1. Subject Code: **SE208**   Course Title: **Discrete Structures**
2. Contact Hours: L: 3   T: 1   P: 0
3. Examination Duration (ETE) (Hrs.):   Theory   3 Hrs   Practical 0
4. Relative Weightage: CWS 25   PRS 0   MTE 25   ETE 50   PR   0
5. Credits: 4
6. Semester: IV
7. Subject Area: DCC
8. Pre-requisite: Nil
9. Objective: To give basic knowledge of combinatorial problems, algebraic structures and graph theory.
10. Details of Course

S.No.	Contents	Contact Hours
1.	**Formal Logic:** Statement, Symbolic Representation and Tautologies, Quantifiers, Predicator and validity, Normal form, Prepositional Logic, Predicate Logic, Logic Programming and Proof of correctors	3
2.	**Proof, Relation and Analysis of Algorithm**: Technique for theorem proving : Direct Proof, Proof by Contra position, proof by exhausting cares and proof by contradiction, Principle of mathematical induction, principle of complete induction, recursive definition, solution methods for linear, first-order recurrence relations with constant coefficients, analysis of algorithms involving recurrence rotations-recursive selection sort, binary search, quick sort, solution method for a divide-and-conquer recurrence relation.	7
3.	**Sets and Combinations**: Sets, Subtracts, powersets, binary and unary operations on a set, set operations/set identities, fundamental country principles, principle of inclusion, exclusion and pigeonhole, permutation and combination, pascal's triangles, binomial theorem, representation of discrete structures.	8
4.	**Relation/function and matrices**: Rotation, properties of binary rotation, operation on binary rotation, closures, partial ordering, equivalence relation, properties of function, composition of function, inverse, binary and n-ary operations, characteristics for, permutation function, composition of cycles, Boolean matrices, Boolean matrices multiplication.	7
5.	**Lattices & Boolean Algebra**: Lattices: definition, sublattices, direct product, homomorphism Boolean algebra: Definition, properties, isomorphic structures (in particulars, structures with binary operations) subs algebra, direct product and homo-morphism, Boolean function, Boolean expression, representation & minimization of Boolean function.	7
6.	**Graph Theory**:Terminology, isomorphic graphs, Euler's formula (Proof) four color problem and the chromatic number of a graph, five color theorem. Trees terminology, directed graphs, Computer representation of graphs, Warshall's algorithms, Decision Trees, Euler path & Hamiltonian circuits, Shortest path & minimal spanning trees, Depth-first and breadth first searches, analysis of research algorithm, trees associated with DFS & BFS Connected components, in order, preorder & post order trees traversal algorithms.	8
	TOTAL	42

11. Suggested Books