Topics in Topology and Complex Manifolds – MATH 995
Introduction into Complex Geometry
Professor Gerald Hoehn – Fall 2007

The course will give an introduction into the geometry of compact complex manifolds. This subject and the introduced concepts are a prerequisite for the understanding of many modern developments in algebra, differential geometry and topology, for example in string theory.

Topics to be covered include: holomorphic functions of several variables, complex differential forms, holomorphic vector bundles, general sheaf cohomology, blow-ups, Hermitian metrics, Kähler manifolds, Hodge theory, complex connections and curvature, Chern classes.

Main results proven are the Serre duality theorem, Kodaira's vanishing and embedding theorems. I will also formulate the Riemann-Roch-Hirzebruch theorem.

Book: *Complex Geometry, An Introduction,* by Daniel Huybrechts, Springer 2005.

Prerequisites for this course are algebra and topology classes on the 800 level. Please see Prof. Hoehn in case there are questions.