
Presents topics in sets, counting, graphs, logic, proofs, functions, relations, mathematical induction, Boolean Algebra, and recurrence relations. Lecture 3 hours per week. 3 credits.

General Course Purpose

The goal is to give the student a solid grasp of the methods and applications of discrete mathematics to prepare the student for higher level study in mathematics, engineering, computer science, and the sciences.

Course Prerequisites/Corequisites

Prerequisite: Completion of MTH 263 Calculus I with a grade of C or better or equivalent.

Course Objectives

Upon completing the course, the student will be able to:

Note: ~~Identify~~ Identify condition

- x Exhibit proper use of set notation, abbreviations for common sets, Cartesian products, and ordered n-tuples.
- x Combine sets using set operations.
- x List the elements of a power set.
- x Lists the elements of a cross product.
- x Draw Venn diagrams that represent set operations and set relations.
- x

Functions and Relations

- x Identify a function's rule, domain, codomain, and range.
- x Draw and interpret arrow diagrams.
- x Prove that a function is well-defined, one-to-one, or onto.
- x Given a binary relation on a set, determine if two elements of the set are related.
- x Prove that a relation is an equivalence relation and determine its equivalence classes.
- x Determine if a relation is a partial ordering.

Counting Theory

- x Use the multiplication rule, permutations, combinations, and the pigeonhole principle to count the number of elements in a set.
- x Apply the Binomial Theorem to counting problems.

Graph Theory

- x Identify the features of a graph using definitions and proper graph terminology.
- x Prove statements using the Handshake Theorem.
- x Prove that a graph has an Euler circuit.
- x Identify a minimum spanning tree.

Boolean Algebra

- x Define Boolean Algebra.
- x Apply its concepts to other areas of discrete math.
- x Apply partial orderings to Boolean algebra.

Recurrence Relations

- x Give explicit and recursive descriptions of sequences.
- x Solve recurrence relations.

Major Topics to be Included.007 Tw6 (v)8.9 (e r)-5.9 (ec)-2</MCID 124 >>BDET /Artif85 (q)- 0 Td 457 0 Td e6523