Math 334/634: Differential Geometry
Syllabus, Fall 2010

Professor: **Dr. Jason Parsley**
Office: 330 Manchester Hall
Office hours: M 2-3, WTh 2-3:30; and also by appointment
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1. Course Time & Location: MWF 12-1, Manchester 124

2. Course Synopsis: This course will study, in detail, the geometrical properties of curves and surfaces. As we will discover, the subject is remarkably more difficult than your high school geometry class. We will utilize calculus and linear algebra to understand the basic idea of curvature, which is somewhat intuitive for a curve but less so for a surface. One highlight is the Gauss-Bonnet Theorem, which relates the total curvature of a surface to its topology (roughly, how many holes it has). We will talk about the shortest path between two points on a surface, that is a *geodesic*, and how to find geodesics. This is an excellent course for anyone planning graduate study in mathematics (or physics).

3. Text: Manfredo do Carmo, *Differential Geometry of Curves and Surfaces*

4. Secondary Text: Ted Shifrin, *Differential Geometry: A First Course in Curves and Surfaces*, available freely online at `http://www.math.uga.edu/~shifrin/ShifrinDiffGeo.pdf`,
This used with the expressed permission of Dr. Shifrin. They should not be distributed to others without the author's consent.

5. Homework: Homework forms an important portion of this course. Written assignments will be due on Fridays at the start of class. Late work is discouraged; each day late earns a 5 point deduction from your score; no work over 1 week late is accepted. I'm willing to work with you – if there are circumstances which will not allow you to submit homework on time, let me know and we can work something out.

The written homework should be neatly written using proper English grammar. I anticipate using the following grading system: most graded problems are worth 5 points; problems which are ungraded are checked for 'completeness' – whether you have made an honest attempt; these are worth 2 points.

Homework problems will generally be broken into three categories:

- ♣ computations

- ♡ easy/moderate problems

- ◇ challenging problems

You will have some choices regarding which problems you submit. Students enrolled in the graduate version of the course (Math 634) will be required to do more problems and to do more of the challenging ◇ problems.

Academic integrity is something I take quite seriously. Here are my expectations: you may discuss course material freely with each other. The written assignments that you submit must be your original work, i.e., when writing your solutions, you should be working independently, not together.

6. Exams: There will be two midterm exams and a final exam. The midterms may consist of a take-home component and/or an in-class component.

- 1st midterm: **F., Feb. 18**

- 2nd midterm: **F., Apr. 1**

- Final Exam: **F., Apr. 29, 2-5 pm**

7. Project: You will investigate one topic from the course in detail and write a 5-8 page report on it. The project is due on Monday, April 18. We will pick an evening and you will give a short presentation about your topic.

8. Grade Calculation:

Homework	30%
Midterm Exam 1	15%
Midterm Exam 2	15%
Project	15%
Final Exam	25%

If you have a disability which may require an accomodation for taking this course, please contact the Learning Assistance Center (758 5929), then contact me, within the first 2 weeks of the semester.