ED1110 Vector Analysis 4.5 credits

Vektoranalys

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 ED1110 valid from Autumn 2016

Grading scale

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

Education cycle

First cycle

Main field of study

Electrical Engineering,Technology

Specific prerequisites

Eligibility for studies at KTH.

Language of instruction

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

Intended learning outcomes

The purpose of the course is to provide an understanding of the basic relations of vector analysis, to demonstrate practical applications of vector analysis and to train the student in problem formalization and in methods of solution.

The course objectives are examined; the student should be able to:

- explain the characteristics of scalar and vector valued functions and master these in calculations
- provide a physical interpretation of the gradient, divergence, curl and related concepts
- carry out differentiation and integration of vector valued functions in cartesian, cylindrical and spherical geometry
- transform vector valued functions between different coordinate systems
- use nabla operations for simplification of vector analytical expressions
- give an account of important vector field models of Nature
- solve the Laplace and and Poisson equations for simple cases

Course contents

Scalar and vector valued functions. Differentiation and integration of vector valued functions. The gradient. The potential. Line and surface integrals. Gauss´ and Stokes´ theorems. Nabla operators. Index operations. Integral theorems. Coordinate transformations. Important vector fields. The equations of Laplace and Poisson.

Disposition

The course employs learning focused pedagogics with goal oriented lectures.

Course literature

A. Ramgard: Vektoranalys.

Available at Kårbokhandeln.

Examination

- TENA - Exam, 4.5 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.

Continual examination is employed. The examination consists of home assignments as well as individual and group work during tutorial sessions ("övningar"). A written final exam is given for those who desire higher grades or do not participate in the continual examination.

Other requirements for final grade

Grade E can be achieved without a final written exam by carrying out home assignments as well as individual and group work during tutorial sessions. Requirements in terms of points are provided in Course PM. How points from the continual examination are credited in the final written exam are described in the Course PM.

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.