C. U. SHAH UNIVERSITY
Wadhwancity

FACULTY OF:- Technology and Engineering
DEPARTMENT OF: - CE/IT
SEMESTER: - IV
CODE: - 4TE04DSM2
NAME: – Discrete Mathematics

Teaching and Evaluation Scheme:-

Subject code	Subject name	Teaching Scheme(Hours)				Credits	Evaluation Scheme							
							Theory				Practical/Tutorial			
							Sessional Exam		University Exam		Internal		Total	Total
		Th	Tu	Pr	Total		Marks	Hours	Marks	Hours	Pr/Viva	Tw		
4TE04DSM2	Discrete Mathematics	3	2	0	5	4	30	1.5	70	3	30	20	50	150

Objectives:-

- To analyze Predicate Calculus
- To solve Graph Theory and Lattices Problem
- To create a modelling of engineering problems
- To solve Boolean Algebra and Combinatory

Prerequisites:-

Students should have the basic knowledge of set theory, Algebra, Graph etc.

Course Outline:-

Sr. No.	Course contents
1	**Predicate Calculus:** Introduction, Objectives, Predicates, Statement Functions, Variable and quantifiers, Free and bound variables, special valid formulas involving, quantifiers theory of interface for the predicate calculus
2	**Group Theory:** Definitions and examples of semi groups, Monoids and groups, Abelian group, Cyclic group, Sub group, permutation groups, Set Decomposition of group, Normal Subgroups, Lagrange's theorem
3	**Lattices:** Poset, Lattice as a Poset, properties of lattices as an algebraic systems, sub lattices, Direct product, Complete Lattice, Bounded Lattice, Distributive Lattice, Complemented Lattice, Homomorphism and Isomorphism of lattices
4	**Boolean Algebra:** Introduction, Definition and properties Boolean algebra, Sub-Boolean algebra, direct product and homomorphism, Atoms, Stone's representation theorem, Boolean expressions and their equivalences, Min term and max terms, Values of Boolean expressions, canonical forms, Boolean functions, symmetric Boolean functions
5	**Graph Theory:** Basic concept of graph theory, basic definitions, Path Reachability and connectedness, Matrix representation of graphs, Trees
6	**Combinatories:** Counting techniques – pigeon-hole principle, infinite sets, mathematical

	induction, Permutations. Generating functions, Recurrence relation

Learning Outcomes:-

After the successful completion of the course, students will be able to

- Analyze Predicate Calculus
- Solve Graph Theory and Lattices Problem
- Create a modelling of engineering problems
- Solve Boolean Algebra and Combinatory

Teaching & Learning Methodology:

- Assignments will be given to students for active learning
- Student friendly environment i.e. more interaction between student and faculty (Drilling method)

Books Recommended:-

1. Discrete Mathematical structures with application to computer science by **Jean-Paul Tremblay, R. Manohar**, McGraw-Hill, 1987
2. Discrete Mathematics and its applications by **Kenneth H. Rosen**, Tata McGraw Hill, 7th Edition, 2007
3. Applied discrete structures for computer science by Alan **Doerr, Kenneth Levasseur**, Macmillan, 1989
4. Discrete Mathematical structures for computer science by **Bernard Kolman, Robert C. Busby, Sharon Cutler Ross**, Pearson/Prentice-Hall, 2004
5. Introduction to combinatorial Mathematics by **C. L. Liu,** McGraw-Hill, 1968

E-Recourses:-

1. http://en.wikipedia.org