

Math 431/531

Fall 2019

Lecture: MWF 12:00–12:50, 104 Deady Hall
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Outline of the sequence. I will teach point-set topology in the fall (431/531) and manifolds in the winter (432/532). The curves and surfaces course (433/533) will not run this year, but you can continue with de Rham cohomology in the spring (410/510), taught by Nick Proudfoot.

Books. There is no required textbook for the fall, but if you want to read one, here are some recommendations:

- Munkres, *Topology*.
The standard choice.
- Patty, *Foundations of topology*.
This is the book I used in college.
- Dugundji, *Topology*.
Terse and old-fashioned, but it has a certain charm.
- Lee, *Topological manifolds*.
Starts with the essentials of point-set topology before going on to classification of surfaces, and quite a bit of algebraic topology. Rich in examples, like all of Lee's books.

Grading. Your grade will be based on the following:

- **Homework.** On Mondays, upload your homework through Canvas: either scan it in, or take a picture with your phone, or if you type, upload a PDF. You'll be assigned two of your colleagues' homeworks to give feedback on, by Wednesday. By Friday, you'll submit a revised version of your homework based on feedback from your colleagues and the grader.

I encourage you to work with other students, but you must do the writing yourself, in your own words. If you write by hand, use pencil, because you will inevitably want to erase something. If you type, use \TeX , not Microsoft Word. I will drop the lowest score.

- **Midterms.** Friday, November 1 and Friday, November 22, in class.
- **Final Exam.** Tuesday, December 10, 10:15–12:15, in the usual room.

Graduate students (531) should do all the optional problems on the homework, and will have additional work: some reading about the history of topology, and a project on the compact-open topology.

Learning outcomes. The successful student will come away understanding connectedness, compactness, and separation properties of topological spaces, both formally (how to use the axioms) and in examples. The student will both acquire and demonstrate this understanding by *writing proofs*. Especially important will be writing in paragraphs, rather than in strings of symbols; keeping in mind the audience for your writing, which is your peers; and “making the easy parts look easy,” that is, avoiding belaboring the routine parts of the proof so that the essential content can shine through.