COURSE OBJECTIVES AND COURSE OUTCOMES

S. Y. B. Sc. SEMESTER - III

MATHEMATICS PAPER - II

SUBJECT: ALGEBRA - III (USMT 302)

Sr. No.	Course Objectives	Course Outcomes
1)	Linear maps and matrices are reviewed and Rank and Nullity theorem and elementary matrices are introduced.	**Students will understand** Rank-Nullity theorem along with its proof, elementary matrices and the fact that invertible matrix is a product of elementary matrices, how to compute row space, column space, row rank and column rank of a matrix, the relationship between the rank of m x n matrix and rank of linear transformation from R^n to R^m, solutions of non-homogeneous system of Linear equations A X=B
2)	Determinant of a matrix is introduced via permutations and linear in each column vector	Determinant and its basic properties and related theorems, how to verify the linear dependence or independence of vectors in R^n using determinants and how to use Cramer's Rule to find solution of AX=B, when A is a non-singular square matrix
3)	Inner product on a vector space is defined and norm is defined in an inner product space.	Student understands that Inner product is a generalization of dot product in Eulidean space, angle between the vectors in an inner product space, orthogonal & orthonormal vectors along with Gram – Schmidt process of orthogonalization process, function spaces, how to compute norm besides knowing geometric interpretation of Pythagoras theorem

COURSE OBJECTIVES AND COURSE OUTCOMES

F. Y. B. Sc. SEMESTER - IV

MATHEMATICS PAPER - II

SUBJECT: CALCULUS - IV (USMT 402)

Sr. No.	Course Objectives	Course Outcomes
1)	Groups, subgroups and their properties	**Students will understand:** Definition and properties of groups & subgroups, standard examples of groups such as Z, R, Q, C under addition, Z*, R*, Q*, C* under multiplication, Zn, U(n), Sn, Dn, Klien's 4- group, GL(n, R), SL(n, R), etc, Abelian group, order of a group, order of an element, finite and infinite groups and centre of a group.
2)	Cyclic groups and its properties	Definition and examples of cyclic group, finite & infinite cyclic groups and their generators, results on cyclic group such as every cyclic group is Abelian, a finite cyclic group has a unique subgroup for each divisor of the order of the group, subgroup of a cyclic group is cyclic etc
3)	Lagrange's Theorem & Group homomorphism	Definition of coset and its properties, Lagrange's theorem and its consequences such as Fermat's Little theorem, Euler's theorem, A group that has no nontrivial subgroups is a cyclic group of prime order, concept of group homomorphism, group automorphism, kernel and related properties.