I Year I Semester   **L   P   C**

Code: 17CS102   **4   0   3**

MATHEMATICALFOUNDATIONSOFCOMPUTERSCIENCE

UNIT-I:
Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Theory of inference for the statement calculus, Rules of inference, Consistency of premises and indirect method of proof, Automatic Theorem Proving Predicate calculus: Predicates, statement functions, variables and quantifiers, predicate formulas, free &bound variables, universe of discourse, inference theory of predicate calculus

UNIT-II:
Set theory & Relations: Introduction, Relations and ordering, Properties of binary Relations, Equivalence, Compatibility Relations, Partial ordering, Hasse diagram. Functions: composition of functions, Inverse Function, Recursive Functions, Lattice and its Properties, Pigeon hole Principles and its application. Algebraic structures: Algebraic systems, Examples and general properties, Semi groups and Monoids, groups, sub groups, Definitions, Examples, homomorphism, Isomorphism and related problems.

UNIT-III:
Elementary Combinatory: Basis of counting, Enumeration of Combinations & Permutations, Enumerating of Combinations & Permutations with repetitions and constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, principles of Inclusion–Exclusion.

UNIT-IV:
Recurrence Relations: Generating Function of Sequences, Calculating Coefficient of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, the method of Characteristic roots, Solution of Inhomogeneous Recurrence Relation.

UNIT-V:
Graph Theory: Representation of Graph, Spanning Trees, BFS, DFS, Kruskals Algorithm, Binary trees, Planar Graphs, Graph Theory and Applications, Basic Concepts, Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

TEXTBOOKS:

1. Discrete Mathematical Structures with Applications to computer science J.PTremblery, R.Manohar, TMH
2. Discrete Mathematical for computer Scientists & Mathematicians " J.L. Molt, A.KandelT.P.Baker,PHI

REFERENCETEXTBOOKS:

1. ElementsofDiscrete Mathematics,CLLiu,DPMohanpatra,TMH
2. DiscreteMathematics,Schaum'sOutlines,Lipschutz,LipsonTMH.
3. DiscreteMathematical Structures,Kolman,Busby,Ross,6thed.,PHI,2009