

Introduction to Mathematical Proof

MTH 301, Fall 2026

Mon and Wed, 4:40 - 6:20 pm, 1S-217

Instructor: [Professor Abhijit Champanerkar](#)

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Office Hours: Mon and Wed 3-4 pm

Class Homepage: <http://www.math.csi.cuny.edu/abhijit/301/> (this page)

Course Information

Course description: The goals of this course are for you to become adept at logical reasoning by learning mathematical processes that are essential for studying higher mathematics. We will focus especially on the idea of a mathematical proof. We will learn how to (1) understand mathematics in its **three modes** of communication - hearing, reading and writing, and (2) discover mathematics by exploration and experimentation. You will have succeeded in this course if by the end of the semester you understand or have learned

- properties of sets, integers, functions, proof by induction, relations and partitions covered in class
- existential and universal quantifiers; translating between English and symbolic sentences using quantifiers
- if-then statements: when they are true, what they are saying / not saying, what constitutes a counterexample
- how the appearance of quantifiers in the conclusion of an if-then statement guides the structure of its proof
- how to think deeply, carefully, and logically about new concepts
- how to explore a concept, formulate your own questions about the concept as a result of your exploration, and use proof techniques to prove or disprove these questions with certainty
- how to express your ideas clearly, both in English and using the language of mathematics

Prerequisite MTH 232.

Text Book and Syllabus: Fendel and Resek, *Foundations of Higher Mathematics*, Pearson ISBN 9780201125870. We will cover Chapters 1 to 6 from the text book. See [below](#) for a tentative list of topics by dates for this semester.

The first 6 chapters of the textbook will be supplied to students on first day of classes. Please note that you may not distribute, photocopy any parts of this material at any time, and students have to return the textbook at the end of the semester. Please bring the textbook to every class.

Attendance and class participation:

- **Attendance** for classes is very important and mandatory. Students are allowed 3 excused absences.
- **Class participation** in form of in-class interaction and group work is important.

Homework, Quizzes and Exams Practising the concepts learned in the class and their assessment will be in the following ways:

- **Homework** will be assigned in most weeks in form of reading and hand-in problems. Quizzes will be based on homework problems.
- **Quizzes** will usually be held at end of every chapter usually on Wednesday. Quizzes are announced on the course schedule. Additional quizzes, if any, will be announced a week in advance.
- **Exams:** There will be one midterm exam during the semester and a Final exam at the end of the semester. Here are the tentative dates (any changes will be announced well in advance)
 - **Midterm Exam:** Wednesday Oct 28th, **Review:** Monday Oct 26th
 - **Final Exam:** TBA

Grading: The course grade will determined as follows:

- **Midterm Exam** - approximately 25% each exam
- **Final Exam** - approximately 40%
- **Homeworks and Quizzes** - approximately 30 %
- **Attendance and class participation** - 5%

Resources

- For help and question please use my office hours or email me for questions.
- Use [Math Building Tutoring Lab 1S-214](#). I will hold some of my office hours here.

Course Policies

- **Textbook Return Policy:** Failure to return the textbook on day of the final exam will result in a **F** grade in the course.
- Attendance is mandatory.
- Cell phone usage of any kind during class and on exams is not allowed.
- Missing the Final exam will result in an F grade. Any changes to the grading policy will be announced in the class.
- You must take the Final exams at the time scheduled by the university.
- Students are not allowed to step out of the classroom during exams, except in case of emergencies.
- **Academic dishonesty:** Cheating in any form will not be tolerated. Please see [CUNY Policy on Academic Integrity](#).
- **Disability policy:** Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the [Center for Student Accessibility](#). Please provide written verification of student's eligibility from the OAS. Prior to granting disability accommodations in this course, the instructor must receive written verification of student's eligibility from the Center for Student Accessibility, which is located in 1P-101. It is the student's responsibility to initiate contact with the Center for Student Accessibility staff and to follow the established procedures for having the accommodation notice sent to the instructor.

Course schedule and Homework Here is a tentative list of topics by week for this semester. Note that this schedule may change depending on how the class progresses.

Week #	Week of	Topic	Homework
1	Aug 31	1.1 Exploration, 1.2 From Exploration to Proof	
2*	Sept 7	1.3 Proof: An Introduction (<i>Note: Mon, Sept 7 College Closed</i>)	
3	Sept 14	1.3 Proof: An Introduction, Quiz 1	
4*	Sept 21	2.1 Exploring Sets (<i>Note: Mon, Sept 21 No Classes</i>)	
5	Sept 28	2.2 Proofs about Sets, 2.3 Exploring Integers	
6	Oct 5	2.4 Proofs about Integers, Quiz 2	
7*	Oct 12	3.1 Quantifiers (<i>Note: Mon, Oct 12 College Closed; Tue, Oct 13 follows Monday schedule</i>)	
8	Oct 19	3.1 Quantifiers	
9	Oct 26	Review and Midterm Exam	
10	Nov 2	3.2 Working with Quantifiers	
11	Nov 9	4.1 Proofs with Quantifiers	
12	Nov 16	4.2 Equivalences in Proofs, Quiz 3	
13*	Nov 23	5.1 Induction (<i>Note: Wed, Nov 25 No Classes</i>)	
14	Nov 30	5.1 Induction	
15	Dec 7	5.2 Second Principle of Induction, Quiz 4	
16	Dec 14	Review for Final Exam	