RUTGERS
NEWARK

COMPLEX VARIABLES

21:640:403 (3 credits)

COURSE DESCRIPTION:
Analytic functions; Cauchy's integral theorem; contour integration; residues; series; and conformal mapping.

PREREQUISITE:
21:640:311 (Advanced Calculus I), or permission of instructor.

TEXTBOOK: "Complex Variables and Applications," (8th edition), by Churchill, published by McGraw Hill.

DEPARTMENT WEB SITE: http://www.ncas.rutgers.edu/math

THIS COURSE COVERS THE FOLLOWING:

We begin with a study of analytic functions, that is, complex valued functions defined on open subsets of the complex plane which are differentiable in the complex sense. Examples of analytic functions, such as polynomials, power series, linear fractional transformations and the exponential function are studied. We prove the fundamental Cauchy Integral Formula, which gives an integral representation of an analytic function, and derive various consequences: the representation of analytic functions as power series, the residue formula, the open mapping theorem and the fundamental theorem of algebra. We show how to calculate various improper integrals using the calculus of residues.

Department of Mathematics & Computer Science
Smith Hall 216, 101 Warren Street, Newark, New Jersey 07102
Phone: (973) 353-5156 Fax: (973) 353-5270