Paper Code	THEORY	Credits:2
MT102	**Title: Algebra-I**	**30 L**
Unit 1	**Matrices and System of linear equations**	**15 L**
	Matrices: addition and multiplication, transpose and inverse. Reduction to echelon form by elementary row operations, Elementary matrices. Finding inverse of a matrix. Solving system of linear equations. Determinants: expansions about a row or column, Elementary row and column operations on determinants, Properties of determinants. Cofactor expansion of determinant.	
Unit 2	**Properties of Integers and Polynomials**	**15 L**
	Properties of Integers, relation, equivalence relation, equivalence classes. Divisibility of integers, division algorithm, g.c.d of integers. Primes, prime factorization, congruence, solve linear congruence, Chinese Remainder Theorem, Euler's φ-function. Add, multiply and divide polynomials, roots of a polynomial, g.c.d of polynomials.	

References:

1. Linear Algebra, Kenneth Hoffman, Ray Kunze, Prentice-Hall.
2. Elementary Number Theory, David M. Burton, Second Edition, UBS, New Delhi.

Additional References:

1. Concrete Mathematics, Graham, Knuth and Patashnik, Pearson Education Asia Low Price Edition.
2. Introduction to the theory of numbers, I. Niven and S. Zuckerman, Third Edition, Wiley Eastern, New Delhi, 1972.
3. Shaum's outline of Theory and Problems of Matrix Operations.

Paper Code	Practical	Credits:2
MP101	**Title: Practicals based on MT101 and MT102**	**30 L**
	Group A: Calculus-I	
	1. Graphs and functions. 2. Limits of functions, calculating limits using rules of limits and Sandwich theorem 3. Differentiability, chain rule, implicit differentiation. 4. Higher order derivatives and Leibnitz theorem. 5. Mean Value Theorems, Taylor's Theorem. 6. Extrema.	
	Group B: Algebra – I	
	1. Matrix operations, echelon form of matrices. 2. Solving system of linear equations. 3. Determinant, cofactor, inverse of a matrix. 4. Division Algorithm in Z, gcd of integers. 5. Primes and the Fundamental Theorem of Arithmetic, Congruence and Euler φ-function. 6. Polynomials, gcd of polynomials.	