DISCRETE MATHEMATICS

MATH 2030

Course Description:

A foundations course in discrete mathematics for applied disciplines including computer science and computer engineering. Topics include: logic, sets, relations, functions, complexity functions and big-O, congruencies, induction and recursive definitions, elementary combinatorics, discrete probability, graphs, trees. **3 credits**

Prerequisites:

MATH 1950 or MATH 1930

Major Topics:

1) Logic and Sets
- a. Propositional Calculus
- b. Predicates and Quantifiers
- c. Sets and Set Operations
- d. Applications to computer science and engineering

2) Relations and Functions
- a. Cartesian product
- b. Equivalence relations and congruencies
- c. Complexity functions and big-O

3) Induction and Recursion

4) Combinatorics
- a. Fundamental Counting Principle
- b. Combinations and Permutations

5) Discrete Probability
- a. Finite probability
- b. Conditional probability
- c. Random Variables and Distributions

6) Graphs and Trees

Textbook:

Rosen, Kenneth. *Discrete Mathematics and Its Applications, 7th ed*. New York: McGraw-Hill Education, 2011.

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