

Introduction to Differentiable Manifolds

Math 622, Fall 1999

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Classes meet at Malott 230, Tue, Thr. 1:25-2:40

Office Hours: Tue. Thr. 2:40-3:40

The aim of this course is to introduce the idea of differentiable manifolds, and to generalize calculus so that one can compute various quantities associated to geometry of the manifolds. We will use Boothby's book "An Introduction to Differentiable manifolds and Riemannian Geometry" as a close reference to the topics to be covered in the course. The following is a selection of topics I intend to go over. It roughly corresponds to the content of the book, from Chapter 3 to Chapter 7.

- Inverse function theorem, implicit function theorem
 - Tensor calculus
 - Exterior Lie derivative
 - Frobenius theorem
 - de Rham cohomology
 - Integration on manifolds
 - Differentiation on Riemannian manifolds
 - Lie groups and homogeneous spaces
- (not necessarily in a chronological order)

The grading will be based on weekly assignments (70 % of the final grade) and one take-home final exam (30 %).