IX1301 Mathematics I 7.5 credits

Matematik I

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for IX1301 valid from Autumn 2008

Grading scale

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

Education cycle

First cycle

Main field of study

Mathematics, Technology

Specific prerequisites

Language of instruction

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

Intended learning outcomes

The students shall be able to:

Use elementary vector algebra.

Describe lines and planes with vector equations.

Discuss applications of linear systems, and their solutions

Use elementary matrix algebra.

Evaluate determinants and explain the importance of a determinantequaling zero

Use a Matrix to describe a transformation, explain how to obtain a transformation matrix and to find transformation matrices for single transformations or a composition of transformations.

Use transformations for applications in R2 and R3.

Describe subspaces in R2 and R3, and find the base for a subspace.

Explain the principle of orthogonal projections and find the projection on a subspace.

Explain the principles of coordinates and a change of base, and find and use a transitation matrix.

Solve simple eigenvalue problems.

Calculate or compute permutations or combinations for selections, with or without respect to order.

Desricribe fundamental principles in set theory, use binarary operations on sets and use Venn diagrams.

Apply set theory on compinatorical calculations.

Explain the principles of conclusion an inclusion and use them in combinatorical calculations.

Course contents

Linear algebra and geometry:

Vectrors, dot- and cross-product

Geometry in R2 and R3 and generalizations in Rn

Linear systems of equations

Matrices and determinants; inverse matix.

Linear transformations

Bases and change of base.

Least squares.

Eigenvalues.

Discrete mathamatics:

Numbers

Combinatorics.

Set theory

Introduction to probability

Course literature

Diskret matematik övningsbok, Böiers, Lars-Christer

Upplaga: Förlag: Studentlitteratur År: 2003

ISBN: 91-44-03119-X

Contemporary Linear Algebra, Howard Anton/ Robert C Busby

Upplaga: Förlag: Wiley År: 2003

ISBN: 0-471-16362-7

Diskret matematik, Böiers, Lars-Christer

Upplaga: 2 Förlag: Studentlitteratur År: 2003

ISBN: 91-44-03102-5

Examination

- INL1 - Assignments, 1.5 credits, grading scale: P, F
- TEN2 - Laboratory Work, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 1.5 credits, grading scale: P, 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Computational test (1,5 hp), examining the ability to use the computer for mathematical cumputations. Grade P, F.
Computational assignments(1,5hp) examining the ability to use methods in applied problems; Individual oral examination. Grade P, when all tasks are passed.
Written examination (4,5hp), examining theory, concepts and methods.
Grade: A-F.

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.