MTH 583, Complex Variables

Catalog Description: Introduction to the complex differential and integral calculus: Cauchy’s theorem and formula, the residue calculus, power series and Laurent series, harmonic functions, conformal mapping, and applications.

Credits: 3 (This course combines approximately 90 hours of instruction and assignments.)

Terms offered: S

Prerequisites: Enforced: MTH 256 and either MTH 253 or MTH 306 with C- or better.

Meets: Three 50 minute lectures weekly.

Course Content:
1. Complex differentiation and integration
2. Cauchy’s theorem and Cauchy’s formula
3. Residues
4. Laurent series and power series
5. Harmonic functions
6. Conformal mappings

Learning Resources: The required course text is Complex Variables and Applications, by Brown and Churchill.

Math 583 Student Learning Outcomes: A successful student in MTH 583 will be able to:
1. Derive and apply the basic algebraic and geometric properties of complex numbers.
2. State, comprehend, and apply the fundamental concepts and theorems of complex differential and integral calculus including the following.
   a. Holomorphic functions
   b. Cauchy-Riemann equations
   c. Cauchy Integral Tehorem
   d. Cauchy’s formula
   e. Laurent series
   f. The Residue Theorem
   g. Conformal mapping
**Evaluation of Student Learning:** Your grade and measurement of your progress on the course outcomes will be based on written homework (assigned in class and collected approximately weekly) along with written midterm and final exam. Additional in-class activities will include problem sessions with blackboard presentations.

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<tr>
<th>Component</th>
<th>Grade</th>
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<tbody>
<tr>
<td>Homework</td>
<td>40%</td>
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<tr>
<td>Discussion and Participation</td>
<td>10%</td>
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<tr>
<td>Midterm Exam</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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You may collaborate on homework but you should write up your own solutions in your own words. If you use external sources, you should cite them. The midterms and final exams will be closed book.

**Students With Disabilities:** Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098. Consult [http://ds.oregonstate.edu/home](http://ds.oregonstate.edu/home).

**Academic Honesty and Student Conduct:** Students are expected to be familiar with the Homework and Exam policies stated in this syllabus, as well as Oregon State University's Student Conduct Code.