Math 4250/6250 Syllabus

1. Course Information

Dr. Jason Cantarella
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Our classroom: Boyd 323
11:15-12:05 MWF
http://www.jasoncantarella.com/

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

2. Course Schedule

Topics	Sections	Reading Quiz Date
Review of Linear Algebra & Calculus	Appendix A	(no quiz)
Parametrized Curves	1.1	1/20
The Frenet and Bishop Frame	1.2	1/25
Global Theorems about Curves	1.3	2/1
Fabricius-Bjerre and Potato Chip theorems	(notes only!)	2/8
Geometric Flows and Evolution Equations	(notes only!)	2/15
Parametrized Surfaces and First Fundamental Form	2.1	2/22
Gauss Map and 2nd Fundamental Form	2.2	2/29
Codazzi and Gauss Equations	2.3	3/14
Covariant Differentiation and Geodesics	2.4	3/21
Holonomy and the Gauss-Bonnet Theorem	3.1	3/28
Hyperbolic Geometry	3.2	4/11
Constant Mean Curvature Surfaces	3.4	4/18
Differential Geometry of Manifolds	(notes only!)	3/25
Final Exam (12-3pm), Boyd 323		5/9 (Monday)

3. Prerequisites

Students are expected to have a solid foundation in multivariable calculus, equivalent to that offered in the MATH 2270 or MATH 2500 course in order to enroll in the course. Computer skills in Mathematica or similar symbolic computation environment (Sage or Maple) 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 material on finding geodesics. 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, but deviations may become necessary over the course of the semester.

6. Principal Course Assignments

The course will have a midterm paper and a final exam. Homework will be due weekly, generally on Fridays.

7. Grading and Policies

The overall course grade is computed from homework, exam, and final grades by the formula:

(1) 30% for the midterm paper.
(2) 30% for the final exam.
(3) 40% for the homework assignments.

After grades are calculated for each student using these weights, the instructor will rank the students by average and determine thresholds for grades of A, B, C, D, and F. Generally, these are somewhat lower than 90 %, 80 %, 70 %, and 60 % of the total points in the course. Though improvement and other circumstances are taken into account in deciding thresholds for letter grades, students with a higher numerical average almost always receive higher letter grades than those with lower numerical averages.

In order to receive a grade of "WP", you must have attended class regularly and turned in homework assignments representing a good faith effort for all homework assignments due before the date of withdrawal.

8. Attendance Policy

Students are expected to attend class regularly. Students who miss more than 6 classes (two weeks of class) may be withdrawn from the course by the instructor.

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.

It is perfectly acceptable to work on homework problems in groups in this course. However, the help you should get from your fellow students should enable you to complete the problem on your own. Recruiting another student to complete the homework for you, or to simply provide answers to the problems, is a violation of the honesty policy.

10. Make-up Examinations

No makeup examinations will be given in the course.