



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

Course syllabus for MJ2383 valid from Autumn 2019

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

Upon successfully completing this course, the student should be able to:

- Explain key economics and costs of energy infrastructure investments
- Develop economic screening curves to assess the performance of energy investment and operation
- Explain the drivers of long term energy-environment-economic (3E) optimization models and contextualize their role in the planning process.
- Map out the energy system from services to supply in a RES (Reference Energy System) Diagram.
- Develop and model scenarios, policies, technology and other interventions.
- Interpret important outputs of bottom-up 3E optimization models in terms of their economic implications (including system costs and shadow prices).
- Identify and derive Indicators for Sustainable Development (ISED) in the modeling and evaluation of an energy system. And to interpret them in terms of their social, economic and environmental dimensions.

Course contents

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

The participants will gain exposure to economic screening curves, energy-environment-economic (3E) modeling, understand basic linear programming techniques and interpretation and model scenarios, policies, technology and other interventions and map these to key indicators for sustainable development ISED.

Examination

- SEM1 - Seminar, 0.5 credits, grading scale: P, F
- SEM2 - Seminar, 0.5 credits, grading scale: P, F
- PRO1 - Project, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Written exam, 2.0 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.