FMCC 502 NUMBER THEORY (3-1-0)

Module-I (12 Hours)

Integer arithmetic, Divisibility, Division Algorithm, Greatest Common Divisor, Euclidian Algorithm, Linear Diophantine Equation,Prime Numbers, Fundamental Theorem of Arithmetic, Sieve of Eratosthenes, Dirichlet's Theorem on infinitely many primes in arithmetical progression, Introduction to Congruence, Basic Properties of Congruence, Linear Congruence and Chinese Remainder Theorem

Module-II (14 Hours)

Fermat's Little Theorem, Carmichael Numbers, Wilson's Theorem, Sum and Number of Divisors, Greatest Integer Function, Application to the Calendar, Euler's Theorem, Euler's Phi Function, Properties of phi Function, Order of an Integer Modulo n, Primitive Roots for Primes, Composite Numbers Having Primitive Roots, Theory of Indices.

Module-III (14 Hours)

Euler's Criterion, Legendre Symbol and Its Properties, Quadratic Reciprocity, Quadratic Congruences With Composite Moduli ,Perfect Numbers, Mersenne Primes and Amicable Numbers, Fermat Numbers, Solution of Nonlinear Diophantine Equations, Sum of Two Squares, Finite and Infinite Continued Fractions, Pell's Equation.

Recommended Texts:

1. **David M. Burton**, **Elementary Number Theory**, 6th Edition. TATA McGraw-HILL
   Chapters: 2,3(3.1,3.2),4,5(5.2,5.3),6(excluding 6.2),7,8,9,11,12,13,15.
2. **Kenneth H. Rosen**, Elementary Number Theory (and its applications) 5th Ed. Pearson Addition-Wesley.

Reference Books:

1. **H. Davenport**, Higher Arithmetic,7th Ed. Cambridge University Press
2. **G.H. Hardy and E.M. Wright**, An Introduction to the Theory of Numbers, 5th Ed. Oxford University Press.
3. **Koshy**, Elementary Number Theory with Applications, Academic Press.
4. **A. Weil**,Number Theory for Beginners, Springer.