



# MJ2443 Heating, Cooling and Indoor Climate 6.0 credits

Värme, kyla och inomhusmiljö

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 spring term 2023 (registration number M-2023-1783).

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering, Technology and Health

## Specific prerequisites

Bachelor degree in mechanical engineering. Preferrably with knowledge in applied thermodynamics (example MJ1112, 9 credits) and heat transfer (example MJ1401, 6 credits).

## 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 should be able to:

1. Describe the indoor climate requirements for thermal comfort.
2. Perform heating and cooling load calculations for building
3. Describe the principles of heat pumping technologies for heating and cooling in buildings.
4. Identify the main differences between the various energy system solutions for buildings.
5. Explain the functions of the main components in the heating and cooling systems.
6. Using given principle and tools, solve and analyze basic problems within the heating and cooling in buildings.

In order to achieve higher grades, the student should also be able to:

1. Using given principle and tools, solve and analyze advanced problems within the heating and cooling in buildings.
2. Use ideas and knowledge from this course to design new highly efficient energy systems for buildings.
3. Improve on the existing and conventional energy solutions for buildings.

## Course contents

Main subjects that are treated in the course are:

Various types of buildings and their energy use.  
Conventional heating and cooling system in buildings.  
Current and new technology for heat and cold.  
Concepts and design details for heat pumping technology (steam compression systems).  
Components for heat pump systems.  
Simulation tools for cold and heat calculations in buildings.  
Calculation tools for heating and cooling system.  
Analysis of energy performance for heating and cooling systems in buildings.

## Examination

- INLA - Hand in assignment, 2.0 credits, grading scale: P, F
- LABA - Laboratory work, 1.0 credits, grading scale: P, F
- TEN1 - Written Exam, 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.

## 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.