

2019 Fall Course Syllabus - Mathematics 9063

Course: Mathematics 9063.001.

Course Title: Riemann Surfaces.

Time: TR 11:00-12:20.

Place: Wachman 527.

Instructor: Gerardo A. Mendoza.

Instructor Office: Wachman 618.

Instructor Email: gerardo.mendoza@temple.edu

Instructor Phone: 1-5053.

Office Hours: TR 9:00-10:30 or by appointment (or just come in: Ill see you if I have time).

Course Web Page:

<http://math.temple.edu/~gmendoza/courses/math.9063.2019/HW.html>

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

Textbook: Simon Donaldson, *Riemann Surfaces*, Oxford Graduate Texts in Mathematics, 2011. ISBN: 9780199606740.

Course Goals: To master a number of topics related to Riemann Surfaces such as introductory differential geometry, differential topology, complex structures on 2-manifolds, covering spaces.

Topics Covered: Riemann surfaces are orientable surfaces (two-dimensional manifolds) with a specified complex structure. The course will begin by explaining these two concepts (manifold, complex structure), plus some basic facts of complex-differentiable (i.e. holomorphic) functions. For the latter, only Green's theorem and power series are needed (which will be reviewed as necessary). Building up from that we will discuss holomorphic mappings between Riemann surfaces, algebraic surfaces, embeddings of Riemann surfaces in complex projective space. Fundamental theorems to be proved include the Uniformization theorem and the Riemann-Roch theorems. Along the way we will discuss the topological classification of compact two dimensional manifolds and the mapping class group. Depending on the pace of the course we will discuss additional topics such as moduli spaces or some generalizations to higher dimensional complex manifolds. The conjunction of differential topology, complex analysis, and algebra that is present in the theory of Riemann surfaces leads to a very rich and satisfying body of knowledge, useful in many other parts of mathematics.

Course Grading: Grading will be based on homework.

Exam Dates: No exams.

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

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 100 Ritter Annex (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.

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 # 03.70.02¹).

Students will be charged for a course unless dropped by the Drop/Add deadline date. Check the University calendar² 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 calendar² for exact dates. Consult the full policy.³

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.⁴

¹<http://policies.temple.edu>

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

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

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