cmpe 220 - Fall 2013-3 bingol

Discrete and Combinatorial Mathematics, 5e

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Logic

1. Fundamentals of Logic.

1. Basic Connectives and Truth Tables.
2. Logical Equivalence: The Laws of Logic.
4. The Use of Quantifiers.
5. Quantifiers, Definitions, and the Proofs of Theorems.

Sets, Functions, Relations

3. Set Theory.

1. Sets and Subsets.
3. Counting and Venn Diagrams.


5. The Axioms of Probability (Optional).
7. Discrete Random Variables (Optional).

6. Relations and Functions.

1. Cartesian Products and Relations.
2. Functions: Plain and One-to-One.
4. Special Functions.
5. The Pigeonhole Principle.
6. Function Composition and Inverse Functions.


1. Relations Revisited: Properties of Relations.
4. Equivalence Relations and Partitions.


1. The Ring Structure: Definition and Examples.
2. The Integers Modulo n.
4. The RSA Cipher (Optional).
5. Elements of Coding Theory.
6. The Hamming Metric.
7. The Hamming Code as a Generator Matrix.
8. Group Codes: Decoding with Coset Leaders.
10. The Design of Experiments.


1. Polynomials.
2. Irreducible Polynomials: Finite Fields.
3. Latin Squares.
4. Finite Geometries and affine planes.

Integers

2. Recursive Definitions.
3. The Division Algorithm: Prime Numbers.