UCLouvain

lstat2410

2017

Copulas: models and inference

3 credits	15.0 h	Q1

Teacher(s)	Segers Johan ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	The course focuses on copulas and their use in modelling dependence between random variables. Both theoretical and practical aspects will be covered.
Aims	1 By the end of the course, the student will have a working knowledge on copula models and their use in modelling dependence between random variables. He will be able to select, calibrate, and validate a copula model and use the fitted model to answer questions related to multivariate data: calculation of risk measures, prediction, decision making. - - - - *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Content	• Copulas: definitions and general properties • Dependence measures • Elementary copula models: Archimedean, Elliptical, Extreme-value • Advanced copula models: Factor copulas, vine copulas, copulas within other statistical models • Monte Carlo simulation • Inference in parametric and semiparametric models: estimation, testing, model selection • Implementation of methods in R and application to actual data analysis
Bibliography	• Joe, H. (2014) 'Dependence modelling with copulas', Chapman and Hall/CRC. • Mai, J.-F. and Scherer, M. (2012) 'Simulating copulas', World Scientific. • McNeil, A. J., Frey, R. and Embrechts, P. (2015) 'Quantitative Risk Management: Concepts, Techniques and Tools', Princeton University Press.
Other infos	Hand-outs of the slides will be made available to the students.
Faculty or entity in charge	LSBA

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Statistics: General	STAT2M	3		
Master [120] in Statistics: Biostatistics	BSTA2M	3		