**Course out come for B.Sc Mathematics**

**Course I: : ESSENTIALS OF MATHEMATICS:**

1: Complex Number Exploration Provide students with a set of complex numbers in both rectangular and polar forms. They will plot the complex numbers on the complex plane and identify their properties 2: Trigonometric Ratios Problem Solving Give students a set of problems that require the calculation of trigonometric ratios and their relations. Students will solve the problems using the appropriate trigonometric functions (sine, cosine, tangent, etc.) and trigonometric identities.

3: Vector Operations and Applications Provide students with a set of vectors in Cartesian form. Students will perform vector addition and subtraction operations to find the resultant vectors. They will also calculate the scalar and vector products of given vectors.

4: Statistical Measures and Data Analysis Give students a dataset containing numerical values. Students will calculate the mean, median, and mode of the data, as well as other statistical measures if appropriate (e.g., range, standard deviation). They will interpret the results and analyze the central tendencies and distribution of the data.

**Course2: ADVANCES IN BASIC MATHEMATICS**

1: Straight Lines Exploration Provide students with a set of equations representing straight lines in different forms, such as slopeintercept form, point-slope form, or general form. Students will explore the properties and characteristics of straight lines, including their slopes, intercepts, and point of intersection.

2: Limits and Differentiation Problem Solving Students will apply the concept of limits to solve various problems using standard limits. Encourage students to interpret the results and make connections to real-world applications, such as analyzing rates of change or optimizing functions.

3: Integration Exploration Students will explore the concept of integration as a reverse process of differentiation and apply basic methods of integration, such as the product rule, substitution method, or integration by parts. Students can discuss the significance of integration in various fields, such as physics and chemistry.

4: Matrices Manipulation Students will perform operations on matrices, including scalar multiplication, matrix multiplication, and matrix transpose. Students can apply their knowledge of matrices to real-world applications, such as solving systems of equations or representing transformations in geometry.

**COURSE 3: DIFFERENTIAL EQUATIONS:**

1. solve first order first degree linear differential equations

2. convert a non-exact homogeneous equation to exact differential equation by using an integrating factor.

. know the methods of finding solution of a differential equation of first order but not of first degree.

4. solve higher-order linear differential equations for both homogeneous and non-homogeneous, with constant coefficients.

5. understand and apply the appropriate methods for solving higher order differential equations.

**COURSE 4: ANALYTICAL SOLID GEOMETRY**

1. understand planes and system of planes

2. know the detailed idea of lines

3. understand spheres and their properties

4. know system of spheres and coaxial system of spheres

5. understand various types of cones

**ABSTRACT ALGEBRA**

1. acquire the basic knowledge and structure of groups, subgroups and cyclic groups.

2. get the significance of the notation of a normal subgroups.

3. get the behavior of permutations and operations on them.

4. study the homomorphisms and isomorphisms with applications.

5. understand the ring theory concepts with the help of knowledge in group theory and to prove the theorems.

6. understand the applications of ring theory in various fields.

**COURSE-IV , REAL ANALYSIS :**

1. get clear idea about the real numbers and real valued functions.

2. obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence/ series.

3. test the continuity and differentiability and Riemann integration of a function.

4. know the geometrical interpretation of mean value theorems

**COURSE-V,LINEAR ALGEBRA:**

1. understand the concepts of vector spaces, subspaces, basis, dimension and their properties

2. understand the concepts of linear transformations and their properties

3. understand the elementary properties of matrices and rank of matrix

4. apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods Course Syllabus

Course-6B: Multiple integrals and applications of Vector calculus :

1. Learn multiple integrals as a natural extension of definite integral to a function of two variables in the case of double integral / three variables in the case of triple integral.

2. Learn applications in terms of finding surface area by double integral and volume by triple integral.

3. Determine the gradient, divergence and curl of a vector and vector identities.

4. Evaluate line, surface and volume integrals.

5. under stand relation between surface and volume integrals (Gauss divergence theorem), relation between line integral and volume integral (Green’ s theorem), relation between line integral and volume integral (Green’ s theorem), relation between line and surface integral (Stokes theorem)

**Course-7B: Integral transforms with applications:**

1. Evaluate Laplace transforms of certain functions, find Laplace transforms of derivatives and of integrals.

2. Determine properties of Laplace transform which may be solved by application of special functions namely Dirac delta function, error function, Bessel function and periodic function.

3. Understand properties of inverse Laplace transforms, find inverse Laplace transforms of derivatives and of integrals.

4. Solve ordinary differential equations with constant/ variable coefficients by using Laplace transform method.

5. Comprehend the properties of Fourier transforms and solve problems related to finite Fourier transforms.