



# MJ2407 Sustainable Energy Utilisation 9.0 credits

Uthållig energianvändning

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

## Establishment

On 22/04/2022, the Dean of the ITM School has decided to establish this official course syllabus to apply from autumn term 2021 (registration number M-2022-0604).

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering

## Specific prerequisites

Master of Science in Engineering/engineer with Degree of Bachelor/3 year engineering degree, or the equivalent education as well as prior knowledge equivalent to MJ1112 Thermodynamics 9 credits, MJ1401 Heat transfer 6 credits and SG1220 Fluid Mechanics for Engineers 6 credits or a combination of these courses totalling at least 15 credits.

Documented knowledge in English B 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 passing the course, the student should be able to:

1. Demonstrate understanding of cooling systems and/or its components
2. Predict function of processes including moist air relevant for built environment and/or components thereof
3. Calculate and/or identify suitable indoor environment
4. Assess need for heating and/or cooling in stationary and/or transient processes in built environment
5. Predict function of components or systems for distribution of media (e g heat, cold, air distribution, active and/or passive) in built environment
6. Discuss sustainability aspects related to the intended learning outcomes above.

## Course contents

This course will treat the energy use in today's society with consideration taken to environment and sustainability aspects. The course focuses on the technologies that are used to satisfy the needs for cooling, heating and ventilation that are required in the built environment.

In the first part of the course, function and structure of components and systems that are used in cooling and heat pump systems are treated. The emphasis is placed on for example compressor driven cooling devices, heat pumps and refrigerated and frozen storage.

In the second part of the course, function and structure of components and systems that are used to create a good and energy efficient indoor environment for people and processes are treated with heating, ventilation, air conditioning, energy conservation, thermal comfort and air quality as central concepts.

## Examination

- ÖVN1 - Exercise, 1.5 credits, grading scale: P, F
- TEN1 - Written exam, 5.0 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN2 - Exercise, 1.5 credits, grading scale: P, F
- LAB1 - Laboratory Work, 1.0 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.

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.