University of Florida

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Department of Mathematics

College *of* Liberal Arts *and* Sciences

Sets and Logic (MHF3202)

Welcome to Sets and Logic!

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

Basic Information

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

Class meetings: MWF 1:55-2:45pm in LIT223.

Office hours: M 3-3:50pm, T 1:55-2:45pm (over Zoom), F 10:40-11:30am, or by appointment.

Required textbook: Joel David Hamkins, *Proof and the Art of Mathematics*, The MIT Press (2020).

Supplementary text: Richard Hammack , *Book of Proof* (available free   online).

Recommended reading: Apostolos Doxiadīs a Christos Papadimitriou, *Logicomix: An Epic Search for Truth*, Bloomsbury USA (2009).

Announcements on Canvas: There will be frequent announcements to update you on any new additions to class Modules, information on group presentation and project, practice exams, changes and reminders of any due dates.

Modules on Canvas: Modules will be updated as the course progresses.

Course description

This course is the first introduction to rigorous mathematical proofs. We will use familiar notions of a set, relation and function, and playing games to learn how mathematical statements come to be, how to guess a conjecture, how to prove a conjecture to make it a theorem, or how to find a counterexample to show that our conjecture needs to be corrected.

By the end of this course, you should be able to:

1. Analyze and formulate (mathematical) statements.
2. Correctly use simple deduction and detect incorrect deduction.
3. Apply a variety of strategies to find, write, and check a mathematical proof.
4. Play a few games and analyze logic in them.

This will be achieved by:

1. Completing reading before class. (This will give you content to work with.)
2. Active participation in class meetings, where we will review the material, and discuss assigned problems is small groups. (Here you can clarify and deepen your understanding of the material, as well as practice its application with direct feedback.)
3. Completing assignments and learning from feedback to them. (Get a thorough practice of the very basics with personal feedback.)
4. Connecting with your peers through discussions, peer-to-peer review of your practice work, and attending office hours to clarify any confusions and to obtain additional feedback.(Find peers to work with, brainstorm, ask questions, and check one another's work.)
5. Deep research on a topic of your presentation and discussion with your teammates, and presentations of your classmates. (Get profound understanding of a part of the material by reading what interests you and peak into what math research is like. There is no better way to check your understanding than to try to explain to your colleagues.)

Course requirements and evaluations

Requirement	#	Pt/each	Details
Assignments	10	20	lowest grade dropped; once 3 days late ok, submitted on Canvas and due by 11:59pm on dates indicated.
Midterms	3	50	During the usual class meeting time, tentatively scheduled for 9/17, 10/15, 11/10.
Final exam	1	100	12/15/2021, 10am-12pm.
Group presentation	1	50	Group research on a topic (below) with slide presentation; 5 mins/person.

Assignments: There will be 10 assignments due on Tuesdays by 11:59pm on dates indicated on Canvas in Assignments. Your work will be corrected directly there for you to see comments and your points will be recorded in Grades. The lowest score will be dropped and you can submit 3 days late once (that is, by Friday 11:59pm) without any reason. Otherwise, late submission will not be accepted unless there is a well documented reason to do so.

Exams: There will be 3 midterms during the usual class meeting time. The final exam is scheduled for 12/15/2021 between 10am and 12pm. The exams will be closed book and notes

on paper. Make up exams need to substantiated and will be considered on case by case basis.

Group presentation on one of the following topic during our lecture time. Sign up for a topic on Canvas by **August 30**. The exact content is completely up to your team, but I am happy to provide guidance should you prefer that. We will schedule a joint meeting in person or on Zoom a week before your due date to discuss your progress. The expectation is to narrate your slides for 5 minutes each, however other means of delivery, such as, drawing on the blackboard are welcome. Presentations will be delivered during the usual class time on days as indicated. A date can be changed upon mutual agreement.

1. Why do we need formal proofs. (September 10)
2. Proof systems and automated proving. (September 24)
3. Model theory. (October 1)
4. Relations and functions. (October 22)
5. Recurrence and mathematical induction. (November 5)
6. Infinite sets. (November 19)

Grades: The total number of points is 475. The grades will be distributed as follows: 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% and below. For university grading policies see https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies .

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.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 .

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