AH2174 Trafiksimulering, modellering och applikationer 7,5 hp

Traffic Simulation Modelling and Applications

När kurs inte längre ges har student möjlighet att examineras under ytterligare två läsår.

Fastställande

Kursplan för AH2174 gäller från och med HT10

Betygsskala

A, B, C, D, E, FX, F

Utbildningsnivå

Avancerad nivå

Huvudområden

Särskild behörighet

A completed Bachelor´s degree in Engineering, Science, Economics or Planning and documented proficiency in English B or equivalent.

Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

Lärandemål

The overall objective of the course is to provide fundamental knowledge on the principles, characteristics, and application of traffic simulation models. After succesful completion of the course students should be able to:

• Understand the basic principles of simulation;

• Understand the structure of different approaches and types of traffic simulation models (macroscopic, mesoscopic, microscopic) and the underlying assumptions that govern their behavior;

• Identify applications for which simulation is the apprpriate model for use;

• Identify the specific simulation approach (microscopic, mesoscopic, macroscopic) that is the most appropriate for a particular application;

• Develop and apply appropriate methods for the calibration of traffic simulation;

• Identify and apply appropriate methods (including statistical tests) to validate traffic simulaiton models;

• Interpret results from simulation models;

• Develop proper experimental designs to test and evaluate alternative designs using a traffic simulation model;

• Compare alternative designs and make recommendations on the basis of the simulation results.

Kursinnehåll

Advanced course on traffic simulation. Introduction to general concepts of simulation modeling and use, including the scientific principles that govern the development and use of simulation models. In depth presentation of traffic simulation models and the undelying models and algorithms. Traffic simulation model dichotomy including principles and characteristics of macro, meso, and micro traffic simulation models. Application of traffic simulation models for analysis of dynamic traffic systems and design: input data preparation, calibration, validation, analysis of output. Case studies and examples. Students will become familiar with existing commercial and research traffic simulation models (for example, VISSIM, Mezzo, NETCELL, MITSIMLab, DynaMIT, DYNAMEQ). Students will have hands-on experience with the use of traffic simulation models for alternatives analyses and evaluation through project work and case studies.

Kurslitteratur

A. M. Law and W. David Kelton, Simulation Modeling and Analysis, 4rth edition,McGraw Hill, 2006.

R. Dowling, A. Skabardonis, and V. Alexiadis, Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software, FHWA-HRT-04-040.

R. Roess, E. Prassas, and W. McShane, Traffic Engineering, 3rd edition, Prentice Hall, 2004.

S. Washington, M. Karlaftis, and F. Mannering, Statistical and Econometric Methods for Transportation Data Analysis, Chapman & Hall/CRC, 2003.

Selected papers and class notes

Manuals of traffic simulation software to be used for projects and case studies

Examination

- PRO1 - Assignments, 3,5 hp, betygsskala: A, B, C, D, E, FX, F
- TEN1 - Examination, 4,0 hp, betygsskala: A, B, C, D, E, FX, F

Examinator beslutar, baserat på rekommendation från KTH:s handläggare av stöd till studenter med funktionsnedsättning, om eventuell anpassad examination för studenter med dokumenterad, varaktig funktionsnedsättning.

Examinator får medge annan examinationsform vid omexamination av enstaka studenter.

Övriga krav för slutbetyg

A mandatory written examination equivalent to 4.5 ECTS credits on the A-F grading scale and a mandetory project assignment eqivalent to 3.0 credits with grading scale A-F. The course will be determined by the grade of both.

Etiskt förhållningssätt

- Vid grupparbete har alla i gruppen ansvar för gruppens arbete.
- Vid examination ska varje student ärligt redovisa hjälp som erhållits och källor som använts.
- Vid muntlig examination ska varje student kunna redogöra för hela uppgiften och hela lösningen.