MATH 527 Homotopy Theory
Spring 2021

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Course Moodle site: `https://learn.illinois.edu/course/view.php?id=51684`

Course logistics: All aspects of this course will be carried out remotely this semester. Some lectures will be prerecorded and some may be held "live" online (and recorded for those who can't attend). We'll use Campuswire to host a course discussion site and Zoom for course meetings and office hours. Further details and links will be provided once the term starts.

Required technology: To participate in this course you will need:
- computer or tablet,
- webcam, speakers/headphone and microphone,
- reasonable internet connection for downloading course content and participating in course discussions and office hours.

Course description: This is an introduction to homotopy theory. Topics will include
- classical homotopy theory of spaces
- cofiber, fiber sequences
- homotopy limits and colimits
- spectral sequences
- Brown representability

Other possible topics (depending on interest) include: simplicial methods, model categories, introduction to ∞-categories, spectra and stable homotopy theory.

Prerequisites: MATH 526 or consent of instructor.

Textbooks: Textbook: We'll use the following text for the first portion of the course:
- *Modern Classical Homotopy Theory*, by J. Strom. (freely available through our library)

A couple more useful texts:
- *Algebraic Topology*, by Hatcher. Free pdf available at `http://www.math.cornell.edu/~hatcher/AT/ATpage.html`.
- *Geometry and Topology*, by Bredon. Free pdf available through our library.

Assessment: Ample opportunities to demonstrate mastery of course material will be provided.
- *Homework exercises.* Homework exercises form an integral part of the course.
- *Course participation.* Ask and answer questions on the course discussion board about lecture materials, homework exercises, or anything related to homotopy theory.

Disabilities: To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class are asked to contact me as soon as possible.