COURSE OBJECTIVES AND COURSE OUTCOMES

F. Y. B. Sc. SEMESTER - I

MATHEMATICS PAPER - II

SUBJECT: ALGEBRA - I (USMT 102)

Sr. No.	Course Objectives	Course Outcomes
1)	To acquaint students with knowledge of integers, divisibility & related results such as Euler theorem, Fermat's theorem, Wilson theorem etc.	After completing this topic, students will be able to explain: Statement of well-ordering principle, the principle of induction as its consequence, binomial theorem, how to find greatest common divisor of two integers using Euclidean algorithm, the relationship between gcd and lcm, standard results such as Euclid's lemma, prime number's are infinite etc along with applications of Euler's theorem, Fermat's theorem & Wilson's theorem
2)	To introduce students with the concept of functions & relations	After completing this topic, students will be able to explain: Concept of a function, its domain, co-domain, range, direct & inverse image of a set under a function, injective, subjective & bijective functions, the composition of functions and its inverse, binary operation & relation as a function, congruence as an equivalence relation and related results with proofs
3)	To acquaint students with the definition, theorems and sums associated with Polynomials.	After completing this topic, students will be able to explain: Definition of a polynomial over R, C, Q and Z, division algorithm for polynomials (without proofs): remainder theorem & factor theorem as its consequence, rational root theorem with proof, the concept of irreducible polynomials & that □p is an irrational number whenever p is prime, statement of the fundamental theorem of Algebra and its applications

COURSE OBJECTIVES AND COURSE OUTCOMES

F. Y. B. Sc. SEMESTER - II

MATHEMATICS PAPER - II

SUBJECT: DISCRETE MATHEMATICS (USMT 202)

Sr. No.	Course Objectives	Course Outcomes
1)	To give basic knowledge about Preliminary Counting.	After completing this topic, students will be able to explain: Finite and infinite sets, countable and uncountable sets, Addition and multiplication Principle, counting sets of pairs, two ways counting. Stirling numbers of the second kind and Pigeonhole principle simple and strong form and its applications to geometry
2)	To acquaint students with the examples related to Advanced Counting.	After completing this topic, students will be able to solve problems related to: Permutation, combination of sets and multi-sets, circular permutations, Binomial and Multinomial Theorem, Pascal identity, Principal of inclusion and exclusion and its applications, derangements, explicit formula for d_n and deriving formula for Euler's function $\varphi(n)$
3)	To acquaint students with the definition, theorems and examples associated with Permutations and Recurrence relation.	After completing this topic, students will be able to solve examples connected with: Permutation of objects, Sn, the composition of permutations, transpositions, signature of a permutation, even and odd permutations, cardinality of Sn, Recurrence Relations, homogeneous, non-homogeneous, linear, non-linear recurrence relation, obtaining recurrence relations of Tower of Hanoi, Fibonacci sequence, etc. in counting problems, solving homogeneous as well as non-homogeneous recurrence relations by using iterative methods, solving a homogeneous recurrence relation of second degree using algebraic method