



# KE1160 Thermodynamics 7.5 credits

## Termodynamik

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

## Establishment

Course syllabus for KE1160 valid from Spring 2020

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

Recommended courses: Engineering chemistry and the mathematic courses in the programme.

## Language of instruction

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

## Intended learning outcomes

After completing the course, the students should be able to:

- describe and apply the first and second laws of thermodynamics to open systems, closed systems and isolated systems of the following types: ideal gases, binary mixtures and reactive systems.
- describe and perform calculations on thermal cycle processes for the applications: steam turbine and gas turbine processes for work production and for cooling machines and heat pumps.

## Course contents

The energy situation in the world - conditions, problems and opportunities. Sustainability aspects of the production of power, heat and chemicals. State laws for gases. The laws of thermodynamics, internal energy and entropy. Open and closed thermodynamic system. Cycle processes for the production of technical work. Cycle processes for cooling machines and heat pumps. Equilibrium conditions, free energy. Partial molar quantities and the chemical potential. Chemical equilibria in ideal and non-ideal systems. Thermodynamics of mixtures. Phase equilibria and phase diagrams for one-and two-component systems.

## Examination

- ÖVN1 - Compulsory Attendance, 1.5 credits, grading scale: P, F
- TEN1 - Written exam, 5.0 credits, grading scale: A, B, C, D, E, FX, 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.

Examination, compulsory attendance and laboratory work.

One not compulsory intermediate test that gives credit at the examination.

## 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.