COMS 218 - Discrete Structures Course Outline

Approval Date: 03/11/2021
Effective Date: 08/13/2021

SECTION A

Unique ID Number	CCC000623853
Discipline(s)	Computer Science Mathematics
Division	Career Education and Workforce Development
Subject Area	Computer Studies

Distance Education Mode of Instruction

On-Campus
Hybrid
Entirely Online
Online with Proctored Exams

SECTION B

General Education Information:

SECTION C

Course Description

Repeatability May be repeated 0 times

Catalog Description This course will introduce the discrete structures used in Computer Science, with an emphasis on their applications. Topics covered include: Functions, Relations and Sets; Basic Logic; Proof Techniques; Basics of Counting; Graphs and Trees; and Discrete Probability.

Schedule Description

SECTION D

Condition on Enrollment

1a. Prerequisite(s)

COMS 215

1b. Corequisite(s): *None*

1c. Recommended

MATH 108

1d. Limitation on Enrollment: *None*

SECTION E

Course Outline Information

1. Student Learning Outcomes:

A. Explain the relationship between mathematical induction and heatin wi an/48(a)-8(t)17(i)-5

B. Basic Logic
    a. Propositional logic
    b. Logical connectives
    c. Truth tables
    d. Normal forms (conjunctive and disjunctive)
    e. Validity
    f. Predicate logic
    g. Universal and existential quantification
    h. Modus ponens and modus tollens
    i. Limitations of predicate logic
C. Proof Techniques
    a. Notions of implication, converse, inverse, contrapositive, negation, and contradiction
    b. The structure of mathematical proofs
    c. Direct proofs
    d. Proof by counterexample
    e. Proof by contradiction
    f. Mathematical induction
    g. Strong induction
    h. Recursive mathematical definitions
    i. Well orderings
D. Basics of Counting
    a. Counting arguments
    b. Sum and product rule
    c. Inclusion-exclusion principle
    d. Arithmetic and geometric progressions
    e. Fibonacci numbers
    f. The pigeonhole principle

induction to recursion and recursively defined structures.
Projects:
Online Adaptation: Discussion

1. Methods of Evaluation: Describe the general types of evaluations for this course and provide at least two, specific examples.

Typical classroom assessment techniques

Exams/Tests --
Quizzes -- The student will be quizzed on the different traversal methods for trees and graphs.
Home Work -- Students will describe how formal tools of symbolic logic are used to model real-life situations, including those arising in computing contexts such as program correctness, database queries, and algorithms.
Final Exam -- In the final exam, the student will apply the binomial theorem to independent