Syllabus for Math 375: Complex Variables

MWRF 8:30am-9:30am
MWF: Student Services Wing 331
R: Science II 143

Professor: Lucas Sabalka
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Office Hours: Mondays 9:30-11:30, Thursdays 9:30-10:30

Webpage: math.binghamton.edu/~sabalka/teaching/09Spring375
Book: Departmental lecture notes by Beck, Marchesi, and Pixton.
Available on course webpage.

Midterm: Thursday, 12 March, 8:30am-9:55am in Science II 143
Final: Monday 11 May 8:30am-10:30am in Lecture Hall 007

1 Course Description

The goal of this course is to give you a familiarity with the basic concepts of complex analysis.

Complex analysis is a fundamental field of mathematics that, in a quite literal sense, ‘completes’ what we can do with real numbers. Roughly, the complex numbers are formed from the real numbers by adding an extra number - the square root of $-1$ - to be able to state answers for some previously unanswerable problems. Many of the tools from calculus on real numbers can be generalized to apply to the complex numbers, but there are also many differences between the reals and the complexes. This is especially apparent in many amazingly powerful tools for complex numbers which have no real analogue.
The goal of this course is to explore the complex numbers and many results which work with them. We will generalize calculus to deal with differentiating and integrating functions defined over the complex numbers. We will then concentrate on a few big hammers in complex analysis: Cauchy’s Theorem, harmonic functions, Taylor series, and the Residue Theorem.

2 Class Format

MWF classes will be standard 1 hour lectures with the occasional pop quiz. We will cover roughly 1 section in the notes per lecture.

Thursday classes will be multipurpose days. most Thursdays will be 1 hour of problem-solving and going over homework questions. Homework will be due each week at the beginning of class on Thursday. There will be some form of class participation required on Thursdays, from attendance to presenting solutions to class discussions.

The midterm will be on a Thursday, and will cover Chapters 1-5. The Final will be cumulative. No notes, calculators, books, or cellphones on tests. Cheating will be dealt with severely.

NO LATE HOMEWORK WILL BE ACCEPTED. Instead, I will drop your lowest homework grade(s). (there will be 13 or 14 homework assignments; 12 will count towards your final grade).

3 Grades

For this class, you will have weekly homework assignments, occasional quizzes, attendance points, a midterm, and a final. You will be able to drop your lowest homework score. The breakdown of your final grade will be:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>240</td>
</tr>
<tr>
<td>Quizzes</td>
<td>60</td>
</tr>
<tr>
<td>Participation</td>
<td>100</td>
</tr>
<tr>
<td>Midterm</td>
<td>200</td>
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<tr>
<td>Final</td>
<td>400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1000</td>
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There MAY be a curve, but only for the whole class and only at the end of the semester. I guarantee that 97% is an A+, 93% is an A, 90% an A-, 87% a B+, etc.