MATH 440/508: Complex Analysis
(2026 Winter Term 1, 3 credits)

Instructor: Dr. Mathav Murugan
Lectures: MWF 9:00–10:00 AM in MATH 225.
Office hours: Tue, Thu 9:30–10:30 AM and Fri 1:00–2:00 PM in MATH Annex 1104.
Course webpage: We will use Canvas: `https://canvas.ubc.ca/courses/191228`.
Piazza: There is a link to Piazza on Canvas. Please use Piazza for questions that arise in your learning and for questions about all issues related to the course.

Text: *Complex Analysis* by Elias Stein and Rami Shakarchi. The textbook is available online at UBC Library.
Prerequisite: Math 300 (or equivalent) and a score of 68% or higher in Math 320.
Outline. The UBC course description is as follows:

- The residue theorem
- The argument principle
- Conformal mapping
- The maximum modulus principle
- Harmonic functions
- Representation of functions by integrals, series, and products
- Other topics at the discretion of the instructor (Possible options here are the geometric properties of conformal mappings, Prime number theorem and Riemann zeta function).

Chapters 1, 2, 3 and 8 of the textbook form the core part of the course.

References: *Functions of One Complex Variable* (I and II) by John Conway, *Complex Analysis* by Theodore W. Gamelin.

Evaluation: The final mark will be calculated (subject to possible scaling) according to the following formula :

Homework: 35%
Midterm: 25%
Final Exam: 40%.

Homework: Homework will be assigned approximately once every two weeks. Late submissions will not be accepted. You are encouraged to discuss the homework problems and collaborate with your classmates, but the solutions you submit must be written independently in your own words. Solutions will be graded both on accuracy and quality of exposition. Solutions should be mathematically rigorous, well-crafted, and written in complete English sentences. Solutions must always be legible; use of LaTeX is encouraged and appreciated. The use of generative AI tools in solving homework problems, generating solutions or proofs, or obtaining mathematical explanations related to the assignments is prohibited. AI tools may be used only for checking spelling, grammar, and LaTex formatting.
Midterm: There will be one 50-minute test held in person during the regularly scheduled class hour on: Friday, October 30
Final Exam: There will be a final examination during the December examination period.

Academic integrity: By enrolling as a student at UBC, you have agreed to abide by the University Rules on Academic Honesty. Here is what you have agreed to and are bound by: "Academic honesty is essential to the continued functioning of the University of British Columbia as an institution of higher learning and research. All UBC students are expected to behave as honest and responsible members of an academic community. Breach of those expectations or failure to follow the appropriate policies, principles, rules, and guidelines of the University with respect to academic honesty may result in disciplinary action. It is the student's obligation to inform himself or herself of the applicable standards for academic honesty. Students must be aware that standards at the University of British Columbia may be different from those in secondary schools or at other institutions. If a student is in any doubt as to the standard of academic honesty in a particular course or assignment, then the student must consult with the instructor as soon as possible, and in no case should a student submit an assignment if the student is not clear on the relevant standard of academic honesty. If an allegation is made against a student, the Registrar may place the student on academic hold until the President has made his or her final decision. When a student is placed on academic hold, the student is blocked from all activity in the Student Service Centre."

University policies: UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the UBC Senate website: `https://senate.ubc.ca/policies-resources-support-student-success`.

Updated: September 1, 2026