

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY		
ACADEMIC UNIT	DEPARTMENT OF STATISTICS		
LEVEL OF STUDIES	1st Cycle (UNDERGRADUATE)		
COURSE CODE	6106	SEMESTER	5 th
COURSE TITLE	Bayesian Statistics		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
Lectures		4	7
Workshops			
Labs		1	
COURSE TYPE	Elective		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://www.dept.aueb.gr/en/stat/content/bayesian-stat-7-ects		

(2) LEARNING OUTCOMES

Learning outcomes
After successful completion of the course, students will be able to handle issues regarding: objective and subjective probability, features in the Bayes approach, the likelihood principle, a-priori distribution and how to choose one (conjugate, non-informative, improper, Jeffreys, a-priori mixtures), Sufficiency and sequential updating, Multivariate Bayesian statistics, Statistical inference: (decision theory, Bayes risk, Bayes rule, MINIMAX rule, point estimate, interval estimation, hypothesis testing), predictive distribution, Markov chain Monte Carlo algorithms.
General Competences

(3) SYLLABUS

The aim of this course is to introduce students to the Bayesian approach to statistics and to compare the Bayesian with the classic (frequentist) approach to statistics. During this course are taught: objective and subjective probability,

features in the Bayes approach, the likelihood principle. A-priori distribution and how to choose one (conjugate, non-informative, improper, Jeffreys, a-priori mixtures). Sufficiency and sequential updating. Multivariate Bayesian statistics. Statistical inference: decision theory, Bayes risk, Bayes rule and MINIMAX. Point estimate, interval estimation, hypothesis testing. Predictive Distribution. Asymptotic theory. Markov chain Monte Carlo algorithms.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	YES	
TEACHING METHODS	Activity	Semester workload
	Lectures	60
	Studying and Analyzing Bibliography	30
	Assignment	30
	Self Study	55
	Course total	175
STUDENT PERFORMANCE EVALUATION	Written examination at the end of the semester Information is available at eclass	

(5) ATTACHED BIBLIOGRAPHY

• Δελλαπόρτας Π & Τσιαμυρτζής Π (2012) "Στατιστική κατά Bayes". Πανεπιστημιακές Σημειώσεις: • Bernardo J. M. & Smith A. F. M., (1994). Bayesian Theory, Wiley, London. • Carlin B.P. & Louis T.A. (2000). Bayes and Empirical Bayes Methods for Data Analysis, Chapman and Hall/CRC. • O' Hagan A. and Forster J. (2004). Kendall's advanced Theory of Statistics, Volume 2b: Bayesian Inference, Edward Arnold, London.
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