Math 4250/6250 Syllabus
Spring 2023

1. Course Information

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Our classroom: Boyd 222
11:10-12:25 TR
http://www.jasoncantarella.com/

Book: **Theodore Shifrin, Differential Geometry: A first course in curves and surfaces**.

2. Course Schedule

This course is an in-person lecture course with in-class quizzes and graded homework. The official schedule for the course is provided on the the course webpage. Homework due dates are provided in Gradescope (see below) and aren't listed on the webpage. You are expected to read the notes and the book sections before coming to class. There will be a brief quiz at the start of some classes (quiz dates are announced in advance on the webpage). You aren't expected to completely understand after this first reading, but it will prepare you to get much more out of the lecture and class activities.

3. Prerequisites

Students are expected to have

(1) a very solid foundation in multivariable calculus equivalent to the MATH 2270 or MATH 2500 course (or MATH 3500/3510),
(2) a working understanding of linear algebra equivalent to the MATH 3000 or MATH 3300 course (or MATH 3500/3510),
(3) a basic understanding of ordinary differential equations, equivalent to the MATH 2700 course.

Computer skills in Mathematica or similar symbolic computation environment (Sage, Maple, Jupyter) will also be helpful.

4. Course Goals

Students will develop an understanding of the geometry of curves and surfaces, including curvature and torsion for space curves and Gauss and mean curvature for surfaces. The course will include discussion of the geometry of three dimensional space, and end with the Gauss-Bonnet theorem. At the end of the course, students should be prepared for a graduate course in Riemannian geometry.

5. Disclaimer

The syllabus is a general course plan and represents the best available information at the time of writing. Many of the course materials were developed during the pandemic, so we'll probably have to make adjustments as we go.

6. Principal Course Assignments

This course is taught in an in-person active learning model. Course material will be presented in the form of reading assignments, short videos, and homework assignments posted on the course webpage: http://www.jasoncantarella.com/wordpress/courses/math-4250/. Homework will be turned in (online only) through Gradescope http://www.gradescope.com/ and returned through Gradescope as well.

There will be two in-class exams (a midterm exam and a final exam). Exams and exam grades will be returned via Gradescope. **Note that ELC will not be used for this course.**

7. Grading and Policies

The grading structure for the course is 40% for the homework assignments and reading quizzes (total) and 30% for each exam. The course curve is expected to be 85-100 (A), 70-84 (B), 55-69 (C), below 55 (F). Grades of "D" will not be awarded.

8. Attendance Policy

In-person attendance is strongly encouraged, as the active learning component of the class simply doesn't work well unless you're actually there talking with the other students. Reading quizzes cannot be made up, though you can get a grade of "X" (excused) if you have a reasonable need to miss class.

9. Academic Honesty

As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, "A Culture of Honesty," and the Student Honor Code. All academic work must meet the standards described in A Culture of Honesty found at: `www.uga.edu/honesty`. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

Group work on homework problems is strongly encouraged. However, to get the most out of group work, you need to follow a few simple rules:

- Cite your sources– generously. Example: "After some online searching, I found a helpful discussion on StackExchange (include the url), which suggested that I try the approach below." or "I talked about the problem with Fionna, and got this idea." **Copying an online solution without providing a link is an academic honesty violation.**
- Help others– responsibly. Example: "Why don't you try . . . ?", or "It helped me to think about the problem this way."
- Do your own writeups, preferably alone. If your homework shares lots of complete sentences with someone else's, it might be a sign that you haven't fully digested the solution. You'll learn more from rephrasing, even if you're mostly following along with something you've found elsewhere.
- If you don't try to hide anything, you can't get in trouble over honesty, even if you don't do all the work on your own. Example: "I couldn't figure out the solution to (problem) on my own, but I was able to work through it with a friend who had already taken the course. I copied their solution by hand and tried to rewrite it where I could." is completely ok, worth substantial partial credit, and I won't think any less of you. On the other hand, just copying someone else's solution and representing it as all your own *is* a violation of the academic honesty policy.

10. Make-up Examinations

Make-up examinations are generally not given. In cases where students miss an exam for a valid reason (usually legal or medical), the exam is generally waived and the student's course grade is determined by the remaining exam and homework.