Course Outline

MATH 3171, Complex Analysis

Instructor: Maria Grazia Viola
Office: RB 2018
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Office Hours: Monday 2:30-4:00, Wednesday 2:30-4:00, Friday 1:30-2:30, or by appointment.

Lectures and Lab: Lectures on Wednesday and Friday 10:00-11:30 in RB 2024.

Text: Complex Variables and Applications, by J. Brown and R. Churchill, McGraw-Hill.

Course Outline:
- **Complex numbers (Chapter 1):** operations between complex numbers, complex conjugates, argument of complex numbers, exponential form, roots of complex numbers.
- **Analytic functions (Chapter 2):** functions of a complex variable, mappings, limits, continuity, derivative, Cauchi-Riemann equations, analytic functions.
- **Elementary functions (Chapter 3):** the xponential function, the logarithmic function, complex exponential, trigonometric functions.
- **Integrals (Chapter 4):** Derivative of functions, definite integrals of functions, contiurs integrals, antiderivative, Cauchy-Goursat theorem, simply connected domains, Cauchy integral formula, Liouville's theorem.
- **Series (Chapter 5):** convergence of sequence, convergence of series, Taylor series, Laurent series, absolute and uniform convergence of power series, intehration and differentation of power series.
- **Residues and poles (Chapter 6):** isolated singular points, residues, Cauchy's residue theorem, the types of isolated singular points, residues at poles, zeros of analytic functions, zeros and poles.
- **Applications of residues (Chapter 7):** improper integrals, indented paths, integration along a branch cut, definite integrals involving sine and cosine.

Grading System: The final grade will be determined by a midterm, the homework and the final. The weight of each component is as it follows:

Homework Grade 20%
Midterm 30%
Final 50%

Exam Schedule: The midterm will be on October 23, 2013.

Lectures: Students are expected to attend all lectures prepared by reviewing the previous lecture and previewing the upcoming material according to the announcement made in class. Students are fully responsible for any missed information, including announcement made in class, due to absence from the lecture.

Homework:

1. I will email a list of homework problems to work as a practice. Weekly homework assignment will be due on Friday. I will drop one homework grade (the lowest) when determining your homework grade for the semester. **Students who work all the practice questions should do well in the course.** .
2. The Math tutorial service (LUMAC) offered through the Department of Mathematical Sciences can help you with your math questions.
3. No late homework will be accepted except with a well documented valid university excuse.
4. Students are expected to do their assignment independently. Plagiarism will be disciplined according to university regulations.

Midterm and final exam: There will be a one hour and half midterm during class time and a three hour final. Students are allowed to bring a 1 page (letter size, both sides) formula sheet. Calculators are not allowed during the exams.

Make-up policy: A make-up midterm will be given only with well documented valid university excuses (sickness, etc). A make-up midterm must be written by the student within a week of the date of the original midterm.

This is a general outline. Any communication or change regarding this outline, the time and location of exams as well as other matters concerning the course will be announced in the lecture.