

MTG 6347: Topology 2

University of Florida, Department of Mathematics
Course Syllabus, Spring 2019

Instructor: Peter Bubenik

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Class meetings: MWF 6th period (12:50–1:40pm), Matherly Hall 006

Prerequisites: MTG 6346 or equivalent, or permission from instructor.

Course textbook.

- Allen Hatcher. Algebraic Topology. Cambridge University Press, 2002. ISBN 0-521-79540-0. <http://www.math.cornell.edu/~hatcher/AT/ATpage.html>

Additional resources.

- Anatoly Fomenko and Dmitry Fuchs. Homotopical Topology, 2nd edn. Springer, 2016. ISBN 978-3-319-23487-8.
- Glen E. Bredon. Topology and Geometry. Springer, 1993. ISBN 0-387-97926-3.
- James R. Munkres. Elements of Algebraic Topology. Perseus Publishing, 1984. ISBN 0-201-62728-0.
- Wikipedia has good articles on most of the topics covered in this course.

Course description. This course is an introduction to algebraic topology and applied algebraic topology. We will study basic categorical notions, simplicial approximation, persistent homology, cohomology groups, cup products and Poincaré Duality.

Course Objectives. To understand the basic concepts in algebraic topology and applied algebraic topology and be able to apply them in calculations, computations, and proofs. To understand and formulate mathematical arguments and to apply them in proofs. To be able to discuss mathematics. To be able to effectively present mathematical work in writing and orally.

Course schedule (tentative).

Week 1	Homology
Weeks 2–4	Persistent Homology
Weeks 5–8	Homology with Coefficients and Cohomology
Weeks 9–12	Multiplications
Weeks 13–15	Homology and Manifolds

Course work and assessment. The grading for the course will be based on homework assignments which will be collected and graded. Students may also be asked to give short presentation of their homework solutions and/or discuss the homework solutions with their classmates.

Grading scheme. A: 90% – 100%, A-: 85% – 89%, B+: 80% – 84%, B: 75% – 79%, B-: 70% – 74%, C+: 65% – 69%, C: 60% – 64%, D+: 57% – 59%, D: 54% – 56%, D-: 50% – 53%, E: 0% – 49%.

Expectations.

- You will read the relevant notes ahead of class and use available resources (classmates, textbooks, internet resources) to try to learn the necessary concepts.
- You will come to class with a list of concepts that you didn't fully understand and also questions that you have.

Homework. The best way to learn mathematics is to do mathematics. The textbook contains many good exercises and I will regularly assign a selection of these as well as my own problems. You are encouraged to discuss the exercises with your classmates, but you must write up your own solutions. Copying solutions or allowing your solutions to be copied is considered cheating. If you are unable to do any of the homework ask me for help as soon as possible. Solutions to some of the homework problems can be found on the web. Do not use these! It is considered cheating and you are depriving yourself of the crucial opportunity to learn by struggling with these problems.

Students will also be expected to present their homework solutions to the class. Being able to verbally explain your mathematical work is a vital skill. We will work together to fix up any arguments that are incorrect or unclear.

Class demeanor. Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Other students should be respected in discussion.

Class attendance. “Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.”

Course evaluation. Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Disabilities statement. Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <http://www.dso.ufl.edu/drc/>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Academic honesty. 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 Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

Grade points. For current UF grading policies for assigning grade points see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

Campus resources.

Health and wellness.

- U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352-392- 1575 so that a team member can reach out to the student.
- Counseling and Wellness Center: <http://www.counseling.ufl.edu>, 352-392-1575.
- Sexual Assault Recovery Services (SARS) Student Health Care Center, 352-392-1161.
- University Police Department, 392-1111 (or 9-1-1 for emergencies). <http://www.police.ufl.edu/>

Academic resources.

- Career Resource Center, Reitz Union, 352-392-1601. Career assistance and counseling. <http://www.crc.ufl.edu/>
- Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.
- Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <http://teachingcenter.ufl.edu/>
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <http://writing.ufl.edu/writing-studio/>