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Resume

Publications

UF Logic and Set
Theory Group

MHF4203 –
Foundations of
Mathematics

Sets and Logic Fall
2024

Sets and Logic Fall 2024

Course: Sets and Logic, MHF3202, section 1079, course number 15549

Meeting time and place: MAT 102, MWF 3rd period

Instructor: Jindrich Zapletal

Office: 456 Little Hall, office hours MWF 5th period

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

Course Description: Examples of sets, operations on sets, set algebra, Venn diagrams, truth tables, tautologies, applications to mathematical arguments and mathematical induction. Taking one, but not both, of MAS 3300 or MHF 3202 is required of mathematics majors. MHF 3202 can also be very useful for prospective and in-service secondary and middle school teachers. 3 credits

Course Pre-Requisites / Co-Requisites: A UF math course at the 2000 level or above with a minimum grade of C.

Course Objectives: Students who successfully complete the course will be able to read, write and present theorems and proofs.

Textbook: Richard Hammack: Book of Proof. Available for free download [here](#) [Links to an external site.](#)

[Links to an external site.](#) or [here](#) [Links to an external site.](#) [Links to an external site.](#); if you want a paper copy, you have to pay, for example [here](#). [Links to an external site.](#)

[Links to an external site.](#) We will go through most if not all sections of the book. An alternative is Velleman's How to prove it, available as a reserve at Marston Science Library.

Provisional timeline of the course: The first midterm on September 25, covering roughly Chapter I and II of the book (except section I.3). The second midterm on October 30, covering Chapter III and section I.3 of the book. The final exam will be held on Thursday 12/12/2024 at 12:30—2:30PM at the usual meeting place (MAT

102).

Grading: There will be two midterm exams and a (non-inclusive) final, each worth 100 points. There will be 6 homework assignments, each worth 20 points. The students will have an option to sign up for an individual presentation. If you do make a presentation, you will be able to drop three lowest homework assignment scores and receive 60-point credit in their stead. Thus, a student can earn up to 420 points. 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%.

Topics for presentations. The following are suitable topics for individual presentations. Please e-mail me if you want to do a presentation, and select a topic. If you want to do a presentation on a different topic related to class, please let me know.

Computer assisted proofs. There are several possible stories one could cover here, the four color theorem, Kepler's conjecture, or Tarski's theorem on the decidability of the real numbers. Another possibility would be an introduction to the world of machine proving.

Axiomatic development of mathematics. One could present the axiomatic set theory (ZFC), or introduce some statements undecidable in mathematics with its usual axiomatization. Another possibility would be alternative axiomatizations such as New Foundations

Induction and recursion. One could present axiomatic arithmetic (Peano Arithmetic, PA). Another interesting option is multiple recursion, with Ackermann's function as one example of a double recursive definition

Counting. One option could be counting the number of equivalence relations on a set of n elements, up to isomorphism. This is so-called partition function. One could also count graphs, labeled graphs etc. This is more difficult than it looks.

Legal aspects of mathematics. Only for people with prior interest in law. Can one file a patent for a definition or a proof? Or a calculation? Can a mathematical theorem be subject to export control or classification as a national secret matter?

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. 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 website [Links 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.](#)

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