## Discrete Mathematics

Background

This topic deals with fundamentals of discrete mathematics (counting, relations, functions and partially ordered sets).

* **Mathematical Logic**

Prove identities/equalities/inequalities by induction

* **Counting**

multiplication principle, sumrule and the five basic formulas

pigeonhole principle

* **Relations and Digraphs**

Directed graphs, matrix of finite relation

Properties of relations on a set of pairs (reflexivity, irreflexivity,

symmetry, asymmetry, antisymmentry, transitivity)

transitive closure of a relation.

* **Functions**

one-to-one, onto, bijective, invertible and inverses

* **Order Relations and Structures**

Partial order (set + relation)

Isomorphic (two partial orders)