SG1115 Particle Dynamics with project 7.5 credits

Partikeldynamik med projekt

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

Establishment

The Dean of SCI School has on the 14 Oct. 2019 decided to adopt this syllabus to apply from VT 2021 (file number S-2019-1667).

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Active participation in the mathematics course in single variable analysis.

Language of instruction

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

Intended learning outcomes

After completing the course the student should be able to:

- read and understand mathematical text applied in the field of mechanics and communicate reasoning and calculations in this field orally and written in such a way that they are easy to follow,
- identify a concrete mechanical problem, and choose suitable mechanical models based on a problem description,
- translate the mechanical model into a mathematical model,
- mathematically treat the problem and critically analyze the significance of the result,

in order to use a physical mindset and communicate this within the framework of engineering science contexts.

Course contents

Quantities, units and dimensions, vector algebra and vector geometry. Particle kinematics in Cartesian coordinates, cylinder coordinates and natural components. Inertial systems, forces, free-body diagram and Newton's laws. Work, power, energy, conservative forces, kinetic and potential energy. Movement torque and moment equation. Central force motion. Linear oscillations in one dimension: harmonic, damped and forced.

Examination

- INL1 - Hand-in assignments, 1.5 credits, grading scale: P, F
- PRO1 - Project, 1.5 credits, grading scale: P, F
- TEN1 - Theory exam, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN2 - Problem exam, 3.0 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.

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.