

MATHEMATICS 430 COMPLEX VARIABLES (3) (EFFECTIVE SPRING 2005)

PREREQUISITES: Math 320.

CATALOG DESCRIPTION: Algebraic operations and geometry of complex numbers, definitions of limit, continuity, and analytic functions, differentiation, mapping of simple functions, line integrals, Cauchy integral formula, Laurent series, evaluation of real integrals using residue theorem.

OBJECTIVES: The student will:

1. Understand Euler's formula, the polar representations of complex numbers and the Riemann surface.
2. Determine if functions are analytic using the definition of the derivative, the Cauchy Riemann Equations and sufficient conditions for analyticity.
3. Define and use the elementary functions: exponential, logarithmic, trigonometric and hyperbolic.
4. Find and use the Taylor and Laurent series expansions of functions.
5. Integrate and apply complex valued functions on regions and curves using Cauchy's theorems, the residue theorem.
6. Understand conformal mappings, especially the linear fractional transformations.

TEXT: Complex Variables for Mathematics and Engineering, John H. Matthews and Russell W. Howell, 4th edition, Publisher-Jones and Bartlett
 ISBN: 0-7637-1425-9.

OUTLINE:

CHAPTER	TITLE	PERIODS
1	Complex Numbers	(2-6) 4
2	Complex Functions	(1-5) 5
3	Analytic and Harmonic Functions	(1-3) 3
5	Elementary Functions	(1-6) 4
6	Complex Integration	(1-6) 6
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9	Conformal Mapping	(1-4) 4
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