



# Faculté des sciences appliquées

**FSA**

INMA2702 **APPLIED MATHEMATICS : OPTIMIZATION**

[30h+15h exercises] 4 credits

This course is taught in the 1st semester

**Teacher(s):** Vincent Blondel  
**Language:** french  
**Level:** 2nd cycle course

## 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 credits in programs

<b>ELEC22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil électricien	(4 credits)	
<b>INCH21</b>	Première année du programme conduisant au grade d'ingénieur civil chimiste	(4 credits)	
<b>INCH22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil chimiste	(4 credits)	Mandatory
<b>INFO22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil informaticien	(4 credits)	
<b>INFO23</b>	Troisième année du programme conduisant au grade d'ingénieur civil informaticien	(4 credits)	
<b>MAP21</b>	Première année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(4 credits)	Mandatory
<b>MECA22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil mécanicien	(4 credits)	
<b>MECA23</b>	Troisième année du programme conduisant au grade d'ingénieur civil mécanicien	(4 credits)	