DEPARTMENT OF MATHEMATICAL SCIENCES

MMG700   Analytic Function Theory, 7.5 higher education credits

Analytiska funktioner, 7,5 högskolepoäng

First Cycle

Confirmation

This course syllabus was confirmed by Department of Mathematical Sciences on 2017-06-26 to be valid from 2017-07-01, autumn semester of 2017.

Field of education: Science 100%
Department: Department of Mathematical Sciences

Position in the educational system

The course can be part of the following programme: 1) Bachelor's Programme in Mathematics (N1MAT)

Main field of studies	*Specialization*
Mathematics	G2F, First Cycle, has at least 60 credits in first-cycle course/s as entry requirements

Entry requirements

General entry requirements and the equivalent of 60 credits in mathematics.

Learning outcomes

On successful completion of the course the student will be able to

- define basic concepts and prove basic theorems in the course,
- represent general holomorphic functions as superpositions of simpler ones, that is, as integrals, power series and/or Laurent series,
- construct conformal mappings,
- compute residues,
- solve certain equations involving elementary holomorphic functions and compute the number of solutions to certain algebraic equations using the general theory,

- compute certain real integrals as well as contour integrals using complex analytic techniques, and deform integration contours.

Course content

Holomorphic functions and their properties. Geometry in the complex plane and the Riemann sphere. Möbius transformations and conformal mappings. Cauchy's theorem. Cauchy's formula. Liouville's theorem. Power series and Laurent series. The identity principle. Analytic continuation. Rouché's theorem. The residue formula with applications. Harmonic functions. The maximum principle. The Dirichlet theorem.

Form of teaching

The course will be taught in English unless everyone involved speaks Swedish.

Assessment

The examination consists of a written exam at the end of the course. During the course, there may be optional assignments that give bonus points on the exam. Examples of such assignments are small written tests, labs, and oral or written presentations. Information about this is found on the course home page.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

Course evaluation

The course is evaluated with an anonymous questionnaire and/or a discussion with the student representatives. The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.

Additional information

For a list of course literature, see:
https://www.chalmers.se/sv/institutioner/math/utbildning/grundutbildning-goteborgs-universitet/kurslitteratur/Sidor/Kurslitteratur-i-matematik.aspx

The syllabus for MMG700 was originally established to take effect from 2007-07-01, when it replaced MAN420.