SF1694 Applied Linear Algebra 10.5 credits

Tillämpad linjär algebra

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 SF1694 valid from Autumn 2020

Grading scale

A, B, C, D, E, FX, F

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Basic requirements.

Language of instruction

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

Intended learning outcomes

After the course the student should be able to

- use concepts. theorems and methods to solve and present solutions to problems within the parts of linear algebra described by the course content,
- use Matlab to solve problems within the parts of linear algebra and numerical analysis described by the course content,
- read and comprehend mathematical text.

in order to

- develop a good understanding for basic mathematical concepts within linear algebra and to use these for mathematical modeling of engineering and scientific problems,
- develop a skill, with the help of computers, to illustrate key concepts and solve applied problems with Matlab as well as to visualize and present the results in a clear way.

Course contents

Basic ideas and concepts in linear algebra: vectors, matrices, systems of linear equations, Gaussian elimination, matrix factorization, vector geometry with scalar product and vector product, determinants, vector spaces, linear independence, bases, change of basis, linear mappings, eigenvalue, eigenvector, the least squares methods, orthogonality, Gram-Schmidt's method.

Computational aspects: numerical solution of systems of linear equations with Gaussian elimination and LU factorization, complexity, determine complexity by numerical experiments, condition number and numerical computation of condition numbers, assessment of accuracy.

Examination

- LAB1 - Laboratory work, 2.0 credits, grading scale: P, F
- PRO1 - Project work, 1.0 credits, grading scale: P, F
- TEN1 - Exam, 7.5 credits, grading scale: A, B, C, D, E, FX, F

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.

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.