

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY		
ACADEMIC UNIT	DEPARTMENT OF STATISTICS		
LEVEL OF STUDIES	1st Cycle (UNDERGRADUATE)		
COURSE CODE	6033	SEMESTER	4rth
COURSE TITLE	Sampling		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
Lectures		4	7
Workshops			
Labs		2	
COURSE TYPE	Elective – Scientific Field`		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO		
COURSE WEBSITE (URL)	https://www.dept.aueb.gr/en/stat/content/sampling-7-ects		

(2) LEARNING OUTCOMES

Learning outcomes
The students who attend and successfully pass the course will be ideally able to apply basic methods of sample selection and to combine these methods to collect a sample from a finite population. To choose the most effective and appropriate plan, depending on the population, among alternatives. To find estimators, their typical errors, confidence intervals and in general, statistical inference based on the sampling method used to collect the data. To be aware of sampling and non-sampling errors entering a survey and how to minimize them, and finally to compile an effective questionnaire.
General Competences
• Search, analysis and synthesis of data and information, using the necessary technologies • Adaptation to new situations • Decision-making • Respect for the natural environment • Exercise of criticism and self-criticism • Promotion of free, creative and inductive thinking

(3) SYLLABUS

1. Introductory Concepts and Principles
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Finite populations, subpopulations, and variables. Census and sample surveys. Probability and non-probability sampling. Inclusion and selection probabilities of population units. Finite population parameters and their estimation. Properties of estimators. Sampling frames, questionnaires, and methods of data collection. Sources of error in sample surveys.

2. Simple Random Sampling

Principles and implementation of simple random sampling. Estimation of population totals, means, and proportions. Variance estimation and confidence intervals. Determination of the required sample size.

3. Stratified Sampling

Principles and implementation of stratified sampling. Estimation of population parameters and their variances. Allocation of the sample among strata, including proportional and optimal allocation. Comparison of stratified sampling with simple random sampling.

4. Systematic Sampling

Principles and implementation of systematic sampling. Estimation of population parameters and variance estimation. Comparison of systematic sampling with other sampling designs.

5. Cluster Sampling

Principles and applications of cluster sampling. Single-stage cluster sampling. Sampling with equal- and unequal-size clusters. Two-stage cluster sampling and estimation of population parameters.

(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	50
	Lab Exercise	20
	Tutorials	30
	Assignments	5
	Self Study	70
	Course total	175
STUDENT PERFORMANCE EVALUATION	Written examination at the end of the semester. The instructor may additionally conduct a supplementary oral examination of a selected sample of students, based on an appropriate sampling procedure, the outcome of which shall be taken into consideration in determining the final grade. Information is available at eclass.	

(5) ATTACHED BIBLIOGRAPHY

• Παπαγεωργίου Ι., Θεωρία Δειγματοληψίας, 2016. • Sarndal, C-E., Swensson, B., Wretman, J. (1992) Model assisted survey sampling. Springer. • Lohr, S. (2010) Sampling: Design and Analysis. 2nd Edition. Brooks/Cole. Sengage learning. • Kish, L. (1965). Sampling Surveys. John Wiley & Sons. New York. • Barnett, V. (1974). Elements of Sampling Theory. The English Universities Press Ltd. • Pascal Ardilly, Yves Tillé. Sampling Methods: Exercises and Solutions. • Δαμιανού, Χ. (2006) Μεθοδολογία της Δειγματοληψίας. Τεχνικές και εφαρμογές. Εκδόσεις Σοφία. • Ξεκαλάκη Ε. (1995) Τεχνικές Δειγματοληψίας. Σημειώσεις, Οικονομικό Πανεπιστήμιο Αθηνών.
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