MJ2438 Modeling of Energy Systems - Heat and Power Generation 6.0 credits

Modellering av energisystem - kraft och värme produktion

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

Establishment

On 2021-10-15, the Dean of the ITM School has decided to establish this official course syllabus to apply from spring term 2023 (registration number M-2021-2042).

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

MJ2405 "Sustainable Power Generation", 9 credits or equivalent, and the knowledge required for MJ2405:
- Science / Engineering with kandidatexamen/3-årig degree or equivalent education and
- Knowledge corresponding MJ1112 "Thermodynamics" 9hp, MJ1401 "Heat transfer" 6hp and SG1220 "Engineering Fluid Mechanics" 6hp or a combination of these courses of at least

15 credits.
English B or equivalent.

Language of instruction

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

Intended learning outcomes

After passing the course, the student should be able to:

1. Describe and identify the relevant theoretical interpretation of modelling strategies applied to the simulation of energy technology-related processes and systems; such as the system definitions and limitations, input and output data, setup and parametrization of building blocks, model validation and result verification, choice of best-match simulation tool with regards to specific application.
2. Formulate and replicate realistic models for computer-based simulation of energy conversion systems in complex heat and power generation applications.
3. Analyse the layout with respect to performance, and through a sensitivity analysis evaluate parameters that influence the performance of combined energy systems based on thermal, chemical and polygeneration processes.
4. Construct and validate a functioning system model and demonstrate activity in a teamwork environment for productive project output.

Course contents

The course is structured in the form of a project to be implemented using a modeling tool for power analysis. In some cases, the project will have clients from industry. The course begins with lectures relevant support for the project and the software to be used and then the project will be conducted in groups or individually, where follow-up workshops are in support of the project. The results of the study will be presented in a report and an oral presentation.

Examination

- PROA - Project, 5.0 credits, grading scale: A, B, C, D, E, FX, F
- SEMA - Seminar, 1.0 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.

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.