



5 credits

30.0 h

Q1

Teacher(s)	Davila Muro Julio ;Van Bellegem Sébastien ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	For the mathematics part, the themes of matrix algebra, functions, optimization, and difference/differential equations. For the statistics part: multivariate distributions and related concepts. The two parts are linked in particular by matrix algebra.
Aims	<p>1 The purpose is that students learn the most important mathematical and statistical tools needed for advanced courses in macroeconomics, microeconomics and econometrics. The course serves mostly to refresh students' knowledge in certain topics, and to ensure that all students taking the advanced courses have a common mathematical and statistical level.</p> <p>-----</p> <p><i>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".</i></p>
Evaluation methods	Written exam
Teaching methods	Methods: Lectures and home works
Content	<p>Mathematics : Matrix algebra (inverse, rank, derivatives, eigenvalues, diagonalization and factorization, quadratic forms). Metric and topological spaces, vector spaces. Real functions on \mathbb{R}^n (continuity, concavity, differentiability, Taylor expansion, mean value theorem, implicit function theorem). Static optimization (constrained and unconstrained). Difference and differential equations (steady states, stability).</p> <p>Statistics: Multivariate distributions: joint, marginal and conditional distributions, (conditional) moments (variance-covariance matrices), independence in probability and linear independence. Law of iterated expectations. Transformation of random vectors. Multivariate normal distribution. Quadratic forms in normal vectors and related distributions (Student, chi-squared, Fisher)</p>
Faculty or entity in charge	ECON

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Economics: Econometrics	ETRI2M	5		
Master [120] in Economics: General	ECON2M	5		
Master [60] in Economics : General	ECON2M1	5		