

CIVIL-462

Sustainable logistics systems

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Cursus	Sem.	Type
Civil Engineering	MA2, MA4	Opt.

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

Summary

The course objectives are for students to understand mathematical and analytical Tools for planning and operating sustainable freight systems that account for economic costs as well as environmental impacts. This optional course will be given only in spring 2019-20!

Content

The course will address aspects of transportation economics, environmental and sustainability issues, optimization and algorithms related to logistics systems and terminals. Many aspects of the course will be treated in a way that is general to all modes. Some specific knowledge related to trucking, railroads and maritime will be considered. Upon completing the course, students should be familiar with the main factors that determine the structure and drive the cost of operating one-to-one, many-to-one, one-to-many and many-to-many systems; this includes traveling salesman and vehicle routing problems. Students should be familiar with the concept of a logistic cost function and methods of improving efficiency and optimizing the systems.

Keywords

Freight operations; logistic cost function; continuous approximation; optimization; emissions

Learning Outcomes

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

- Analyze supply and demand to identify equilibrium quantity and price
- Model a logistics system and formulate a logistic cost function
- Apply continuous approximation to model complex systems
- Optimize a simple logistics system, including costs of holding and shipping
- Estimate a logistics system, including costs of holding and shipping

Transversal skills

- Access and evaluate appropriate sources of information.
- Plan and carry out activities in a way which makes optimal use of available time and other resources.

Teaching methods

Lectures on the board, supplemented with slides; Exercises; Group Project

Expected student activities

Participation in lectures and in-class activities, individual homework assignments, group project

Assessment methods

Midterm Examination; Homework Assignments; Project Presentation and Report