

## Set Theory

MHF 4102/5107 Section: 0822/1105

**Class Periods:** MWF, 6, 12:50—1:40

**Location:** Little 223

**Academic Term:** Spring 2022

### **Instructor:**

Douglas Cenzer

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(352) 294-2350

Office Hours: M3 W5 F4 or by appointment, Little Hall 310 and/or online

### **Course Description**

MHF 4102: Basic axioms and concepts of set theory. Students present proofs. Credit will be given for, at most, MHF 4102 or MHG 5107. 3 credits

MHF 5107: Basic axioms and concepts of set theory, axiom of choice, Zorn's lemma, Schroder-Bernstein theorem, cardinal numbers, ordinal numbers, and the continuum hypothesis. 3 credits

### **Course Pre-Requisites / Co-Requisites**

MHF 4102: MAS 4105 with a minimum grade of C.

### **Course Objectives**

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

### **Required Textbooks and Software**

- Set Theory, Volume I of "Set Theory and Foundations of Mathematics"
- D. Cenzer, J. Larson, C. Porter, J. Zapletal
- World Scientific Press (2020)

### **Course Schedule (Tentative)**

Week 1, January 5--7	Review of Sets and Logic/ Chapter 2
Week 2, January 10--14:	Axioms of Set Theory/ Chapter 3.1—3.5
Week 3, January 19-21:	Axioms of Set Theory/ Chapter 3.6—3.8
Week 4, January 24--28:	Natural Numbers and Countable Sets/ Chapter 4.1—4.2
Week 5, Jan. 31—Feb. 4:	Natural Numbers and Countable Sets/ Chapter 4.3
Week 6, February 7--11:	Natural Numbers and Countable Sets/ Chapter 4.4—4.5
Week 7, February 14—18:	Ordinal Numbers and the Transfinite/ Chapter 5.1--5.2
Week 8, February 21—25:	Ordinal Numbers and the Transfinite/ Chapter 5.1--5.2
Week 9, Feb. 28—March 4:	Ordinal Numbers and the Transfinite/ Chapter 5.3--5.4
Week 10, March 14--18:	Cardinality and the Axiom of Choice/ Chapter 6.1—6.2
Week 11, March 21--25:	Cardinality and the Axiom of Choice/ Chapter 6.3
Week 12, March 28—Apr. 1:	Real Numbers/ Chapter 7.1--7.2
Week 13, April 4--8:	Real Numbers/ Chapter 7.3—7.4
Week 14, April 11--15:	Real Numbers/ Chapter 7.5
Week 15, April 18--20	Models of Set Theory/ Chapter 8.1—8.2

### **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 7 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
70 - 74	B-	2.67
65 - 69	C+	2.33
55 - 64	C	2.00
50 - 54	C-	1.67
40 - 49	D	1.00
00 - 39	E	0.00

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.ua.ufl.edu/students/](http://gatorevals.ua.ufl.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.bluera.com/ufl/](http://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at [gatorevals.ua.ufl.edu/public-results/](http://gatorevals.ua.ufl.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](mailto: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](mailto: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.  
<http://writing.ufl.edu/writing-studio/>.

**Student Complaints Campus:** [https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

**On-Line Students Complaints:** <http://www.distance.ufl.edu/student-complaint-process>.