SF1626 Calculus in Several Variables 7.5 credits

Flervariabelanalys

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

Establishment

Course syllabus for SF1626 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

It is important that the student both UNDERSTANDS the mathematical theory and also knows how to APPLY it to concrete problems.

After the course the student SHALL be able to

- understand basic concepts for functions of several variables, such as limits, continuity, differentiability, partial derivatives, functional matrices, functional determinants, gradients, directional derivatives, multiple integrals and line integrals;
- compute limits for functions of several variables and use these in order to decide whether such functions are continuous or maybe even differentiable;
- compute partial derivatives, use the chain rule, and also apply coordinate transformations in order to simplify and solve certain partial differential equations;
- compute the functional matrix of a given function and use this in order to decide whether the function is locally invertible or not;
- use Taylor's formula in several variables for approximating functions with polynomials;
- use the gradient for calculating directional derivatives and tangent planes for level surfaces;
- compute multiple integrals;
- use multiple integrals in order to calculate areas, volumes and masses;
- solve extremal problems without or with constraints;
- calculate line integrals and potential functions;
- use Green's formula for calculating line integrals along closed curves.

Course contents

Examination

- TEN1 - Examination, 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.

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

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.