SD2415 Process Modelling for Composite Manufacturing 6.0 credits

Processmodellering för kompositttillverkning

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

Establishment

Course syllabus for SD2415 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

SD2410 or SD2414

Language of instruction

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

Intended learning outcomes

The course aims to provide the basic knowledge required to describe and model the physical parameters governing manufacturing of fibre composites and experience of experimental design to verify developed models.

After finished course the participant should be able to:

- describe the physical phenomena and material properties which actively affect manufacturing of composite materials
- extract and use information from scientific literature
- describe the most important process parameters and manufacturing processes using basic physical laws and constitutive equations
- perform relevant simplifications of laws and equations in order to develop simplified models
- implement and develop models in suitable code (MATLAB or FEM) and perform simulations
- design experiments for model verification
- analyse experimental results and make conclusions on the validity and accuracy of the developed models
- use developed models for basic process optimisation

Course contents

Introduction to process modelling, matrix flow, cross-linking, viscosity, permeability, Darcy's law, drapability, heat transfer modelling, numerical implementation, experimental verification and validation.

Course literature

Åkermo, M., An introduction to Process Modelling in Composites Manufacturing, KTH, 2006.

Material handed out at lectures.

Examination

- TEN1 - Examination, 2.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 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.

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

Other requirements for final grade

Assignment (LAB; 4 university credits) and
written exam (TEN; 2 university credits)

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.