

Home

Courses

Publications

Topological
dynamics
(MAT4903/6932)

Research

Curriculum Vitae

Previous Courses

Category theory
with applications
(MAT6932)

Sets and Logic
(MHF3202)

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

Model theory
(MAT4930/6932)
[Spring 2021]

Sets and Logic
(MHF3202) [Fall
2020]

Logic/Set Theory:

Topological dynamics (MAT4903/6932)

Welcome to Topological Dynamics!

All further information will be published on Canvas.

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

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

Class meetings: MWF 1:55-2:45pm.

Office hours: F 12:50-1:40 pm or by appointment.

Announcements on Canvas: There will be announcements with information on presentations, changes, and reminders of homework due dates.

Texts: There is no specific textbook required for this course. Here are a few resources that I will be using.

1. Robert Ellis, Lecture notes on dynamical systems, W. A. Benjamin (1969)
2. Joseph Auslander, Topological dynamics, W. A. Benjamin (1968)
3. Shmuel Glasner, Proximal flows, Springer-Verlag (1976)
4. Harry Furstenberg, Recurrence in ergodic theory and combinatorial number theory, Princeton University Pres (1981).
5. Vladimir Pestov, Dynamics of infinite-dimensional groups: The Ramsey-Dvortzky-Milman phenomena, AMS University Lecture Series, Volume 40 (2006)

Course description

The focus will be on abstract topological dynamics and its modern interactions with set theory, model theory, combinatorics, and algebra that have been developing over the past 20 years. The objective is to introduce basic notions, techniques and theorems in order to be able to present current open problem.

Combinatorial
number theory
(MAT6932/4930)

Sets and Logic
(MHF 3202)
[Spring 2020]

AWM Student
Chapter at UF

Math Parents
Coffee

We will start with classical abstract topological dynamics at its foundations by Ellis and Auslander. They were concerned mostly with dynamics of (countable) discrete groups, where they developed both a rich general theory of studying dynamical systems via Ellis semigroups which admit a structure of a compact right-topological semigroup, as well constructed numerous important examples. We will briefly discuss Furstenberg's breakthrough structure theory of minimal metrizable distal flows that lay foundations for applications of topological dynamics into number theory, as well as for structure theorems in ergodic theory and the ergodic proof of Szemerédi's theorem on arithmetic progressions in natural numbers. We will show how the foundational results and constructions can be lifted to topological groups via ultrafilter dynamical systems. This technique unites dynamics of locally compact and infinite dimensional topological groups. We will show how it simply proves recent connections between dynamics and combinatorics and applies to a yet more recent study of interactions between algebraic operations on groups and their dynamics.

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 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.

Grades: Each homework (total of 6) will be 10 points 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>.

Diversity, equity, and inclusion statement

I am committed to diversity and inclusion of all students in this course. I acknowledge, respect, and value the diverse nature, background and perspective of students and believe that it furthers academic achievements

It is my intent to present materials and activities that are respectful of diversity: race, color, creed, gender, gender identity, sexual orientation, age, religious status, national origin, ethnicity, disability, socioeconomic status, and any other distinguishing qualities.

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.bluera.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.](#)

