MATH-I

1. Introduction

Credits: 4-0-0

2. Course Outline

UNIT - I: Matrices
Basic concepts of matrices, multiplication of matrices by scalars, addition and multiplication of matrices, transpose, trace, determinant of a matrix, rank and inverse of a matrix, special matrices such as Hermitian, unitary matrices, system of linear equations, solution by Crammer's rule, existence and general properties of solutions, eigenvalues, eigenvectors, diagonalization of matrices, functions of matrices and Caley-Hamilton theorem.

UNIT - II: Elementary functions
Defnition and examples of sequences and series. Using these, study Trigonometric functions, logarithmic, exponential function, hyperbolic trigonometric functions

UNIT – III: Analytical geometry in 3-D
Cartesian co-ordinates in 3-D, distance between two points, direction cosines, direction ratios and their properties, equation of plane using given data, equation of straight line in different forms, image of a point with respect to a plane, distance between a point and a plane along a straight line, equation of sphere, circle.

UNIT – IV: Complex numbers, vector algebra
Algebra of complex numbers, polar form, argand diagram, triangle inequality, curves and regions in complex plane. Addition of vectors, dot product, cross product and their geometric interpre-tation, triple product, area, volume given in terms of vector products.

Reference:

1. **Linear Algebra, Kenneth Hoffman and Ray Kunze,pearson,1971**
2. **Linear Algebra: A geometric approach, S Kumaresan,Pre…hall of.. 2004**
3. **Calculas and analytic geometry, George Thomas & Ross Finney..1995**