

MA681 - Theory of Functions of a Complex Variable

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Lectures: Wednesdays 06:15-08:45 pm, Morton 106.

Grading:

- * Homework assignments: 30 %
- * Midterm: 30 %
- * Final: 40 %

General comments:

MA681 is a standard graduate-level course in complex analysis. The major objective of this course is to introduce classical topics such as analytic functions, conformal mappings, complex integrals and complex series. The classical results will be rigorously proved and interpreted geometrically. The course will also have a strong emphasis on problem solutions. Numerous homework assignments of different complexity ranging from standard calculation problems to proposition proofs will be offered. Provided that the mandatory material is covered some additional topics may be considered, for example, applications of complex analysis to the equations of mathematical physics and mathematical biology.

Textbooks:

- 1) Theory of Functions of a Complex Variable by A.I. Markushevich
- 2) Introductory Complex Analysis by R.A. Silverman, A.I. Markushevich
- 3) Complex Analysis by K. Kodaira
- 4) Complex Analysis by L.V. Ahlfors

Lectures:

1. Complex numbers.
2. Topology. Continuity.
3. Analytic functions.
4. Conformal mapping.
5. Polynomials and rational functions.
6. Exponentials and logarithms.
7. Complex integrals 1.
8. Complex integrals 2.
9. Complex integrals 3.
10. Power series 1.
11. Power series 2.
12. Singular points.
13. The Residue Theorem.
14. Applications.