Math 871 Topology I

Section 001: TuTh 2:00 - 3:15 Avery (AvH) 119

Your instructor will be working remotely for the fall 2020 semester; class will be delivered via Zoom meetings. You are invited to attend class via Zoom from any location; you will also be able to view and interact in real time from the classroom. The link to the Zoom class meetings will be posted to the Canvas page for the class.

Instructor: Mark Brittenham
Office: Avery Hall (AvH) 329
Telephone: I no longer have an office phone! [I didn't answer it anyway...]
E-mail: mbrittenham2@unl.edu
WWW: http://www.math.unl.edu/∼mbrittenham2/
WWW pages for this class: http://www.math.unl.edu/∼mbrittenham2/classwk/871f20/

I will maintain this page, but given the current state of things, we will run the course through its Canvas site. But (for reasons of public sharing, basically), I will mirror everything to this public-facing page, as well. On Canvas, and at the above link, you will find copies of every handout from class, lists of homework problems assigned, dates and review sheets for exams, etc.)

Office Hours: To be determined. Office hours will be run through a (different) Zoom link (than the class), and, following a recommendation from individuals at the university, will employ a waiting room format (so that people don't just suddenly pop into the middle of an ongoing conversation...).

Prerequisite: Math 325 (analysis) or Math 417 (algebra), or equivalent, or permission of instructor.

Texts: *Topology*, by James Munkres (2nd edition, Prentice Hall),
which will be our primary resource for the first 65–75% of the course, and

Algebraic Topology, by Allen Hatcher (Cambridge University Press),
which will be our primary resource for the remainder.

Algebraic Topology is also available for free, in electronic form, from author's website,
http://www.math.cornell.edu/∼hatcher/AT/ATpage.html .

(but, on the other hand, it is pretty inexpensive anyway...)

This course, as the name is intended to imply, is about topology. More precisely, it is intended to provide you with an introduction to the basic concepts, techniques, and goals of topology. At minimum, we will work through chapters 2 through 4 and chapter 9 of *Topology*, followed by the initial parts of *Algebraic Topology*. [The follow-on course Math 872 will continue in *Algebraic Topology*.] In particular, we will cover basic definitions and examples of topological spaces and continuous functions, properties of topological spaces (connectedness, compactness, separation axioms, separability (which, surprisingly, is something completely different), deforming one space into another (homotopy), and applications.

Problem sets will be assigned (approximately) each week. It is an essential ingredient to the course - as with almost all of mathematics, we learn best by doing (again and again and ...). A subset of each problem set will be collected and graded. Cooperation with other students on these assignments is acceptable, and even encouraged. You must, however, work at least half of the problems (as a running average) chosen for collection and grading without consulting other students. This will help to make sure you are understanding the process of finding the solution on your own - after all, you get to bring only one brain to exams (and it can't be someone else's). These problem sets will account for 50 % of your final grade. We will work out a mechanism for you to submit your solutions to the problem sets electronically, and your graded work will be returned in the same way. Probably the simplest solution would be for you to type up your work in TeX/LaTeX, and submit your solutions as .pdf files; the raw .tex files for the problems will be provided to assist you with this. But that is of course not the only possible method.

In addition to the problem sets, two **exams** will be given during the semester on dates which will be determined in consultation with the class. These exams will also be administered online, and the exact format (self-timed in a single sitting, or more 'traditional' take-home with a due date) will be determined after consultation with the class. The main difference between the exams and the problem sets is that you must not consult with any other resource (e.g., each other) besides the instructor, while formulating your solutions. Each exam will account for 25 % of your final grade.

Because nearly all of the students in this class are involved with the teaching of one of the mathematics department's 100-level courses, which hold their common final exams on Saturday, November 21, and which usually hold their last midterm exam during the (Tuesday and Wednesday of the) 13th/14th week of class, some care seems in order over the timing of the second of these exams (i.e., not at the scheduled final exam time, which happens to be 3:30 to 5:30 p.m. on Saturday, November 21 (!)). We will discuss possible options during the first weeks of class.

Your course grade will be based upon these two components, and will be converted to a letter grade, taking into account the overall average of the class. However, a score of 90% or better will guarantee some kind of **A**, 80% or better at least some sort of **B**, 70% or better at least a flavor of **C**, and 60% or better at least a **D**.

In mathematics, new concepts continually rely upon the mastery of old ones; it is therefore essential that you thoroughly understand each new topic before moving on. Our classes are an important opportunity for you to ask questions; to make sure that you are understanding concepts correctly. Speak up! It's your education at stake. Make every effort to resist the temptation to put off work, and to fall behind. Every topic has to be gotten through, not around. And it's a lot easier to read 50 pages in a week than it is in a day. Try to do some mathematics every single day. **Class attendance** and **doing the homework** are your best methods for insuring that you will keep up with the material, and to make sure that you understand all of the concepts.

Departmental Grading Appeals Policy: The Department of Mathematics does not tolerate discrimination or harassment on the basis of race, gender, religion, or sexual orientation. If you believe you have been subject to such discrimination or harassment, in this or any other math course, please contact the department. If, for this or any other reason, you believe your grade was assigned incorrectly or capriciously, then appeals may be made (in order) to the instructor, the department chair, the department grading appeals committee, the college grading appeals committee, and the university grading appeals committee.

ADA Notice: Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office [www.unl.edu], 132 Canfield Administration, 472-3787 voice or TTY.

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Canvas account during the last two weeks of class. You will get an email when the form becomes available. Evaluations are anonymous and instructors do not see any of the responses until after final grades have been submitted. Evaluations are important—the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

Some important academic dates

Aug. 17	First day of (asynchronous) classes.
Aug. 24	Classes begin running on a synchronous ('in-person') basis.
Aug. 28	Last day to withdraw from a course without a **'W'**.
Sept. 7	Labor Day - but classes are in session!
Oct. 2	Last day to change a course to or from P/NP.
Oct. 19-20	Around about the time we would have had fall break...
Oct. 28	Last day to withdraw from a course.
Nov. 20	Last day of classes.
Nov. 21-25	Final exam week.
Nov. 21	Math 871 final examination scheduled time slot.
Nov. 26-28	Thanksgiving holiday (not 'vacation'...).