



# MH1035 Thermodynamics I 7.5 credits

## Termodynamik I

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

## Establishment

The official course syllabus is valid from the fall semester 2024 in accordance with the decision by the Head of the ITM School: M-2023-2082. Date of decision: 2023-10-12.

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

For CMATD, at least 45 higher education credits in the Technology main field of study from programme syllabus for year 1-3.

## Language of instruction

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

# Intended learning outcomes

On completion of the course, the student should be able to carry out thermodynamic calculations in relevant systems and demonstrate an understanding how thermodynamics influences our daily life. It implies more concretely that the student on successful completion of the course should be able to:

1. Give an account of commonly occurring terms, concepts and laws in thermodynamics.
2. Apply methods in thermodynamics to solve thermodynamic problems.
3. Communicate results and hypotheses - in thermodynamics - both orally and in writing, and provide arguments for these.

# Course contents

The course content is grouped in five parts:

- The laws of thermodynamics (0th to the 3rd main principle, temperature, pressure, internal energy, work, enthalpy, heat engines, reversible/irreversible processes, entropy)
- Basic concepts in thermodynamics (systems and control volumes, state and equilibrium, processes and cycles, pressure and measuring equipment, ideal gases)
- Energetics (different forms of energy, transfer of heat and work, mechanical and non-mechanical types of work, analysis of energy in closed systems, specific heat, enthalpy and internal energy)
- Heat and mass balances (conservation of mass, energy in flowing fluids, stationary flow systems)
- Clean substances/substances (phase transformation of clean substances, T-V and P-V diagrams, ideal gases)

Note that parts of the course content are given in English (course literature and problems); this implicitly requires proficiency in English terminology connected to the subject.

# Examination

- TENA - Written exam, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory experiments, 3.5 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.

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.