



# MJ2505 Practical Optimization of Energy Networks 6.0 credits

Praktisk optimering av energinätverk

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

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

## Establishment

Course syllabus for MJ2505 valid from Autumn 2018

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering

## Specific prerequisites

- MJ2411 Renewable Energy Technology, 6 ECTS (or corresponding 2nd cycle course)
- MJ2405 Sustainable Power Generation, 9 ECTS (eller motsvarande kurs på avancerade nivå)

## Language of instruction

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

## Intended learning outcomes

After the completion of this course, participants will be able to:

- Apply energy network optimization for heat and power production based on energy market price and regulation signals
- Apply energy network optimization and operation with respect to heating grid demands
- Evaluate heat and power production optimization for a relevant heat and power production test case representing a city or region with BOFIT
- Evaluate heating grid operation optimization for a relevant heat and power production test case representing a city or region with TERMIS
- Analyse the impact of market drivers on operation and optimization of heat and power grids in the future

## Course contents

The course is an advanced 2nd level course in sustainable energy engineering, with special focus on real heat and power production network operation and optimization. The course is a collaboration with our industrial partners FORTUM and VATTENFALL who perform these studies on daily basis. Advanced state-of-the-art simulation tools are introduced in the course and applied on relevant test cases of heat and power production optimization and heating grid operation in cities and regions of Sweden.

The course consist of a few key lectures, with student-centered seminars carrying the bulk of the learning process in discussing and analyzing. A project is introduced in the beginning of the course, and follows the course period throughout. Through the projects, the tools mentioned above are practiced on real cases, such that upon completion of the project, the course objectives are reached.

The course will be examined based on a report and presentation of the project work carried out in the course.

## Disposition

- PRO1 PROJECT 3 ECTS, A-F
- PRO2 PROJECT 3 ECTS, A\_F

## Examination

- PRO1 - Project in production planning, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- PRO2 - Project in network optimization, 3.0 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.

## Other requirements for final grade

- PRO1 PROJECT 3 ECTS, A-F
- PRO2 PROJECT 3 ECTS, A\_F

## 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.