Chapter	Title	Overview
1	**The Foundations: Logic and Proofs**	1.1 Propositional Logic 1.2 Applications of Propositional Logic 1.3 Propositional Equivalences 1.4 Predicates and Quantifiers 1.5 Nested Quantifiers 1.6 Rules of Inference 1.7 Introduction to Proofs
2	**Basic Structures: Sets, Functions, Sequences, Sums, and Matrices**	2.1 Sets 2.2 Set Operations 2.3 Functions 2.4 Sequences and Summations
3	**Algorithms**	• Time Complexity: $\boldsymbol{T(n)}$, Counting the Cost • Time Complexity: $\boldsymbol{T(n)}$, Examples • Validating $\boldsymbol{T(n)}$ • $\boldsymbol{O(f(n)), \Omega(g(n)), \Theta(f(n))}$ • $\boldsymbol{O(f(n)), \Omega(f(n)), \Theta(f(n))}$ Examples
4	**Number Theory and Cryptography**	4.1 The Divisibility and Modular Arithmetic 4.2 Integer Representations and Algorithms 4.3 Primes and Greatest Common Divisor 4.4 Solving Congruences 4.5 Applications of Congruences 4.6 Cryptography
5	**Induction and Recursion**	5.1 Mathematical Induction 5.2 Strong Induction and Well-Ordering 5.3 Recursive Definitions and Structural Induction 5.4 Recursive Algorithms
6	**Counting**	6.1 The Basics of Counting 6.2 The Pigeonhole Principle 6.3 Permutations and Combinations 6.4 Binomial Coefficients and Identities 6.5 Generalized Permutations and Combinations