

Math 132 - Topology II: Smooth Manifolds. Harvard University.
Spring 2017, MWF 1-2pm. Science Center 310.
Instructor: George Melvin

Note: §A.x refers to Section A.x in *Differential Topology* by Guillemin & Pollack, AMS Chelsea Pub. (2010 Edition).

(Tentative) Schedule:

- 1/23-1/27:** Smooth manifolds, smooth maps; manifolds with boundary. (§1.1-1.2,2.1)
- 1/30-2/3:** Inverse function theorem. Immersions, embeddings, submersions. Lie groups. (§1.3-1.4)
- 2/6-2/10:** Homotopy, stability. Sard's theorem, Morse functions. Whitney embedding theorem. (§1.6-1.8)
- 2/13-2/17:** Whitney embedding theorem continued. Classification of 1-manifolds. (§1.8, 2.2)
- 2/15:** Diagnostic quiz.
- 2/20:** University holiday, no class.
- 2/22-2/24:** Transversality. (§1.5,2.3)
- 2/27-3/3:** Transversality continued. Intersection theory mod 2. Winding numbers, Jordan-Brouwer separation theorem. (§2.3-2.5)
- 3/6-3/10:** Borsuk-Ulam theorem. (§2.6)
- Spillover week.
- 3/10:** Project I submission deadline.
- 3/11-3/19:** Spring Recess
- 3/20-3/24:** Orientations. Oriented intersection numbers, Euler characteristic. (§3.1-3.3)
- 3/27-3/31:** Lefschetz numbers. Vector fields. (§3.4-3.5)
- 4/3-4/7:** Poincaré-Hopf theorem. Hopf degree theorem. (§3.5-3.6)
- 4/10-4/26:** Additional topics.