MATH 203 Discrete Mathematics

This course focuses on logic, methods of proof, set theory, number theory, equivalence, and order relations, counting (combinations and permutations), and solving recurrence relations.
(Pre-requisites: Math 151 or Math 153)

Course Learning Outcomes:

By the end of the course, students will be able to:

1. Demonstrate detailed knowledge and understanding of discrete mathematical structures such as logic, sets, relations, counting, functions, and graphs.
2. Solve mathematical problems using various discrete structures such as: symbolic logic, sets, functions, counting techniques, trees, and graphs.
3. Prove mathematical statements by applying various proof methods including induction and contradiction.
4. Model computer and engineering problems using discrete mathematical structures.

Textbook & Course Materials:

- Kenneth Rosen (2019). Discrete Mathematics and Its Applications (8th Edition). Mc Graw-Hill.

Course Content:

1. Propositional Logic
2. Applications of Propositional
3. Propositional Equivalences
4. Predicates and Quantifiers
5. Nested Quantifiers
6. Rules of Inference
7. Introduction to Proofs
8. Proof Methods and Strategy
9. Sets
10. Set Operations
11. Functions
12. Sequences and Summations
13. Cardinality of Sets
14. Matrices
15. Divisibility and Modular Arithmetic
16. Integer Representations and Algorithms
17. Primes and Greater Common
18. Divisors
19. Solving Congruences
20. Applications of Congruences
21. Mathematical Induction
22. Recursive Definitions and
23. Structural Induction
24. Recursive Algorithms
25. The Basics of Counting
26. The Pigeonhole Principle
27. Permutations and Combinations
28. Relations and their Properties
29. Equivalence Relations
30. Graphs and Graph Models
31. Introduction to Trees