126
A5. Title of the Course	STOCHASTIC PROCESSES I

Lecturers

Name	Rank	Specialization
ZAZANIS MICHAEL	Professor	Applied Probability - Operations Research
KASKOURAS CHRISTOS	PhD Candidate	

B. TYPE OF COURSE

B1. Year of Study	2
B2. Semester	3rd
B3. Level of Course (if applicable)	1st Cycle
B4. Type of course	Core
B5. Field	Scientific Field
B6. ECTS credits allocated (ECTS)	8.00
B7. Is the Course in the Syllabus?	Yes
B8. If yes, which is the reference Page?	29-68
B9. Is there a site for the course?	Yes https://www.dept.aueb.gr/el/stat-courses

C. INSTRUCTION

C1. Lectures Include:	Classroom lectures: Yes Distance learning lectures: No Seminars: No Laboratory exercises: No Field training exercise: No Literary analysis: Yes Tutorial: Yes Interactive teaching: No Educational visits: No Project: No Essays/reports: No Independent study: Yes Lectures given by scientists: No Internship: No
C2. Scheduled Hours for Lectures per week	4.00
C3. Scheduled Hours for Tutorials per week	
C4. Scheduled Hours for Workshops per week	2.00
C5. Scheduled Hours for Case Studies per week	
C6. Scheduled Hours for Other Activities per week	
C7. Scheduled Hours for Lectures per semester	52
C8. Scheduled Hours for Tutorials per semester	
C9. Scheduled Hours for Workshops per semester	26
C10. Scheduled Hours for Case Studies per semester	
C11. Scheduled Hours for Other Activities per semester	
C12. Mode of Delivery	Face to Face
C13. Student’s Evaluation	Written examination at the end of the semester: Yes Oral examination: No Midterm exam: No Homework: No Project: No Public Presentation: No Laboratory exercises: No Practical exercises: No Exempt work: No

C14. Language of Instruction	Greek

D. PREREQUISITE COURSES

Πιθανότητες Ι, Πιθανότητες ΙΙ, Γραμμική Άλγεβρα Ι, Μαθηματικός Λογισμός Ι.

E. COURSE CONTENTS (Syllabus)

Introduction. probability generating functions, Poisson limit theorems. The random walk. Combinatorial and probabilistic arguments. Markov Chains in discrete time. State classification. Asymptotic behavior, stationary distriction and balance equations. Time reversibility. Speed of convergence to stationarity. Perfect simulation and the Propp—Wilson algorithm. The Poisson process. Markov chains in continuous time. Branching processes. Birth, death, and immigration processes.

F. LEARNING OUTCOMES

Upon successful completion of the course, students should be able to: classify stochastic processes according to the state space and the parameterization set, determine whether a stochastic process is stationary or non-stationary, know the basic properties of a simple random walk process on the integers, Poisson and Wiener processes in continuous time, Markov chains in discrete time, renewal and branching processes.

G. LITERATURE

G1. Use of Multiple Literature	Yes
G2. Recommended or required reading	