

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Discrete Mathematics
2.	Course Number	MA5111
3.	Status of the Course	Core
4.	Structure of Credits	3-0-0-3
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Mathematics
8.	To take effect from	July 2019
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	Course Objective: 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.	
12.	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.	
13.	Text book(s): 1. R. R. Stoll, <i>Set Theory and Logic</i> , Dover Publications Inc, New York, (1979). 2. K. H. Rosen, <i>Discrete Mathematics and its Applications</i> , Tata McGraw Hill Publishers, (2007).	
14.	Reference(s): 1. C. L. Liu, <i>Elements of Discrete Mathematics</i> , McGraw-Hill Inc, (1985). 2. P. J. Cameron, <i>Combinatorics: Topics, Techniques, Algorithms</i> , Cambridge University Press, (1994). 3. T. Koshy, <i>Discrete Mathematics with Applications</i> , Elsevier, New York, (2004). 4. J. A. Bondy, U. S. R. Murty, <i>Graph Theory</i> , Springer-Verlag, New York, (2008). 5. K. D. Joshi, <i>Foundations of Discrete Mathematics</i> , New Age International, (1989).	