MJ2424 Computational Methods in Energy Technology 6.0 credits

Numeriska beräkningsmetoder inom energiteknik

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

Establishment

Course syllabus for MJ2424 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

Bachelor of Science or corresponding + Heat transfer 4A1601/MJ1401 eller motsvarande + Fluid Mechanics, 6 hp, or corresponding

Language of instruction

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

Intended learning outcomes

The aim of the course is, first to give a basic understanding of numerical methods for solving heat transfer and fluid flow problems and second to give som experience in using commercial codes for solving such problems.

Course contents

Basic relations for heat transfer and fluid flow. Formulation of relations using different numerical methods (finite volumes/finite elements/finite differences) and comparisons between these methods. Discussion of advantages and disadvantages of different modern numerical solution schemes for different types of energy related heat transfer and fluid flow problems. Discussion of numerical models for optimization of systems and of inviscid and viscuous flow. Exercises with commercial FEM and CDF programmes.

Course literature

Prel. Patankar: Numerical heat transfer and fluid flow.

Examination

- TEN1 - Written exam, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 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.

Other requirements for final grade

Written exam (TEN 1, 3 cr), Labwork (LAB1, 3 cr)

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.