Mathematics II

Program: Bachelor in Information Technology
Course Code: BSM102
Year : 1
Semester : II
Credit Hour: (3TH + 0PR)

Course Objectives:

1. **Permutation and Combination** **6hrs**
   Introduction, principle of counting, factorial notation, permutation, permutation of Objects alike, permutation with restrictions, circular permutation, combination, combination with restriction

2. **Infinite Series** **10hrs**
   Introduction, convergent test of infinite series, Direct comparison test, Limit comparison test, P-series Test , De'Alembert's ratio test , Cauchy root test, Alternative series test, Interval and radius of convergence

3. **Function of Several Variables** **9hrs**
   Introduction, Functions of two or more variables, partial differentiation (First order partial derivatives, Higher order partial derivatives), total derivatives, homogeneous functions, eulers theorem, maxima and minima of functions of several variables

4. **Differential Equations** **8hrs**
   Introduction, Order and degree of differential equations, solution of first order and first degree differential equations (separation of the variables, first order homogeneous differential equation, fist order linear differential equations, exact differential equation), second order liear differential with constant coefficient, initial and boundary value problems

5. **Functions of Complex Variable** **12hrs**
   Basic Definitions, functions of complex variable, algebra of complex numbers, properties of complex numbers, conjugate of a complex number, modulus of a complex number and its properties, arg and diagram, polar representation, square roots of a complex number, De'Moivre's theorem (statement only) and its application to find up to cube root of a complex number, limit and continuity an differentiation, cauchy-Riemann equations, analytical functions, harmonic functions, complex exponential trigonometric hyperbolic functions, statements of Taylor's theorem and Laurent's theorem

Text Books

1. Kreyszing , E. *Advanced Engineering Mathematics*, New Delhi : John wiley and sons Inc.

2. Thomas , G.B. Jr and Finney , R.L. *Calculus and Analytical Geometry* , New Delhi, Narosa Publishing House

Reference Books

1. Sastry, S.S. , *Engineering Mathematics- Volume II*, Prentice Hall of India

2. Grewal, B.S., *Higher Engineering Mathematics*, New Delhi, Khanna Publications