Syllabus for MTH G122:
Geometry 1
Fall 2005

INSTRUCTOR: David Massey

CONTACT INFO:
office: 529 NI
phone: 617-373-5527
e-mail: dmassey@neu.edu
Web site: http://www.massey.math.neu.edu/

OFFICE HOURS:

Tuesday, Wednesday, Thursday: 2:45-4:15pm
Other times: Drop in (I'm around A LOT) or by appointment

TEXTS:
Guillemin and Pollack, *Differential Topology* ;
Warner, *Foundations of Differentiable Manifolds and Lie Groups*

COURSE DESCRIPTION: Differential geometry can be looked at in two ways: in terms of embedded submanifolds of Euclidean space, and intrinsically, without reference to a surrounding ambient space. The embedded situation is very intuitive; one can picture tangent vectors and the action of derivatives. The intrinsic description is very beautiful in its own way; the whole question of how to define a "tangent vector", when there is no ambient space for it to point into, is interesting. Moreover, what a smooth manifold means when there is no surrounding space is highly non-trivial.

In this course, we shall begin with the intuitive embedded situation, following the treatment of Guillemin and Pollack. I intend to proceed through this entire book, skipping the more topological topics, and concentrating on the more standard geometric parts.

After we finish Guillemin and Pollack, we shall start in on Warner's book, covering at least the first chapter on the intrinsic approach to differential geometry. We will also use the fourth chapter of Warner as an added reference when covering Integration on Manifolds in Guillemin and Pollack.

GRADING: There will be problem sets assigned every week or two. It is intended that students work on the problem sets together, in order to come up with ideas, but each student must write up their own answers to turn in (i.e., I do not want to see people turn in essentially identical proofs for every problem.) These problem sets will count as 80% of the grade. The remaining 20% of the grade will come from a final exam. This exam will consist mainly of "filling in the blanks" on, or regurgitating statements of, important basic definitions and theorems. There may also be one or two simple, straightforward proofs. This exam will **NOT** be take-home.