MJ1455 Future Energy Technology 7.5 credits

Framtidens energiteknik

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 MJ1455 valid from Spring 2012

Grading scale

P, F

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Completed and documented upper secondary schooling incl documented proficiency in English which is equivalent to En. B. Exceptions to the eligibility requirements in Swedish knowledge is given if the language of instruction is English.

Language of instruction

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

Intended learning outcomes

The overall objective with the course is to give the student an understanding of the Swedish and the global energy systems, explain why they look the way they do and what the technical, economic and the political boundary conditions are. After successful course completion, the student shall be able:

· to account for different energy technologies/systems as they exist today as well as future energy technologies/systems.

· to discuss the complex of problems that the energy supply must relate to (for example climate- and environmental impact, safety of supply, cost perspective) and formulate ideas for solutions from an overall perspective

· to describe advantages and disadvantages of different energy technologies/systems in relation to the external environment and to argue for and against different technical and economic solutions

· to perform simple calculations in order to judge the cost effectiveness, sustainability and safety of supply of different energy technologies/systems and be able to relate this to other effects such as environmental or social impact in a comprehensive manner.

Course contents

Energy systems: historical background, energy markets, energy sources and carriers, political and economic governance.
Energy production: various energy conversion and energy transmission technologies, their relationship to the cost-effectiveness, security of supply, sustainability, political and public opinion point of acceptance and climate and environment.
Transport: passenger and freight transport and their role in the energy system.
Energy use: buildings, energy efficiency in industry, energy-saving measures.

Disposition

The course runs full-time during four weeks starting period 5.

The course is given daytime on campus Valhallavägen and comprises lectures, seminars, home assignments, group assignments and study visits.

Course literature

- Under kursen utdelat material tillgängligt via Bilda

- Eventuellt kan ytterligare kompletterande kurslitteratur tillkomma. Denna kommer i så fall att anslås på kursens hemsida senast fyra veckor före kursstart.

För den Intresserade studenten finns följande material:

CompEDU: educational platform developed at the department of energy technology, KTH:

http://www.energy.kth.se/compedu/webcompedu/WebHelp/index.html

Examination

- SEM1 - Seminar 1, 1.5 credits, grading scale: P, F
- SEM2 - Seminar 2, 1.5 credits, grading scale: P, F
- SEM3 - Seminar 3, 1.5 credits, grading scale: P, F
- STU1 - Studyvisit, - credits, grading scale: P, F
- ÖVNA - Assignment, 1.5 credits, grading scale: P, F
- ÖVNB - Quizzes, 1.5 credits, grading scale: P, 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.

- SEM1 - Seminar 1, 1.5 credits, grade scale: P, F
- SEM2 - Seminar 2, 1.5 credits, grade scale: P, F
- SEM3 - Seminar 3, 1.5 credits, grade scale: P, F
- STU1 - Studyvisit,, 0 credits, grade scale: P, F
- ÖVNA - Assignment, 1.5 credits, grade scale: P, F
- ÖVNB - Quizzes, 1.5 credits, grade scale: P, F

This course applies progressional examination, meaning that it is necessaqry to pass the course through active participation in lectures and seminars. The course marks are either pass or fail. The following examination forms are applied in the course:

1. Presence at lectures:

Each week of active lectures are completed with a quiz section that will be performed in BILDA, to rehearse the fundamental information that has been taught in lectures during the week. The quiz will be open for one week after publishing. At least 75% of the quiz questions shall be answered correctly to pass. Thesuccessful completion of all quizzes renders 1,5 credits. (ÖVNB)

2. Home Assignment:

During the first week, the basic principles of energy conversion and their application to energy technology will be presented. In week 1 the students will receive a home assignment to assess their understanding of this basic knowledge. You will have 1 week to complete the assignment. You will then bring your home assignment to a dedicated lecture in week 2 where

it will be discussed and corrected by your fellow students. The successful completion of the home assignment renders 1,5 credits. (ÖVNA)

3. Participation in study visits and study visit seminar:

There will be a study visit. The students will be divided in groups and each group shall prepare 3 questions to be answered during the study visit. After the visit a study visit seminar will give the opportunity to present your study visit experience and results to the other groups. The questions shall be submitted in BILDA before the study visit. The presentations shall be submitted in BILDA before deadline. The participation in the study visit and successful completion of the study visit seminar renders 1,5 credits. (STU1, SEM3)

3. Active participation in 2 additional seminars:

In front of the seminar, the students shall have prepared an exercise (group based) resulting in a short writtenreport (max 3 pages)(doc, pdf)and a presentation (max 20min)(power point). Thegroup reportwill be given feedback with the help ofpeer reviewby other students based on a peer review template. The group based report, the peer review and the presentation shall be submitted in BILDA. Successful participation in the seminar renders the student 3 credits. (SEM1-2)

Other requirements for final grade

Ongoing examination.

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.