

MATH-600

Optimization and simulation

Bierlaire Michel

Cursus	Sem.	Type
Civil & Environmental Engineering		Obl.
Neuroscience		Obl.
Systems Engineering minor	E	Obl.

Language of teaching	English
Credits	4
Session	
Semester	Spring
Exam	Multiple
Workload	120h
Weeks	
Hours	90 weekly
Courses	35 weekly
TP	55 weekly
Number of positions	

Remark

Every year/ Next time: Spring 2018

Summary

Master state-of-the art methods in discrete optimization and simulation. Work involves: - reading the material beforehand - class hours to discuss the material and solve problems - homework

Content

Part 1: Simulation

Sheldon M. Ross (1997) Simulation

Draws (Chapters 4 & 5)

Discrete event simulation (Chapter 6)

Statistical data analysis, bootstrapping (Chapter 7)

Variance reduction techniques (Chapter 8)

Markov Chain Monte Carlo methods (Chapter 10)

Part 2: Optimization:

heuristics Bierlaire M. (2015) Optimization: principle and algorithms Classical optimization problems (chapter 25)

Greedy heuristics (section 27.1)

Neighborhood and local search (section 27.2)

Diversification (sections 27.3 and 27.4)

Note

5 weeks on nonlinear optimization + 8 weeks on simulation

Keywords

optimization, simulation

Learning Prerequisites**Required courses**

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Resources**Bibliography**

Bierlaire M. (2015) Optimization: principles and algorithms, EPFL Press
Ross S. (2013) Simulation, Elsevier

Ressources en bibliothèque

- [Optimization : principles and algorithms / Bierlaire M.](#)
- [Simulation / Ross S.](#)