EPFL

MATH-600	**Optimization and simulation**		
	Bierlaire Michel		

Cursus	Sem.	Type
Civil & Environmental Engineering		Obl.
Neuroscience		Opt.
Robotics, Control and Intelligent Systems		Opt.

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

Frequency

Every year

Remark

Every year/ Next time: Spring 2021

Summary

Master state-of-the art methods in optimization with heuristics 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)

Keywords

optimization, simulation

Learning Prerequisites

Required courses

Analysis, algebra, probability and statistics, Python programming language

Supervision

Office hours	Yes

Assistants	Yes
Forum	Yes

Resources

Bibliography

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

Ressources en bibliothèque

- Simulation / Ross S.
- Optimization : principles and algorithms / Bierlaire M.

Websites

- http://transp-or.epfl.ch/

Moodle Link

- http://moodle.epfl.ch/course/view.php?id=6791