UCLouvain

mlsmm2155

2024

Quantitative Decision Making

5.00 credits	30.0 h	Q2

Teacher(s)	Catanzaro Daniele ;
Language :	English
Place of the course	Mons
Prerequisites	• MQANT1110 - Mathématiques de gestion 1 • MQANT1227 - Mathématiques de gestion 2 • MQANT1329 - Optimisation • MQANT1223 - Informatique et algorithmique • MINFO1302 - Projet de Programmation
Main themes	This course is designed to develop in the student both the ability to quantitatively analyze practical problems and to interpret and understand quantitative results in order to perform a more informed decision-making. Its aim is to introduce a broad range of optimization concepts and associated quantitative techniques with a view to helping the student appreciate the merits and limitations of these techniques as well as the data and technical requirements involved with their use.
Learning outcomes	**At the end of this learning unit, the student is able to :** This course contributes to develop the following competencies. • Knowledge • Scientific reasoning and systematic approach • Communication and interpersonal skills • Project management 1 • Leadership At the end of this course, students will: • Improve their strategical thinking skills • Acquire fundamental knowledge on the modeling of practical problems • Apply the appropriate techniques to propose a useful solution.
Evaluation methods	The examination method (e.g., project, written exam, or other forms) will be communicated by the lecturer during the first and *madatory* lecture of the course.
Teaching methods	Slided & Blackboard lectures.
Content	This course, taught in english, is designed to develop both the ability to quantitatively analyze very large-scale practical problems in management science and to interpret and understand quantitative results in order to perform a more informed decision-making. Its aim is to introduce a broad range of optimization concepts and associated quantitative techniques with a view to helping the student appreciate the merits and limitations of these techniques as well as the data and technical requirements involved with their use. The specific content of the course may change from year to year but often involves 1. Introduction to Large Scale Optimization 2. Projection, inverse projection, and their applications 3. Heuristics, Local Searches, Metaheuristics, and Matheuristics 4. Optimization methods for machine learning 5. Case studies
Bibliography	The lectures will be integrated with some capita selecta from the following references: (1) R. Kipp Martin. Large Scale Linear and Integer Optimization: A Unified Approach. Springer, 1999. (1) S. Boyd and L. Vandenberghe. Convex Optimization. Cambridge University Press 2004. (2) M. Conforti, G. Cornuejols, G. Zambelli. Integer Programming. Springer, 2014. (3) S. Heipcke. Applications of optimization with Xpress-MP. Dash Optimization, 2002.
Faculty or entity in charge	CLSM

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] : Business Engineering	INGE2M	5		
Master [120] : Business Engineering	INGM2M	5		
Master [120] in Management (with work-linked-training)	GESA2M	5		