

MATH-265

**Introduction to optimization and operations research**

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<b>Cursus</b>	<b>Sem.</b>	<b>Type</b>
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	4
Session	Winter
Semester	Fall
Exam	Written
Workload	120h
Weeks	14
<b>Hours</b>	<b>4 weekly</b>
Lecture	2 weekly
Exercises	2 weekly
<b>Number of positions</b>	

**Summary**

Introduction to major operations research models and optimization algorithms

**Content**

introduction to the course  
 Linear optimization - introduction  
 The simplex algorithm  
 Duality  
 Networks  
 Transshipment  
 Shortest path  
 Integer optimization - Branch and bound.  
 Unconstrained non linear optimization.

**Learning Prerequisites****Required courses**

Linear algebra  
 Analysis

**Teaching methods**

The course is a combination of ex-cathedra lectures, interactive sessions and exercises.  
 Interactive sessions allow the student to verify if the main concepts have been well understood.

**Assessment methods**

Written exam

**Resources****Virtual desktop infrastructure (VDI)**

No

**Bibliography**

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

<http://optimizationprinciplesalgorithms.com>

### Ressources en bibliothèque

- [Optimization / Bierlaire](#)

### Moodle Link

- <https://go.epfl.ch/MATH-265>

### Prerequisite for