

Complex Analysis II. – winter term 2014/15

Major: Mathematics 619 – elective course

Web page: <http://thales.doa.fmph.uniba.sk/niepel/CA/complexE.html>

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Office hours: M 131, Tuesday 14:00-15:00, Wednesday 14:00-15:00

Topics covered

This course is intended as a second course in Complex Analysis. Its main goal is to broaden theoretical background and illustrate applications and overlaps with other parts of Mathematics. At the beginning, we will overview basic results and techniques from the previous course – Complex Analysis I. (analytic functions, Cauchy-Riemann equations, Cauchy integral formulas, singularities, residues), later we will discuss Riemann-Hilbert problem, analytic continuations, infinite products, special functions, asymptotic methods for integration, conformal mappings, Riemann surfaces, applications to PDE, basics of the theory of several complex variables, holomorphic functions on manifolds, etc.

Later parts of the course (topics, level of detail, order) can be adapted to match the interests of students.

Course reading

Additional information, as well as many examples and exercises, can be found in many excellent textbooks. Copies of some of them are available at the course webpage.

M. Ablowitz, A. Fokas: Complex Variables. Introduction and Applications, Cambridge Texts in Applied Mathematics, 2003

L. Ahlfors: Complex Analysis. McGraw-Hill, 1979

J. B. Conway: Functions of One Complex Variable. Springer, GTM 11, 1978

E. Stein, R. Shakarchi: Complex Analysis. Princeton University Press, 2003

Course evaluation

Homework during the semester will be worth 100 points. Final grade will be decided according to the amount of work shown over the semester.

Homework sets

Homework sets will be posted on the course web page weekly (more or less). These problems are intended for practice, attaining practical computational skills, deeper understanding or further applications of the theory covered during the lectures. Completed written homework sets will be collected at the beginning of lectures.

Collaboration on the problem sets is not limited, but every student should write up the solutions on his/her own and indicate the amount of cooperation, inspiration or origin of any copied ideas.

In the case of difficulties, the recommended remedy is the collaboration with fellow classmates or consulting during the office hours.