



SF1691 Complex Analysis 7.5 credits

Komplex analys

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for SF1691 valid from Autumn 2019

Grading scale

A, B, C, D, E, FX, F

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Completed basic course SF1626 Calculus in Several Variable or SF1674 Multivariable Calculus.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After the course the student should be able to

- explain the meaning of basic concepts, theorems and methods within the parts of complex analysis described by the course content
- use concepts, theorems and methods to solve and present solutions to problems within the parts of complex analysis described by the course content,

in order to solve applied problems and to communicate with the help of mathematical language, even in other contexts.

For higher grades, the student should in addition be able to

- explain how different theorems and concepts are connected and deduce relationships from the given theorems.

Course contents

Complex numbers in rectangular and polar form. Basic geometry and topology of the complex plane and on the Riemann sphere. Holomorphic, meromorphic and harmonic functions. Conformal mappings. Taylor and Laurent series. Radius of convergence and termwise differentiation and integration of power series. Classification of singularities. Poles and zeros, the argument principle and Rouché's theorem. Liouville's theorem with applications. Differentiation and integration in the complex plane. Cauchy-Riemann equations. Cauchy's theorem and Cauchy's integral formula with corollaries. The maximum principle. Residues. Applications to, for example, transform theory, heat conduction and electricity theory.

Course literature

The course literature is announced on the course webpage four weeks before the start of the course.

Examination

- TEN1 - Exam, 7.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

The examiner decides, in consultation with KTH's Coordinator of students with disabilities (Funka), about any customized examination for students with documented, lasting disability. The examiner may allow another form of examination for re-examination of individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.