Linnæus University

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# Course syllabus

Faculty of Technology
Department of Mathematics

## 2MA404 Optimeringsmetoder, 7,5 högskolepoäng
## Optimization methods, 7.5 credits

**Main field of study**
Mathematics

**Subject Group**
Mathematics

**Level of classification**
First Level

**Progression**
G2F

**Date of Ratification**
Approved 2014-10-03
Revised 2020-09-03 by Faculty of Technology. Literature list is revised.
The course syllabus is valid from autumn semester 2020

**Prerequisites**
60 credits in mathematics including the course 1MA452 Analysis of several variables, 7,5 credits or equivalent.

## Objectives
The student shall

- be familiar with important classes of optimization problems
- get training skills in formulation and analysis of optimization problems from technique, physics, biology and economics
- have knowledge in efficient optimization methods for computer use
- get training skills in solutions of optimization problems, manually as well as with computer.

## Content
The course contents is

- modeling of optimization problems
- linear programming and the simplex method
- sensitivity analysis
- duality
- introduction to non-linear programming
- methods for unconstrained programming
- optimality conditions and Lagrange duality with Karush-Kuhn-Tucker conditions
- methods for constrained non-linear programming

## Type of Instruction
Lectures , execises and laboratory lessons. Compulsory as-signments may be given during the course.

## Examination
The course is assessed with the grades A, B, C, D, E, Fx or F.
The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

The student's knowledge is assessed in the form of oral and/or written examinations.

## Course Evaluation
A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

## Credit Overlap
The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: 2MA104 Optimization methods, 7.5 credits

## Other
Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

## Required Reading and Additional Study Material
**Mandatory literature**
Lundgren J, Rönnqvist M & Värbrand P, *Optimization*. Studentlitteratur, 2010 or latest edition. 437 (537) pages.

Henningsson Mathias, Lundgren Jan, Rönnqvist Mikael, Optimization Exercises. 2010 eller senaste upplaga.