Discrete-Event Simulation

Programme course

6 credits

Diskret simulering

TNK089

Valid from: 2017 Spring semester

Determined by
Board of Studies for Industrial Engineering and Logistics

Date determined
2017-01-25

Main field of study
Transportation Systems Engineering

Course level
First cycle

Advancement level
G2X

Course offered for
- 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
Statistics and Probability.

Intended learning outcomes
The main goal of this course is to provide students with basic knowledge in discrete-event simulation and its use for the analysis of communication, transport, production and service systems. The course also aims at providing practical experience in simulation modeling. After completion of the course the student will be able to:

- Describe fundamental concepts in discrete-event simulation.
- List and explain advantages and disadvantages of simulation as analysis tool.
- Model stochastic input data with probability distributions and assess quality of input models.
- Build simulation models of production, service and transportation systems
- Perform analysis with simulation models and draw conclusions from stochastic simulations.

Course content

- Fundamental concepts in dynamic discrete-event simulation.
- Setting up a simulation study. Steps in a simulation study.
- Input modelling.
- Verification and validation of simulation models.
- Experimentation and output analysis.
- Simulation software. Modeling in ARENA.
- Applications of simulation. Simulation of manufacturing systems.
- Simulation of communication and transport systems.

Teaching and working methods

The course is organized in lectures and computer labs.

Examination

LAB1	Series of model-building exercises	3 credits	U, 3, 4, 5
TEN1	Written examination	3 credits	U, 3, 4, 5

Grades

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

Other information

Supplementary courses:
Applications of discrete-event simulation

Department

Institutionen för teknik och naturvetenskap

Director of Studies or equivalent

Erik Bergfeldt

Examiner

Krisjanis Steins

Course website and other links

http://www2.itn.liu.se/utbildning/kurs/index.html?coursecode=TNK089

Education components

Preliminary scheduled hours: 58 h
Recommended self-study hours: 102 h

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.