MATH 411 Complex Analysis II

1. Catalog Description

    MATH 411 Complex Analysis II   **4 units**

    Prerequisite: MATH 408.

    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.

2. Required Background or Experience

    A working knowledge of partial differentiation, infinite series, differential equations, power series and contour integration.

3. Learning Objectives

    The student should be able to:

    a. Use conformal maps and Poisson integrals to solve selected problems.
    b. Use complex Fourier series and Laplace transforms in applied problems.

4. Texts and References

    To be chosen by 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

    Topics

    a. Further applications of residues and contour integrals
    b. Complex integral transforms and applications

    c.   Theory and applications of conformal mapping
    d.   Other advanced topics which may include:
        1.   Harmonic functions and the Dirichlet problem
        2.   Analytic continuation and the Gamma function
        3.   Mobius transformations
        4.   Weierstrass and Mittag-Leffler expansions

8.   <u>Methods of Assessment</u>

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