CIVIL-349

Traffic engineering

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Cursus	Sem.	Type
Civil Engineering	BA5	Obl.
Urban Planning and Territorial Development minor	H	Opt.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

Introduce the major elements of transportation systems and traffic engineering-Develop analytical and technical skills in applying the fundamentals of the transport field-Understand the key concepts and physics of the transport phenomena-Connect with real transportation problems and data analytics

Content

Traffic Modeling
Basic assessment tools , Traffic flow modeling for urban and freeway systems, Fundamental diagram, Theory of Shockwaves, Route Choice, User Equilibrium/System Optimum
Traffic Operations
Traffic signal control, Signal coordination, ramp metering,
Data analytics and Experiments
Analyzing real data from experiments to connect theory with applications
Intro to multimodal systems
Intro to bus operations, Bus priority, HOV/HOT lanes

Keywords

Traffic engineering, Shockwave Theory, Traffic Control, Data collection, Bus operations

Learning Prerequisites

Required courses

- Introduction to Transportation Systems I

Learning Outcomes

- By the end of the course, the students must be able to:
- Analyze mobility and performance of transport systems
- Assess/Evaluate transport phenomena with real data
- Demonstrate knowledge in traffic engineering
- Develop a critical thinking how to resolve mobility problems

Transversal skills

- Use a work methodology appropriate to the task.
- Take account of the social and human dimensions of the engineering profession.
- Evaluate one's own performance in the team, receive and respond appropriately to feedback.
- Demonstrate a capacity for creativity.

Teaching methods

Ex-cathedra with assisted exercises, course group projects

Expected student activities

Attending lectures, doing exercises and lab projects, preparing for exams

Assessment methods

Midterm 30%
Final Exam 40%
Laboratories 30%

Resources

Moodle Link

- https://go.epfl.ch/CIVIL-349