Office. IH-1149b, 718-951-5000/2734, IH-1156 (the main Mathematics Department Office) 718-951-5246.

Office Hours. Tuesday, Thursday: 3:35–4:10 pm, 6:00–6:25 pm, 7:50–8:05 pm.


List price: $168.00 (available on Amazon for much less). The textbook is available at the College Bookstore in the basement of Boylan Hall.


This is an excellent book, has a lot of material relevant to the course, but it has not been selected as a textbook for the course, since some students might find it harder to read than the textbook, and the material is organized somewhat differently from the material in the textbook.

or at other places.

Exams. October 1, October 29, December 3. Final exam: Thursday, December 17, 6:00–8:00 pm. Class exams count 60%, the final exam counts 40% in the course grade. One of the grades for the first or the second class exam will be dropped if this improves your grade. The grade for the third class exam will not be dropped. A grade zero assigned to an exam missed without a proper excuse will not be dropped either. Irregular attendance or being late to class often may result in a grade lower than indicated by exam averages.

Web Site. Course material may be put on the Web site:
http://www.sci.brooklyn.cuny.edu/~mate/intro_proofs/

Note carefully that the character before “mate” in the above address is a tilde, found on the top left-hand side of the keyboard.

Department Web Site.
http://depthome.brooklyn.cuny.edu/math/

Syllabus. (What follows is the official class syllabus. The actual material covered, and the order in which it is covered may be slightly different, to best take advantage of the resources offered by the textbooks.)

1. How to communicate mathematics, and sets (Chaps. 0 and 1) 2 weeks
a. Structure and guidelines of mathematical writing  
b. Common words and phrases in mathematics  
c. Sets, subsets, and set operations  
d. Indexed collections, partitions, and Cartesian products of sets  

2. Logic (Chaps. 2) 2 weeks  
a. Statements, negations, disjunctions, and conjunctions of statements  
b. Implications and biconditional  
c. Tautologies and contradictions, logical equivalence  
d. Characterizations of statements, quantified statements, and their negations  

3. Direct proof and proof by contrapositive (Chap. 3, §§1-4) 1 week  
a. Trivial and vacuous proofs, direct proofs  
b. Proof by contrapositive, proof by cases  

4. Proof in elementary number theory (§§11.1-2 and §§4.1-2)  
a. Division properties of integers and related proofs  
b. The division algorithm and proofs involving congruence of integers  

5. Proofs by contradiction and disproof (§§5.1-2, §§7.1-7.2)  
a. Proof by contradiction  
b. Counterexamples and disproving statements  

6. Relations (Chap. 8) 1 week  
a. Relations, reflexive, symmetric, transitive, and equivalence relations  
b. Properties of equivalence classes and examples  

7. Functions (Chap. 9) 1 week  
a. Definition, the collection of functions, one-to-one, onto, and bijective functions  
b. Composition of functions and inverse functions, permutations  

8. Mathematical induction (§§6.1-4) 1 week  
a. The well-ordering principle and induction principle, and related examples of proofs  
b. More examples of proofs  

9. Cardinalities of sets, and the real number system (Chap. 10) 2 weeks  
a. Countable sets, uncountable sets, and the Schroeder-Bernstein Theorem  
b. Development of the real number system, and its uncountability  
c. The order completeness of the real number system, and Cauchy completeness  

10. Other topics (Proofs is Calculus, Chap. 12, and Proofs in Group Theory, Chap. 13) may be considered if there is time.