

# MTG 430/5317: Elements of/Introduction to Topology 2

University of Florida, Department of Mathematics

Course Syllabus, Spring 2025

**Instructor:** Peter Bubenik

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**Office hours:** MW 1:55–2:45pm or by appointment

**My web page:** <http://people.clas.ufl.edu/peterbubenik/>

**Lectures:** MWF Period 6, 12:50–1:40pm, Little Hall Room 217

**Textbook:** *Topology*, second edition, by James R. Munkres.

**Course overview:** This course is the second part of a two semester introduction to topology. We will start with a few basic notions from category theory that will make some of the results easier to state and easier to understand. Next, we will learn a few advanced topics of general topology, including the Tietze extension theorem, the Tychonoff theorem, and Stone–Čech compactification. The majority of the course will cover basic topics and examples in algebraic topology. Algebraic topology translates difficult questions about spaces into algebraic questions that can be more readily answered. Topics will include the fundamental group and covering spaces, the Seifert-van Kampen theorem, and the classification of surfaces.

The catalog course description is available at <https://gradcatalog.ufl.edu/graduate/courses-az/mathematics> and we also refer students, especially graduate students, to the first year graduate exam topics at <https://math.ufl.edu/first-year-exam-syllabi/mtg-5317-introduction-to-topology-2>.

## Schedule:

- Week 1: Some basic category theory
- Weeks 2-4: Tietze extension theorem, Tychonoff theorem, Stone–Čech compactification
- Weeks 4-8: The fundamental group
- Weeks 8-12: The Seifert-van Kampen theorem
- Weeks 13-15: Classification of surfaces

**Goals:** Students will become fluent with the main ideas and the language of topology, and will be able to communicate these ideas to others. Students will learn how to write rigorous mathematical proofs and how to construct counterexamples. A goal of the class is to teach the foundations of rigorous argument through proving claims built on axioms.

**Prerequisites:** MTG 4302/5316 (Topology 1) with a minimum grade of C, or permission from the instructor depending on mathematical experience.

**Requirements:** The grading for the course will be based on homework 25%, and three exams, 25% each.

**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%.

**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:

- Exam 1, , during class.
- Exam 2, , during class.
- Exam 3, , during class.

**Additional resources:** [Wikipedia](#) has good articles on many of the topics covered in this course.

**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://sccr.dso.ufl.edu/process/student-conduct-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.

**Class attendance:** Requirements for class attendance 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 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.ua.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.ua.ufl.edu/public-results/>.

**Disabilities statement:** Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

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

## Campus resources

### *Health and wellness*

- U Matter, We Care: If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) or 352-392-1575 so that a team member can reach out to the student.
- Counseling and Wellness Center: Visit <https://counseling.ufl.edu> 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 <https://shcc.ufl.edu/>.
- University Police Department: Visit <https://police.ufl.edu/> or call 352-392-1111 (or 9-1-1 for emergencies).

- UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; <https://ufhealth.org/emergency-room-trauma-center>.
- GatorWell Health Promotion Services: For prevention services focused on optimal well-being, including Wellness Coaching for Academic Success, visit <https://gatorwell.ufsa.ufl.edu/> or call 352-273-4450.

*Academic resources*

- E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).
- Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services <https://career.ufl.edu/>.
- Library Support: <https://cms.uflib.ufl.edu/ask> various ways to receive assistance with respect to using the libraries or finding resources.
- Academic Resources, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring. <https://academicresources.clas.ufl.edu/>
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>
- Student Complaints On-Campus:  
<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>