DD1354 Models and Simulation 6.0 credits

Modeller och simulering

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

Establishment

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Knowledge and skills in programming, 6 credits, equivalent to completed course DD1337/DD1310-DD1319/DD1321/DD1331/DD1333/DD100N/ID1018/ID1022.

Intended learning outcomes

After passing the course, the student shall be able to

- formulate particle models and mass-spring models as systems of ordinary differential equations, solution methods for system sof linear and nonlinear equations and general time-stepping methods for the solution of systems of ordinary differential equations

- design computer programs for computer simulation with ordinary differential equations, initial conditions, time-stepping and stability
- implement visualisations for computer simulation
- define and examine a problem with computer simulation, ordinary differential equations, solution methods for system of linear and non-linear equations and/or general time-stepping method for the solution of system of ordinary differential equations and visualise the results.

Course contents

Basic ideas and concepts: particle models, mass-spring models, ordinary differential equations, stability, systems of non-linear equations.

Algorithms and programming: time-stepping for the solution of a general ordinary differential equation, fixed point iteration, Newton's method.

Examination

- LABA - Laboratory work, 2.0 credits, grading scale: P, F
- PROA - Project, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TENA - Written exam, 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.