

Foundations of Mathematics
MHF 4203/5207 Section: 23665/23666
Class Periods: MWF, 6, 12:50—1:40
Location: Little 235
Academic Term: Fall 2021

Instructor:

Douglas Cenzer
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Office Hours: M7, F5 or by appointment, Little Hall 310 and/or online

Course Description

MHF 4203: Models and proofs. Foundations of real and natural numbers, algorithms, Turing machines, undecidability and independence. Examples and applications in algebra, analysis, geometry and topology. Credit will be given for, at most, MHF 4203 or MHF 5207.

MHF 5207: Languages, models, and theories; Godel's completeness and incompleteness theorems; formal number theory and axiomatic set theory; applications to other areas of mathematics.

Course Pre-Requisites / Co-Requisites

MAS 4105 with a minimum grade of C (for MHF 4102).

Course Objectives

Students who successfully complete the course will be able to understand and apply basic concepts of logic and computability. They will be able to read, write and present theorems and proofs in higher mathematics.

Required Textbooks and Software

- Foundations of Mathematics, notes developed by the instructor, forthcoming book.
- D. Cenzer, J. Larson, C. Porter, J. Zapletal

Course Schedule (Tentative)

Week 1: August 23--27: Propositional Logic, Chapter 1

Week 2: August 30--September 3: Propositional Logic, Chapter 1

Week 3: September 8--10: Propositional Logic, Chapter 1

Week 4: September 13--17: Predicate Logic, Chapter 2

Week 5: September 20--24: Predicate Logic, Chapter 2

Week 6: September 27--October 1: Predicate Logic, Chapter 2

Week 7: October 4--6: Models of Predicate Logic, Chapter 3

Week 8: October 11--15: Models of Predicate Logic, Chapter 3

Week 9: October 18--22: Boolean Algebras, Chapter 4

Week 10: October 25--29: Computability, Chapter 5

Week 11: November 1--5: Computability, Chapter 5

Week 12: November 8--12: Computability, Chapter 5

Week 13: November 15--19: Decidable and Undecidable Theories, Chapter 6

Week 14: November 23: Decidable and Undecidable Theories, Chapter 6

Week 15: November 30-December 3: Nonstandard Numbers, Chapter 8

Week 16: December 6--8: Nonstandard Numbers, Chapter 8

Attendance Policy, Class Expectations, and Make-Up Policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies which can be found at

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Excused absences must be consistent with university policies in the Graduate Catalog (<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance>) and require appropriate documentation.

Evaluation of Grades

Grades will be based on written homework problems.

There will be about 6 homework assignments, worth 20 points each, with the best 5 scores counted.

Grading Policy

Points	Grade	Grade Points
90 - 100	A	4.00
85 - 89	A-	3.67
80 - 84	B+	3.33
75 - 79	B	3.00
71 - 74	B-	2.67
67 - 70.	C+	2.33
60 - 66	C	2.00

More information on UF grading policy may be found at:

<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. 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.

Course Evaluation Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at gatorevals.afl.edu/students/. 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 at gatorevals.afl.edu/public-results/.

University Honesty Policy

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 (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. 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 or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual

violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.