Syllabus. Math 210B. Complex Analysis


- **Analytic functions as mappings. Möbius transformations**
- **Compactness and convergence in the space of analytic functions**
  - Review of the spaces of analytic functions from Math 210A
  - Spaces of meromorphic functions
  - Weierstrass Factorization Theorem
  - Factorization of the sine function
  - The gamma function
  - The Riemann zeta function. The Riemann Hypothesis
- **Runge’s Theorem**
  - Runge’s Theorem
  - Simple connectedness
  - Mittag-Leffler’s Theorem
- **Analytic Continuation and Riemann Surfaces**
  - Schwarz Reflection Principle
  - Analytic continuation along a path
  - Monodromy Theorem
  - The sheaf of germs of analytic functions on an open set
  - Analytic manifolds
  - Covering spaces
- **Harmonic functions**
  - Basic properties of harmonic functions
  - Harmonic functions on a disc
  - Subharmonic and superharmonic functions
  - The Dirichlet Problem
  - Green’s functions
- **Entire Functions**
  - Jensen’s Formula
- The genus and order of an entire function
- Hadamard Factorization Theorem

- **The Range of an analytic function**
  - Bloch’s Theorem
  - The Little Picard Theorem
  - Schottky’s Theorem
  - The Great Picard Theorem