

SYLLABUS

Applied systems simulation 7.5 credits M7030T

Tillämpad systemsimulering

Course syllabus admitted: Autumn 2018 Sp 1 - Spring 2021 Sp 4

**DECISION DATE
2018-02-15**

Applied systems simulation 7.5 credits M7030T

Tillämpad systemsimulering

Second cycle, M7030T

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Maskinkonstruktion	Mechanical Engineering

Entry requirements

Fundamental knowledge within CAD and good knowledge in ordinary differential equations, for example M0010T Computer-aided Design and M0031M Linear Algebra and Differential Equations.

Selection

The selection is based on 30-285 credits

Examiner

Jan-Olov Aidanpää

Course Aim

The purpose is to understand, simulate and analyze coupled systems. In here, coupled systems refers to integrated simulation of different physical disciplines (e.g. dynamics-control, flow-hold, etc.).

1. Knowledge and understanding

- Understand the basics and be able to solve coupled problems in mechanics.
- Get a critical scientific approach to equations used in simulation of coupled systems to see possibilities and limitations in methods.
- Be able to analyze and solve coupled problems.
- Understand simulation and programming of coupled systems.

2. Skills and abilities.

- Be able to create coupled models from real problems.
- Be able to use different programs and create interfaces to simulate the entire system.
- Be able to evaluate results from the simulations

3. Judgement and approach

- Critically assess the validity of numerical results.
- Know tomorrow's simulation challenges in mechanical engineering
- Feel more experienced in engineering assessments as well as identification and formulation of problem.

Contents

The course deals with coupled systems from analysis of simpler models to simulation of advanced systems. The course includes: analytical formulation of simple coupled systems, simulation of mechanical systems with active components and control systems, simulation of hardware connected to digital model, simulation of software in a real system, evaluation of simulation results.

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The course includes lectures and computer assignments.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Approved assignments and presentation are required for pass. Grades are based on the quality of the assignments.

Overlap

The course M7030T is equal to M7032T

Literature. Valid from Autumn 2018 Sp 1

Will be found on Canvas

Course offered by

Department of Engineering Sciences and Mathematics

Items/credits

No items/credits available

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Syllabus established

by Mats Näsström 2018-02-15