MATH 305: APPLIED COMPLEX ANALYSIS

- **Text:** *Fundamentals of Complex Analysis with Applications to Engineering and Science (Third Edition)*, by E. Saff and A. Snider.

- **Topics:**
    - Fundamentals; complex exponentials, roots of unity, powers and roots, elementary mappings: (Sections 1.1-1.7)
    - Functions of a Complex Variable: analytic functions, Cauchy-Riemann equations, Harmonic functions, some special functions such trigonometric functions (Sections 2.1-2.6,3.1-3.2)
    - Multivalued functions, inverse functions, and branch cuts. The Logarithm function. (Sections 3.3, 3.5, and course notes).
    - Contour integration. Cauchy's integral theorem, path independence, (Sections 4.1–4.7)
    - Laurent series, singularities, poles and residue Calculus (Sections 5.5–5.7,6.1-6.5)
    - Fourier transform integrals (Section 8.1–8.2 and class notes)
    - Laplace transform integrals, integrals of multivalued functions, Nyquist criteria and applications. Fourier transform integrals (section 8.3 and class notes)

- **Grading:** The weighting will be: Final 50%, 2 Midterms 20% each, HW 10%. The first midterm is October 19th, and the second midterm is November 16th. There are no make-up midterms. If you miss a midterm for a valid medical reason, the weighting for the final will be adjusted. Other than this, no re-negotiating of the weights of the different components of the overall grade will be considered.

- **Homework:** There will be weekly homework assignments assigned. No late homeworks will be accepted for any reason. I will drop the lowest HW score.

- **Instructor:** Michael Ward, Tel: 822-5869. Office: Room 1217 Math Annex. Office hours to be arranged.