CIVIL-324

Urban public transport systems

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Cursus	Sem.	Type
Civil Engineering	BA6	Obl.
HES - GC	E	Obl.

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

Summary

An introduction to urban public transport systems. The lectures cover the planning, operation, and management problems of different types of public transport services, along with assignments strengthening the understanding of base models and the group project tackling real-world problems.

Content

Module 1 : Fixed-route transit
- Shuttle system
- Bus corridor
- Transit network
- Railway system

Module 2 : Flexible-route and on-demand service
- Flexible-route transit
- Taxi and ride-hailing
- Micromobility

Module 3 : Integrated transport system
- Park & ride
- First/last-mile service
- Mobility-as-a-Service (MaaS)
- Co-modality

Keywords

Public transit ; on-demand mobility ; multi-modal transportation system

Learning Prerequisites

Required courses

CIVIL-355 Introduction to transportation system (BA4)
MATH-106 Analysis II (BA2)
MATH-265 Introduction to optimization and operations research (BA3)

Learning Outcomes

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

- Define major forms of public transport services.
- Elaborate Key concepts and variables in transit planning, operation, and management.

- Implement basic model to solve hypothetical transit design problems
- Manipulate learned models to solve real-world transit design problems.

Transversal skills

- Demonstrate a capacity for creativity.
- 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.
- Make an oral presentation.
- Write a scientific or technical report.

Teaching methods

Lectures with assisted exercises ; regular checkout and feedback on group project

Expected student activities

Attend lectures; complete assignments; participate in group project

Assessment methods

Assignments: 40%
- four short assignments with assistant during the exercise sessions
Project: 60%
- regular checkouts (5%)
- self- and peer-evaluation (5%)
- final presentation (20%)
- final report (30%)

Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

Resources

Virtual desktop infrastructure (VDI)

No

Ressources en bibliothèque

- Public transportation systems / Daganzo, Ouyang
- Urban transit / Vuchic

Moodle Link

- https://go.epfl.ch/CIVIL-324