

- Mathematical Logic (9 hrs)
  - Propositional Logic
  - Predicate Logic
    - Predicates and Quantifiers
    - Nested Quantifiers
  - Proof Methods
  
- Sets (3 hrs)
  - Basic Set Theory Concepts
    - Membership, Inclusion, Equality
    - Set operations, Power sets
  - Countable and Uncountable sets
  
- Relations and Functions (6 hrs)
  - Reflexive, Symmetric and Transitive Relations
  - Equivalence Relations and Partitions
  - Partial Ordering
  - Injections, Surjections, Bijections
  - Equinumerosity Principle
  
- Mathematical Induction (3 hrs)
  - Principle of Mathematical Induction
  - Strong Induction and Well Ordering
  
- Combinatorics (9 hrs)
  - The Pigeonhole Principle
  - Permutations and Combinations
  - Combinatorial Proofs
  - Binomial Theorem