

# Vector Analysis

Programme course

4 credits

Vektoranalys

TATA44

Valid from: 2017 Spring semester

**Determined by**

Board of Studies for Electrical Engineering,  
Physics and Mathematics

**Date determined**

2017-01-25

## Main field of study

Mathematics, Applied Mathematics

## Course level

First cycle

## Advancement level

G1X

## Course offered for

- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering
- Biomedical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering, M Sc in Engineering
- Physics, Bachelor's Programme
- Mathematics, Bachelor's Programme
- Applied Physics and Electrical Engineering - International, M Sc in Engineering

## Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

## Prerequisites

Courses in calculus and linear algebra.

## Intended learning outcomes

The course deals with vector functions and vector fields, and gives the mathematical theory of potentials and flows which are at the basis of, amongst other areas, theoretical electrotechnology and fluid mechanics. After the course one can

- find potentials for a vector field

- calculate path and flux integrals, with and without the use of integral theorems
- use spherical and cylindrical coordinates in calculations

## Course content

Vector functions and vector fields. Spherical and cylindrical coordinate systems. The concepts of potential, gradient, divergence and curl. Integral theorems: Gauss', Stokes' and Green's theorems.

## Teaching and working methods

Teaching is done in lectures and problem classes.

## Examination

TEN1	Written examination	U, 3, 4, 5	4 credits
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## Grades

Four-grade scale, LiU, U, 3, 4, 5

## Other information

Supplementary courses: Complex Analysis, Fourier Analysis

## Department

Matematiska institutionen

## Director of Studies or equivalent

Jesper Thorén

## Examiner

Peter Basarab-Horwath

## Course website and other links

<http://www.mai.liu.se/und/kurser/index-amne-tm.html>

## Education components

Preliminär schemalagd tid: 46 h  
Rekommenderad självstudietid: 61 h

## Course literature

### **Kompletterande litteratur**

### **Kompendier**

K. Daho, Kompendium i vektoranalys M. Nikoltjeva-Hedberg, Exempelsamling i vektoranalys, utgiven av MAI

# Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at [http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning\\_pa\\_grund-\\_och\\_avancerad\\_niva](http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva).