

Course Title: Differentiable Manifolds
 Course Number: MATH 6510 - 1
 Instructor: Andrejs Treibergs
 Home Page: <http://www.math.utah.edu/~treiberg/M6510.html>
 Place & Time: M, W, F, 10:45 - 11:35 in JWB 333
 Office Hours: 11:45-12:45 M, W, F, in LCB 224 (tent.)
 E-mail: treiberg@math.utah.edu
 Prerequisites: Prerequisites: "C" or better in MATH 4510 AND MATH 5520 or consent of instructor.
 Main Text: Math 6510 Notes by Kevin Wortman
<http://www.math.utah.edu/~wortman/6510.pdf>

In this first semester of a year long graduate course in topology, we shall focus on differentiable manifolds. The second semester, Math 6520 taught by K. Bromberg will homotopy and homology theory. In this course, along with the Math 6520, we shall try to cover the syllabus for the qualifying exam in topology. Although some mathematical sophistication is required to take the course, and it moves at the blazing speed of a graduate course, I shall provide any background materials needed by the class.

We shall follow Wortman's notes. We shall also use several other texts such as John M. Lee's "Introduction to Smooth Manifolds," Springer, New York 20013, ISBN 978-1-4419-9981-8. We shall discuss as many applications as we can.

Expected Learning Outcomes

At the end of the course the student is expected to master the theorems, methods and applications of the following topics:

- Manifolds
- Tangent spaces
- Orientation
- Whitney's embedding theorem
- Transversality
- Sard's theorem
- Partitions of unity
- Tubular neighborhoods
- Fiber bundles
- Degree theory
- Vector fields
- Flows
- Lie derivatives
- Frobenius' integrability theorem
- Differential forms
- DeRham cohomology.

Grading

The success of the student will be measured by graded daily homework. A student who earns 50% of the homework points will receive an A for the course. In addition, the student's performance will be reported to the Graduate Committee, which decides the continuation of financial support annually. Ultimately, the learning will also be measured by the Topology Qualifying Examination.