Analysis on Manifolds

Joseph Bernstein Feb 02, 2006

In this course I will discuss several topics in global analysis on manifolds.

This course will use many notions and results discussed in the course of Differential Geometry in semester A.

Syllabus.

0. Recall of basic notions of differential geometry.
1 Transversality.
2. Sard's Lemma.
3. Deformation theorem and moving lemma.
4. Morse functions.
5. Embedding of manifolds into Euclidean space.
6. Index of a morphism and other applications of Sard's Lemma.
7. Recall of basic notions of homology theory.
8. Characteristic classes of vector bundles.
9. Basics of symplectic geometry.
10. Some global results in Riemannian geometry.
11. Morse theory.
12. Lie groups and Lie algebras.
13. Differential geometry on complex manifolds.

I'll use the following

Books

Guillemin, Pollack, Differential topology.
Chern, Chen, Lam, Lectures on Differential Geometry.