

Math647: Differential Geometry

Fall 2002

TIME: MWF: 3:00 - 3:50.

INSTRUCTOR: Xiaobo Liu.

COURSE DESCRIPTION:

The first part of this course will be an introduction to Riemannian geometry, which studies geometric properties of differentiable manifolds equipped with positive definite inner products on tangent spaces. The distance function, covariant derivative, and curvature tensor associated to a Riemannian metric will be studied.

The second part of this course studies complex manifolds, i.e. those differentiable manifolds locally look like a domain in C^n . Topics include Hermitian metrics, Chern classes, and other structures of complex manifolds. The intersection of Riemannian geometry and complex geometry is the Kähler geometry where the complex structure is compatible with the Riemannian metric. If time permits, we will also cover basics of Kähler geometry.

Although basic concepts of differentiable manifolds, differential forms, tensors, vector bundles will be briefly reviewed. Prior knowledge on these concepts will surely be very helpful.

REFERENCE:

Fangyang Zheng *Complex Differential Geometry*, International Press, 2000.