UCLouvain

mqant1329

2017

5 credits	30.0 h + 15.0 h	Q1

Teacher(s)	Catanzaro Daniele ;Meskens Nadine ;
Language :	English
Place of the course	Mons
Main themes	**Part I (Continuous Optimization):** Continuity, differentiability in n dimension, conditions for differentiability, necessary conditions for optimality, convex sets, convex functions, convex optimization problems, Lagrangian duality, descent methods, rudiments of smooth and non-smooth nonlinear optimization; **Part II (Discrete Optimization):** Introduction to integer and combinatorial optimization; formulations; optimality, relaxations, and relationships among relaxations; well-solved problems; matchings and assignments; branch and bound;
Aims	This course contributes to develop the following competencies : • Knowledge • Scientific reasoning and systematic approach 1 Study limits, continuity, directional derivatives and differentiability for functions of several variables. Locate and identify free extrema of a function; locate extrema under constraints of a function using the technique of Lagrange multipliers. Understand and learn the foundations of continuous and discrete optimization and the main computing techniques to tackle an optimization problem. - - - - *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	Students are assessed individually in order to test the competences announced above. The final written exam involves both (i) solving exercises similar to those proposed during the course and the tutorials and (ii) understanding and applying the theory to a specific case.
Teaching methods	Blackboard lectures.
Content	• Limits, continuity and continuous extension for functions of several variables • Directional derivative, differentiation, tangent plane and Jacobian matrix • Partial derivatives of higher order and Taylor polynomials • Fermat's theorem, free extrema and extrema under constraints • Convex sets, convex functions, convex optimization problems, Lagrangian duality • Descent methods, rudiments of smooth and non-smooth nonlinear optimization • Introduction to integer and combinatorial optimization, formulations, optimality, relaxations, and relationships among relaxations • well-solved problems • matchings and assignments • branch and bound
Faculty or entity in charge	CLSM

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Business Engineering	INGM1BA	5		