INMA1702 Applied mathematics : Optimization

[30h+22.5h exercises] 5 credits

This course is not taught in 2005-2006
This course is taught in the 1st semester
Language: French
Level: First cycle

Aims

The goal of the course is to initiate the students to problem formulation, analysis and resolution of optimization problems arising in engineering and to illustrate the usefulness of optimization theory with practical applications. The course includes an introduction to the use of specialized optimization software.

Main themes

Introduction to the theory and applications of linear and non-linear optimization.

Content and teaching methods

1. Linear programming (formulation, simplex algorithm, duality). Linear programming software.
2. Convex programming. Properties of convex sets, important engineering models (quadratic programming, semi-definite programming), optimality conditions, solution algorithms.
3. For the exercises: description and modeling of optimization problems arising in different engineering areas: filter design, structure optimization, Markovitz model in finance, antenna design, optimization of chemical processes, circuit design, traffic planning, etc.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

no special information