Mathematics Space 7.5 credits M0046M

Matematik Ry

Course syllabus admitted: Autumn 2018 Sp 1 - Spring 2020 Sp 4

DECISION DATE
2018-02-15

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Mathematics Space 7.5 credits M0046M

Matematik Ry

First cycle, M0046M

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

Main field of study

Engineering Physics and Electrical Engineering

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and Courses M0029M, M0030M, M0031M, M0032M, or equivalent.

Selection

The selection is based on 1-165 credits.

Examiner

Johan Byström

Course Aim

After completed course, the student should:

- be able to use the Laplace transform as a tool for solving ordinary differential equations with initial conditions.
- be able to solve systems of differential equations using diagonalization and matrix exponential.
- be able to compute Fourier series and Fourier transforms for some elementary functions and distributions.
- manage concepts as transfer function, LTI-systems, causality, stability, impulse response and convolution integrals for linear systems.
- have gained knowledge about distribution theory and be able to use distributions such as the dirac delta function to model certain physical phenomena.
- be able to formulate a few common partial differential equations, boundary- and initial conditions, starting with problems from physics and be able to solve these with variable separation techniques.

Contents

Linear systems, Laplace transform, Fourier series, Fourier transform, use of transforms för solving differential equations. Systems of differential equations. Distributions. Mathematical models for diffusion, heat transfer, wave propagation. Solution of PDEs with variable separation.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Lectures, problem solving, computer tasks.

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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. Written examination and computer tasks.

Overlap

The course M0046M is equal to M0053M

Literature. Valid from Spring 2018 Sp 3

1) B.P. Lathi: Linear systems and signals, 2nd edition, Oxford University Press, 2010.
2) Handed out material

Course offered by

Department of Engineering Sciences and Mathematics

Items/credits

Number	Type	Credits	Grade
0001	Written exam	6.9	TG G U 3 4 5
0002	Laboration	0.6	TG U G#

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Mats Näsström 2018-02-15

Syllabus established

by Mats Näsström 2017-02-15