LSTAT2170
2016-2017

Times series

5.0 credits	22.5 h + 7.5 h	2q

Teacher(s) :	von Sachs Rainer ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	The principal subjects of this course on an introduction into time series analysis will include the modelling, estimation and prediction of two types of processes - linear processes and heteroscedastic models of non-linear processes. We follow basically a parametric approach - the student will learn how to quantify statistical uncertainty while estimating the model parameters for the problem of forecasting future values of the observedseries.
Aims :	The aim of this course is to give a good comprehension of the theory and application of stochastic time series modelling, with a view towards prediction (forecasting). *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 :	Content 1. Modelling time series data: an introduction 2. Linear processes - simple parametric models (ARMA) 3. Estimation and prediction of ARMA models 4. Box-Jenkins analysis - (S)ARIMA models 5. Non-linear processes - heteroscedastic (G)ARCH models - applications to modelling financial data Methods Basic models of linear time series will be treated in the first part. The data analysis, i.e. estimation of the model parameters for forecasting, will be based predominantly on Box-Jenkins methods. In the second part of the course some elements of modelling financial data with the more recently developed ARCH and GARCH models will be given and included into the practical part of the course (done with the S-Plus software).
Other infos :	Prerequisites A general knowledge of basic statistical concepts (on the level of a first introductory course in statistics) is necessary. Evaluation The examination will be oral. An applied data analysis project has to be prepared on the computer. Teaching material Course notes, von Sachs, R. and S. Van Bellegem, Script. References : Brockwell, P., Davis, R. : Introduction to Time Series and Forecasting. 1996, Springer, New York Brockwell, P., Davis, R. : Times Series : Theory and Methods. 1991, Springer, New York Gourieroux, Ch. : Modèles ARCH et applications financières. 1992, Economica, Paris
Faculty or entity in charge:	LSBA

Programmes / formations proposant cette unité d'enseignement (UE)

Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Master [120] in Biomedical Engineering	GBIO2M	5	-	🔍
Master [120] in Economics: General	ECON2M	5	-	🔍
Master [120] in Actuarial Science	ACTU2M	5	-	🔍
Master [120] in Statistics: Biostatistics	BSTA2M	5	-	🔍
Master [120] in Statistics: General	STAT2M	5	-	🔍
Master [120] in Mathematical Engineering	MAP2M	5	-	🔍
	STAT2FC	5	-	🔍