URB-408

Shaping future railway systems

Kummer Peter

Cursus	Sem.	Type
Civil Engineering	MA2, MA4	Opt.
Systèmes urbains	MA2	Opt.

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

This course focuses on the strategies and decisions involved in planning future rail systems in an era of decarbonized mobility.

Content

- How to enhance railways strengths and tackle weaknesses to gain an understanding in organization and leadership developing the transport systems.
- Digital transformation: Applying the latest technologies to operate a modern railway system, enhance capacity allocation, reduce costs and optimize customer interfaces.
- Innovation: Get to know success factors for innovation management, international best practices and how to integrate it into an organization.
- Sustainability and climate goals: Further improvement and conflict of objectives.
- Customer-centric future services: Learn about future customer needs, demand forecasting, ticketing and mobility as a service with changing customer behaviour and population growth.
- Future challenges: Predict how transportation will tackle demand growth in the next decades and interact with urban and landscape planning.

Keywords

Railway, mobility, transport systems, infrastructure, sustainability, innovation, customer services, digital transformation, leadership

Learning Prerequisites

Recommended courses

Railway systems and their transition. URB-406

Learning Outcomes

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

- Use skills for strategic decision making to integrate railway into a mobility perspective.
- Assess / Evaluate the latest technologies to operate a modern railway system and demonstrate possible applications

- Analyze sustainability improvements and conflicts of objectives.
- Interpret predictions about future transportation challenges and their impact on urban planning.
- Discuss and decide upon conflict of interests in long-term decision making.

Transversal skills

- Demonstrate the capacity for critical thinking
- Communicate effectively, being understood, including across different languages and cultures.
- Take responsibility for environmental impacts of her/ his actions and decisions.

Teaching methods

Lectures, guest lectures by mobility and railway professionals, group semester projects, field trips

Expected student activities

Attend lectures, join field trips, complete case studies, participate in project

Assessment methods

Project written report (50%):
- groups of 3-4 students
- submit a written report
Project presentation (40%)
- present findings
- participate in an oral defense
Group role play (10%)

Resources

Moodle Link

- https://go.epfl.ch/URB-408