MATH 410 Complex Analysis I

1. Catalog Description

MATH 410 Complex Analysis I **4 units**
GE Area B6

Prerequisite: MATH 242, or MATH 241 and MATH 244.

Elementary analytic functions and mappings. Cauchy's Integral Theorem; Poisson's Integral Formula. Taylor and Laurent series, theory of residues, and the evaluation of integrals. Harmonic functions, conformal mappings. 4 lectures. Fulfills GE B6.

2. Required Background or Experience

Math 242, or Math 241 and Math 244.

3. Learning Objectives

The student should:

a. Develop facility in using the complex plane in engineering and physics.
b. Be able to define and use the concepts of regions and analytic functions.
c. Be able to use Laurent series and contour integration in applied problems.

4. Texts and References

To be chosen by the instructor. Suggested texts include:

- Brown, James W. and Ruel Churchill, Complex Variables and Applications
- Fisher, Stephen D., Complex Variables
- Wunsch, A. David, Complex Variables with Applications
- Marsden, Jerrold E. and Hoffman, Michael J., Basic Complex Analysis

5. Minimum Student Materials

Paper, pencils and notebook.

6. Minimum University Facilities

Classroom with ample chalkboard space for class use.

7. Content and Method

Topic

a. Complex numbers
b. Analytic functions

c. Elementary functions
d. Complex integration
e. Series representations for analytic functions
f. Residue theory

8. Methods of Assessment

Comprehensive final exam, mid-term exams or quizzes, homework.