



# SF2812 Applied Linear Optimization 7.5 credits

Tillämpad linjär optimering

This is a translation of the Swedish, legally binding, course syllabus.

## Establishment

The course syllabus is valid from Spring 2022 according to the school principal's decision: S-2022-0529 Decision date: 2022-02-24

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Mathematics

## Specific prerequisites

- English B / English 6
- Completed basic course in optimization (SF1811, SF1861 or equivalent)
- Completed basic course in mathematical statistics (SF1914, SF1918, SF1922 or equivalent)
- Completed basic course in numerical analysis (SF1544, SF1545 or equivalent)
- Completed basic course in differential equations (SF1633, SF1683 or equivalent).

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

To pass the course, the student shall be able to:

- Apply theory, concepts and methods from the parts of optimization that are given by the course contents to solve problems.
- Model, formulate and analyze simplified practical problems as optimization problems and solve by making use of given software.
- Collaborate with other students and demonstrate ability to present orally and in writing.

To receive the highest grade, the student should in addition be able to do the following:

- Combine and explain the methods in the course, and
- Apply and explain the theory and the concepts of the course in the practical problems that are included.

## Course contents

- The simplex method and interior methods for linear programming.
- Utilization of problem structure in linear programming, e.g., decomposition and column generation.
- Stochastic programming: methods and utilization of problem structure.
- Branch-and-bound methods for integer programming.
- Lagrangian relaxation and subgradient methods for large-scale integer programming problems with special structure.

## Examination

- PRO2 - Project, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- PRO1 - Project, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.