22F Math 320: Topology I
Reiss 502, MW 3:30–4:45

Instructor: Prof. Peter Bonventre
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Office Hours: TBD (Zoom)

Textbook. *Introduction to Topology: Pure and Applied* by Colin Adams and Robert Franzosa.

Course Description. This course is an introduction to the fundamentals of (point-set) Topology. In broad terms, topology is the study of spaces and shapes, which can be thought of as settings that allows for a notion of "limits" and "continuous functions" that generalize the definitions from calculus. Topology has results that touch on every field of mathematics, from algebra and combinatorics to analysis and geometry.
We will define and investigate (through proofs and examples) different spaces and their properties. Topics may include:

- interiors and closures
- limit points and boundaries
- subspaces, products, and quotients
- continuous functions and homeomorphisms
- connectedness and the Intermediate Value Theorem
- compactness and the Extreme Value Theorem

Assignments and Assessments.

(1) **Written Homework, due Wednesdays at the start of class.**
    Written homework assignments will be posted on Canvas weekly. All assignments should be **carefully**, **clearly**, and **cleanly** written. Among other things, this means your work should include proper grammar, punctuation and spelling.
    Quite often, you will go through many attempts and drafts before arriving at a correct proof. I would highly recommend that you get in the habit of separating your scratch work from your submitted assignment.
    In general, writing proofs is hard! Part of the purpose of this course is to provide guidance and encourage the growth of this skill. For resources and style suggestions for proof writing, see Elements of Style.
    You are encouraged to work together on your homework assignments and when studying for your exams. However, the solutions you submit for credit **must be your own work**.

(2) **Midterms, in-class on Wednesday Oct 5 and Wednesday Nov 16**
    There will be two, in-class, closed-note, timed midterm exams.

(3) **Final Exam, on Friday Dec 16, 9–11am**
    There will be a comprehensive, commulative, closed-note, timed final exam during finals week at the assigned time.

Tokens. Each student will have two **tokens**. Communicated to me before hand, these can be used to grant a 2-day extension on any written homework. Otherwise, late assignbments will **not** be accepted. However, the lowest homework grade will be dropped at the end of the semester.

Grading. Grades will be assigned based on the following scheme:

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Homework – 25%

Groupwork and Participation – 10%

Midterm Exams – 20% each

Final Exam – 25%

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I will use the usual grading distribution in assigning final grades. (A: 90% - 100%, B: 80% - 89%, etc.)

Class Structure. Mathematics, like many skills, cannot be learned simply by observing. Listening to Chopin will not help you learn to play the piano, and watching Wimbledon doesn't help you learn to hit a strong forehand, To encourage the growth of these skills and learning outcomes, we will incorporate methods from an education philosophy called "active learning." Some of our class time together will consist of working on guided worksheets, with student engagement with the material as the primary focus. I may ask for some students to present the results of their group's work to the class.

While working in groups:

- *Share responsibility for making sure all voices are heard:* If you tend to have a lot to say, make sure you leave sufficient space to hear from others. If you tend to stay quiet in group discussions, challenge yourself to contribute so others can learn from you.
- *Understand that we are bound to make mistakes in this space:* Everybody (myself included!) does so when approaching complex tasks or learning new skills. In particular, you are invited to step outside your comfort zone!

Course expectation. This is a weird and difficult time for us all. I expect myself to work hard to make this class effective and flexible, and I expect you to do the same. You are expected to complete your assignments, come to class on time, and be ready to participate and engage with the material and their fellow classmates. Additionally, you are responsible for announcements made in class, sent to your Georgetown email account, or through Canvas.

Attendance. I will be taking attendance daily. If you miss several days, this will be noticed, and unless we have been in communication this will affect your participation grade. Additionally, as this class is participation and discussion focused, and the material builds on itself, missing class will most likely affect your ability to perform well in this course.

That being said, there is no standard attendance policy that can fit our current situation, that can take into account the complexities of remote instruction, or all the different ways covid may interfere with your ability to attend class, etc. In light of all this, I would ask that you **come to class if you can**, as it will provide the largest benefit to you and your classmates. However, if you cannot make class, just let me know.

Above all, when we are in-person, **do not come to class if you are sick**. If you do, I will ask you to leave. I'd rather you miss class, and we work together to make up material, than for you to give a classmate COVID. I will not ask for medical documentation or too many specifics; instead, I will trust your judgment and voice in these matters.

Please also see Georgetown's Quarantine and Isolation Policy.

Electronic Devices. Use of calculators is **not permitted**. Additionally, during class, all electronic devices which are not being used to facilitate learning should be put away. Electronic devices such as phones, laptops, and tablets are a large distraction from instruction, causing anyone viewing them to retain and understand less of what is being discussed in class (this includes the user and anyone behind them). This goes for in-person as well as remote learning.

Academic Integrity. By taking this class, you assume responsibility towards following the policies of Georgetown University's Honor System. If you cheat in this class (e.g. using assistance of any form on exams, presenting someone else's work as your own), you risk failing the course.

Collaboration. Mathematics is an inherently collaborative and social activity. You are encouraged to work together on your homework assignments and when studying for your exams. However, the solutions you submit for credit **must be your own work**. Copying the written work of another student will not only not help you learn topology, but will also be considered cheating. Please see the Georgetown University Honor Council website What is Plagiarism? for more information.

Accommodations. It is my job to provide all students with an accessible and inclusive learning environment. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Academic Resource Center to determine appropriate accommodations. Any information you provide is private and confidential, and will be treated as such.

Title IX and Sexual Misconduct. Georgetown University and its faculty are committed to supporting survivors and those impacted by sexual misconduct, which includes sexual assault, sexual harassment, relationship violence, and stalking. Georgetown requires faculty members, unless otherwise designated as confidential, to report all disclosures of sexual misconduct to the University Title IX Coordinator or a Deputy Title IX Coordinator. If you disclose an incident of sexual misconduct to a professor in or outside of the classroom (with the exception of disclosures in papers), that faculty member must report the incident to the Title IX Coordinator, or Deputy Title IX Coordinator. The coordinator will, in turn, reach out to the student to provide support, resources, and the option to meet. [Please note that the student is not required to meet with the Title IX coordinator.]. More information about reporting options and resources can be found on the Sexual Misconduct Website: `https://sexualassault.georgetown.edu/resourcecenter`.

If you would prefer to speak to someone confidentially, Georgetown has a number of fully confidential professional resources that can provide support and assistance. These resources include:

Health Education Services for Sexual Assault Response and Prevention: confidential email `mailto:sarp@georgetown.edu`

Counseling and Psychiatric Services (CAPS): 202.687.6985 or after hours, call (833) 960-3006 to reach Fonemed, a telehealth service; individuals may ask for the on-call CAPS clinician.

More information about reporting options and resources can be found on the Sexual Misconduct Website.

Advice.

- Work with others!
- Attend class, participate, and ask questions.
- Office hours are a great place to ask questions, go over material, and work through problems.
- Drop by the Math Assistance Center for free tutoring.
- Learning is not fast, don't try to rush it. Be patient with yourself.
- Just because the first approach at a problem does not work, does not mean that the second or third will not. Sometimes the first thing you (or I) try doesn't work, but this does not necessarily mean that you do not understand the tools required to solve the problem.
- Start your homework early and work together! Get help when needed, at office hours, the MAC, or from your peers.

Important Dates.

- Last day to Add/Drop: September 2 (F)
- No Classes (Labor Day): September 5 (M)
- **Monday class schedule**: September 6 (Tu)
- No Classes (Mid-Semester Holiday): October 10 (M)
- Last day to withdraw: November 17 (Th)
- No Classes (Fall Recess): November 23 (W) – 25 (F)
- Last day of classes: December 6 (Tu)
- Last day of Finals: December 17 (Sa)