Jindrich Zapletal
Department of Mathematics

College *of* Liberal Arts *and* Sciences

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MAT6932 – Spec Topics in Logic: Invariant Descriptive Set Theory

Course: Spec Topics in Logic MAT6932, section 3F90, course number 13183

Meeting time and place: LIT 205, MWF 7th period

Instructor: Jindrich Zapletal

Office: 456 Little Hall, office hours MWF 4th period

Contact: zapletal@math.ufl.edu, 352-294-2343

Course Description: Descriptive set theory of analytic equivalence relations. Basics of Polish spaces, Borel and analytic sets, Borel reducibility between analytic equivalence relations on Polish spaces. 3 credits

Course Pre-Requisites / Co-Requisites: Elements of topology/ Introduction to topology 1, or the corresponding first-year test, or instructor's permission.

Course Objectives: Students who successfully complete the course will understand the chart of analytic equivalence relations ordered by Borel reducibility, and they will be able to place many classification problems in mathematics on the chart.

Textbook: Su Gao, Invariant Descriptive Set Theory, Chapman & Hall/CRC 2008, ISBN 9780429146152

Provisional timeline of the course:

Each of the following topics will take approximately 8 lectures.

1. Polish spaces.
Polish space is a completely metrizable separable metric space. Constructions of Polish spaces. Borel and analytic sets, and their comparison. Universal analytic sets.

2. Analytic equivalence relations.

Borel and analytic equivalence relations. Borel reducibility and the chart of all analytic equivalence relations. Examples from mathematical practice. Universal analytic equivalence relations. Silver dichotomy: every Borel equivalence relation either has countably many classes or a perfect set of pairwise incompatible elements. Glimm–Effros dichotomy.

3. Countable Borel equivalence relations.

Every countable Borel equivalence relation (cBer) is an orbit equivalence relation of a Borel action of a countable group. Universal cBer. Amenability and a cBer not reducible to a Vitali equivalence relation. Examples from mathematical practice.

4. Polish groups, their continuous actions, and orbit equivalence relations.

Polish groups. Examples from mathematical practice. Universal Polish groups. Universal orbit equivalence relations. E1 conjecture: there is a simplest Borel equivalence relation not reducible to an orbit equivalence relation.

5. Equivalence relations classifiable by countable structures.

Isomorphisms of countable structures and permutation groups. Model theory and infinitary languages. Turbulence. Examples from mathematical practice.

Grading: There will be five brief homework assignments, one per each of the topics mentioned above, each worth 20 pts. The total grade will be figured according to the standard flat curve: A above 93%, A- 90-92%, B+ 87-89%, B 83-86%, B- 80-82%, C+ 77-79%, C 73-76%, C- 70-72%, D+ 67-69%, D 63-66%, D- 60-62 %, E, I, NG, WF 59%.

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. Links to an external site.

Links to an external site. 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.Links to an external site.

Links to an external site.

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. Links to an external site.

Links to an external site.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. Links to an external site.

Links to an external site.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/. Links to an external site.Links to an external site.Summaries of course evaluation results are available to students here.Links to an external site.

Links to an external site.

Complaints. The official UF policy for filing a complaint about the course may be found here

Links to an external site..

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 Links to an external site.

Links to an external site.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 Links to an external site.

Links to an external site.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 Links to an external site.

Links to an external site..

University Police Department: Visit UF Police Department website Links to an external

site.

Links to an external site.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 websiteLinks to an external site.

Links to an external site.

Academic resources. *E-learning technical support*: Contact the UF Computing Help Desk Links to an external site.

Links to an external site.at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center Links to an external site.

Links to an external site.: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support Links to an external site.

Links to an external site.: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center Links to an external site.

Links to an external site.: 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 Links to an external site.

Links to an external site..

On-Line Students Complaints: View the Distance Learning Student Complaint Process Links to an external site.

Links to an external site..

18, 2024

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