

**MATH 4200, INTRODUCTION TO COMPLEX VARIABLES,
FALL 2013**

Classroom: JTB 120 **Time:** MWF 11:50–12:40
Instructor: Domingo Toledo
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Office Hours: M, W, F 10:45–11:35, or by appointment.
Web-page: <http://www.math.utah.edu/~toledo/4200F13.html>

Prerequisites: Grade of “C” or better in Math 3220.

Textbook: J. E. Marsden and M. J. Hopkins, *Basic Complex Analysis*, Third Edition

Course Description: This course studies complex-valued functions of a complex variable. This is not a routine variation of familiar themes of real variable theory. Surprising things happen. When you apply to complex functions the familiar definition of derivative that we use for real functions, it turns out that a differentiable complex function (called an *analytic function*), is much more than just differentiable. It can be expanded in a convergent power series. Its real and imaginary parts satisfy interesting partial differential equations. And much more.

This course is an introduction to this theory. We will cover most of the first 5 chapters of the text. We will start with a review of complex numbers, then look at examples of complex functions (Chapter 1). The main topic will be Cauchy’s theorem, which gives an integral formula for representing analytic functions (Chapter 2). From this we get power series expansions (chapter 3) and the method of residues (chapter 4). Finally, the geometric interpretation of an analytic function is that it preserves angles. This is called a *conformal map* (chapter 5).

Homework and Quizzes: Every week I will assign homework problems. These are to be worked on schedule, but not to be handed in. Every Friday, beginning September 6, I will give a 20 minute quiz on the homework on material discussed by the previous Monday. Please make sure that you can do all the homework problems, and get all the help you need. You are encouraged to ask questions in class, or during office hours. Since I will drop the lowest three quiz scores, there will be no make-ups for quizzes.

Midterms: Two midterm exams on October 4 and November 15.

Final: Comprehensive final exam on Thursday December 19, 10:30–12:30.

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| Grading: Quizzes, drop lowest 3: | 30 % |
| Two Midterm Exams: | 40 % |
| Final exam: | 30 % |

Important dates: Last day to add classes without permission code: Monday September 2. Last day to drop (delete) classes: Wednesday, September 4. Last day to withdraw from classes: Friday, October 25.

ADA: The Americans with Disabilities Act requires that reasonable accommodations be provided for students with physical, cognitive, systemic, learning, and psychiatric disabilities. Please contact me at the beginning of the semester to discuss any such accommodations you may require for this course.