



FSI3130 Differential Geometric Methods in Physics 7.5 credits

Fysikens differentialgeometriska metoder

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

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for FSI3130 valid from Spring 2009

Grading scale

Education cycle

Third cycle

Specific prerequisites

Theory of Relativity.

Language of instruction

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

Intended learning outcomes

To give an understanding of the mathematical principles of differential geometry and their applications by studying a number of examples. These include classical mechanics, general relativity and particle physics.

Course contents

Manifolds, tangent bundles and vector fields. Differential forms and integration on manifolds. Riemannian metrics, geodesics and parallel transport. Symplectic geometry and the Hamiltonian formulation of classical mechanics. Yang-Mills theory and minimal coupling in particle physics.

Course literature

M. Nakahara: Geometry, Topology, and Physics. A Hilger 1990.

Examination

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.

Other requirements for final grade

Written 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.