

## 2022 Fall Course Syllabus - Mathematics 8051

**Course:** Mathematics 8051.001.

**Course Title:** Functions of a Complex Variable I.

**Credits:** 3 credits.

**How this course will be taught:** In-person.

**Time:** TR 12:30-1:50.

**Place:** Wachman 617.

**Instructor:** Gerardo A. Mendoza.

**Instructor Office:** Wachman 618.

**Instructor Email:** gerardo.mendoza@temple.edu

**Instructor Phone:** 1-5053.

**Course Web Page:** <http://math.temple.edu/~gmendoza>.

**Office Hours:** Wednesday 1:00-3:00. Office hours by appointment are also possible (try to arranged one day in advance). Or just come to my office: if I have time, I'll see you.

**Prerequisites:** As specified in the Graduate Bulletin, or permission from instructor.

**Course Materials:** Textbook: John B. Conway, Functions of One Complex Variable I, Graduate Texts in Mathematics, Vol. 11. 2nd ed. 1978. Corr. 7th printing, 1995, Hardcover, ISBN: 978-0-387-90328-6.

**Course Goals:** This is a two semester course. In addition to gaining a deep working understanding of the subject, the student is expected to be able to write clear complete proofs in the subject.

**Topics Covered:** For the two-semester sequence: Elementary properties and examples of holomorphic functions; differentiability and analyticity, the Cauchy-Riemann equations; power series; conformality; complex line integrals, the Cauchy Integral Formula and Cauchy's Theorem; applications of the Cauchy Integral Formula—power series expansion for a holomorphic function, the Maximum Modulus principle, the Cauchy estimates, Liouville's Theorem; Singularities of holomorphic functions, Laurent expansions, the calculus of residues and applications to the calculation of definite integrals and sums; zeros of a holomorphic function, the Argument Principle, Rouché's Theorem, Hurwitz's Theorem; conformal mappings. Topics for the second semester include Harmonic functions, the Poisson integral formula, maximum and minimum principles, the mean value property, the Dirichlet problem, Harnack's inequality; spaces of holomorphic and meromorphic functions, the Riemann Mapping Theorem; analytic continuation. Weierstrass and Hadamard's Factorization Theorems; Picard's Theorems; introduction to Riemann Surfaces.

**Course Grading:** Homework will be given frequently. The final grade will be based on the homework, the tests and a final examination.

**Exam Dates:** Tentative dates for partial exams: September 20 and November 10. Final exam date to be determined.

**Attendance Policy:** Attendance is required. An excessive number of unjustified absences will result in a failing grade.

**Attendance and Your Health:** To achieve course learning goals, students must attend and participate in classes, according to your instructors' requirements. However, if you feel unwell or if you are under quarantine or in isolation because you have been exposed to the virus or tested positive for it, you should not come to campus or attend in-person classes or activities. It is the student's responsibility to contact their instructors to create a plan for participation and engagement in the course as soon as they are able to do so, and to make a plan to complete all assignments in a timely fashion, when illness delays their completion.

**Disability Statement:** Any student who has a need for accommodations based on the impact of a documented disability or medical condition should contact Disability Resources and Services (DRS) in Howard Gittis Student Center South, Rm 420 (drs@temple.edu; 215-204-1280) to request accommodations and learn more about the resources available to you. If you have a DRS accommodation letter to share with me, or you would like to discuss your accommodations, please contact me as soon as practical. I will work with you and with DRS to coordinate reasonable accommodations for all students with documented disabilities. All discussions related to your accommodations will be confidential.

**Academic Freedom:** Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has adopted a policy on Student and Faculty Academic Rights and Responsibilities (Policy # 03.70.02<sup>1</sup>).

**Add/Drop Policy:** Students will be charged for a course unless dropped by the Drop/Add deadline date. Check the University calendar for exact dates.

During the Drop/Add period, students may drop a course with no record of the class appearing on their transcript. Students are not financially responsible for any courses dropped during this period. In the following weeks prior to or on the withdrawal date students may withdraw from a course with the grade of "W" appearing on their transcript. After the withdrawal date students may not withdraw from courses. Check the University Calendar<sup>2</sup> for exact dates. See the full policy.<sup>3</sup>

**Incomplete Policy:** The grade "I" (an "incomplete") is only given if students cannot complete the course work due to circumstances beyond their control. It is necessary for the student to have completed the majority of the course work with a passing average and to sign an incomplete contract which clearly states what is left for the student to do and the deadline by which the work must be completed. The incomplete contract must also include a default grade that will be used in case the "I" grade is not resolved by the agreed deadline. See the full policy.<sup>4</sup>

**Student Support Services:** The following academic support services are available to students:

- The Math Consulting Center
- Student Success Center
- University Libraries
- Undergraduate Research Support
- Career Center
- Tuttleman Counseling Services
- Disability Resources and Services

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<sup>1</sup><http://policies.temple.edu>

<sup>2</sup><http://www.temple.edu/registrar/documents/calendars/>

<sup>3</sup><http://bulletin.temple.edu/undergraduate/academic-policies/withdrawal-policies/>

<sup>4</sup><http://bulletin.temple.edu/undergraduate/academic-policies/incomplete-coursework/>

If you are experiencing food insecurity or financial struggles, Temple provides resources and support. Notably, the Temple University Cherry Pantry and the Temple University Emergency Student Aid Program are in operation as well as a variety of resources from the Division of Student Affairs.