



MJ2508 Energy Systems for Sustainable Development 6.0 credits

Energisystem för hållbar utveckling

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

On 15/10/2021, the Dean of the ITM School has decided to establish this official course syllabus to apply from autumn term 2022 (registration number M-2020-2013).

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

English B/6 or equivalent, knowledge in the subjects mathematics and physics, and thermodynamics from a Bachelor of Science (the equivalent of course MJ1112).

Language of instruction

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

Intended learning outcomes

After passing the course, the student should be able to

1. Describe and critically compare different interpretations of sustainability and sustainable development in relation to the most important international agreements in the area
2. Describe, categorise and compare processes for energy transformation connected to different needs (in the industrial sector, the housing and service sectors and the transportation sector) with regard to resource need and effect on the environment.
3. With regard to shifting conditions in different parts of the world, evaluate alternative energy supply strategies in relation to given targets for sustainable development.
4. Discuss and evaluate global trends for the use of energy supply and - use (renewable and fossil) and connect these trends to ongoing political processes and international technology and market development.
5. Plan, carry out and critically discuss the results of a so-called integrated planning for optimal energy supply in a region or a country from resource outtake to final use.

Course contents

The course covers energy systems and their adaptation for sustainability by highlighting several different perspectives: energy and climate – trends and scenarios, energy mix, the effect of various technology options, market, policy actors and so-called integrated planning of access to energy services. In all parts of the course, we bring up differences in effects and possible solutions for industrialised countries, compared to developing countries. Furthermore, a so called nexus perspective is central, as it deals with inter-dependencies between the resources energy-land-water and effects on these systems from the climate changes

Examination

- INL1 - Assignment, - credits, grading scale: P, F
- INL2 - Assignment, - credits, grading scale: P, F
- PRO1 - Project, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Written exam, 3.0 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.

Other requirements for final grade

Requirements for final grade are approved exam (TEN1; 3hp) and approved project (PRO1; 3hp).

INL1 and INL2 are voluntary, and part of the offer of continuous examination. The results of these can be credited on the exam. Passed on both assignments within the course of one (1) year gives passed on the exam with grade E. Passed on only one of the assignments gives grade FX on the exam, with the possibility to complete for grade E within a given time frame.

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.