

SYLLABUS

Linear Algebra and Differential Equations 7.5 credits M0049M

Linjär algebra och differentialekvationer

Course syllabus admitted: Autumn 2023 Sp 1 - Present

**DECISION DATE
2022-02-14**

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Linjär algebra och differentialekvationer

First cycle, M0049M

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

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 the courses Differential Calculus (M0047M) and Linear Algebra and Calculus (M0048M) or their equivalents.

Selection

The selection is based on 1-165 credits.

Course Aim

After completed course, the students should be able to:

- use central concepts and techniques for complex numbers, algebraic equations and the complex exponential function.
- use vector spaces, subspaces and bases.
- use eigenvectors and eigenvalues for diagonalization.
- perform orthogonal diagonalization for symmetric matrices.
- solve basic differential equations as first order separable equation, linear equation of order one and higher.
- use computers programs to do calculations within the course (MATLAB).
- identify and solve problems within the course.

Contents

This course treats basic principles and techniques concerning complex numbers, algebraic equations and differential equation and a continuation of linear algebra. The linear algebra part deal with vector spaces, subspaces and bases, eigenvalues and eigenvectors, diagonalization, orthogonal projection, method of least square and quadratic forms. Several concepts are investigated with computer aid (MATLAB).

Realization

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

The teaching consists of lectures and tutorials. The main learning is achieved by home studies, mainly problem solving.

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. The course aims are examined by a written individual exam and compulsory computer tasks. Grading according to the scale G U 3 4 5.

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term “unauthorized aids” refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Overlap

The course M0049M is equal to M0031M, M0060M, M0059M

Course offered by

Department of Engineering Sciences and Mathematics

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Laboration	U G#	1	Mandatory	A19	
0003	Written exam	G U 3 4 5	6.5	Mandatory	A21	

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 Niklas Lehto, Programme Director 2022-02-14

Syllabus established

by Niklas Lehto 2019-02-15