Simulation in Production and Logistics

Programme course

6 credits

Simulering av produktion och logistik

TPPE99

Valid from: 2017 Autumn semester

Determined by
Board of Studies for Industrial Engineering and Logistics

Date determined

Main field of study
Industrial Engineering and Management

Course level
Second cycle

Advancement level
A1X

Course offered for
- Mechanical Engineering, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering
- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, Master's programme

Prerequisites
Basic course in mathematical statistics, basic course in logistics management and/or operations management.

Intended learning outcomes
The main goal of this course is to provide students with advanced level knowledge in discrete-event simulation (DES) methodology and application in the analysis of production and logistics systems. The course therefore provides practical experience in DES modeling coupled with theoretical depth in applied DES methods. After the course the student should be able to:

- Describe fundamental concepts in discrete-event simulation.
- List and explain advantages and disadvantages of simulation as an analysis tool.
- Model stochastic input data with probability distributions and assess the quality of input models.
- Build simulation models of production systems and logistics systems.
- Perform advanced system analysis by experimental design with simulation models and draw conclusions from stochastic simulations.

Course content

- Fundamental concepts in discrete-event simulation.
- Simulation study methodology. Steps in a simulation study.
- Input modelling.
- Verification and validation of simulation models.
- Experimentation and output analysis.
- Modelling in a commercial simulation software.
- Applications of simulation. Simulation of production systems and logistics systems.

Teaching and working methods

The course is organized in lectures, modelling classes (tutorials), and computer labs.

Examination

LAB1	Computer labs	3 credits	U, 3, 4, 5
TEN1	Written examination	3 credits	U, 3, 4, 5

The final grade is a combination of the individual grades.

Grades

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

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Fredrik Persson

Examiner

Fredrik Persson

Course website and other links

http://www.iei.liu.se/prodek/utbildning/

Education components

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

Course literature

Robinson, S. (2014) Simulation - The Practice of Model Development and Use, Palgrave Macmillan, 2nd Ed.