



# MJ1111 Supplementary Course in Applied Thermodynamics 3.0 credits

## Kompletteringskurs i Tillämpad termodynamik

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

Course syllabus for MJ1111 valid from Spring 2019

## Grading scale

P, F

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

Completed first cycle course in thermodynamics, 6.0 credits, or the equivalent. The course is given only in agreement with examiner.

# Language of instruction

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

## Intended learning outcomes

After the course, the student should be able to:

- formulate, model and solve problems for technical systems and devices with different types of energy exchange and energy conversion.
- model systems, and identify subsystems and components in engineering systems.

## Course contents

In the course the following topics are treated:

- different energy forms, fundamental concepts and theorems of thermodynamics
- the properties of gases and gaseous mixtures, with an introduction to combustion and stoichiometry
- state variables and the concepts of work, heat, exergy and anergy
- applications of the first law of thermodynamics to closed and open systems, and the energy equation
- different expressions of the second law of thermodynamics, with applications in reversible cycles for energy conversions
- state diagrams for real media and equations of state
- technical processes in compressors and turbines, as well as important cycles such as those in combustion engines, gas turbines, steam power plants, refrigeration plants and heat pumps
- fundamental relations for the flow of liquids and gases in ducts and nozzles, both for reversible cases and for flow with losses
- basic concepts and general laws for heat transfer and for heat exchangers
- properties of moist air and its psychrometric charts, with applications.

## Course literature

Uppgift om kurslitteratur meddelas i kurs-PM.

## Examination

- ÖVN1 - Assignments, 3.0 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.

ÖVN1, Practical assignments/Assignments, 3 credits, P/F.

Examiner determines, in consultation with KTH's coordinator for disabilities, about possible adapted examination for students with documented, permanent disabilities. The examiner may permit other examination formats at the re-examination of individual students.

## **Other requirements for final grade**

ÖVN1, Practical assignments/Assignments, 3 credits, P/F.

## **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.