

COURSE OBJECTIVES AND COURSE OUTCOMES

S. Y. B. Sc. SEMESTER - III

MATHEMATICS PAPER - III

SUBJECT: DISCRETE MATHEMATICS (USMT 303)

Sr. No.	Course Objectives	Course Outcomes
1)	Permutations and Recurrence relations are introduced.	Students will understand Composition of permutations, few basic results such as every permutation is a product of disjoint cycles, every cycle is a product of transpositions, types of permutations such as odd and even permutations, rank and signature of a permutation and how to compute the same.
2)	Countable and uncountable sets are revised and Stirling Numbers of second kind, Applications of Second Form of Pigeonhole Principle is introduced.	Types of infinite sets as countable and uncountable, how to prove certain sets as countable and uncountable, ways of counting such as two way counting, addition and multiplication principle, sets of pairs, notation of Stirling Numbers with basic results and computation techniques, applications of pigeonhole principle to geometry, monotonic sequences etc.
3)	Binomial, Multinomial Theorem, Permutations and Combinations are revised and the concepts of Inclusion Exclusion Principle, Derangement, Euler Function are introduced.	Proof of Pascal and some other combinatorial identities, Problem solving techniques in Permutations, Circular Permutations, Combinations of sets and multi-sets, Inclusion Exclusion Principle, Derangements, Euler Function and their applications.

COURSE OBJECTIVES AND COURSE OUTCOMES

F. Y. B. Sc. SEMESTER - IV

MATHEMATICS PAPER - III

SUBJECT: DIFFERENTIAL EQUATIONS (USMT 403)

Sr. No.	Course Objectives	Course Outcomes
1)	Differential Equations, Types and Applications, Existence and Uniqueness Theorem with Applications, Lipschitz Function	Definition of Differential Equation, concepts like order and degree of Differential Equation, Conditions in Existence and Uniqueness Theorem, Examples based on these conditions, Lipschitz Function Definition, Types of Differential Equations such as Homogeneous, Non-homogeneous, Exact, Reducible to Exact, Linear, Reducible to Linear, Applications to orthogonal trajectories, population growth etc.
2)	Types of second order linear differential equations	Homogeneous and Non-homogeneous second order linear differential equations, Wronskian, Linear Dependence, Independence, General Solution, Complimentary Function, Particular Integral, Auxiliary Equation, Method of Undetermined Coefficients, Method of Variation of Parameters.
3)	Linear System of Ordinary Differential Equations	Existence and Uniqueness Theorem, Homogeneous Linear System of ODE in two variables, Wronskian of two solutions, Linearly Independent Solutions, General Solution, Explicit Solutions of Homogeneous Linear System of ODE with constant constant coefficients.