COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Information Sciences & Technology		
ACADEMIC UNIT	Department of Statistics		
LEVEL OF STUDIES	1st Cycle (undergraduate)		
COURSE CODE	**6128**	**SEMESTER**	**5th**
COURSE TITLE	**Advanced Sampling Methods**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	4	7
Workshops		
Labs		

COURSE TYPE	Elective – Scientific Field
PREREQUISITE COURSES:	Knowledge of topics related to Sampling will be useful
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/advanced-sampling-methods-7-ects

(2) LEARNING OUTCOMES

Learning outcomes
Upon successful completion of the course, students will be able to recognize the type of statistical problems in real-time sample surveys as well as to select and apply the appropriate by case methodology. They will also have the ability to evaluate the quality of the results of the selected method.
General Competences
• Decision-making • Independent work • Teamwork • Promoting free, creative and inductive thinking

(3) SYLLABUS

- Sampling with unequal probabilities of selection.
- Sampling with probabilities proportional to size.
- Sampling weights.
- Parameter estimation methods for unequal probability sampling and calculation of estimator variance.
- Cluster sampling with unequal probabilities.

- Use of auxiliary information in estimation
- Ratio estimator.
- Regression estimator.
- Post-stratification estimator
- Variance estimation in complex sample designs.
- Estimation for subpopulations (Domain estimation).
- Estimation for rare populations.
- Treatment of non-sampling errors.
- Adjustment methods for non-response. Reweighting, Imputation.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	YES
TEACHING METHODS	

Activity	*Semester workload*
Lectures	52
Lab Exercises	35
Studying and analyzing Bibliogrpahy	10
Assignment	8
Sel 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

- Academic Notes.
- Papageorgiou, I. (2016). Sampling Theory [Electronic Resource]. Hellenic Academic eBooks and Resources - "Kallipos" Repository. (in Greek). https://repository.kallipos.gr/handle/11419/1296
- Lumley, T. (2010). Complex surveys: A guide to analysis using R [Electronic resource]. Wiley. https://onlinelibrary.wiley.com/doi/book/10.1002/9780470580066
- Lehtonen, R., & Pahkinen, E. (2014). Practical methods for design and analysis of complex surveys [Electronic resource]. Wiley. https://onlinelibrary.wiley.com/doi/book/10.1002/0470091649
- Laaksonen, S. (2018). Survey methodology and missing data [Electronic resource]. Springer International Publishing. https://link.springer.com/book/10.1007/978-3-319-79011-4
- Longford, N. T. (2005). Missing data and small-area estimation [Electronic resource]. Springer London. https://link.springer.com/book/10.1007/1-84628-195-4

- Lu, Y., & Lohr, S. L. (2022). R companion for sampling: Design and analysis, third edition [Electronic resource]. Chapman & Hall. https://math.unm.edu/~luyan/rbook/Rbook.pdf