

MATH-265

Introduction to optimization and operations research

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Cursus	Sem.	Type
Chemistry	BA5	Opt.
Civil Engineering	BA3	Obl.
Environmental Sciences and Engineering	BA5	Opt.
HES - GC	H	Obl.
HES - GM	H	Obl.
Mechanical engineering	BA5	Obl.
Systems Engineering minor	H	Opt.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	Written
Workload	90h
Weeks	14
Hours	3 weekly
Courses	2 weekly
Exercises	1 weekly
Number of positions	

Remark

Les exercices sont donnés à raison de deux heures toutes les deux semaines.

Summary

Introduction to major operations research models and optimization algorithms

Content

Week 1: introduction to the course
 Weeks 2 & 3: Linear optimization - introduction
 Weeks 4 & 5: The simplex algorithm
 Weeks 6 & 7: Networks and duality
 Week 8: mid-term exam
 Weeks 9 & 10: Transshipment and shortest path.
 Weeks 11 & 12: Integer optimization - Branch and bound.
 Weeks 13 & 14: Unconstrained non linear optimization.

Learning Prerequisites**Required courses**

Linear algebra
 Analysis

Teaching methods

The course is organized on the concept of "flipped classroom".
 Each of the six topics spans two weeks. During the first week, the students review the available material (book, videos, exercises). During the second week, the course in the class focuses on difficult aspects, examples, and responses to questions.
 Exercises are also organized the same way. They are organized in class every over week.

Assessment methods

Written exam

Resources**Bibliography**

Bierlaire (2015) Optimization: principles and algorithms, EPFL Press

Ressources en bibliothèque

- [Bierlaire optimization](#)

Références suggérées par la bibliothèque

- [Bierlaire](#)

Prerequisite for

"Le contenu de cette fiche de cours est susceptible d'être modifié en raison du covid-19"