MATH 3260 Course Outline

General Information

Course Title: Complex Analysis

Prerequisite(s): MATH*2200

Course Description: This course extends calculus to cover functions of a complex variable; it introduces complex variable techniques which are very useful for mathematics, the physical sciences and engineering. Topics include complex differentiation, planar mappings, analytic and harmonic functions, contour integration, Taylor and Laurent series, the residue calculus and its application to the computation of trigonometric and improper integrals, conformal mapping and the Dirichlet problem.

Credit Weight: 0.5

Academic Department (or campus): Mathematics & Statistics

Campus: University of Guelph

Semester Offering: Winter 2019

Class Schedule and Location: MWF 9:30-10:30 in MacKinnon 228

Instructor Information

Instructor Name: Rajesh Pereira
Instructor Email: pereirar@uoguelph.ca
Office location and office hours: MacNaughton 519, Office Hrs TBA

Course Content

Specific Learning Outcomes: Students in this course will learn the basic ideas and tools of complex analysis. Students will learn the arithmetic properties of the complex number plane and will learn how calculus generalizes to functions of a complex variable. Students will see how complex variable can be introduced to simply certain purely real problems such as evaluating certain real improper integrals.

Lecture Content: The development of complex analysis was a major turning point in the history of mathematics and a key building block of modern mathematics. We will explore these topics in the course outline in detail and develop the mathematical tools needed to study them. Specific topics are listed below.

Complex functions as planar mappings. Algebraic and geometric properties of the complex derivative.
Analytic functions and the Cauchy-Riemann equations. Harmonic functions.
Exponential, logarithmic and trigonometric functions on the complex plane.
Contour integration. Cauchy's theorem and formulae. The maximum modulus principle.
The Fundamental Theorem of Algebra. Applications to Matrix Theory.
Taylor and Laurent Series. Analytic continuation.
Isolated singularities. The residue calculus and some of its applications.
Introduction to conformal mapping and the Dirichlet problem.

Course Assignments and Tests:

Marking Scheme: Assignments 20%
                      2 Midterms   15% each
                      Final Exam   50%
There will be six assignments.

Midterms: TBA
Final examination date and time: Monday April 8th 8:30-10:30
Final Examination regulations are detailed at:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-exam.shtml

Course Resources
Required Text: Complex Analysis, 2nd. Ed. Ian Stewart and David Tall, Cambridge University Press 2018 ISBN 9781108436793

Course Policies

Course Policy on Group Work: While you may consult with one another or any reference about the general ideas on assignments, any written work must be your own. It is not permitted to ask someone for step by step guidance on assignment problem nor to copy from the work of another student or any other source**.**

University Policies and Information

The following are standard statements for inclusion on all course outlines (adapted with permission from the College of Arts).

E-mail Communication
As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement
When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

Drop Date
Courses that are one semester long must be dropped by the end of the fortieth class day; in the Winter 2019 semester this day is March 8th. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar.

Copies of out-of-class assignments
Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility
The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: www.uoguelph.ca/sas

Academic Misconduct
The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

[The Academic Misconduct Policy is detailed in the Undergraduate Calendar](#).

Recording of Materials
Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources
The [Academic Calendars](#) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.