

MGT-530

Sustainable logistics operations

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Cursus	Sem.	Type
Managmt, dur et tech	MA2	Obl.

Language of teaching	English
Credits	4
Withdrawal	Unauthorized
Session	Summer
Semester	Spring
Exam	During the semester
Workload	120h
Weeks	14
Hours	4 weekly
Courses	2 weekly
Project	2 weekly
Number of positions	40

Il n'est pas autorisé de se retirer de cette matière après le délai d'inscription.

Summary

We address quantitatively the management of logistics operations, focusing notably on their environmental impact. Considering practical situations, focus is paid on the optimization of logistics systems, in particular when the objective is to minimize their associated environmental footprint.

Content

- Chapter 0: Course Description
- Chapter 1: Introduction - Mobility and Transportation
- Chapter 2: Theoretical Foundation - Mathematical Programming
- Chapter 3: Contextualization - Supply Chains and Logistics
- Chapter 4: The Travelling Salesman Problem
- Chapter 5: The Vehicle Routing Problem and Heuristics
- Chapter 6: Variants of the Vehicle Routing Problem
- Chapter 7: Evolutions in the Logistics Sector
- Chapter 8: Packing Problems
- Chapter 9: Facility Location Problems
- Chapter 10: Supply Chains and Sustainability

Keywords

Logistics; operations research; optimization; mathematical programming; sustainability.

Learning Prerequisites**Important concepts to start the course**

Basic knowledge of Python

Learning Outcomes

By the end of the course, the student must be able to:

- Distinguish the different components that are composing the supply chain and be aware of logistics situations that arise commonly
- Perform to the mathematical modeling of typical situations arising in logistics systems

- Solve these models by using various tools from operations research, ranging from exact methods to heuristics
- Analyze the results and draw managerial insights accordingly

Transversal skills

- Write a scientific or technical report.
- Make an oral presentation.
- Use both general and domain specific IT resources and tools
- Demonstrate the capacity for critical thinking
- Take responsibility for environmental impacts of her/ his actions and decisions.
- Set objectives and design an action plan to reach those objectives.
- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Demonstrate a capacity for creativity.

Teaching methods

- Weeks 1 to 8 : course (in-class) and practical sessions (in-class)
- Week 9 : mid-term quiz (in-class)
- Weeks 10 to 13 : individual group meetings for the project (online)
- Week 14 : project presentations (in-class)

Assessment methods

- Mid-term quiz: 40%
- Team project: 60%

Supervision

Office hours	No
Assistants	Yes
Forum	Yes

Resources

Virtual desktop infrastructure (VDI)

No

Bibliography

- (optional) A Gentle introduction to optimization, B. Guenin, J. Könemann and L. Tunçel, Cambridge University Press, 2014

Ressources en bibliothèque

- [A Gentle introduction to optimization / Guenin](#)

Moodle Link

- <https://go.epfl.ch/MGT-530>