

Complex Analysis

Komplex analys
6 credits

Programme course

TATA45

Valid from: 2022 Spring semester

Determined by	Main field of study	
Board of Studies for Electrical Engineering, Physics and Mathematics	Mathematics, Applied Mathematics	
Date determined	Course level	Progressive specialisation
2021-09-01	First cycle	G2X
Revised by	Disciplinary domain	
	Natural sciences	
Revision date	Subject group	
	Mathematics	
Offered first time	Offered for the last time	
Autumn semester 2007		
Department	Replaced by	
Matematiska institutionen		

Course offered for

- Master of Science in Industrial Engineering and Management
- Master of Science in Industrial Engineering and Management - International
- Master of Science in Applied Physics and Electrical Engineering
- Master of Science in Applied Physics and Electrical Engineering - International
- Bachelor's Programme in Mathematics

Prerequisites

Linear Algebra and Calculus in one and several variables or equivalent. Vector calculus is recommended but not necessary.

Intended learning outcomes

The course will give basic proficiency in one-variable complex analysis required for subsequent studies. After completing this course, students should

- be able to define and explain basic concepts such as analytic function and harmonic function, and discuss connections between these function classes
- be familiar with the elementary functions and their properties
- be able to classify different types of singular points and discuss their characteristic properties
- be able to formulate and use central results in complex analysis such as the Cauchy-Riemann equations, the Cauchy integral theorem and formula and their applications, the maximum principle, Taylor and Laurent expansions of analytic functions, the residue theorem and its applications, the argument principle and how to use it
- know the fundamental properties of linear fractional transformations and how to use them in conformal mapping.

Course content

Complex numbers. The notion of analytic function. Elementary functions. Complex line integrals. Cauchy's integral theorem and formula. Taylor and Laurent series. Residue calculus. The argument principle. Linear fractional transformations.

Teaching and working methods

Lectures and lessons.

