

# Course Syllabus

## MTG 6346, Topology 1, Fall 2024

**Instructor:** Henry Adams

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**Office:** Little Hall 418

**Office hours:** Mon 1:55-2:45pm and Wed 3:00-3:50pm (?), or by appointment

**Lectures:** MWF 6th period (12:50-1:40pm) in Little Hall 207

**Textbook:** *Algebraic Topology* by Allen Hatcher

Freely available at <https://pi.math.cornell.edu/hatcher/AT/ATpage.html>

**Class Webpage:** <https://people.clas.ufl.edu/henry-adams/mtg6346-F2024>

**Course Overview:** This is the first part of a two semester course on topology. Topics covered include general topology, algebraic topology, homotopy theory, and the topology of manifolds. We begin with a brief review of homotopy equivalences and an introduction to CW complexes. We then proceed to an advanced treatment of the fundamental group, covering spaces, van Kampen's theorem, and covering spaces. The main focus of the course is the theory of homology, including simplicial homology, singular homology, homotopy invariance, exact sequences, excision, the Mayer–Vietoris sequence, and the Lefschetz fixed point theorem.

The catalog course description is available at

<https://gradcatalog.ufl.edu/graduate/courses-az/mathematics>.

We also refer students, especially graduate students, to the PhD exam topics at

<https://math.ufl.edu/first-year-exam-syllabi/phdtopologyexamsyllabus>

and to the past PhD exams at <https://gma.math.ufl.edu/past-exams/phd-topology>.

### Schedule:

- Week 1: Chapter 0: Some Underlying Geometric Notions
- Weeks 2–5: Chapter 1: The Fundamental Group
  - Week 2: §1.1: Basic Constructions
  - Week 3: §1.2: Van Kampen's Theorem
  - Week 4: §1.3: Covering Spaces
  - Week 5: §1.A and §1.B: Additional Topics
- Weeks 6–14: Chapter 2: Homology
  - Weeks 6–8: §2.1: Simplicial and Singular Homology
  - Weeks 9–11: §2.2: Computations and Applications
  - Week 12: §2.3: The Formal Viewpoint; §2.A: Homology and Fundamental Group
  - Week 13: §2.B: Classical Applications
  - Week 14: §2.C: Simplicial Approximation

**Goals:** Students will become fluent with the main ideas of algebraic topology, and will be able to communicate these ideas to others. Algebraic topology involves abstract machinery, which students will learn. Students will also ground their knowledge by applying the tools of algebraic topology to solve concrete problems and to construct counterexamples.

**Prerequisites:** MTG 5317 (Introduction to Topology 2), or permission from the instructor depending on mathematical experience.

**Requirements:** Your grade will be based on the following components:  
40% homework, 20% midterm, and 40% final exam.

**Grading scheme:** A if  $\geq 90\%$ , A- if  $\geq 83\%$ , B+ if  $\geq 77\%$ , B if  $\geq 73\%$ , B- if  $\geq 70\%$ , C+ if  $\geq 67\%$ , C if  $\geq 63\%$ , C- if  $\geq 60\%$ , D+ if  $\geq 57\%$ , D if  $\geq 53\%$ , D- if  $\geq 50\%$ .

**Homework:** The clarity of your solutions is as important as their correctness. Working in groups on homework and to study is encouraged! However, your submitted homework should be written up individually, in your own words, and without consulting anyone else's written solutions of any form.

**Exams:** The dates for the exams (all in-class) are:

- Midterm, Wednesday October 16, during class.
- The final exam is [set by UF](#) for TBD.

**Academic Policies and Integrity:** UF students are bound by The Honor Pledge which states, "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code.*" On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "*On my honor, I have neither given nor received unauthorized aid in doing this assignment.*" The [Conduct Code](#) specifies a number of behaviors that are in violation of this code and the possible sanctions. If you have any questions or concerns, please consult with the instructor.

**Attendance and make-up work:** Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies>.

**Accommodations:** Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center (DRC): <https://disability.ufl.edu/get-started>. Please share your accommodation letter with the instructor and discuss your access needs as early as possible in the semester.

**Grade points:** Information on current UF grading policies for assigning grade points is

available at <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies>.

**Course evaluation:** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results>.

#### **Health and wellness:**

- U Matter, We Care: If you or someone you know is in distress, please contact [umatterufl.edu](mailto:umatterufl.edu), 352-392-1575, or visit the [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.
- Counseling and Wellness Center: Visit the [Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the [Student Health Care Center website](#).

#### **Academic resources:**

- E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdeskufl.edu](mailto:helpdeskufl.edu).
- [Career Connections Center](#): Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- [Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources.
- [Teaching Center](#): Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.