COMPLEX VARIABLES
MATH 4270/8276

1.0 Course Description

1.1 Overview of Content and Purpose: (3 hours) Differentiation, integration, and power series expansions of analytic functions, conformal mapping, residue calculus, and applications.

1.2 Prerequisites: MATH 3230/8325 or equivalent

2.0 Objectives

2.1 Performance Objectives for the Student: This is a standard first course in complex variables, designed to give the student a basic knowledge of functions of a complex variable and some of their applications.

3.0 Content and Organization

3.1 Topics

1. Complex numbers
2. Analytic functions
3. Exponential, logarithmic, and trigonometric functions
4. Complex integration
5. Power series
6. Residues and poles
7. Mapping by elementary functions
8. Conformal mapping and applications

4.0 Teaching Methodology

4.1 Methods to be Used: The presentation is by lecture with recitation and discussion. Numerous problems are assigned. Graduate students will be required to do additional, more challenging problems not required of undergraduate students.

5.0 Evaluation

5.1 Basis for Evaluating Student Performance: Evaluation will be based on examinations and homework grades.

6.0 Resource Material

6.1 Textbook(s) or Other Required Readings: *Fundamentals of Complex Analysis*, 3rd edition, Prentice Hall,

6.2 Current Bibliography Of Resources:

1. Ahlfors, L.V., *Complex Analysis*, 3rd edition, McGraw Hill, New York, 1979.

2. Churchill, Ruel V., and Brown, James W., *Complex Variables and Applications*, 4th edition, McGraw Hill, New York, 1984.

3. Hile, E., *Analytic Function Theory, Vols. 1 and 2*, 2nd edition, Chlesea, New York, 1973.

4. Knopp,. K., *Elements of Theory of Functions*, Dover, New York, 1952.

5. Springer, G., *Introduction to Riemann Surfaces*, 2nd edition, Chelsea, New York, 1981.