











4.00 credits

15.0 h + 5.0 h

Q2

Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	Concepts and tools equivalent to those taught in teaching unit LSTAT2014 Eléments de probabilités et de statistique mathématique
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.
Learning outcomes	At the end of this learning unit, the student is able to : 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. 1
Evaluation methods	Written exam in session and/or individual project assessed on the project report and its oral defense.
Teaching methods	8 x 2 hours of masterful presentations and 2 x 2 hours of practical exercices on computer. This teaching is designed to adapt quickly to health developments (face-to-face, co-modal or distance teaching). Students are encouraged to regularly check their class schedule on ADE as well as the information available on Moodle.
Content	General framework of inference in finite population : <ul style="list-style-type: none"> • Techniques of random samplings and estimators properties. • Simple random sampling • Stratified random sampling • Uneven probability sampling • Cluster sampling • Multi-level sampling Estimation improvement by use of auxiliary information.
Inline resources	MOODLEUCL : lecture LSTAT2200.
Bibliography	Tillé, Y. (2001). Théorie des sondages : échantillonnage et estimation en populations finies, (Cours et exercices avec solutions), Dunod, Paris. Mouchart M. et J.-M. Rolin (1981), Enquêtes et Sondages, Série " Recyclage en Statistique ", Vol.5, , Louvain : U.C.L., Comité de Statistique. Sharon Lohr (1999), Sampling : Design and Analysis, Duxbury Press Rao Poduri S.R.S. (2000), Sampling Methodologies with Applications, London : Chapman and Hall.
Other infos	It is essential to have taken and successfully completed at least one course in inferential statistics.
Faculty or entity in charge	LSBA

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Data Science : Statistic	DATS2M	4		
Master [120] in Statistics: Biostatistics	BSTA2M	4		
Master [120] in Statistics: General	STAT2M	4		
Approfondissement en statistique et sciences des données	APPSTAT	4		
Master [120] in Economics: General	ECON2M	5		
Mineure en statistique et science des données	MINDATA	4		
Master [120] in Data Science Engineering	DATE2M	4		
Minor in Statistics, Actuarial Sciences and Data Sciences	MINSTAT	4		
Certificat d'université : Statistique et science des données (15/30 crédits)	STAT2FC	4		
Master [120] in Data Science: Information Technology	DATI2M	4		
Additional module in Geography : global change and transition management	APPGEO	4		