Algebraic Methods in Physics 7.5 credits M7022M

Fysikens algebraiska metoder

Course syllabus admitted: Autumn 2011 Sp 1 - Spring 2012 Sp 4

DECISION DATE
2010-11-18

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Algebraic Methods in Physics 7.5 credits M7022M

Fysikens algebraiska metoder

Second cycle, M7022M

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Matematik	Mathematics

Entry requirements

Basic knowledge of analysis, linear algebra and functions of several variables.

Selection

The selection is based on 30-285 credits

Examiner

Norbert Euler

Course Aim

To study differential equations by the use of Lie symmetry methods, i.e. Lie symmetry groups and Lie symmetry algebras. The main emphasis is on nonlinear differential equations and exact solutions.

Contents

Symmetry properties of differential equations are described and exploited for the integration of linear and nonlinear ordinary - and partial differential equations. Method to construct solutions, first integrals and conservation laws are studied using the equations symmetry properties. The underlying mathematical structure is provided by the Lie Transformation Group Theory and its Lie Algebra representations.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Classical classroom lectures and seminars.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.
Oral and written presentation.

Remarks

The course takes place every two years, alternating with the course Geometric Methods in Physics.

Overlap

The course M7022M is equal to MAM219

3525

Literature. Valid from Autumn 2007 Sp 1

1) Symmetry Methods for Differential Equations, by Peter E Hydon, Cambridge Text, 2000.
2) Symmetry and Integration Methods for Differential Equations, by G W Bluman and S C Anco, Springer Verlag 2002.

Course offered by

Department of Engineering Sciences and Mathematics

Items/credits

Number	Type	Credits	Grade
0002	Oral and written presentation	7.5	G U 3 4 5

Last revised

by 2010-11-18

Syllabus established

The syllabus is valid from Autumn 2007.

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