



MJ2493 Environomical Pathways for Sustainable Energy Conversion

7.0 credits

Ekonomisk- och miljöanpassad energiomvandling

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

Course syllabus for MJ2493 valid from Autumn 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

Environmental Engineering, Mechanical Engineering

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 energy services in focus.

--> To conduct an overall analysis of energy, environmental and cost efficiency of complex energy conversion schemes where renewable energy sources are integrated.

--> To use the result to carry out an environmental discussion at an advanced level, and be able to in detail analyse different environmental choices and their consequences.

* Through project-based working method, be able to take charge and carry out an innovation process concerning problem solving in complex energy conversion chains.

Course contents

This course is the last in a series of Environmental Pathways courses given within the context of the EM MSc programme SELECT. From an overall perspective, it ties together methods for energy conversion assessment in a sustainability context that have been introduced in Year 1 of the programme.

The course is given by KTH to students located elsewhere in partner universities across Europe. It is thus a distance-based course where student groups, lecturers and project advisors come together using distance-based meeting technology.

In this course the student shall, under guidance of senior teachers at each one of the universities, perform a case study related to an industrial environmental energy conversion problem of the future. If possible, this case study can be a pre-study to their MSc thesis topic. The intermediate results will be presented at "remote seminars" throughout the semester and the final results of these case studies are supposed to attract significant industrial response as the case studies will all be of high present and future relevance, selected by the SELECT Steering Committee from suggestions from the academic as well as industrial partners.

Disposition

The course will be given over periods 1-4

Planned hours:

- Lectures -- 20h (10 occasions)
- Seminars -- 20 h (5 occasions)
- Project work, P -- 60 h (scheduled time for project work, 8 occasions)
- Project presentation, PRO1 -- 8h (scheduled last week of period 2)
- Project presentation, PRO2 -- 8 hrs (scheduled last week of period 4)

Specific prerequisites

MJ1112 Applied Thermodynamics (or equivalent).

MJ2490 Environmental pathways

MJ2491 Environmental Pathways, Advanced Course

Course literature

Dewulf J., van Langenhove H.

Renewable-based Technology: Sustainability Assessment. ISBN: 978-0-470-02241-2 (or equivalent)

Scientific articles available through KTH library

Lecture Handout

Examination

- PRO1 - Project, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- PRO2 - Project, 4.0 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.

PRO1 --Project 3hp, Grading A-F

PRO2-- Project4hp, 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.