

5.0 credits	30.0 h + 22.5 h	2q
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Teacher(s) :	Nesterov Yurii ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Main themes :	General nonlinear optimization. Smooth and non-smooth convex optimization. Interior-point methods. Prerequisites: standard undergraduate level in Linear Algebra and Calculus.
Aims :	<p>Introduce a modern theory of optimization and general principles of complexity analysis of algorithms for solving nonlinear problems. Present the most efficient algorithmic schemes.</p> <p><i>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".</i></p>
Content :	<p>-General problem of nonlinear optimization. Black-box concept. Iterative methods and analytical complexity. Gradient method and Newton method. Local complexity analysis.</p> <p>-Convex optimization: convex sets and functions; minimization of differentiable and non-differentiable convex functions; lower complexity bounds; optimal methods.</p> <p>-Interior-point methods: notion of self-concordant functions and barriers; path-following methods; structural optimization.</p>
Other infos :	<p>- copy of transparencies and of the text of the lectures.</p> <p>- Yu.Nesterov. "Introductory lectures on convex optimization. Basic course." Kluwer 2003</p> <p>- P. Polyak, « Introduction in optimization », J. Willey & Sons, 1989</p> <p>- Yu. Nesterov, A. Nemirovsky, « Interior-point polynomial algorithms in nonlinear optimization », SIAM, Philadelphia, 1994.</p> <p>The course is given in English. Evaluation: a written exam (in French or in English).</p>
Cycle and year of study :	> Master [120] in Mathematical Engineering
Faculty or entity in charge:	MAP