





4.00 credits

15.0 h + 5.0 h

Q1

Teacher(s)	Pircalabelu Eugen ;
Language :	French
Place of the course	Louvain-la-Neuve
Learning outcomes	
Evaluation methods	<p>The evaluation for this course consists of three parts:</p> <ul style="list-style-type: none"> • During the semester, the student must hand-in 2 compulsory assignments (short, 1 to 2 pages maximum per assignment), counting for 20% of the final grade. The homework is to be solved individually or in groups of 2. A grade will be awarded per group. • A project (written in French / English in min 5 and max 9 pages in the template on Moodle, annexes not included) which will illustrate the bootstrap method in a concrete case (30% of the points). The project is evaluated on the basis of the written report. The project is to be solved individually or in groups of 2. A score will be awarded per group. • An oral exam (~ 45 min.) at which the lecturer will assess the knowledge of the student with respect to the materials covered during the class (50% of the points). If necessary the lecturer will also ask questions about the results and the methodology used for the report and for the homework. <p>The exact evaluation methods could be adapted according to the constraints linked to the sanitary conditions in force at the time of the exam sessions.</p>
Teaching methods	<p>The class consists of lectures (15h) and exercises sessions (5h). The classes and the TP are intended to be face to face. Teaching language: English.</p>
Content	<p>The class is focused on the presentation of key concepts based on resampling methods such as:</p> <ul style="list-style-type: none"> • Basic ideas of bootstrap • Monte-Carlo methods • Applications to certain basic problems in estimation and inference • Bias/variance of an estimator • Confidence intervals • Hypothesis testing based on resampling • Theoretical properties of bootstrap • Bootstrap for regression • Iterated bootstrap • The jackknife • The "smoothed" bootstrap • Bootstrap for time series models
Inline resources	<p>Moodle website of the class: LSTAT2180 - Méthodes de rééchantillonnage avec applications. https://moodleucl.uclouvain.be/course/view.php?id=8140</p>
Bibliography	<ul style="list-style-type: none"> • Chernick, M.R. (2008). Bootstrap methods : a guide for practitioners and researchers, Wiley Series in Probability and Statistics. • Davison, A.C. et Hinkley, D.V. (1997). Bootstrap Methods and their Applications, Cambridge University Press. • Efron, B. et Tibshirani, R.J. (1993). An Introduction to the Bootstrap, Chapman and Hall. • Hall, P. (1992). The Bootstrap and Edgeworth Expansion, Springer. • Mammen, E. (1992). When does bootstrap work ? Springer.
Faculty or entity in charge	LSBA

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Statistics: General	STAT2M	4		
Master [120] in Statistics: Biostatistics	BSTA2M	4		
Certificat d'université : Statistique et sciences des données (15/30 crédits)	STAT2FC	4		
Master [120] in Mathematical Engineering	MAP2M	4		
Master [120] in Data Science : Statistic	DATS2M	4		