



5.00 credits

30.0 h + 12.0 h

Q1

Teacher(s)	Monti Francesca ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	Time series analysis requires to understand the notions of stationarity and non-stationarity, which will be presented in an intuitive and detailed way by the use of examples of macroeconomic and financial time series. Then, econometric models adapted to model such series will be explained and applied. The theme of prediction is obviously very important for time series and will be covered for each type of model. Although the course is focused on the univariate approach, an introduction to multivariate aspects is foreseen. Inference methods (like ordinary least squares and maximum likelihood) are taught or reminded in the context of the models that require them.
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>The objective is to train students to use econometric methods for modelling and predicting economic and financial time series. The emphasis is put on applications in macroeconomics and finance, and to the extent necessary for that, on understanding the methods and models.</p> <p>1</p>
Evaluation methods	The evaluation will be based on problem sets (30%) assigned during term and a final written project (70%).
Teaching methods	<p>The course includes lectures by the lecturer, delivered online via Teams, and tutorials supervised by an assistant, delivered in person if the COVID situation permits it.</p> <p>The teacher explains the theory and some implementations. The methods are each illustrated by examples of application in various fields of the economy.</p> <p>During the practical work sessions, students learn to apply the methods seen during the course on real data. This learning is done with the software R.</p>
Content	<p>(subject to change)</p> <ol style="list-style-type: none"> 1. Introduction to Time Series Data and Programming 2. Stationarity 3. Moving Average Model (MA) 4. Auto-Regressive Model (AR) 5. ARMA Modeling 6. Forecasting 7. Non-stationarity and Integrated process 8. VAR 9. Cointegration and VECM 10. Kalman Filter
Inline resources	See Moodle UCL (> https://moodleucl.uclouvain.be/).
Bibliography	<p>Livre de référence (Reference book):</p> <p><i>Time Series Analysis and Its Applications with R Examples (2011)</i>, <u>3rd Edition</u>, Robert H. Shumway, David S. Stoffer</p> <p><i>Times Series Analysis (1994)</i>, James D. Hamilton, Princeton University Press</p> <p>Other books:</p> <p><i>Econometrics (2021)</i>, Bruce Hansen. Available at https://www.ssc.wisc.edu/~bhansen/econometrics/</p>
Faculty or entity in charge	ECON

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Economics: General	ECON2M	5		
Master [120] in Agriculture and Bio-industries	SAIV2M	5		
Master [120] in Mathematical Engineering	MAP2M	5		