

1.	Title of the course	Discrete Mathematics
2.	Course number	MA505L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To MA5111/7
6.	To be offered by	Department of Mathematics and Statistics
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	Course Objective(s): To introduce the concepts like logical notation, proof and counting techniques, functions and relations to the student . To illustrate the principles of lattices and its applications in the computing world. To introduce the basic graph theory with few algorithm.	
10.	Course Content: Logic: Statement Calculus, Connectives, truth tables, validity, consequence, applications, predicate calculus and quantifiers. Reasoning: proof techniques, mathematical induction, recursive definitions and algorithms. Counting: Pigeon-hole principle, permutations and combinations, recurrence relations, generating functions, principles of inclusion-exclusion, counting by bijections, double counting, Schroder-Bernstein theorem, finite and infinite sets, countable and uncountable sets, continuum hypothesis, axiom of choice, well-ordering principle, Zorn's lemma. Lattices: Partially ordered sets, chains, complete, Modular and distributive lattices, Boolean Algebra, polynomials, application. Graph Theory: Relations and digraphs, simple graphs, paths and cycles, connected graphs, trees, Hamiltonian and Eulerian graphs, planar graphs, Minimal spanning trees, Kruskal Algorithm, Prim Algorithm.	
11.	Textbook(s): 1. Rosen K H, <i>Discrete Mathematics and its Applications</i> , Tata McGraw Hill Publishers (2007). 2. Stoll R R, <i>Set Theory and Logic</i> , Dover Publications Inc, New York (1979).	
12.	Reference(s): 1. Liu C L, <i>Elements of Discrete Mathematics</i> , McGraw-Hill Inc, (1985). 2. Cameron P J, <i>Combinatorics: Topics, Techniques, Algorithms</i> , Cambridge University Press, (1994). 3. Koshy T, <i>Discrete Mathematics with Applications</i> , Elsevier, New York, (2004). 4. Bondy J A, Murty U S R, <i>Graph Theory</i> , Springer-Verlag, New York, (2008). 5. Joshi K D, <i>Foundations of Discrete Mathematics</i> , New Age International, (1989).	