Math 222 — Comp 224
Discrete Mathematics — Discrete Structures

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Textbook

Discrete Mathematics and Its Applications (5th Edition) by Kenneth H. Rosen.

Evaluation

· Two term tests: 40%
· Homework Assignments : 10%
· Comprehensive final exam: 50%

Final exams are held from December 13 - 17. You must be available at the scheduled time.

The following percentage conversion to letter grade will be used:

Percentage: 0–49 50–59 60–64 65–69 70–74 75–79 80–84 85–89 90–94 95–100
Letter grade: F D C C+ B- B B+ A- A A+

Course Outline

1. The Foundations: Logic and Proof, Sets, and Functions
· Logic (1.1)
· Propositional Equivalences (1.2)
· Predicate and Quantifiers (1.3)
· Nested Quantifiers (1.4)
· Methods of Proofs (1.5)
· Sets (1.6)
· Set Operations (1.7)
· Functions (1.8)
2. The Fundamentals: Algorithms, The Integers, and Matrices
· Algorithms (2.1)
· The Growth of Functions (2.2)
· Complexity of Algorithms (2.3)
· The Integers and Division (2.3)
· Integers and Algorithms (2.4)
· Applications of Number Theory (Cryptography) (2.5)
3. Mathematical Reasoning: Induction and Recursion
· Proof Strategy (3.1)
· Mathematical Induction (3.3)
· Recursive Definitions and Structural Induction (3.3)
· Recursive Algorithms (3.4)
4. Counting
· The Basics of Counting (4.1)
· The Pigeonhole Principle (4.2)
· Permutations and Combinations (4.3)
· Binomial Coe_cients (4.4)

· Generalized Permutations and Combinations (4.6)
5. Advanced Counting Techniques
· Recurrence Relations (6.1)
· Solving Recurrence Relations (6.2)
· Inclusion–Exclusion (6.5)
· Applications of Inclusion–Exclusion (6.6)
6. Graphs
· Introduction to Graphs (.1)
· Graph Terminology (8.2)
· Representing Graphs and Graphs Isomorphism (8.3)
· Connectivity (Definitions only) (8.4)
· Euler and Hamilton Paths (8.5)
· Shortest Path Problems (8.6)
7. Trees
· Introductions to Trees (9.1)
· Applications of Trees (9.2)
8. Boolean Algebra
· Boolean Functions (10.1)
· Representing Boolean Functions (10.2)
· Logic Gates (10.3)
· Minimization of Circuits (10.4)
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