



MJ2491 Environomical Pathways, Advanced Course 9.0 credits

Energisystemanalys med exergi-, ekonomi- och miljöperspektiv, fördjupningskurs

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

Establishment

Course syllabus for MJ2491 valid from Spring 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

Environmental Engineering, Mechanical Engineering

Specific prerequisites

MJ1112 Applied Thermodynamics (or equivalent).

MJ2490 Environomical pathways (or equivalent)

Enrolled in the TMESM Masterprogram

Language of instruction

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

Intended learning outcomes

After completing the course, students should be able to:

- Apply a system approach in analyzing the chain for energy conversion, from primary energy source to energy services. This includes:
 - To identify a proper system boundary for energy conversion problems, addressing a whole chain for energy conversion with target energyservices in focus.
 - To conduct an overall analysis of energy, environmental and cost efficiency of an energy conversion scheme.
 - To use the result to carry out an environomical discussion at an advanced level, and be able to in detail analyse different environomical choices and their consequences.
- By using project based working method, be able to work with energy systems analysis and environomics in a structured way employing common project work tools, including time sheets, project plans, and resource assessment.

Course contents

In this course issues like consumer behaviour, energy economic, transition management, H₂ as an energy vector, thermoeconomy, energy in network (the net, transmission and distribution) are discussed more in detail. Just like in MJ2490 Environomical pathways, the environmental consequences will (as far as known today) be brought up for discussion in this course.

The lectures and seminars classes presents the tools of life-cycle analysis, net energy balancing and exergy assessment on case studies of energy chains for energy conversion, from primary energy source to desired energy service.

The project covers a deepened analysis of Environomics from the perspective of specific cases

Disposition

The course will be given in periods 3 and 4

Planned hours:

- Lectures -- 30 h (15 occasions)
- Seminars -- 20 h (5 occasions)
- Project work, P -- 60 h (sheduled time for project work, 8 occasions)

- Exam, TEN1 -- 3h (scheduled during exam period after period 3)
- Project presentation, PRO1 -- 8h (scheduled last week of period 4)

Course literature

Dewulf J., van Langenhove H.

Renewable-based Technology: Sustainability Assessment. ISBN: 978-0-470-02241-2

Fransson, T.H., et al., 2009, "Computerized Educational Program", KTH, Energiteknik -- Kraft- och värmeteknologi

Lecture Handouts

Examination

- PRO1 - Project, 6.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

TEN1 -- EXAM 3 hp, Grading: A-F

PRO1 -- Project 6 hp, Grading: A-F

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.