MANIFOLDS I, Math 703, Fall 2006

Monday & Wednesday 2:30–3:45 in LGRT 1334 or 1535
Working Session Wednesday 4:15–5:45 in LGRT 1535

- Prof. Rob Kusner, 1435G [5-6022] or 1535 (the GANG Lab) [5-4605], kusner@math.umass.edu, www.gang.umass.edu/~kusner/class/

- Office hours by appointment Wednesday at GANG after the seminar ends (around noon) - please join us (for the seminar and for lunch).

- The text is *Foundations of Differentiable Manifolds and Lie Groups* by Warner. There are several other basic texts on differential geometry and topology, such as those by Boothby, Lee, Sharpe, Hirsch or Guillemin & Pollack. More specialized (or advanced) books by Bott & Tu, Hirsch, Kobayashi & Nomizu Milnor, Seifert & Threlfall, Spivak or Thurston are also worth consulting. I want to recommend in particular two beautiful, concise books by Milnor: *Topology from the Differentiable Viewpoint* and *Morse Theory*.

- 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 include the basic definitions and examples of manifolds and their morphisms; vector fields and flows; Lie groups; vector and fibre bundles; transversality and other ideas in differential topology.

- This is a hybrid of a topics course and a year-long "standard advanced graduate course", so there will be an opportunity in December (and again in May) for students to present topics to the class. The Departmental advanced exam in geometry is the "final"; 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 presentation. 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.