



Logic/Set Theory: Topological groups (MAT6932/4930)

Welcome to Topological groups!

This is a 100% online course. All information will be published on Canvas. I will post recommended reading for each class, sometimes accompanied by a video, which we will discuss during our synchronous lecture time on Zoom. Please, don't hesitate to contact me with any (technological) issues you might have and I am happy to hear your suggestions.

Disclaimer: This syllabus is a subject to change and it is your responsibility to keep updated. Nevertheless, any modifications will appear in announcements.

Instructor: Dana Bartošová **Office:** LIT 436 **Email:** dbartosova@ufl.edu

Class meetings: MWF 11:45am-12:35pm via Zoom (available from Canvas).

Office hours: M 3-3:50pm, W 10:40-11:30, F 12:50-1:40pm, or by appointment (via Zoom available from Canvas).

Announcements on Canvas: There will be frequent announcements to update you on any new additions to class Modules, information on presentations, changes, and reminders of homework due dates.

Modules on Canvas: Modules will be updated as the course progresses with videos, activities, recommended problems, and further materials.

Discussions: Discussions will be enable in Canvas, where you can connect with others in the class, ask questions and chat about the material.

Technology: No advanced technology is required. You will need a device with internet that can support video sessions for class meetings, office hours, and exams. Honorlock requires a camera. Should you experience any technical difficulties or lack necessary equipment, please contact me immediately to find a solution and keep you up beat with the course. Privacy and accessibility policies of software we will be using can be found here [Privacy and accessibility policies](#).

Course description

I. Recall

1. Algebra – group, normal subgroup, quotient group, isomorphism theorems, group actions
2. Topology – compactness, connectedness, separability, metrizability, completeness

Reading: Any book on algebra and topology.

II. Introduction to topological groups

1. Generating group topologies
2. Separation properties
3. Metrizability
4. (Semi-)direct products, group extensions, inverse limits

Reading: Taqdir Husain, *Introduction to Topological Groups*, Saunders (1966) (Edition by Dover Publications, Inc., Mineola, New York (2018))

Edwin Hewitt and Kenneth A. Ross, *Abstract harmonic analysis*, Springer-Verlag Berlin Heidelberg GmbH (1963)

III. Geometric group theory

1. Free groups
2. Finitely generated groups
3. Cayley graphs
4. Actions on Cayley graphs

IV. Locally compact groups

1. Lie groups and Hilbert's fifth problem
2. van Dantzig's theorem

V. Infinite-dimensional groups

1. Groups of structures with many symmetries
2. Continuous actions
3. Connections to combinatorics (Ramsey property)

Course requirements and evaluation

Assignments: Every two weeks I will post 4 problems to think about out of which 1 shall be submitted via Canvas.

Presentation: You can choose any topic related to the course to research deeper about and present your findings to everyone during our usual Zoom class meeting. You can work alone or in pairs. The idea is for everyone to speak 20-30min, but if you would like to take full 50 minutes, that works too. Here are a few suggested topics:

1. Subgroup of a free group is free.

2. Group actions.
3. Course geometry.
4. Hilbert's fifth problem.
5. Groups of (homogeneous) (continuous) structures.
6. Groups of homeomorphisms of compact spaces.

Grades: Each homework (total of 7) will be 10 points (and lowest score dropped) and the presentation will be 40 points; in total 100 points. The grades will be distributed as follows: A above 90%, A- 85-89%, B+ 80-84%, B- 75-79%, C+ 70-74%, C 65-69%, C- 60-64%, D+ 55-59%, D 52-54%, D- 50-51 %, E, I, NG, WF 49% and below. For university grading policies see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies>.

Recording

Part of our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who unmute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Diversity, equity, and inclusion statement

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, religion, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In particular, I will gladly honor your request to address you by an alternate/ preferred name or gender pronoun. Please advise me of this preference early in the semester so I may make appropriate changes to our records.

Honor code

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 specifies a number of behaviors that are in violation of this code and the possible sanctions. [Click here to read the Honor Code](#). 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 in this class.

Class attendance

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. [Click here to read the university attendance policies](#).

Accommodations for students with disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. [Click here to get started with the Disability Resource Center](#). 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.

Online evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. [Click here for guidance on how to give feedback in a professional and respectful manner](#). 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 ufl.bluer.com/ufl/. Summaries of course evaluation results are available to students [here](#).

Health and wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit [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](#).

University Police Department: [Visit UF Police Department website](#) 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; Visit the [UF Health Emergency Room and Trauma Center website](#)

Academic resources

E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at helpdesk@ufl.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.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the [Student Honor Code and Student Conduct Code webpage](#) for more information.

On-Line Students Complaints: View the [Distance Learning Student Complaint Process](#).

