

Academic Year: ( 2023 / 2024 )

Review date: 22-05-2022

Department assigned to the subject: Statistics Department

Coordinating teacher: MARIN DIAZARAQUE, JUAN MIGUEL

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

Probability  
Statistical Inference  
Programming in R

**OBJECTIVES**

ACQUISITION of KNOWLEDGE about:

- 1) Introduction to sample designs. Inference under a design versus inference under a model. Traditional direct and indirect sample estimators.
- 2) Sampling models at the level of small areas. Synthetic Post-stratified Estimator and Composite Estimator. Fay-Herriot area-level model. Model at the level of individuals with nested errors. EBLUP predictors.
- 3) Method and EB predictors. Extensions for categorical data models.

**DESCRIPTION OF CONTENTS: PROGRAMME**

Common topics to the subjects:

- 1) Sampling distributions.
- 2) Multivariate distributions.
- 3) Conditional distributions on the observed sample.

Specific topics to each subject:

- 1) Introduction to sample designs. Inference under a design versus inference under a model. Traditional direct and indirect sample estimators.
- 2) Test models at the level of small areas. Synthetic Post-stratified Estimator and Composite Estimator. Fay-Herriot area-level model. Model at the level of individuals with nested errors. EBLUP predictors.
- 3) Method and EB predictors. Nested error model. Extensions for categorical data models.

**LEARNING ACTIVITIES AND METHODOLOGY**

Theoretical classes  
Practical classes  
Laboratory practices  
Tutorials  
Team work  
Individual students' work

**ASSESSMENT SYSTEM**

Class participation  
Individual or group work done during the course  
Final exam

<b>% end-of-term-examination:</b>	100
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	0

**BASIC BIBLIOGRAPHY**

- Rao, J.N.K. and Molina, I. Small Area Estimation, Wiley, 2015

#### ADDITIONAL BIBLIOGRAPHY

- Särndal, C.E., Swenson, B. and Wretman, J.H. Model Assisted Survey Sampling, Springer-Verlag, 1992