Math 141: Differential Topology
Spring 2016

Instructor: Kathryn Mann
    Office: 793 Evans.
    Office hours: Tuesdays 12:30 - 1:30;   Wednesdays 1:00-2:00, Thursdays 10:00-11:00.
    E-mail: kpmann@math.berkeley.edu
    My website: `math.berkeley.edu/~kpmann`
    Course website: `http://math.berkeley.edu/~kpmann/141differential2016.html`

Lectures: This section meets Tu/Th 11:10 - 12:30 pm in 141 Giannini. I expect you to attend and participate in lectures.

Text: *Differential Topology* by V. Guillemin and A. Pollack. We will cover chapters 1-3 (perhaps not all of chapter 3). Other optional reading is listed on the course website. A rough schedule of lectures is on the following page.

Homework:
    Problem sets (homework) are assigned weekly. These will be posted on the course webpage by midnight on Tuesday and due immediately at the *beginning* of class on the following Tuesday.

    Late homework will *not be accepted under any circumstances*. If you are late to class on Tuesday, your homework is late and and will not be graded. In case of extended illness, you must contact me as soon as possible. Information on what happens if you miss the quiz or midterm due to illness is on the course website.

    You are encouraged to discuss homework together, but you must write up *your own* solutions. Plagiarism and copying (from classmates, notes, the internet etc.) are not tolerated and will result in a grade of 0 for all people involved.

Exams: We have a 30-minute quiz, a midterm exam, and a final exam.

Grading scheme:
    Homework: 20%. (lowest 2 assignment scores dropped)
    30-minute quiz: 10%
    Midterm exam: 30%
    Final Exam: 40%

Important dates:
- 30-minute quiz: Tuesday, February 16
- Deadline to drop this class: Friday, February 19
- Midterm exam: Tuesday, March 15
- Final exam: Thursday, May 12, 8-11 am.

General policies: If you are a DSP student requiring special accommodations, or if you have extracurricular activities that may conflict with this course, *read the guidelines on the course webpage* and contact me ASAP (now or early next week).

How to get an A in my class:
    See the attached sheet or course webpage for advice

Optimistic week by week schedule.
All section numbers are from Guillemin and Pollack.

1. Basic concepts in topology (Hatcher notes)

2. Smooth maps and manifolds (1.1, 1.2)

3. Inverse function theorem, immersions, embeddings, submersions (1.3, 1.4)

4. Submersions and Lie groups (1.4), Transversality (1.5)

5. *30 minute quiz.* Homotopy and Stability (1.6)

6. Sard's theorem and the whitney Embedding theorem (1.7, 1.8)

7. Manifolds with boundary, classification of 1-manifolds, applications. (2.1, 2.2)

8. Transversality again, Epsilon-neighborhood theorem (2.3) (2.3)

9. *Midterm exam.* Intersection theory mod 2 (2.4)

   ∗ Spring break ∗

10. Winding number, Jordan-Brouwer separation theorem (2.5)

11. Bosak–Ulam (2.6) Introduction to orientation (3.1, 3.2)

12. Oriented manifolds (3.2), oriented intersection number (3.3)

13. More on the oriented intersection number (3.3), Lefschetz fixed point theory (3.4)

14. Poincaré–Hopf (3.5)

15. Reading/Review week (no class)

    ∗ Final exam ∗