

**Hunter College
of the City University of New York
Department of Mathematics and Statistics**

STUDENT SYLLABUS

Math 14000 - Mathematical Reasoning Workshop

2hr – 1 Credits

Fall 2023

Time: xxxxxxxxxxxx

Room: xxxxxxxxxxxx

Instructor: xxxxxxxxxxxx

Email: xxxxxxxxxxxx

Office Hours: xxxxxxxxxxxx

Course Description:

This workshop focuses on developing mathematical thinking skills needed for Math150. Students will become familiar with formal mathematical logic and reasoning.

Prerequisites:

Math12400/Math12550 or appropriate score on the Accuplacer Exam; may be taken at the same time as Math150/Math152.

Textbook: Book of Proof, Second Edition, by Richard Hammack © 2013, Richard Hammack (publisher). ISBN 978-0-9894721-0-4, (313 pages). Download the ebook for free from our course web site: <https://tinyurl.com/ybthw554>, and/or purchase the print edition on Amazon or Barnes & Noble for around \$15. The instructor will also provide course notes, based on the textbook, which contain the entire material for the course.

Course Learning Outcomes:

- Make and combine logical statements with "and, or, not", and use truth tables,
- Construct direct and indirect proofs and determine the appropriateness of each type in a particular setting.
- Formulate proofs that are not only mathematically correct but also clearly written, *convincing*, readable, notationally consistent, and grammatically correct,
- Apply the logical structure of various proof techniques, proof types, and counterexamples and work symbolically with connectives and quantifiers,
- Apply mathematical reasoning to precalculus problems,
- Approach counting problems systematically and construct proofs with mathematical induction,
- Perform set operations on finite collections of sets and be familiar with properties of set operations.

Lecture#	Topic
1	1.1 - 1.3 - Set builder notations, number systems and intervals as sets, cardinality, subsets
2	1.5 - 1.8 - Union, intersection, difference, complement of sets, Venn diagrams, indexed sets
3	2.1 - 2.4 Combining logical statements with "and, or, not", truth tables, conditional and biconditional statements
4	2.5 - Truth tables for statements
5	2.6 - 2.10 Logical equivalence, contrapositives, quantifiers, negating statements, applications to precalculus
6	Review
7	MIDTERM
8	3.1 - 3.4 - Counting: lists, factorials, Binomial theorem,
9	4.1 - 4.3 - Direct Proof: integers, divisors, inequalities
10	4.4 - 4.5 - Direct Proof: cases
11	5.1 - Proof by Contrapositive, applications to calculus
12	6.1 - Proof by Contradiction
13	10.1 - Mathematical induction
14	Review

Grading Policy

MIDTERM	20%
FINAL	40%
Homework	20%
Attendance & Classwork	20%

Letter grades are determined by the following standard Hunter system:

<u>Grade</u>	<u>Percent</u>
A+	97.5-100
A	92.5-97.4
A-	90.0-92.4
B+	87.5-89.9
B	82.5-87.4
B-	80.0-82.4
C+	77.5-79.9
C	70.0-77.4
D	60.0-69.9
F	0-59.9

CR/NC – grades

New from Fall 2021: This course **DOES NOT** accept the CR/NC grading system.

Exams

There are 2 in-class exams, a midterm and a final. The final exam occurs during final exam week, date TBA.

Classwork

The material in this course is best learned through practice, practice and more practice. Every lecture you will be solving problems in class, based on the day's lecture. ***This classwork will be marked as completed or not completed.*** You can get assistance from your instructor as well as your peers in completing your classwork.

Homework

There will be weekly homework assignments.

Attendance

Attendance is required, and there will be an attendance sheet every lecture. Since there is class work to be done in class, missing lecture will reflect negatively on your course performance. You are responsible for all work missed.

Tutoring

Drop-in tutoring and audiovisual materials are available at The Dolciani Mathematics Learning Center, located at the Silverstein Student Success Center 7th Floor Hunter East. **(Dolciani center is running virtual and in-person tutoring sessions.)**

Best Practices

- Attend each class. Math, by nature is a very cumulative subject, missing just one lecture can set you back in the course. If you are sick or have a family emergency and must miss class, you must still make up the work.
- Take good notes, and keep course materials organized.
- Make sure to complete all the homework assignments in a timely manner.
- If you need extra help, go to your instructor's office hours or the math learning center.

Academic Integrity:

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

Disability:

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/or Learning) consult the Office of AccessABILITY located in Room 1214B Hunter East to secure necessary academic accommodations. For further information and assistance please call (212-772-4857)/TTY (212-650-3230).

Hunter College Policy on Sexual Misconduct:

"In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444).

b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

CUNY Policy on Sexual Misconduct Link: <http://www.cuny.edu/about/administration/offices/ia/Policy-on-SexualMisconduct-12-1-14-with-links.pdf>