Prerequisites: Math 522.

Class:

VAN VLECK B223, 2:30PM - 3:45 PM, TR.

Professor: Bing Wang, Department of Mathematics,
Office Hours in Van Vleck 813, MW 1:00-2:00pm or by appointment,

Grade:

Your overall score will be calculated according to the following categories and weights.

- **Midterm Exams (20 \% \times 2)**.
- **Final Exam (40%)**.
- **Attendance (20%)**.

All the exams are take-home. You have one week time for each exam. I will also list helpful homework problems on my website. These problems are only for your exercise and will not be graded.

Course Content:

This class will be an introduction to the theory of Manifolds, including Lie groups. We will cover:

- Differentiable manifold, differential maps.
- Sard’s theorem, partition of unity, embedding theorem.
- Tangent space, bundles.
- Vector fields, Lie derivatives.
- Tensors and exterior algebra.
- Integration, DeRham cohomology.
- Frobenius theorem.
- Lie groups and Lie algebras, the natural Poisson structure on the dual of a Lie algebra.
- Integral curves and flows.
- Cartan’s magic formula.
Textbook:

*A comprehensive introduction to differential geometry*, first volume, by Michael Spivak, compensated by lecture notes.