

## UGCBCS501: Discrete Mathematics (3-1-0)

Credit: 4

Marks: 100 (Theory)

### UNIT –WISE SYLLABUS

#### 1 **Unit 1: Fundamentals**

Set, set representation methods, types of sets: null set, finite set, infinite set, equivalent sets and equal sets, subsets, power sets, operations on sets : union, intersection, complement, difference and symmetric difference. Matrices and mathematical structures

#### 2 **Unit 2: Counting**

Permutations, Combinations, Pigeonhole Principle, Elements of Probability and Recurrence Relations

#### 3 **Unit 3: Relations and Diagraphs**

Produce sets and partitions, Relations and Diagraphs, Paths in relational diagraphs, Properties of relations, Equivalence relations, Data structures for relations and diagraphs, Operations on Relations , Transitive Closure and Warshall's Algorithm

#### 4 **Unit 4: Semigroups and Groups**

Binary operations, Monoid, Semigroups, Products and Quotients of Semigroups, Groups, Products and Quotients of Semigroups, Groups, Products and Quotients of groups, other Mathematical Structures

#### **\*Text Resource\***

1. Discrete Mathematical Structures  
By Kolman, Busby and Ross, 6<sup>th</sup> Ed, PHI

#### **\*Reference Book\***

- R1. Elements of Discrete Mathematics  
By C L Liu, 2<sup>nd</sup> Ed, Tata Mc Graw Hill Pub.