

Math 506 Complex Analysis

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Topics to cover:

Single complex variables: Cauchy-Riemann equation and analyticity; Cauchy integral theorem; Maximum Modulus principle; Laurent series and singularities; Riemann extension theorem; Residues; Schwartz's lemma; Open mapping theorem; Analytic continuation and Riemann zeta function; Normal families and Montel's theorem; Riemann mapping theorem; Picard theorems.

Several complex variables and introduction to complex manifolds: Analyticity in several complex variables; Weierstrass preparation theorem; Hartog's theorem; Riemann extension theorem; Weierstrass division theorem; Analytic Nullstellensatz; Implicit and inverse function theorems; Complex manifolds; Holomorphic maps of complex manifolds; Complex hyperbolicity; Projective spaces; Riemann surfaces; Elliptic curves and Weierstrass doubly periodic functions.

References:

1. John B. Conway, Functions of One Complex variables, GTM 11
2. Serge Lang, Complex Analysis.
3. H. Farkas and I. Kra, Riemann Surfaces, GTM 71.
4. H. Grauert and K. Fritzsche, Several Complex Variables, GTM 38.

Grading: Homework (10%) Midterm exam (30%) Final exam (60%);
Notes, homework assignments and other course materials are available at
<http://www.math.ualberta.ca/~xichen/math50612w/>