ROWAN UNIVERSITY
Department of Mathematics

Syllabus
Math 01.430 - Introduction to Complex Analysis

CATALOG DESCRIPTION:

Math 01.430 Introduction to Complex Analysis 3 s.h.

(Prerequisites: Math 01.330 Introduction to Real Analysis I)

This course includes properties of complex numbers and their conjugates, functions of a complex variable, limits, continuity and derivatives for complex functions. Also included are: Integration and the Cauchy integral theorems, uniform convergence, Taylor's and Laurent's series and conformal mapping.

OBJECTIVES:

This course is intended to provide an introduction to the techniques of complex analysis for majors in mathematics, physics and engineering. This is an important course for serious students of both pure and applied mathematics who are considering graduate training. While proofs of selected theorems are given, stress is on techniques and applications.

CONTENT:

1. Introduction

1.1 The complex numbers as a non-ordered field

1.2 Elementary algebraic and geometric properties

1.3 Complex sequences

2. Functions

2.1 Functions and continuous functions

2.2 Limits

2.3 Uniformly continuous functions

2.4 Exp(s), Sin(s), Cos(s), Log(s)

3. Analytic Functions

3.1 Derivatives and elementary properties

3.2 Cauchy-Riemann partial differential equations

3.3 Theorems concerning analytical functions

4. Integrals

4.1 Curves and parameterization of curves

4.2 Properties of integrals

4.3 Basic integral theorems, including Cauchy's theorem and Morera's theorem

5. The Cauchy Integral Formula

5.1 Derivative formula

5.2 Liouville theorem

5.3 Fundamental theorem of algebra

5.4 Maximum modulus theorem

TEXTS:

Churchill, and Brown, *COMPLEX VARIABLES AND APPLICATIONS,* 5th ed., MacGraw-Hill Book Company, New York, 1990.

Bak and Newman, *COMPLEX ANALYSIS* (2nd ed), Springer, NY,NY,1997

Spiegel, Murray, *COMPLEX VARIABLES* (Schaun's Outline Series) MacGraw-Hill, NY,NY, 1964 (still available in 2001)

Rev.:2/01 GI/EW

C:\Und.revise syl.complexanal.und.