Basic Information

Instructor: Jen Paulhus paulhus@math.grinnell.edu
  I do not check email between 9 PM and 7 AM on weekdays, and only infrequently on the weekends. I will make every effort to respond to emails within 24 hours.
My Office Hours: Monday 1:30-2:30 PM, Tuesday 3-4:30 PM, Friday 9:30-10:30 AM, or by appointment.

Class Webpage: jenpaulhus.com/teaching/GrinnellTeaching/ma444s24.html

Class Meetings: 1-2:20 PM Tuesdays, Thursdays in Noyce 2245

Primary Texts:
- *Riemann Surfaces and Algebraic Curves*, by Cavalieri and Miles
- *Algebraic Curves and Riemann Surfaces*, by Miranda
- *Complex Analysis*, by Bak and Newman
- *Introduction to Topological Manifolds, 2nd ed.*, by Lee

Some Other Sources:
- *Complex Analysis with Applications*, by Asmar and Grafakos
- *Topology*, by Manetti
- *A Course in Point Set Topology*, by Conway
- *Riemann Surfaces*, by Donaldson

Learning Goals

Riemann surfaces are a beautiful topic in mathematics. The subject draws from various areas of math: algebra, analysis, and topology. The goal of this course is for you to learn the core introductory material on Riemann surfaces, and get a sense of how different areas of math can come together. We will learn some complex analysis and topology along the way.

By the end of the semester you should have a good idea of what Riemann surfaces are, and how they connect to various fields in math. You should also develop skills to learn advanced mathematics independently, and improve your communication skills with advanced, technical material. Progress toward these goals will be judged by the quality of your:
- questions and responses in class, in reading responses, and on Piazza,
- solutions to homework problems, and
- written final project and the accompanying oral presentation.

Course Structure

The course will be set up differently than your prior math classes, Class time will be seminar style and generally consist of all of us together discussing and trying to figure out the concepts we have read *before* each class. I will rarely lecture. We will use quite a few different sources as well.

As you'll note below, almost half of your grade in the class involves participation in discussions in class and on Piazza. **I expect each of you to be respectful of each other. You have all made it to the most advanced math class on campus, and you all deserve to have your mathematical ideas listened to.** Be cognizant of your own implicit biases, too. We're all in this learning process together, and we all need to be prepared to say things we're not sure are true, and debate the veracity of each others' statements.

While participation is an important part of your grade, do not think that means you have to make many frequent comments. Be sure to give classmates time to talk or respond also. Conversely, if you are less comfortable talking in class, be willing to step outside of your comfort zone and know that your classmates and I want to hear your thoughts.

Grading

Class Discussions
Participation will be 40% of your grade. While there isn't an official attendance policy, regularly missing class or showing up late will hurt this grade. Quality of discussion is more important that quantity.

Daily Reading Responses
It's vitally important that you carefully read the daily readings before class and have some idea of the topics we will discuss in the class. Before each class, you will answer a few brief reading questions for the day's reading on Gradescopes. These reading responses are due Mondays and Wednesdays by 1 PM and will be 20% of your grade.

I will give you individual feedback on your class discussion and daily reading response performance on February 9th, and over Spring Break.

Homework
There will be some erratic homework sets, by which I mean I will assign them and give you at least a full week to turn them in, but they won't be "every Monday". Homework is 15% of your grade. Assignments will be posted on the class webpage, **and must be LaTeX'd.** Each homework assignment is worth the same percent of your final grade, although point totals may vary from assignment to assignment. I encourage you to work through as many of the problems in each section as you can, even if they aren't assigned. Homework will be submitted and returned to you on Gradescope. Each student can have

a no-questions-asked 48 hour extension on one assignment as long as they contact me before the assignment is due to let me know they will be using the extensions. Other assignments will incur a 10% penalty for each business day they are late.

Final Project
More details to come soon about the final project. It will be worth 20% of your grade.

Piazza Discussions
Find yourself stuck on or confused about something we discussed in a previous class? Re-reading and you just can't figure something out? We will use Piazza to post questions about content from *prior* readings. We're all here to help each other learn the content so if you find yourself really stuck on a proof, or a statement in one of the books, or confused about an idea, post a question to Piazza. You should also write answers to questions when you can (or incomplete thoughts about a question are good too!). Your participation in Piazza conversations will be 5% of your grade. About 25-30 "interactions" (by which I mean questions or answers) will be considered a good amount of participation, although you can ask or answer more than that.

If someone has already posted one of your questions there, just click "good question", don't re-ask the same question. You can post your questions anonymously if you would prefer (although note that I will still see who you are). You should also tag your question with the appropriate folder for whichever topic(s) the question is from. You are welcome (and in fact encouraged) to answer other students' questions. Just remember to be respectful of your classmates. "Silly" questions are encouraged in this class. Having wrong or confused ideas is the only way to really learning advanced mathematics. Just don't ask direct homework questions.

Miscellaneous

It's imperative that you keep up good communication with me if you find yourself struggling with this class beyond the expected struggle of learning advanced mathematics.

Accommodations
Grinnell College makes reasonable accommodations for students with documented disabilities. Students need to provide documentation to the Coordinator for Student Disability Resources, Jae Baldree, located on the 1st floor of Steiner Hall (x3089) and discuss your needs. Students should then notify me within the first few days of classes so that we can discuss ways to ensure your full participation in the course and coordinate your accommodations.

Workload
The amount of time students spend on this course outside of class varies depending on many factors, but 9 hours a week beyond the classroom time is quite typical.

Academic Honesty
Make sure you are familiar with the [college's guidelines](#) for academic honesty.

For this class, you are allowed (and even encouraged) to work together to solve homework problems but everyone must write their own solutions. Here are some more explicit instructions regarding this: if several students are sitting around discussing how to solve a problem and in the course of the conversation one of you figures out a key piece and discusses that piece with everyone else, then you may all go off on your own and write up your own answers. Additionally, you may discuss your written solutions with anyone you have worked with to solve a particular problem.

However, it is not ok if one of you solves the problem yourself first, and then tells other people the key pieces of the problem. If you already have figured out a solution to a problem, and someone asks you how to solve the problem, tell them you already figured the problem out and they should talk to me. Giving good hints is sometimes very tough. Conversely, if you know your colleagues have figured out a problem, you should not ask them for help but instead should talk to me.

And just to be clear: **Consulting any completed solution is academically dishonest.** Never search the Internet for a solution to a problem. Reading a math solution is much easier than figuring it out yourself. It only hurts your learning to find solutions online or in another book. Talk to me or other students who have not yet solve the problem if you're stuck.