FSF3730 Integrable Systems 7.5 credits

Integrabla system

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 FSF3730 valid from Autumn 2009

Grading scale

Education cycle

Third cycle

Specific prerequisites

A Master degree including at least 30 university credits (hp) in in Mathematics.

Language of instruction

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

Intended learning outcomes

After passing the course the students will understand, and are able to apply, the theory of finite-dimensional Hamiltonian systems, the spectral transform and solitons, and relativistic minimal surfaces.

Course contents

The course covers

- The Projection Method of Olshanetsky and Perelomov
- Classical Integrability of the Calogero-Moser systems
- Solution of a Quantum Mechanical N-Body Problem
- Algebraic Approach to x^2 + α/x^2 Interactions
- Some Hamiltonian Mechanics
- The Classical Non-Periodic Toda Lattice
- r-Matrices and Yang Baxter Equations
- Integrable Systems and gl(∞)
- Infinite Dimensional Toda Systems
- Integrable Field Theories from Poisson Algebras
- Generalized Garnier Systems and Membranes
- Differential Lax Operators, Spectral Transform and Solitons

Disposition

Lectures

Course literature

Jens Hoppe: Lectures on Integrable Systems. Springer Lecture Notes in Physics m10 1992, ISBN: 978-3-540-55700-5 (Print), 978-3-540-47274-2 (Online)

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.

Homework and an oral examination at the end of the course.

Other requirements for final grade

Approved homework and 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.