Linnæus University

Course syllabus

Faculty Board of Science and Engineering
School of Computer Science, Physics and Mathematics

1MA153 Vektoranalys, 7,5 högskolepoäng
Vector analysis, 7.5 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved by Organisational Committee 2009-08-11

The course syllabus is valid from spring semester 2010

Prerequisites
Analysis of several variables, 7,5 hp or the equivalent

Expected learning outcomes

Upon completion of the course, the student should be able to:

- Calculate the arc length of continuously differentiable curves
- describe and use Taylor's formula for local investigations of functions
- determine tangent planes for implicitly given functions

• calculate derivatives (on matrix form) and understand the concept differentiability for vector valued functions and its importance for linearization

- calculate elementary triple- and multiple integrals
- calculate generalized integrals and perform convergence tests on those

• calculate curve integrals by parameterization

- calculate areas and curve integrals with Green's formula
- use Gauss' and Stokes' theorems in two and three dimensions
- definitions and relations in the theory for Vector analysis and to use these in problem solving
- interpret, communicate and argue using the language of mathematics.

Content

- continuous curves and arc lengths
- Taylor's formula
- Local investigations of functions
- Triple integrals, multiple integrals, change of variables
- Integrals with one parameter
- Differential calculus for vector valued functions
- Functional matrices and functional determinants
- Line integrals
- Gauss theorem in two dimensions and Green's formula
- Double integrals
- Gauss' theorem in three dimensions
- Stokes' theorem

Type of Instruction

Lectures and seminars. Compulsory assignments may be given during the course.

Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).
On request, students may have their credits translated to ECTSmarks.
Such a request must be sent to the examiner before the grading process starts.

The student's knowledge is assessed in the form of oral and/or written examinations.

Course Evaluation

After the course a written evaluation of the course will take place according to the University guidelines.

Required Reading and Additional Study Material

Robert. A Adams, *Calculus. A complete course*. 6th edition. Addison Wesley.