MATH 4402 – Complex Variables – Spring 2026

Delivery Mode: Face-to-face; TR: 2:30-3:45pm,
Instructor: Dr. Michael R. Pilla
Email: mpilla@floridapoly.edu
Office Hours: TR 1:30-2:30pm or by appointment.

Classroom: BARC-1123
Office: IST 2007
Phone Number: (863) 874-8662

Required Text and Materials:

Complex Analysis, 3rd Edition, Zill and Shanahan, Jones and Bartlett Learning

Course Description: Algebra and geometric representation of complex numbers, properties of complex analytic functions, contour integration, power series and Laurent series, poles and residues, conformal mapping, and applications.

Prerequisites: *Prerequisite*: C or better in MAC 2313 Analytic Geometry and Calculus 3.

Grading:

The following gives the lowest number required to guarantee the corresponding grade:

A	B+	B	B-	C+	C	D	F
90%	87%	83%	80%	77%	70%	60%	0%

The final grade in the course will be determined by the following factors:

Homework: 25 %
Midterm exams: 45% (15% each)
Final Exam: 30%

Assignments:

Homework

For nearly every section, there will be a homework assignment. All assignments are due by their given deadline. Extensions may be granted in exceptional cases.

Exams

At the end of each chapter or couple of chapters, there will be a midterm exam covering that material. The exams will not be cumulative in the sense that you will see questions directly from previous test material, but mathematics is cumulative so that you may need to apply knowledge from previous test material in order to solve new problems.

Final Exam

A comprehensive final exam will be given the week of finals.

If you miss an exam due to an excused absence, it is up to you to schedule a time with me (office hours or other) during which you can take the exam. You must contact me within a week of the missed exam and complete the exam within two weeks of missing it.

Course Objectives: Students will be able to—

- Perform computations with complex numbers and complex extensions of elementary functions.
- Explain the properties of complex numbers and complex extensions of elementary functions.
- Explain the multiple implications of complex analyticity.
- Relate algebraic, analytic, and geometric representations of numbers, sets, and functions in the complex plane.
- Solve problems using residue calculus.

Course Rationale: The use of complex numbers and complex analytic functions has been central to the development of mathematics over the last three centuries. Complex analysis has played a part in such diverse areas as the study of prime numbers, the development of non-Euclidean geometry, and the discovery of fractals; it has furthermore been widely applied in technical disciplines such as electrical engineering and fluid dynamics. Thus, a solid background in complex analysis is essential for students who intend to continue their studies at the graduate level in mathematics or in the disciplines mentioned.

Course Content: The topics to be covered are: the algebra of complex numbers; properties of analytic functions of a complex variable; elementary functions; branches of the logarithm; path integrals and the Cauchy-Goursat theorem; Cauchy integral formula; Liouville's theorem and the fundamental theorem of algebra; power series and Laurent series; absolute and uniform convergence; integration and differentiation; analytic continuation; residues; isolated singularities; zeros and poles of finite order; applications of residues, evaluation of improper integrals; linear and linear fractional transformations; mapping by elementary functions and square roots; Riemann surfaces; (if time permits) two-dimensional fluid flow.

Course Policies

Attendance

Students are expected "to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the instructor" (University Policy, FPU-5.0010AP). Attending class regularly is important for success in this course. Attendance will be taken daily through A+ Attendance. Absences will be considered "excused" due to illness or family emergency. Falsifying attendance for yourself or for another student is an act of academic dishonesty and subject to academic discipline.

Participation

Students are expected to participate in the classroom experience. The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). Persistent problems with participation may result in a code of conduct referral.

Late Work/Make-up work

Make-up exams will not be permitted except for sickness, family emergency, or University related activity. A written note from an appropriate person (doctor, family member, etc.) is required. If possible, notification SHOULD be made BEFORE the missed event.
Homework submitted up to 24 hours late will be accepted with a 20% penalty. No submissions will be accepted more than 24 hours late.
Extensions without penalty may be granted on a case-by-case basis. Please communicate with your instructor.

Important Dates: https://floridapoly.edu/academics/academic-calendar/index.php

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to library@floridapoly.edu.
- **Peer Learning Strategists (PLS)**: Are specially trained student leaders who help their peers strategize approaches to course content and work through solution methods. PLS work in collaboration with the courses they support so the content and methods are aligned with your instructors' expectations. Students can meet with a PLS in The Learning Center, which is located on the first floor of the Innovation, Science and Technology (IST) building in room 1019.
- **Academic Success Coaches**: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.
  Writing Center: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit **https://floridapoly.edu/writingcenter**.

Civility and Collegiality

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The University, through the Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations.

If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the ODS student portal and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive.
If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

The Office of Disability Services (ODS):
DisabilityServices@floridapoly.edu
(863) 874-8770
The Access Point
ODS website: www.floridapoly.edy/disability

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discussion resources and options available.

Academic Integrity

The faculty and administration take academic integrity very seriously. Violations of academic integrity regulation include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties.

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidentally, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is ***prohibited****.*

Activities Schedule (Tentative)

Class Meeting	**Dates**	**Topic**
Week 1	January 13, 15	Ch. 1: Complex Numbers
Week 2	January 20, 22	Ch. 2: Complex Functions and Mappings
Week 3	January 27, 29	Ch. 3: Analytic Functions
Week 4	February 3, 5	Ch. 3: Analytic Functions, Review
Week 5	February 10 **(No Class),** 12	**Exam 1**
Week 6	February 17, 19	Ch. 4: Elementary Functions
Week 7	February 24, 26	Ch. 3: Elementary Functions, Ch. 5: Integrals
Week 8	March 3, 5	Ch. 5: Integrals
Week 9	March 10, 12	Review, **Exam 2**
Week 10	**(Spring Break)**	
Week 11	March 24, 26	Ch. 6: Series and Residues
Week 12	March 31, April 2	Ch. 6: Series and Residues
Week 13	April 7, 9	Ch. 7: Conformal Mappings
Week 14	April 14, 16	Review, **Exam 3**
Week 15	April 21, 23	Ch. 7: Conformal Mappings
Week 16	April 28 **(Last Day of Class)**	Final Exam Review
Week 17	May 4-8 **(Final Exam)**	Final Exam