

## Math 411/511, Functions of a Complex Variable I, Winter 2018

**Class time:** MWF 2-2:50pm in 205 Deady  
**Instructor:** Marcin Bownik  
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**Office Phone:** 541-346-5622  
**Office Hours:** M3-4pm, W1-2pm, F3-4pm  
**Office:** Fenton 323  
**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 1–4 of the textbook.
2. **Learning Outcomes.** A successful student can:
  - apply algebraic properties of complex numbers  $\mathbb{C}$ ,
  - use polar representation of complex numbers and De Moivre's Formula,
  - use properties of elementary functions such as  $z^n$ ,  $\sqrt[n]{z}$ ,  $e^z$ ,  $\log(z)$ , and identify their mapping behavior,
  - identify topological properties of subsets of  $\mathbb{C}$  and continuity of complex functions,
  - use properties of analytic functions, verify the Cauchy-Riemann equations, and find harmonic conjugates,
  - evaluate and use properties of contour integrals,
  - apply Cauchy's theorem and Cauchy's Integral Formula to evaluate integrals,
  - apply Maximum Modulus Principle for analytic and harmonic functions,
  - show the convergence of sequences and series of analytic functions,
  - compute the Taylor series of an analytic function and radius of convergence of power series,
  - compute the Laurent expansion and classify singularities of complex functions,
  - find the residues of complex functions,
  - apply the Residue Theorem to evaluate integrals.
3. **Exams.** There will be two midterm in-class exam on Wednesday in weeks 4 and 7 and a final exam on Monday, March 19, 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	20%
Midterm 1	20%
Midterm 2	20%
Final Exam	40%