COURSE SYLLABUS

Simuleringsdriven produktutveckling

Simulation-driven Design

7.5 credits (7,5 högskolepoäng)

Course code: MT2559
Main field of study: Mechanical Engineering
Disciplinary domain: Technology
Education level: Second cycle
Specialization: A1F - Second cycle, has second cycle course/s as entry requirements

Subject area: Mechanical Engineering
Language of instruction: English
Applies from: 2018-03-01
Approved: 2018-03-01

1. Decision

This course is established by Dean 2018-01-24. The course syllabus is approved by Head of Department of Mechanical Engineering 2018-03-01 and applies from 2018-03-01.

2. Entry requirements

Admission to the course requires taken course Computational Engineering 1, 7,5 credits.

3. Objective and content

3.1 Objective

The purpose of the course is to give students knowledge to understand, as well as ability to implement and use, theories and methods for simulation support in product development

3.2 Content

The course includes the following main parts:
• Simulation-driven design
• Introduction to optimization and its use in product development.
• Simulation process automation: Setup and execute chained simulation process flows containing several different software packages.
• Methods for structured and efficient design space exploration using mathematical models.
Theory will be exemplified using real-life design or decision-making situations within applications such as solid mechanics, structural dynamics and heat conduction.

4. Learning outcomes

The following learning outcomes are examined in the course:

4.1 Knowledge and understanding

On completion of the course, the student will be able to:
• Be able to describe and explain the principles for how optimization methods and algorithms dealt with in the course works.
• Be able to interpret, analyse and communicate simulation results.
• Show insight in advantages and drawbacks of a model-driven approach in relation to product development.

Skills and abilities
• Be able to define, set-up and solve design optimization problems using methods dealt with in the course.
• Be able to setup and execute chained simulation process flows using methods dealt with in the course.
• Show ability to plan and execute experiments with mathematical models using methods dealt with in the course.
• Show ability to critically, independently and creatively identify, formulate and deal with complex problems.
• Show ability to design, analyze and evaluate different technical solutions.
• Show ability to plan and with suitable methods accomplish qualified tasks within given constraints.
• Show ability to model, simulate, predict and assess behavior even with limited information.
• Show ability to clearly present and discuss drawn conclusions and the knowledge and argument they are based on.

4.2 Judgement and approach

On completion of the course, the student will be able to:

- Show ability to critically evaluate calculated results and assess if they are reasonable.

5. Learning activities

The teaching comprises lectures, laboratory work, project work, seminars and exercises.

6. Assessment and grading

Modes of examinations of the course

Code	Module	Credits	Grade
1810	Written assignment 1	2.5 credits	GU
1820	Written assignment 2	1.5 credits	GU
1830	Written assignment 3	3.5 credits	GU

The course will be graded G Pass, UX Fail, supplementation required, U Fail.

The course information for each course revision should include the assessment criteria and make explicit in which modes of examination that the learning outcomes are assessed.

7. Course evaluation

The course evaluation should be carried out in line with BTH:s course evaluation template and process.

8. Restrictions regarding degree

The course can form part of a degree but not together with another course the content of which completely or partly corresponds with the contents of this course.

9. Course literature and other materials of instruction

Material from the department.

10. Additional information

This course replaces the course MT2549