



MJ2383 Energy System Economics, Modelling and Indicators for Sustainable Energy Development 6.0 credits

Energisystemekonomi, modellering och indikatorer för hållbar energiutveckling

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

Establishment

The head of school at the ITM school has on 19 April 2022 decided to establish this syllabus to apply from autumn 2022 (registration number M-2022-0477).

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

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 students should be able to:

1. Explain key concepts in energy economics.
2. Evaluate economic tools and apply them to examine energy investments and operation.
3. Describe the economic drivers of long term energy transitions and critique how these are modelled.
4. Develop and apply a techno-economic model to policies, technologies and other interventions using scenario analysis.
5. Analyze key outputs of techno-economic models, including system costs and shadow prices, in combination with off-model data and interpret in terms of their social, economic and environmental dimensions and sustainable development.
6. Communicate concepts of energy economics using written, spoken and visual media.

Course contents

The overall objective of the course is to explore basic energy system economic concepts related to energy infrastructure investments, energy-environment economics and the role of indicators for sustainable development.

The participants will gain practical experience in the use of a range of economic tools and models. These include basic linear programming techniques, the economic interpretation of energy models and economic indicators relating to policy and technology scenarios.

In a group project, they will use an energy system model to map key economic indicators to sustainable development goals, and further develop their critical skills in modelling and results interpretation.

Examination

- LABA - Labb, 0.5 credits, grading scale: P, F
- PROA - Project, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- SEMA - Seminars, 0.5 credits, grading scale: P, F
- KONA - Partial exam, 1.0 credits, grading scale: A, B, C, D, E, FX, F
- KONB - Partial exam, 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.