MATH 210 - Discrete Mathematics

Course Syllabus

Instructor Information

Instructor: Dr. Maher Boudabra
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Course Description

Propositional Logic, Propositional Equivalence, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference; Methods of Proof, Divisibility and the Fundamental Theorem of Arithmetic; Sets, Set Operations, Cardinality of Sets; Functions; Recurrence Relations, Solving Recurrence Relations, Equivalence Relations and Congruences, Sequences and Summations; Mathematical Induction, Strong Induction, Recursive Definitions and Structural Induction, Well-Ordering Principle; Basics of Counting, Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients.

Textbook

Kenneth H. Rosen. Discrete Mathematics and Applications, 8th edition

Course Schedule (15 Weeks)

1. Week 1: Propositional Logic
2. Week 2: Propositional Equivalence
3. Week 3: Predicates and Quantifiers
4. Week 4: Rules of Inference and Basic Methods of Proof

5. Week 5: More on Proof Techniques: Contradiction, Induction, and Strong Induction
6. Week 6: Divisibility, Primes, and The Fundamental Theorem of Arithmetic
7. Week 7: Sets and Set Operations
8. Week 8: Functions and Cardinality
9. Week 9: Sequences, Summations, and Recurrence Relations
10. Week 10: Solving Recurrence Relations (PARI/GP software)
11. Week 11: Equivalence Relations and Partitions
12. Week 12: Congruences and Modular Arithmetic
13. Week 13: Basics of Counting: The Sum & Product Rules, Pigeonhole Principle
14. Week 14: Combinations and Binomials
15. Week 15: Permutations

Assessments and Grading

Final Exam	35%
Midterm Exam I	25%
Midterm Exam II	25%
Classwork	15%

Course Policies

Attendance: Students are expected to attend all classes. More than 9 absences may result in failing the course. Excused absences must be justified with valid documentation.

Cheating and Plagiarism: Academic dishonesty in any form (cheating, plagiarism, unauthorized collaboration, or falsifying data) will result in disciplinary action in accordance with university regulations, which may include a failing grade in the course.

Late Submissions: Assignments and projects must be submitted on time. Late submissions may be penalized unless prior arrangements are made with the instructor.

Make-up Exams: Make-up exams will only be given in exceptional cases with documented evidence.