



# MJ1401 Heat Transfer 6.0 credits

## Värmeöverföring

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 MJ1401 valid from Autumn 2007

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Mechanical Engineering, Technology

## Specific prerequisites

4A1112 Applied Thermodynamics or equivalent.

## 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 calculate heat transfer by conduction, different types of convection and by radiation using classical models for these phenomena. The student should also have good knowledge about the theories on which these models are based. The participants should be able to size and calculate the performance of different types of heat exchangers.

Finally they are expected to understand the basics of numerical calculation methods for conduction and by themselves be able to design computer programs for solving such problems.

## Course contents

The lectures consist of a thorough treatment of general heat transfer engineering, including a summary of the relations fundamental to heat exchanger design. Stationary and non-stationary heat conduction are considered; in this connection both analogy procedures and graphic and numerical calculation methods are considered. In addition, convective heat transfer without change of phase, with forced flow, free convection and falling films, as well as heat transfer in connection with phase changes in condensing, evaporating and diffusing media will be considered. Conditions involving heat transfer via radiation are examined.

The laboratory exercises comprise demonstrations of measurement techniques in heat transfer engineering, heat transfer analogies, introduction to the use of finite element methods and determination of heat and flow resistance at heat-exchanging surfaces.

The calculation sessions concern problems deriving from the lectures.

## Course literature

Holman, J.P. Heat Transfer (metric edition). McGraw-Hill.

## Examination

- LAB1 - Laboratory Work, 0.8 credits, grading scale: P, F
- TEN1 - Examination, 5.2 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.

## Other requirements for final grade

The examination (TEN1; 5,2cr) is in writing, consisting of questions and calculations. For credit, also the student must complete the laboratory exercises (LAB1; 08cr).

## 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.