UCL
Université catholique de Louvain

LECON2500
2010-2011

Mathematics and Statistics for Economics

5.0 credits	30.0 h

Teacher(s) :	Davila Muro Julio ; Bauwens Luc ;
Language :	Anglais
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.
Aims :	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 mathe-matical and statistical level. *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".*
Evaluation methods :	Written exam
Teaching methods :	Methods: Lectures and home works
Content :	Mathematics : Matrix algebra (inverse, rank, derivatives, eigenvalues, diagonalization and factorization, quadratic forms). Met-ric and topological spaces, vector spaces. Real functions on Rn (continuity, concavity, differentiability, Taylor expansion, mean value theorem, implicit function theorem). Static optimization (constrained and uncon-strained). Difference and differential equations (steady states, stability). 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)
Cycle and year of study :	> Master [60] in Economics : General > Master [120] in Economics: General > Master [120] in Economics: Econometrics
Faculty or entity in charge:	ECON