LINMA2471

2010-2011

Optimization models and methods

5.0 credits	30.0 h + 22.5 h	1q

Teacher(s) :	Glineur François ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	1. Basic concepts and classification of optimization problems. 2. Introduction to three categories of problems : linear optimization, convex optimization and nonlinear optimization ; for each of them : a.What problems can we formulate ? (presentation of the class of problems that can be modelled) b.How can we solve them ? (description and analysis of relevant solving techniques) 3.Modelling and practical resolution of real-world problems using a modelling language and/or specialized software.
Aims :	Learn how to formulate, analyze and solve optimization problems. *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".*
Content :	Course 1. Optimization models Linear optimization and duality. Convex optimization, duality and conic formulation. Nonlinear optimization and optimality conditions. 2. Optimization methods Interior-point methods for linear optimization, conic optimization (quadratic and semidefinite) and convex optimization ; algorithmic complexity. Trust-region methods and Nelder-Mead method for nonlinear optimization. Exercises and projects Formulation and resolution of concrete problems. AMPL modelling language.
Other infos :	Prerequisites : Basic notions of real calculus, linear algebra and basic notions in optimization (material from the course INMA 2702) Evaluation : Group projects during the semester and final written exam ; course material available on the icampus web site.
Cycle and year of study :	> Master [120] in Mathematical Engineering > Master [120] in Statistics: General > Master [120] in Physical Engineering > Master [120] in Biomedical Engineering > Master [120] in Computer Science and Engineering > Master [120] in Computer Science
Faculty or entity in charge:	MAP