

5.00 credits

30.0 h

Q2

Teacher(s)	Hafner Christian ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Mastery of English at the level of LAGL1330 course. Mastery of basic concepts in statistics and probability calculation, at the level of courses in the FSA1BA, INGE1BA, MATH1BA programs or the access minor in statistics, actuarial sciences and data science.
Main themes	Statistical risk analysis in financial and alternative markets. Estimation of risk measures. Empirical properties of financial time series. Volatility and dependence models. Extreme value theory.
Learning outcomes	
Evaluation methods	70% Written exam 30%: Two projects, 15% each, using empirical data and a statistical software. The use of Artificial Intelligence software such as ChatGPT is not allowed for these projects.
Teaching methods	The class comprises theoretical sessions, exercises, and real world data examples demonstrated on a statistical platform.
Content	Statistical risk analysis in financial and alternative markets. Estimation of risk measures. Empirical properties of financial time series. Volatility and dependence models. Extreme value theory.
Inline resources	MOOC Introduction to econometrics (in french) on edx: https://learning.edx.org/course/coursev1:LouvainX+Louv14x+3T2024/home , to acquire the prerequisites in probability, econometrics and statistics Optional multiple choice tests, not evaluated, to check for each chapter if the student has acquired the material of that chapter. R code and scripts, and the data of the examples shown in class Analytical and numerical exercises, discussed in class
Bibliography	Main reference: McNeil, A., Frey, R. and Embrechts, P. (2015) Quantitative Risk Management, revised edition, Princeton UP. Complementary literature Bauwens, L., Hafner, C.M. and Laurent, S. (2012) Volatility Models and Their Applications, Handbook in Financial Engineering and Econometrics, Wiley. (in particular the first review chapter of this handbook) Franke, J., Härdle, W. and Hafner, C.M. (2015) Statistics of financial markets, 4th ed., Springer. Ruppert, D. (2011) Statistics and Data Analysis for Financial Engineering, Springer. Tsay, R.S. (2010) Analysis of Financial Time Series, Wiley. Tsay, R.S. (2013) An Introduction to Analysis of Financial Data with R, Wiley.
Faculty or entity in charge	LSBA

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Mathematics	MATH2M	5		
Master [120] in Actuarial Science	ACTU2M	5		
Master [120] in Statistics: General	STAT2M	5		
Master [120] in Mathematical Engineering	MAP2M	5		