Topic Outline

Math 6453 Introduction to Geometry and Topology II

Text: At the level of "Riemannian Geometry" by Do Carmo and "Algebraic Topology" by Allen Hatcher or "Topology and Geometry" by Glen Bredon (with emphasis on manifolds and CW- complexes).

- Connections and Riemannian metrics on smooth manifolds

- Introduction to geodesics and the exponential map

- Definition and examples of curvature

- Integration on manifolds, Stokes theorem and DeRham cohomolgy

- Basics of homology and computational techniques

- Integration of differential forms of singular chains

- Basics of cohomology, isomorphism with de Rham cohomology (without proof)

- If time permits: Lie Groups, fixed point theorems, Hodge theory, more on curvature