

Math 666, Spring 1998

Course Information (updated)

Topics in Geometric Analysis on Manifolds of Non-positive Curvature

Instructor:

Jianguo Cao, 221 CCMB 631-8847 (office), 272-4296 (home).

Time to meet: MWF 1:55 pm - 2:45 pm or to be re-scheduled

Course Description:

This is an advanced courses in differential geometry which treats various topics in geometric analysis on manifolds of non-positive curvature.

This course will consist of two main subjects:

(1) *Analysis on manifolds of non-positive curvatures.*

We will discuss the Laplace operator acting on both functions and forms for non-positively curved manifolds. The Dirichlet problem at infinity will be discussed. We also discuss the non-linear equations such as Yamabe equations and Monge-Ampere Equations.

(2) *The geometric and topological structures of manifolds with non-positive curvature.*

Among other things, we will discuss the Preissmann Theorem, Lawson-Yau and Gromoll-Wolf splitting, Eberlein-O'Neill's visibility manifolds, and manifolds with Gromov's hyperbolicity.

Pre-requirement: None.

Exam: None.

Homework: Some.

Reference books:

1. R. Schoen and S. T. Yau.: "Lectures on Differential Geometry", International Press, Boston, 1994. Price: around \$ 25.
2. P. Eberlein.: "Geometry of Nonpositively Curved Manifolds", The University of Chicago Press, 1996.

3. W. Ballmann, Gromov, M. and Schroeder, V.: "Manifolds of non-positive curvature", Birkhauser, 1985.