SI2361 Advanced Mechanics 6.0 credits

Avancerad mekanik

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

Establishment

Course syllabus for SI2361 valid from Spring 2009

Grading scale

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

Education cycle

Second cycle

Main field of study

Physics

Specific prerequisites

Bachelor of Science

Language of instruction

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

Intended learning outcomes

After finished course the students should be able to apply the formalism presented in different areas of applied physics.

Course contents

Analytical mechanics

The Lagrange and Hamilton formalisms, periodic motion, Euler-Lagranges equations, variational calculus, Chirikov's criterion and Poincare plots.

Statistical mechanics

Microcanonical and canonical ensembles. Hamilton's equations and Liouville's theorem. The relation between statistical mechanics and thermodynamics. The ideal gas, the Maxwell-Boltzmann distribution and the entropy concept.

Fluid mechanics

The continuity equation, viscosity and Navier-Stokes equations. Different boundary conditions and solutions in simple geometries. Laminar and turbulent flow. Reynolds number.

Course literature

Lecture notes.

Examination

- TEN1 - Examination, 6.0 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.

Written examination TEN1.

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.