Goals. This course will serve as an introduction to point-set and algebraic topology. In the first half of the course, we will study topological spaces via constructions such as the subspace, quotient, product, and metric topologies; continuous maps; and topological properties such as compactness, connectedness, and separability. In the second part, we will study the fundamental group, covering spaces, and the classification of surfaces.


Lectures. Tuesdays and Thursdays, 8:30–9:45, Gross 318.


Prerequisites. The only official prerequisite is Math 221 (Linear Algebra). Certain parts of the course will assume familiarity with basic real analysis (particularly the \( \delta-\epsilon \) definitions of limits and continuity) and group theory, but I intend to provide any necessarily mathematical background on this material.

Instructor. Prof. Adam Levine
Email: alevine@math.duke.edu
Webpage: www.math.duke.edu/~alevine
Office: Physics 211
Office phone: 919-660-2802
Office hours: Mondays 1:30-3 pm, Thursdays 10-11:30 am, or by appointment

Exams. There will be two 75-minute midterms, held in class on Thursday, February 14 and Thursday, March 28. The final exam will be on Wednesday, May 1, 7–10 pm.

Homework. Homework will be assigned and graded every week, generally collected in class on Tuesdays. Late homework will not be accepted. You can find the assignments on the course web page. Please check this page regularly for updates. You are permitted and encouraged to discuss the homework problems with your classmates; however, submitted homework must be written up in your own words without consulting anyone else’s written solution. Please also clearly indicate the names of other students or individuals (other than your instructor) with whom you had significant discussions of the problems. You are also strongly encouraged to type up your solutions using \( \LaTeX \); see math.duke.edu/tex-and-latex for some resources. Multiple-page submissions must be stapled before class; points may be deducted for unstapled homework.

Course grade. Your grade will be determined based on the following rubric:
- Homework: 15%
- Midterm 1: 25%
- Midterm 2: 25%
- Final exam: 35%

Graduate students. Graduate students taking this course are technically enrolled in Math 711 rather than Math 411. In addition to all the requirements above, graduate students are required to write a short essay (1–2 pages) explaining the relevance of the course to their chosen field of study. Students should meet with the instructor individually to discuss the parameters of this assignment, which is due by the end of the semester.
Policies regarding graded work. You are expected to attend every class on time and submit all homework on time. Late homework will not be graded and missed exams may not be made up. In accordance with Duke policy, there are four situations where an accommodation may be possible: a personal tragedy or emergency, an incapacitating illness, a religious holiday, or varsity athletic participation. Please visit the following pages to familiarize yourself with the procedures:

- trinity.duke.edu/undergraduate/academic-policies/personal-emergencies
- trinity.duke.edu/undergraduate/academic-policies/bereavement
- trinity.duke.edu/undergraduate/academic-policies/illness
- trinity.duke.edu/undergraduate/academic-policies/religious-holidays
- trinity.duke.edu/undergraduate/academic-policies/athletic-varsity-participation

On all exams, you must work completely independently, without collaboration with others. Portable electronic devices that are visible or audible during exams will be confiscated until the exam period ends. Students are expected to adhere to the Duke Community Standard, which can be found at http://studentaffairs.duke.edu/conduct/about-us/duke-community-standard. You must reaffirm your commitment to these standards by writing out and signing the following statement on every assignment and exam: I confirm my commitment to the Duke Community Standard.

In a case of academic dishonesty that is resolved directly through a faculty-student resolution agreement approved by the Office of Student Conduct, the terms of that agreement will dictate the grading response to the activity at issue. If a student is found responsible through the Office of Student Conduct for academic dishonesty on a graded activity in this course, and the infraction is not resolved by a faculty-student resolution agreement, then the student will receive a score of zero for that activity, and the instructor reserves the right to further reduce the final grade for the course by one or more letter grades, possibly to a failing grade.