

COURSE DETAIL

COMPLEX ANALYSIS 1

Country

Sweden

Host Institution

Lund University

Program(s)

Lund University

UCEAP Course Level

Upper Division

UCEAP Subject Area(s)

Mathematics

UCEAP Course Number

114

UCEAP Course Suffix**UCEAP Official Title**

COMPLEX ANALYSIS 1

UCEAP Transcript Title

COMPLEX ANALYSIS 1

UCEAP Quarter Units

6.00

UCEAP Semester Units

4.00

Course Description

The course covers basic theory of analytic functions including elementary properties of analytic functions in one variable. Complex differentiability and Cauchy-Riemann equations. Calculation rules. Elementary examples of analytic functions: power series expansions, exponential functions, branches of logarithms, and functions defined by these calculation rules. Contour integrals in the complex plane. Cauchy's integral theorem and integral formula. Existence of a primitive function and local power series expansion of analytic functions. Cauchy estimates, Liouville's theorem, and the fundamental theorem of algebra. Theory of meromorphic functions, Laurent series expansion, and the residue theorem. Residue calculus. Further elements of the theory of holomorphic functions such as argument principle, Rouché's theorem, and open mapping property. Harmonic functions. Regularity, existence of harmonic conjugate, mean value property, maximum principle, Poisson integrals.

Language(s) of Instruction

English

Host Institution Course Number

MATC21

Host Institution Course Title

COMPLEX ANALYSIS 1

Host Institution Course Details

<https://kursplaner.lu.se/english/MATC21.pdf>

Host Institution Campus

Lund

Host Institution Faculty

Science

Host Institution Degree

Host Institution Department

Course Last Reviewed

2025-2026

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