GUJARAT UNIVERSITY
BCA II SYLLABUS

COURSE TITLE	**Discrete Mathematics**
COURSE CODE	**CC-111**
COURSE CREDIT	**3**
Session Per Week	**4**
Total Teaching Hours	**40 HOURS**

AIM

The objective of this course is to present the foundations of many basic computer related concepts
and provide a coherent development to the students for the courses like fundamentals of Computer Organization, RDBMS, Data Structures, Analysis of Algorithms, Artificial Intelligence, Computer Graphics and others.

LEARNING OUTCOMES

On the completion of the course students will:
1. To become reasonably good at problem solving and algorithm development.
2. Students also enhance their ability to think logically and mathematically.

DETAIL SYLLABUS

UNIT	TOPIC / SUB TOPIC	TEACHING HOURS
1	**Groups**	**10**
	□ Binary operations with properties □ Algebraic structure □ Semigroups and Monoids □ Definition of group and examples □ Order of a group and order of an element	**2**
	□ Abelian and cyclic group □ Groups < Zn, + n > & < Zp, *p > □ Sub-group	**4**
	□ Lagrange's Theorem (without proof) □ Permutation group	**4**
	Relations and Ordering	**10**

	□ Basic concept of binary relation □ Total no. of distinct relations □ Relation matrix and the graph of a relation	**2**
2	□ Basic Property of binary relations in a set □ Equivalence relations and equivalence classes □ Covering and partition of a set □ Partial ordering and partially ordered set	**4**
	□ Comparable elements , Chain □ Cover of an element, Hasse diagram □ Least, Greatest, Maximal, Minimal elements □ Lower and upper bounds of posets	**4**
3	**Lattices and Boolean Algebra**	**10**
	□ Introduction to lattice □ Lattices as partially ordered sets □ Some properties of lattices □ Sub-lattices	**2**
	□ Types of lattices like complete, bounded, distributive and complemented lattice □ Definition and important properties of a Boolean algebra □ Boolean subalgebra	**4**
	□ Isomorphic Boolean algebras (graphically) □ Boolean expressions and their equivalence □ Max/Min terms, canonical forms	**4**
4	**Graph theory**	**10**
	□ Basic concepts of Graph theory □ Paths, Reachability, and Connectedness □ Matrix representation of graphs □ Trees	**2**
TEXT BOOK/S:		
J.P. Tremblay and R. Manohar McGraw-Hill Publication		
REFERENCE BOOKS:		

1. Discrete Mathematics
Publisher: Oxford University Press
By Swapankumar Chakaborty, Bikas Kanti Sarkar
2. Discrete Mathematics
Publisher: Cengage Learning
By D.S. Malik, M.K.Sen