Course Information

- **Course Number and Title: MHF 3302.01 Logic and Proof in Mathematics**
- **Credit Hours: 3**
- **Academic Term: Spring 2026**

Instructor Information

- **Instructor:** Dr. Austin Anderson
- **Office Location:** IST 2002
- **Office Hours:** Tue 9:00-10:00, and 2:00-3:00, Wed 9:00-10:00, Fri 9:00-10:00, and by appointment
- **Email address:** aanderson@floridapoly.edu

Course Delivery and Course Description

- **Delivery Mode**: Face-to-face, MWF 12:00 – 12:50, IST-1015
- **Course Website**: See the Canvas course site.
- **Official Catalog Course Description**: Study of abstract mathematical reasoning, and the creation of mathematical proofs. This includes the use of logic, an in-depth study of mathematical definitions, the construction of examples and counterexamples, and a deep awareness of the types of proof techniques available. These proficiencies are developed through a survey of standard mathematical topics to include sets, cardinality, counting methods, functions on discrete sets, logic, truth tables, equivalence classes, basic number theory, and modular arithmetic.
    - **Course Pre and/or Co-Requisites**: MAC 2312 Analytic Geometry and Calculus 2 and
                                           MAD 2104 Discrete Mathematics
    - **Communication/Computation Skills Requirement (6A-10.030)**: No
- **Required Texts and Materials:**
    - *The Book of Proof*, 3rd edition, by Richard Hammack. A free PDF version is available for this book at the Open Textbook Library: https://richardhammack.github.io/BookOfProof/

Course Objectives and Outcomes

- **Course Objectives**:
    - Students will gain a solid foundation in abstract mathematical reasoning, and the creation of mathematical proofs. This includes the use of logic, an in-depth study of mathematical definitions, the construction of examples and counterexamples, and a deep awareness of the types of proof techniques available. Students will gain these proficiencies through a survey of standard mathematical topics to include sets, cardinality, counting methods, functions on discrete sets, logic, truth tables, equivalence classes, basic number theory, and modular arithmetic.

- **Course Learning Outcomes**:

  1. Construct cogent mathematical arguments in the conventional style of mathematical writing.
  2. Create examples and counterexamples to illustrate mathematical definitions.
  3. Use mathematical notation in a precise and unambiguous way as an integral part of communicating mathematical concepts and ideas.
  4. Demonstrate proficiency using first order predicate logic, to include universal and existential quantifiers, in representing and proving mathematical statements.
  5. Develop a formal understanding of sets, set operations, cardinality, functions between sets, function properties (one-to-one, onto), partitions, equivalence classes, numerical sequences, counting methods, and basic elements of number theory.
  6. Develop the skill of making mathematical conjectures concerning implications and patterns.

- **Alignment with Applied Mathematics Program Outcomes**

Applied Mathematics Program Student Outcomes	Course Learning Outcome and Learning Level*					
	1	2	3	4	5	6
(1) Use mathematical techniques and critical thinking to analyze and solve complex problems.				Analyzing	Applying	Creating
(2) Communicate mathematical solutions, both verbally and in writing, using precise language, mathematical terminology, and proper mathematical notation.	Creating		Applying			
(3) Assess and construct valid arguments/counterexamples using standard methods and conventions of mathematical proofs.	Evaluating	Evaluating				Evaluating
(4) Use principles of mathematical modeling and computers to simulate, model, and analyze data and physical processes.						
(5) Employ mathematical techniques in related interdisciplinary fields, and independently acquire and apply new knowledge as needed.						
(6) Produce best solutions that meet specified needs, while considering public health, safety, and welfare, as well as global, cultural, environmental, and economic factors.						

*Learning level as described in Bloom's taxonomy and Anderson and Krathwohl's taxonomy

Course Policies

Attendance

- Students are expected "to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the instructor" (University Policy, FPU-5.0010AP).

Participation

- Students are expected to participate in the classroom experience. The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). Persistent problems with participation may result in a [code of conduct](#) referral.

Grading Scale

Grade	A	B+	B	B-	C+	C	D	F
Percentage	90%	87%	83%	80%	77%	70%	60%	< 60%
GPA	4.0	3.33	3.0	2.67	2.33	2.0	1.0	0.0

Assignment/Evaluation Methods

Homework/revisions/presentations/participation	40%
Midterm exams	39% (3 exams at 13% each)
Comprehensive final exam	21%
Total	100%

- **Written homework/revisions/presentations/participation**: Written homework will be required for each class day. Learning to write mathematics well takes practice. Thus, you should expect to revise your work based on feedback from the instructor or the other students in the class. Note that many mathematical proofs of standard results can be found online. Plagiarizing or copying a proof from the Internet or another book is not permitted. Whenever outside resources are *consulted*, credit must be given, and the reference cited (see e.g. https://www.citationmachine.net/ for help making a citation). Never attempt to pass off the work of others as your own. Students will discuss their proofs in small groups, make presentations to the class, and provide feedback to classmates.
- **Midterm exams**: There will be three midterm exams.
- **Comprehensive final exam**: There will be a comprehensive final exam given at the time scheduled by the University. Your comprehensive final exam score may be used to replace your one lowest midterm exam score, up to a maximum score of 80 out of 100, if that helps your grade, but the final exam score still counts for the final exam percentage of the course grade listed above regardless.

Late Work/Make-up work

- Written homework may be turned in *up to one class day late or revised* for 70% credit. Your three lowest written homework scores will be dropped to allow for occasional extenuating circumstances (student illness, family emergencies, technical difficulties, etc.)
- Make-up exams will be given only when requested *in advance* for an appropriate reason (e.g. participation in college-sponsored activity, illness requiring medical attention, family emergency, etc.) or in case of extreme circumstances with a documented excuse.
- Extensions without penalty may be granted on a case-by-case basis. Please communicate with your instructor.

Course Schedule (Subject to Change)

Week		Date		Textbook Chapter/Sections
1	M	Jan	12	
	W	Jan	14	Chapter 2: Logic (2.1-2.12)
	F	Jan	16	
2	M	Jan	19	**Martin Luther King Day—no classes**
	W	Jan	21	Chapter 2: Logic (2.1-2.12)
	F	Jan	23	Chapter 4: Direct Proof (4.1-4.5)
3	M	Jan	26	
	W	Jan	28	Chapter 4: Direct Proof (4.1-4.5)
	F	Jan	30	Chapter 5: Contrapositive Proof (5.1-5.3)
4	M	Feb	2	
	W	Feb	4	Chapter 5: Contrapositive Proof (5.1-5.3)
	F	Feb	6	Chapter 6: Proof by Contradiction (6.1-6.4)
5	M	Feb	9	Chapter 6: Proof by Contradiction (6.1-6.4)
	W	Feb	11	Chapter 7: Proving Non-Conditional Statements (7.1-7.4)
	F	Feb	13	**Exam 1: Wednesday Feb 11**
6	M	Feb	16	
	W	Feb	18	Chapter 7: Proving Non-Conditional Statements (7.1-7.4)
	F	Feb	20	Chapter 1: Sets (1.1-1.7)
7	M	Feb	23	
	W	Feb	25	Chapter 1: Sets (1.1-1.7)
	F	Feb	27	Chapter 8: Proofs Involving Sets (8.1-8.3)
8	M	Mar	2	
	W	Mar	4	Chapter 9: Disproof (9.1-9.3)
	F	Mar	6	
9	M	Mar	9	
	W	Mar	11	Chapter 10: Mathematical Induction (10.1-10.2)
	F	Mar	13	**Exam 2: Wednesday Mar 11**
10	M	Mar	16	
	W	Mar	18	**Spring Break- No classes**
	F	Mar	20	
11	M	Mar	23	
	W	Mar	25	Chapter 10: Mathematical Induction (10.1-10.2)
	F	Mar	27	Chapter 11: Relations (11.1-11.6)
12	M	Mar	30	
	W	Apr	1	Chapter 11: Relations (11.1-11.6)
	F	Apr	3	
13	M	Apr	6	
	W	Apr	8	Chapter 12: Functions (12.1-12.6)
	F	Apr	10	
14	M	Apr	13	Chapter 12: Functions (12.1-12.6)
	W	Apr	15	**Exam 3: Wednesday April 15**
	F	Apr	17	
15	M	Apr	20	
	W	Apr	22	Chapter 14: Cardinality of Sets (14.1-14.3)
	F	Apr	24	
16	M	Apr	27	Review for Final Exam

Civility and Collegiality

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations. If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the [ODS student portal](#), and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive. If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible: DisabilityServices@floridapoly.edu; (863) 874-8770; www.floridapoly.edy/disability.

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See [University Policy](#).)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. Any faculty or staff member you speak to is required to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University [Ombuds Office](#), BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at [Peace River Center](#), 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discuss resources and options available.

Academic Integrity

Violations of [academic integrity regulation](#) include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in sanctions up to and including expulsion from the university.

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidentally, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action). *Recording class activities*

*including, but not limited to, lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is **prohibited**.*

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and [Canvas](#), on and off campus. Students may direct questions to library@floridapoly.edu.
- **Tutoring and Learning Center**: The Tutoring and Learning Center (The TLC) provides tutoring to all Florida Poly students who may need additional academic support. The TLC is staffed by students who have excelled in the courses they tutor. They offer support by reviewing concepts and materials from class, clarifying points of confusion and providing assistance with learning strategies. While the focus of TLC is to provide support to students in freshman-level courses, upper-level courses are also tutored at the Center. The TLC is located in the IST Commons (second floor).
  - **Knack Tutoring**: Students looking for additional assistance outside of the classroom are advised to consider working with a peer tutor through Knack. Florida Polytechnic University has partnered with Knack to provide students with access to verified peer tutors who have previously aced this course. To view available tutors, visit floridapoly.joinknack.com and sign in with your student account.
- **Academic Success Coaches**: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.
- **Writing Center**: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit floridapoly.edu/writing center.