



# MJ1145 Energy Systems 7.5 credits

## Energisystem

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

On 13/10/2023, the Dean of the ITM School has decided to establish this official course syllabus to apply from autumn term 2024 (registration number M-2023-1779).

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

MJ1112 "Applied Thermodynamics", SK1110 "Electromagnetism and Waves", or the equivalent,

EI1120 Electrical Circuit Analysis for the Environment and Energy Program, or the equivalent.

## Language of instruction

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

## Intended learning outcomes

After the course, the student should be able to:

1. Describe and analyse dynamic simulation and modelling of the energy use of a building
2. Describe and analyse simulation and modelling of integration of solar cells in the electricity grid as well as analysis of what happens when a cloud covers the area
3. Describe and analyse simulation and modelling of combined heat and power production (CHP) in part of a city and optimisation of electricity and heating

## Course contents

The course is given by lectures, exercises and project work and is based on both independent work and work in small groups. In the course, three tasks/projects should be completed:

1. A simple dynamic model of a building's energy use is developed in a group and reported through a group report and presentation.
2. A simple model of integration of solar cells into electricity grids is developed to determine how much electricity can be fed into a certain grid as well as analysis of what happens when a cloud moves over the area. The report is presented through a group report and presentation.
3. A model of cogeneration production for a part of a city is developed to optimize the production of electricity and heat. The result is reported through a group report and presentation.

## Examination

- PROA - Project, 2.5 credits, grading scale: A, B, C, D, E, FX, F
- PROB - Project, 2.5 credits, grading scale: A, B, C, D, E, FX, F
- PROC - Project, 2.5 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.

## 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.