


5.00 credits

30.0 h

Q1

Teacher(s)	Oikonomou Rigas ;Van Bellegem Sébastien ;
Language :	English
Place of the course	Louvain-la-Neuve
Prerequisites	Basic background in mathematics
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.
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <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>
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 <math>\mathbb{R}^n</math> (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

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [60] in Economics : General	<a href="#">ECON2M1</a>	5		
Master [120] in Economics: General	<a href="#">ECON2M</a>	5		