

CIVIL-461

**Public transportation systems**

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<b>Cursus</b>	<b>Sem.</b>	<b>Type</b>
Civil Engineering	MA2, MA4	Opt.

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

**Summary**

The objectives of this course are to develop analytical skills that students can apply in the planning and management of public transport systems. This optional course will be given only in spring 2019-20!

**Content**

Historical overview of public transportation and a summary of existing and future transit and paratransit systems and technologies; Planning: shuttle (point-to-point), corridor, two-dimensional networks; Optimization of headway, stop spacing and route spacing for non-hierarchical and hierarchical systems; performance and costs evaluation; transit preferential treatments.

**Keywords**

Public transportation; generalized cost function; transit performance; route planning, scheduling

**Learning Prerequisites****Required courses**

A good level of knowledge in mathematics, statistics, physics, optimization and programming as taught in the first 2 years of the Civil Engineering program.

**Recommended courses**

GC-351 Transportation Systems Engineering

**Learning Outcomes**

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

- Estimate agency and user costs
- Develop mathematical models for optimization of certain objectives that meet desired needs with realistic, complex constraints
- Assess / Evaluate transit system performance
- Identify ways to improve efficiency of public transportation systems
- Discuss contemporary public transportation-related issues
- Assess / Evaluate self and peer performance in a project team
- Assess / Evaluate appropriate sources of information

**Teaching methods**

Lectures with slides and/or board description, in-class activities, group mini-projects, in-class student presentations

**Expected student activities**

Participation in lectures and in-class activities, mid-term exam, final exam, homeworks, group mini-projects, in-class student presentations, and online article discussions

**Assessment methods**

Mid-term exam, final exam, homeworks, mini-projects, in-class student presentations, online article discussions