



# MJ2514 District heating and cooling 3.0 credits

Fjärrvärme och fjärrkyla

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 15/10/2021, the Dean of the ITM school has decided establish this official course syllabus to apply from spring term 2023, registration number: M-2021-2019.

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering

## Specific prerequisites

Documented knowledge in Energy engineering and its applications in Built Environment, at least 18 credits, the equivalent of contents of the courses MJ2509 Energy in the built environment, 9 credits, MJ2405 Sustainable Power Generation, 9 credits, MJ2411 Renewable Energy Technology, 6 credits, MJ2413 Energy and Environment, 6 credits

Documented knowledge in English, e.g. Eng B/6. Or English 6 in an internationally recognised English language test, for example an IELTS Academic/IELTS UKVI total points of 6.5 and no section below 5.5.

## Language of instruction

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

## Intended learning outcomes

After passing the course, the student should be able to:

1. Describe, on a basic level, systems and components for district heating and cooling systems. Explain the difference between older and newer generations of district heating systems.
2. Design and assess needs and performance for district heating and cooling systems
3. Describe limitations and impediments and their consequences for these systems, and give an account of the possibilities and challenges that the district heating and the district cooling face in the future.

## Course contents

The course intends to cover basic concepts and system design that is used in district heating and cooling systems. The main advantage of a centralised system lies in the possibility to connect the system to different loads and sources. These aspects will be introduced, evaluated and discussed. System design and control strategies for both needs and sources of the system will to be discussed. Different generations of the district heating and cooling networks and their importance for supply and needs will be covered. Limitations and obstacles for existing systems, as well as existing business models will also be discussed. Different countries' specific conditions, as well as future scenarios and their consequences at design of district heating and cooling systems will also to discussed.

## Examination

- PROA - Project work, 2.5 credits, grading scale: A, B, C, D, E, FX, F
- SEMA - Seminar, 0.5 credits, grading scale: P, 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.