Traffic Planning and Simulation

Programme course

6 credits

Planering och simulering av trafik

TNK095

Valid from: 2017 Spring semester

Determined by
Board of Studies for Industrial Engineering and Logistics

Date determined
2016-01-25

Offered for the last time
Spring semester 2018

Replaced by
TNK119

Main field of study
Transportation Systems Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Intelligent Transport Systems and Logistics, Master's programme
- Communication and Transportation Engineering, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Traffic infrastructure, Discrete simulation, Optimization or similar

Intended learning outcomes
The purpose of the course is to provide basic knowledge in planning and simulation of traffic systems. The course provides an overview of problems, settings and applications in the area of traffic planning, and gives insights in how traffic models may be used for analysis of traffic systems with the aim of making the system more efficient, safer and more environmentally friendly. Furthermore, the course will help the student to gain insights in the underlying theories on which the models are based.
After the course, the student shall have be able to:

- Describe the basics for traffic planning, traffic simulation and modelling of traffic systems
- Analyze traffic data and basic traffic flow relationships
- Describe and analyze route choice models and assignment methods for network assignment
- Describe the traffic simulation concepts for car following, lane changing and overtakings
- Analyze input and output data for a simulation model
- Perform basic calibration and validations of a traffic simulation model
- Perform experiments with microsimulation-based traffic simulation tools

Course content

- Introduction to traffic planning and traffic simulation
- Classification of traffic models
- Collection of traffic data and analysis of traffic flow relations
- Route choice model and assignment principles for network assignment
- Algorithms for equilibrium models
- Experiments with network assignment models
- Traffic simulation concepts for car following, lane changing and overtakings
- Analyze input and output data for a simulation model
- Introduce the concepts of calibration and validation of traffic simulation models
- Experiments with microsimulation-based traffic simulation tools

Teaching and working methods

The course consists of lectures, laborations and computer exercises.

Examination

UPG3	Hand-in assignments, part 2	3 credits	U, 3, 4, 5
UPG2	Hand-in assignments, part 1	3 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

Supplementary courses:
Traffic demand modelling, Traffic engineering and management

Department

Institutionen för teknik och naturvetenskap

Director of Studies or equivalent

Erik Bergfeldt

Examiner

Jan Lundgren

Education components

Preliminary scheduled hours: 34 h
Recommended self-study hours: 126 h

Course literature

Webbsida med kompendiematerial

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.