Optimization and System Analysis

Programme course

6 credits

Optimering och systemanalys

TNK047

Valid from: 2017 Spring semester

Determined by
Board of Studies for Industrial Engineering and Logistics

Date determined
2017-01-25

Main field of study
Mathematics, Applied Mathematics

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
Linear algebra, Optimization,Statistics and probability.

Intended learning outcomes
The course aims at further insight in modelling and optimization of decision problems. Models for decision analysis is analyzed, including models and methods for optimization problems with discrete variables and for problems from game theory. The students can, after the completion of the course, formulate basic models in decision analysis - solve and analyze the formulated models - apply the analysis to practical problems.

Course content
The contents of the course cover mathematical modelling and solution methods. Great weight is given to modelling of problems in decision analysis. Some weight is given to solution techniques for discrete optimization problems. The discussed model types include discrete optimization, and game models. Solution algorithms for these problem types are developed based on the methods and algorithms in the basic optimization course.

Teaching and working methods
Lectures, exercises and laboratory work.

Examination

LAB1	Laboratory work	3 credits	U, G
TEN1	Written examination	3 credits	U, 3, 4, 5

Grades

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

Department

Institutionen för teknik och naturvetenskap

Director of Studies or equivalent

Erik Bergfeldt

Examiner

Joakim Ekström

Education components

Preliminary scheduled hours: 48 h
Recommended self-study hours: 112 h

Course literature

Additional literature

Books

H.A. Eiselt och C.-L.Sandblom, Springer, *Decision Analysis, Location Models, and Sceduling Problems*
ISBN: 3-540-40338-8
Black, Ken, (1994) *Business statistics : contemporary decision making*
ISBN: 0314027882
Minneapolis/Saint Paul : West, 1994
Lundgren, Jan, Rönnqvist, Mikael, Värbrand, Peter, (2008) *Optimeringslära*
ISBN: 9789144053141
Lund : Studentlitteratur, 2008

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.