MANIFOLDS, Math 704, Spring 2003

Tuesday & Thursday 1–2:30, LGRT 1234 or 1535 (GANG Lab)

- Prof. Rob Kusner, LGRT 1435G, 5-6022 or 5-4605, kusner@math.umass.edu, http://www.gang.umass.edu/ kusner/class/
- Office hours are by appointment Tuesday and Thursday after 2:30. An extra problem session will be arranged by mutual agreement.
- The texts are *Differential Forms in Algebraic Topology* by Bott & Tu, and Milnor's classic *Morse Theory.* There are several other good texts on nearby topics in differential toplogy and geometry such as Hirsch, Warner and Spivak.
- Class attendance is expected, in part because you will write up notes from class, filling in details and working exercises. Copies of notes, as well as homework problems assigned from the text, will be assigned and discussed weekly in class (or in our extra session).
- Topics will include forms on R^n and on manifolds, integration and cohomology of forms, and applications to geometry; transversality, Morse functions, handlebody decompositions and homotopy type of manifolds; basic Riemannian geometry, Morse theory of geodesics, the influence of curvature on geodesics and special submanifolds, and topological consequences.
- This is a hybrid of a topics course and a "standard advanced graduate course", so there will be a comprehensive final (take-home) exam in May. The Departmental "advanced exam" in geometry is offered next August; this course should help you prepare for it.
- Grading is based in (more or less) equal parts on the homework, class notes and the final. You are encouraged to work together in preparing class notes and the homework: the only way to not get an "A" is by failing to participate intelligently in the class.