COSC 221 (3) Introduction to Discrete Structures Introduction to sets, logic, combinatorics, and graph theory, as applied in computing: sets and propositions, permutations and combinations, graphs and trees, Boolean algebra, algorithms, and applications. [3-1-0] *Prerequisite:* One of MATH 101, MATH 142, APSC 172. *Corequisite:* COSC 121 Learning Outcomes: After completing this course, students will be able to: understand the fundamental concepts of discrete mathematics; learn the important techniques for computing sets, propositions, permutations and combinations; practice building basic tools in cryptography. Topic include Variables, Cartesian Product, Logical Form and Logical Equivalences, Conditional Statements, Valid and Invalid Arguments, Predicates & Quantified Statements I, Predicates & Quantified Statements II, Statements with Multiple Quantifiers, Arguments with Quantified Statements, Direct Proof and Counter Example I, Direct Proof and Counter Example II, Divisibility, Quotient-Remainder, Floor and Ceiling, Indirect Arguments, Mathematical Induction, Strong Mathematical Induction, Set Theory, Boolean Algebra, Relations and Functions, Reflexive, Symmetric, and Transitive, Equivalence Relations, Modular Arithmetic and Applications to Cryptography, Permutations and Combinations, r-Combinations with Repetition Allowed, Introduction to Graph Theory, Trails, Paths and Circuits, Trees