Institute of Statistics

STAT2540　Survey and Sampling

[15h] 2.5 credits

This course is taught in the 2nd semester

Teacher(s):	Yves Berger
Language:	French
Level:	Second cycle

Aims

Objective (in terms of abilities and knowledge)
This course aims at providing the student the basic knowledges on the sampling methods, with a particular, but not exclusive, emphasis on sampling from (finite) human populations. At the end of the course, the student should be able to correctly designing a simple survey and analysing the results.

Main themes

Topics to be treated
- General framework of inference in finite population; population, sampling, statistics for the inference based on experimental data, linear homogenous estimation: elementary units, complex units.
- Sampling with unequal probabilities: Hansen-Hurwitz and Horvitz-Thompson estimators, for the particular case of simple random sampling.
- Estimators improvement through auxiliary information: ratio estimator, regression estimator
- Sampling from complex units: stratified sampling, cluster sampling, two stages sampling.
- Sampling from biological populations: basic issues in sampling, estimation of the population size.

Content and teaching methods

Summary: Content and methods
- General framework of inference in finite population; population, sampling, statistics for the inference based on experimental data, linear homogenous estimation: elementary units, complex units.
- Sampling with unequal probabilities: Hansen-Hurwitz and Horvitz-Thompson estimators, for the particular case of simple random sampling.
- Estimators improvement through auxiliary information: ratio estimator, regression estimator
- Sampling from complex units: stratified sampling, cluster sampling, two stages sampling.
- Sampling from biological populations: basic issues in sampling, estimation of the population size.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Basic references:
- Mouchart, M. and J.-M. Rolin (1981), Enquêtes et sondages, Série "Recyclage en Statistique, Vol.5, U.C.L. Louvain : Comité de statistique.
- Lohr, Sharon L. (1999), Sampling : Design and Analysis, Duxburry Press: Brooks/Cole Publishing Company.
- Rao Poduri, S.R.S. (2000), Sampling Methodologies with Applications, London: Chapman and Hall.

Other credits in programs

ECGE3DS/MK	Diplôme d'études spécialisées en économie et gestion (Master in business administration) (marketing)	(2.5 credits)	Mandatory
MAP23	Troisième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(2 credits)	
MD3DA/MO	Diplôme d'études approfondies en sciences de la santé (sciences de la motricité)	(2.5 credits)	
STAT21MS/MS	Première année du master en statistique, orientation générale, à finalité spécialisée (marketing et sondage)	(2.5 credits)	Mandatory
STAT22MS/MS	Deuxième année du master en statistique, orientation générale, à finalité spécialisée (marketing et sondage)	(2.5 credits)	Mandatory
STAT3DA/B	diplôme d'études approfondies en statistique (biostatistique et épidémiologie)	(2.5 credits)	
STAT3DA/E	diplôme d'études approfondies en statistique (statistique et économétrie)	(2.5 credits)	
STAT3DA/P	diplôme d'études approfondies en statistique (pratique de la statistique)	(2.5 credits)	