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	4 credits	U, 3, 4, 5

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
Preliminary scheduled hours: 46 h
Recommended self-study hours: 61 h

Course literature

Additional literature

Compendia

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.