MJ1402 Introduction to Energy Technology 3.0 credits

Energiteknik, introduktionskurs

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

Establishment

Course syllabus for MJ1402 valid from Autumn 2007

Grading scale

P, F

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Basic knowledge in mathematic, Thermodynamics, Fluid Mechanics and Heat Transfer

Language of instruction

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

Intended learning outcomes

After this course student should be able to:

Know and understand the relationship between energy consumption, GDP, and "Human Development Index", HDI values.

Know and understand the existence of multiple goals, multiple stakeholders and numerous available technologies which can be used of a system approach to solving energy problems.

Know and understand different tools of the energy system, including the concept of sustainable development, a systems approach to energy and economic tools for evaluation of energy systems.

Understand discussion of the climate change and the availability of fossil fuels.

Know and understand a range of technologies for generating energy for stationary applications, including fossil fuels combustion, carbon sequestration, nuclear energy, solar energy, wind energy and biological energy.

Know and understand energy conversion for use in transportation.

Know and understand the essential knowledge of major energy technologies. This includes how they work, how they are quantitatively evaluated, what they cost and what is their benefit or impact on the natural environment and provide students with an overview of the contexts within which these systems are being used and developed today and in the future.

Course contents

1) Presentation of course literature during seminars by students.

2) Ten pages written individual reflection report on the course content (half page reflection report for each chapter of course book and overall reflection of the course).

3) Lectures in Thermodynamics, Fluid Mechanics and Heat Transfer are available in Bilda.

4) There are 8 sets of multiple choice questions; four for Thermodynamics and four for Heat transfer that can be answered in Bilda. These questions are not compulsory but recommended (if students need repetition in Thermodynamics, Fluid dynamics and Heat Transfer).

Course literature

The required textbook for the course is: Energy Systems Engineering: Evaluation and Implementation by Francis Vanek, Louis Albright, and Lars Angenent (Publisher: McGraw-Hill, New York).

Lectures in Thermodynamics and Fluid mechanics in Bilda are based on “Fundamentals of Thermal-Fluid Sciences, 4/e, Yunus A. Çengel, University of Nevada – Reno, John M. Cimbala, The Pennsylvania State University, Robert H. Turner, University of Nevada – Reno.

Lectures in Heat Transfer in Bilda are based on “Short notes on Heat Transfer, by Björn Palm”

Examination

- PRO1 - Project, 3.0 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.

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

Approved

1) Presentation of given chapters of the course book during the seminars.

2) Individual reflection report.

3) Attendance during seminars.

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.