MAT 305–201 APPLIED COMPLEX ANALYSIS: OUTLINE
2022-2023 Term 2

Instructor: Juncheng Wei, LSK 303B, Tel. 604-822-6510, E-mail: jcwei@math.ubc.ca

Time and Place: Mon-Wed-Fri: 12:00 noon to 1:00 pm in BUCH-A203

Important Information: This course will be in-person. However for office hours it will be a hybrid of zoom and in-person meetings. All course materials (notes, homework, etc) will be posted on Canvas. There is also the Piazza platform for discussions.

Textbook : Fundamentals of Complex Analysis for Mathematics, Science and Engineering,(Third Edition) by E. Saff, A. Snider.

Notes: Notes are important. We will follow the notes. Notes will be posted on Canvas. (Old notes are available at www.math.ubc.ca/∼ward and www.math.ubc.ca/∼jcwei)

Topics and Teaching Scheme

- 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)

- Multi-valued functions, inverse functions, and branch cuts. The Logarithm function. (Sections 3.3, 3.5, and course notes).

- Contour integration. Cauchys 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 8.18.2 and class notes)

- Laplace transform integrals, integrals of multi-valued functions, Nyquist criteria and applications. Fourier transform integrals (section 8.3 and class notes)

Grading: The weighting will be: Final 50/100, 2 Midterms 17/100 each, HW 16/100. The first midterm is Feb. 13rd, and the second midterm is March 27th. 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.

Assignments: There will be weekly assignments. No late homeworks will be accepted for any reason. I will drop the lowest HW score.

Lecture notes, assignments, solutions to assignments and examinations will be posted on canvas or my web when they are ready.

Office Hours:

Monday, Wednesday (In-person): 3:00-4:30pm

Zoom Office Hours: Friday and Sunday 9-10pm

Additional Office Hours may also be arranged.

You are welcome to join PIAZZA–online platform for discussions/help.

Final Remark: Lecture notes, assignments, solutions to assignments and examinations will be posted on my web or Canvas when they are ready.

Any questions? Please send me an email or drop by my office LSK 303B.