

Syllabus, Math 433/533 Spring, 2005

Instructor: Richard Koch
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Office Hours: Monday: 3:00 - 4:00, Wednesday and Friday: 2:00 - 3:00
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Book: **Geometry from a Differentiable Viewpoint** by John McCleary *and Math 433/533 Class Notes*. If you didn't come to the first day of class, be sure to ask me for a copy of these notes. The class notes are also available on the web; I may upgrade the web version from time to time.

Approximate outline:

March 28 - April 1: Local curve theory, reparameterization
April 4 - 8: Frenet-Serret, the fundamental theorem
April 11 - 15: Surfaces, vector fields, metric tensor
April 18 - 22: Geodesics
April 25 - 29: The Fundamental Decomposition, Extrinsic Theory
May 2 - 6: Principle Curvature, Gaussian Curvature, Covariant Derivative
May 9 - 13: Covariant Derivative, Riemann Curvature Tensor
May 16 - 20: Theorema Egregium, Non-Euclidean Geometry
May 23 - 27: Gauss-Bonnet theorem, Global Theory
May 30 - June 3: Memorial Day, Classification of Geometries with Constant Curvature

Grading: Final: 200 Points
Midterm 100 Points
Homework 200 Points

Remarks: The midterm will be on Friday, April 29. The final is on Wednesday, June 8, at 3:35.

Homework is due each Friday. Feel free to ask for hints in my office or by mail. I encourage you to discuss problems with each other as well.

First Assignment: Read the preface and pages 1 - 12 of the notes. Also read pages 3 - 6 of McCleary, paying particular attention to the proof of proposition 1.2. This is a special case of the Gauss-Bonnet theorem, so the course begins and ends with the same theorem.

The first homework set is due on Monday, April 4. All remaining exercises will be due on Fridays. See a separate handout for the first week's exercises.