

Math 412/512, Functions of a Complex Variable II, Spring 2018

Class time: MWF 2-2:50pm in 209 Deady
Instructor: Marcin Bownik
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Office Hours: M1-2pm, W12-1pm, F1-2pm, or by appointment
Office: 323 Fenton
Textbook: *Basic Complex Analysis, Third edition*, by Marsden and Hoffman.

1. **Course outline:** This course introduces students to the subject of complex analysis. The course, which is the first of two in the sequence, covers most of the chapters 4–7 of the textbook.
2. **Learning Outcomes.** A successful student can:
 - find residues of complex functions at isolated singularities,
 - apply the Residue Theorem to evaluate integrals,
 - calculate definite integrals on the real line using residues,
 - evaluate infinite series using residues,
 - find conformal mappings between two domains using linear fractional transformations,
 - apply conformal mappings to solve the Dirichlet and Neumann problems,
 - describe Riemann surfaces using analytic continuation,
 - locate roots of analytic functions using Rouché's theorem,
 - apply the root-pole counting formula,
 - establish convergence of infinite products,
 - show and apply properties of the Gamma Function,
 - find asymptotic expansions using the steepest descent method.
3. **Exams.** There will be one midterm in-class exam on Wednesday in week 6 and a final exam on Tuesday, June 12, 2:45-4:45pm.
4. **Homework.** Homework problems will be assigned every week and be due in class on Wednesday on the material of the previous week. No late homework will be accepted. Collaboration between students is encouraged, but you must write your own solutions and understand them.
5. **Grading.** The grading distribution will be as follows:

Homework	25%
Midterm	25%
Final Exam	50%