

Schedule

A week-by-week breakdown of the material.

Week 1

Monday

- Introduction
- Writing Mathematics¹
- Sets, set notation²
- Subsets³
- Set Operations⁴
- Quiz 0⁵ (Due Monday night together with Quiz 1)
- Homework 1 due Tuesday⁶
- Prepare for class presentation:
 - Exercises 1.9, 1.19, 1.34

Tuesday

- Indexed Collections of sets⁷
- Set Partitions⁸
- Cartesian Products⁹
- Quiz 1¹⁰ (Due Monday night together with Quiz 2)
- Homework 2 due Wednesday¹¹
- Prepare for class presentation:
 - Exercises 1.41, 1.54

Wednesday

- Statements¹²
- Negations¹³

¹[notes/writing.html](#)

²[notes/sets_notation.html](#)

³[notes/subsets.html](#)

⁴[notes/set_operations.html](#)

⁵<https://moodle.hanover.edu/mod/quiz/view.php?id=19351>

⁶[assignments/hw1.html](#)

⁷[notes/indexed_collections.html](#)

⁸[notes/sets_partitions.html](#)

⁹[notes/cartesian_products.html](#)

¹⁰<https://moodle.hanover.edu/mod/quiz/view.php?id=19389>

¹¹[assignments/hw2.html](#)

¹²[notes/statements.html](#)

¹³[notes/negation.html](#)

- Disjunction and Conjunction¹⁴
- Implications¹⁵
- Quiz 2¹⁶ (Due Tuesday night)
- Homework 3 due Thursday¹⁷
- Prepare for class presentation:
 - Exercises 2.18, 2.29, 2.32

Thursday

- Biconditional¹⁸
- Tautologies, Contradictions¹⁹
- Logical Equivalence²⁰
- Fundamental properties of logical equivalence²¹
- Quiz 3²² (Due Wednesday night)
- Homework 4 due Friday²³
- Prepare for class presentation:
 - Exercises 2.39, 2.50, 2.53

Friday

- Exam 1

Week 2

Monday

- Quantified Statements²⁴
- Characterization²⁵
- Quiz 4²⁶ (Due Sunday night)
- Homework 5 due Tuesday²⁷

¹⁴[notes/disjunction_conjunction.html](#)

¹⁵[notes/implications.html](#)

¹⁶<https://moodle.hanover.edu/mod/quiz/view.php?id=19403>

¹⁷[assignments/hw3.html](#)

¹⁸[notes/biconditional.html](#)

¹⁹[notes/tautologies_contradictions.html](#)

²⁰[notes/logical_equivalence.html](#)

²¹[notes/logical_equiv_properties.html](#)

²²<https://moodle.hanover.edu/mod/quiz/view.php?id=19429>

²³[assignments/hw4.html](#)

²⁴[notes/quantified_statements.html](#)

²⁵[notes/characterization.html](#)

²⁶<https://moodle.hanover.edu/mod/quiz/view.php?id=19644>

²⁷[assignments/hw5.html](#)

Tuesday

- Trivial and Vacuous Proofs
- Direct Proofs
- Proof by Contrapositive
- Quiz 5 (Due Sunday night)

Wednesday

- Proof by cases
- Direct and Contrapositive proofs for divisibility
- Direct and Contrapositive proofs for congruence
- Direct and Contrapositive proofs for real numbers
- Quiz 6 (Due Monday night)

Thursday

- Proofs involving sets
- Properties of set operations
- Proofs involving cartesian products of sets
- Quiz 7 (Due Tuesday night)

Friday

- Catching up
- Quiz 9 (Due Thursday night)
- Exam 2

Week 3

Monday

- Proofs by counterexample
- Proofs by contradiction
- Existence proofs
- Disproving existence statements
- Quiz 8 (Due Wednesday night)

Tuesday

- Principle of Mathematical Induction
- General Principle of Mathematical Induction

- Strong Principle of Mathematical Induction
- Quiz 10 (Due Sunday night)

Wednesday

- Proofs by Minimum Counterexample
- Conjectures
- Introduction to Relations
- Quiz 11 (Due Monday night)

Thursday

- Properties of Relations
- Equivalence Relations
- Quiz 12 (Due Tuesday night)

Friday

- Catchup
- Quiz 14 (Due Thursday night)
- Exam 3

Week 4

Monday

- Equivalence Classes
- Congruences as an equivalence
- Quiz 13 (Due Wednesday night)

Tuesday

- Arithmetic on Integers modulo n
- Definition of functions
- Quiz 15 (Due Sunday night)

Wednesday

- One-to-one and onto functions
- Bijective functions, Inverse function
- Image and inverse image of sets under functions/relations. Properties
- Quiz 16 (Due Monday night)

Thursday

- Numerically Equivalent sets
- Denumerable sets
- Quiz 17 (Due Tuesday night)

Friday

- Uncountable sets
- Comparing cardinalities
- Schroder-Bernstein theorem
- Quiz 18 (Due Wednesday night)
- Wrap-up
- Exam 4