

Math. 60370 Basic Complex Analysis I

Mei-Chi Shaw

Fall 2019

MWF 3:00-3:50 pm. Hayes-Healy 125

This is a basic course for every graduate student or advanced undergraduate whose interests are in analysis, not necessarily complex analysis. We will cover the following topics.

- (1) Basic Properties of Holomorphic Functions: Complex Derivatives and Conformal Mappings.
- (2) Complex Integration: the Cauchy Integral Formula and Applications.
- (3) Holomorphic Functions on Simply Connected Domains: the Riemann Mapping Theorem and the Runge Approximation.
- (4) Prescribing Zeros and Poles for Holomorphic Functions: The Mittag-Leffler Theorem and the Weirstrass Theorem.
- (5) The Inhomogeneous Cauchy-Riemann Equation.

Textbook:

We will use the manuscript coauthored with Dr. Charles Stanton. Lecture notes will be distributed to students. Most of the material can be found in the first few chapters in the reference books.

HOMEWORK: Homework will be assigned, collected and graded each week.

EXAMS and GRADING: Your course grade will be computed as follows:

Homework Grades: 40%

Midterm Exam: 30%

Final Exam: 30%

Office Hours: There will be regular office hours every Wednesday, 12:00-2:00 PM at my office (Hayes-Healy 244) or by appointments.

Reference books:

1. Greene, R. and Krantz, S. G., Function Theory of One Complex Variable, Third Edition, John Wiley and Sons, New York. ISBN: 0-471-80468-3
2. Ahlfors, L. V., Complex Analysis, 3rd edition, New York, Mcgraw-Hill, 1979. ISBN 07-00657-01
3. Stein, E. M. and Shakarchi, R., Complex Analysis. Princeton Lecture in Analysis II. Princeton University Press. Princeton New Jersey, 2002 ISBN 0-691-11385-8