Syllabus   Piecewise-Linear Topology

Summer 2010   Jim Fowler

Manifolds are spaces which are locally modeled on Euclidean space, but might be globally twisted in some way; two-dimensional examples include a sphere or a torus. In contrast to the usual introduction to manifolds based on calculus and charts (that is, smooth manifolds), this course will study manifolds as combinatorial objects (that is, piecewise-linear manifolds). Piecewise-linear manifolds are more general than smooth manifolds, and because the basic definitions involve combinatorics instead of calculus, we will find it easier to give rigorous proofs.

Homework

Problem sets will be distributed during most lectures.

Website

The course website is `http://www.math.osu.edu/~fowler/teaching/ross2010/`

Lectures

We meet Mondays, Wednesdays, and Fridays, 1:30p.m.–2:30p.m. in CH240.

Instructor

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Tentative Schedule

This is an ambitious schedule, to say the least. Depending on your interest, we can spend more or less time on certain topics. Let me know.

Week 1 Simplicial complexes and piecewise-linear manifolds

Week 2 Regular neighborhoods and simplicial collapse

Week 3 Sunny collapse and unknotting

Week 4 Simplicial homology

Week 5 Poincaré duality

Week 6 General position

Week 7 Embeddings

Week 8 Handle theory