

Survey Sampling

Course title - Intitulé du cours	Survey Sampling
Level / Semester - Niveau /semestre	M2 / S1
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	RUIZ-GAZEN Anne
Lecture Hours - Volume Horaire CM	21
TA Hours - Volume horaire TD	0
TP Hours - Volume horaire TP	0
Course Language - Langue du cours	Anglais
TA and/or TP Language - Langue des TD et/ou TP	Anglais

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

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Several means of interaction are possible: after the classes, by email or at my office with prior appointment.

Course Objectives - Objectifs du cours :

For most students this course is the first course on survey sampling and so we expect that the students will learn the basics of survey sampling which includes:

- the understanding of the different possible sources of errors in surveys,
- the understanding of the inference under the sampling design which differs from the usual inference in statistics,
- the knowledge of the basic sampling designs in order to draw a sample from a population in a probabilistic way, including the simple random sampling without replacement, the Bernoulli sampling and the stratified sampling design with different types of allocation,
- the knowledge of the basic methods of estimation which includes the Horvitz-Thompson estimator and some calibration methods.

The students are expected to understand the different notions by using some lectures notes, solving some exercises and implementing the methods with the softwares R or SAS on some real data sets. More advanced methods in survey sampling will be covered at the end of the course through a project based learning approach. Students (in groups of 2 students) will choose a topic of interest among several modern topics in survey sampling. Some references will be provided and the students are expected to write a report and make an oral defense in order to present the project to the other students.

Prerequisites - Pré requis :

Probability and Statistics as taught in the first year of Master in Econometrics and Statistics.

Practical information about the sessions - Modalités pratiques de gestion du cours :

During lectures and when working on the exercises, the students need to bring a simple calculator (no laptop nor tablet)

During the computer lab sessions, the students can bring their own laptop or tablet or use the computers in the room.

In order to respect their teacher and class mates, the students are expected not to be more than 5 minutes late.

Grading system - Modalités d'évaluation :

The final grade is divided in 3 parts:

- 2 points out of 20 on a small midterm exam (10-15 minutes exam on the lecture notes)
- 10 points out of 20 on a final exam at the end of the course (2 hours with no document and with some questions on the course and exercises)
- 8 points out of 20 on the final project (report and oral defense) at the end of the course.

Bibliography/references - Bibliographie/références :

Some printed lecture notes will be provided together with exercises and corrections. Some interesting references available at the library at the Manufacture are the following :

- Cochran, *Sampling techniques*, Wiley, 1977
- Lorh, *Sampling, design and analysis*, Pacific Grove, CA : Duxbury Press 1999
- Sarndal, Swensson, Wretman, *Model-assisted survey sampling*, Springer, 1992

Session planning - Planification des séances :

All the details concerning the different sessions will be given during the first lecture.

Distance learning – Enseignement à distance :

Distance learning can be provided when necessary by implementing, for example :

- Interactive virtual classrooms, Online exercises and assignments, Remote tutorials, and Chatrooms via the Moodle site or Zoom.