Calculus in One and Several Variables

En- och flervariabelanalys
6 credits

Programme course

TATA91

Valid from: 2024 Spring semester

Determined by	**Main field of study**	
Board of Studies for Computer Science and Media Technology	Mathematics, Applied Mathematics	
Date determined	**Course level**	**Progressive specialisation**
2023-08-31	First cycle	G1X
Revised by	**Disciplinary domain**	
	Natural sciences	
Revision date	**Subject group**	
	Mathematics	
Offered first time	**Offered for the last time**	
Spring semester 2018		
Department	**Replaced by**	
Matematiska institutionen		

Course offered for

- Master of Science in Information Technology
- Master of Science in Computer Science and Software Engineering

Prerequisites

Calculus in one variable 1, Linear Algebra

Intended learning outcomes

Gain familiarity with mathematical concepts, reasoning and relationships in calculus in one and several variables, and gain the calculation and problem solving skills needed for further studies. After completing this course you should be able to

- cite, explain and use the definitions and theorems of the course's key concepts
- solve problems and verify that results are correct or resonable

Course content

Taylor's and Maclaurin's formulae: Maclaurin expansions of the elementary functions, the Ordo form of the remainder term with applications, e.g. computations of limits. Ordinary differential equations: first order linear and separable equations, higher order linear equations with constant coefficients. Improper integrals: investigation of convergence, absolute convergence. Numerical series: investigation of convergence, absolute convergence, Leibniz criterion. The space R ^ n: basic topological concepts, functions from R ^ n to R ^ p, function surfaces,level surfaces and level curves. Differential calculus: partial derivatives, the chain rule, partial differential equations, gradient, normal, tangent, tangent plane and directional

Teaching and working methods

The course consists of lectures and classes.

For the MSc programme in Information Technology, the course applies problem-based learning.

Examination

TEN1	Written exam	6 credits	U, 3, 4, 5

Grades

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

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

The course is campus-based at the location specified for the course, unless otherwise stated under “Teaching and working methods”. Please note, in a campus-based course occasional remote sessions could be included.