Course Objectives & Outcomes
College of Science & Engineering

Department: Mathematics
Course Number: Math 3362
Course Name: Introduction to Complex Variables

Objective 1: Perform algebra with complex numbers.

Outcomes. Students will:
1. Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers.
2. Write complex numbers in polar form.
3. Compute exponentials and integral powers of complex numbers.
4. Find all integral roots and all logarithms of nonzero complex numbers.

Objective 2: Identify complex-differentiable functions.

Outcomes. Students will:
1. Determine whether a given function is differentiable, and if so find its derivative.
2. Use differentiation rules to compute derivatives.
3. Express complex-differentiable functions as power series.

Objective 3: Compute complex line integrals.

Outcomes. Students will:
1. Find parametrizations of curves, and compute complex line integrals directly.
2. Use antiderivatives to compute line integrals.
3. Use Cauchy’s integral theorem and formula to compute line integrals.

Objective 4: Use the residue theorem.

Outcomes. Students will:
1. Identify the isolated singularities of a function and determine whether they are removable, poles, or essential.
2. Compute innermost Laurent series at an isolated singularity, and determine the residue.
3. Use the residue theorem to compute complex line integrals and real integrals.

Assessment: The instructor will submit a median score and quartiles, on a scale of 0.0-4.0, for his or her students’ achievement of each objective.