UCLouvain	**lecge1230** *2023*	Mathematics in Economics and Management II

6.00 credits	45.0 h + 30.0 h	Q1

Teacher(s)	Klaessens Pieter ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	*The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Main themes	Education focuses on the approach to modeling, and on solving problems or applications in economics, political and social, using mathematical or formal logic. It aims to develop a systematic analysis and resolution. Part 1: Linear Algebra. Indépendance linear bases, vector spaces. Fundamental theorem of linear algebra. Values and eigenvectors. Diagonalisation. Dynamical Systems. Quadratic forms. Part 2: Analysis and Optimization of functions on several variables functions Théorème implied partial derivative of higher order, Hessienne matrix. Optimization free Optimization under constraints (equalities and inequalities). Applications. Part 3: Introduction to linear programming. Modeling and mathematical formulation of problems of decision support and optimization. Primal Simplex, Dual simplex, economic interpretation of dual sensitivity analysis. Each topic is dealt with examples and illustrations in economics and management.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 The second mathematics course is a continuation of Mathematics 1 and is devoted primarily to algebra and matrix calculus, in linear programming and optimization of functions of several variables. We can summarize the objectives and purposes of the course to two key dimensions: - Learning about the mathematical tool (which is directly targeted a set of knowledge). The achievements should be a reasonable ability to handle the concepts discussed in the course, which are the basic concepts used in the models and quantitative methods in social sciences. - The learning of a formalized and rigorous reasoning (which is more difficult to achieve and is more of "knowledge"; of mathematical modeling)
Evaluation methods	The grade will be determined by a final written examination. A midterm test could be organised too.
Teaching methods	Lectures and exercises sessions
Content	Linear Algebra. Multivariate differential calculus. Unconstrained optimisation. Optimisation with equality constraints (Lagrange), with inequalitity constraints (Kuhn-Tucker). The enveloppe theorem. Interpretation of the multipliers. Linear programs. Duality.
Inline resources	Lecture notes and homeworks for the exercises sessions available on Moodle
Other infos	Prerequisite course : Mathématiques en économie et gestion I
Faculty or entity in charge	ESPO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Minor in Economics	MINECON	6		🔍
Bachelor in Philosophy, Politics and Economics	PPE1BA	6	LECGE1112	🔍
Bachelor in Economics and Management	ECGE1BA	6	LECGE1112	🔍
Minor in Statistics, Actuarial Sciences and Data Sciences	MINSTAT	6		🔍