2013/2014, Term 1. MATH 305
Applied Complex Analysis

Instructor: Dong Li, MATH 111 dli@math.ubc.ca 604-827-3039

Class hours: Mon Wed Fri 11:00–12:00 Math Annex 1100

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

Tentative Course Outline:

- 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).

- 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)

- Laplace transform integrals, integrals of multivalued functions, Nyquist criteria and applications. Fourier transform integrals (section 8.3)

Grading: the weighting will be: Final 50%, 1 Midterm 30%, Assignments 15%, Class Participation 5%. 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 homework will be accepted for any reason.