



SI1142 Mathematical Methods in Physics, Additional Course

3.0 credits

Fysikens matematiska metoder, tilläggskurs

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

Establishment

Course syllabus for SI1142 valid from Spring 2016

Grading scale

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

Education cycle

First cycle

Main field of study

Physics, Technology

Specific prerequisites

Recommended prerequisites: To master the contents of the mathematics courses that precede each part of this course in the course plan for the technical physics program. This course should be taken in parallel or after SI1140.

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 a student should be able to:

- Use tensor analysis in order to describe and analyze physical relationships
- Use Lagrange's and Hamilton's formalisms in classical mechanics in order to reach conclusions regarding different physical systems and how they behave
- Within Lagrange's and Hamilton's formalisms, account for how constants of motion appear and apply these to the analysis of physical systems

Course contents

Tensor and vector analysis in general spaces. Tangent and dual vectors. The metric tensor. Lagrange's and Hamilton's formulations of classical mechanics. Noether's theorem. Constants of motion.

Course literature

G. Sparr and A. Sparr, Kontinuerliga system, Studentlitteratur, Lund (2000) och tillhörande Övningsbok.

Ytterligare material kommer att kunna nås via kurshemsidan.

Examination

- **TEN2** - Examination, 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.

Other requirements for final grade

Pass final examination.

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.