# MJ2497 Energy Efficiency and Rational Use of Energy 5.0 credits

**Energieffektivitet och rationell användning av energi**

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

## Establishment

Course syllabus for MJ2497 valid from Autumn 2015

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering

## Specific prerequisites

BSc or the equivalent

## 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 describe the role that energy handling, energy efficiency and energy saving have in connection with global and regional energy systems, their economic, social and environmental connotations and the effects of the related technologies in local and global contexts.
- Be able to describe the relevant organisations, large projects at the international level, the most important sources to information and regulations on handling and efficient using energy in different sectors.
- Have the parts of analysis and knowledge that is required to carry out projects and assist as consultant in connection with administration and efficient using energy in different sectors.
- Be able to suggest transferable results to improve the administration and efficient use of energy by developing new ideas.

## Course contents

1. Introduction. Basic energy efficiency, efficient using energy, control of the demand.

2. Energy audits and diagnostics

3. Energy storage technology

4. Energy efficiency in buildings (housing)

5. Energy efficiency in buildings (industry and services)

6. Improvement of energy efficiency in industry

7. Improvement of energy efficiency in transportation

## Course literature

Eastop, T. D; Croft, D. R. Energy efficiency:  for engineers and technologists. Harlow, Essex, England: New York: Longman Scientific & Technical; Wiley, 1990. ISBN 9780582031845.

Duffie, John A; Beckman, William A. Solar engineering of thermal processes. 3rd ed. Hoboken, N.J.: John Wiley & Sons, cop. 2006. ISBN 9780471698678.

Balcomb, J. Douglas. Passive solar design handbook. New York: American Solar Energy Society, cop. 1983-. ISBN 0895531240.

González Fernández, Francisco Javier; Fuentes Losa, Julio. Ingeniería ferroviaria. 2a ed. act. y ampl. Madrid: Universidad Nacional de Educación a Distancia, 2010. ISBN 9788436260748.

Querol, Enrique, Gonzalez-Regueral, Borja, Perez-Benedito, Jose Luis. Practical approach to Exergy and Thermoeconomic Analyses of Industrial Processes. Springer, 2013.

ASHRAE handbook. SI ed. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, cop. 2006. ISBN 1931862877.

## Examination

- ÖVN1 - Exercis, 1.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Final written work, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Lab Work, 1.0 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.

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.