

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Number Theory
2.	Course Number	MA6023
3.	Status of the Course	Elective
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	CoT
10.	Whether approved by the Department	Yes
11.	Course Objective: To introduce the notions of primes, divisibility and congruence relation. Using these notions to study some major results such as Chinese remainder theorem, Quadratic reciprocity law, Prime number theorem. Also to introduce some of the active areas of analytic and algebraic number theory, such as Elliptic curves and zeros of L-functions.	
12.	Course Content: Partitions, Inclusion–exclusion principle, Pigeonhole principle, Recurrence relations, Generating functions, Primes, Divisibility and the Fundamental theorem of arithmetic, Euclidean algorithm, Congruences, Ring of integers mod n , Chinese Remainder Theorem, Fermat's Last Theorem, Hensel's lemma, Finite Fields, Arithmetic functions, Mobius inversion formula, Quadratic residues, Quadratic reciprocity law, Binary quadratic forms, Sum of two squares theorem, Continued fractions, Pell's equation, Diophantine equations, Prime Number Theorem, Bertrand's postulate, Introduction to Riemann Zeta function, Dirichlet's L-functions and Elliptic Curves.	
13.	Text book(s): 1. K. Ireland, M. Rosen, <i>A Classical Introduction to Modern Number Theory</i> , Springer, (2010). 2. I. Niven, H. S. Zuckerman and H. L. Montgomery, <i>An Introduction to the Theory of Numbers</i> , Wiley, (1991).	
14.	Reference(s): 1. J. H. Silverman, <i>A Friendly Introduction to Number Theory</i> , Pearson, (2012). 2. T. M. Apostol, <i>Introduction to Analytic Number Theory</i> , Narosa, (1998). 3. T. Koshy, <i>Discrete Mathematics with Applications</i> , Elsevier, (2004). 4. J. Stillwell, <i>Mathematics and Its History</i> , Springer-Verlag New York, (2010). 5. J. L. Mott, A. Kandel and T. P. Baker, <i>Discrete Mathematics for Computer Scientists and Mathematicians</i> , PHI Learning, (2003).	