Mathematics

B. Sc. I year

Algebra: This course aims to provide a first approach to the subject of Algebra, which is one of the basic pillars of modern mathematics.

1. The Course on Algebra deals with advance topics on matrices, rank, eigen values.
2. It deals with homogeneous and non-homogeneous system, solutions of cubic and bi-quadratic equations.
3. Students learn to analyze and solve a linear system of equations.
4. Important characteristics of matrices such as its four fundamentals subspaces, rank, determinant, eigen values and eigen vectors, different factorizations etc. to find the inverse of a matrix by Cayley-Hamilton theorem.

5. Important concepts of vector spaces such as independence, basis, dimensions, orthogonally etc.

6. The focus of the course will be the study of certain structures called groups, rings,fields and some related structures.

Trigonometry: Trigonometry is important for surveying and navigation and describing the phenomena that are periodic in nature.

1. Students will learn about the De Movire‟s Theorem and its applications
2. Students will learn how to Derive Gregory series and Summation of series
3. Students will learn about the real and imaginary parts of a circular and hyperbolicfunctions of a complex variable

Paper- II Calculus

Calculus: The study of calculus is normally aimed at giving students the "mathematical sophistication" to relate to such more advanced work. After completing this course the learner should be able to

1. Deal with some important concept of limit, continuity, differentiability of functions. ·
2. Find the higher order derivative of the product of two functions. ·
3. Expand a function using Taylor‟s and Maclaurin‟s series. ·
4. Conceive the concept of asymptotes and obtain their equations. ·
5. Learn about partial derivatives and its applications. ·
6. Learn the area under a given curve, length of an arc of a curve when the equationsare given in parametric and polar form. ·
7. Definite Integrals and Transcendental Functions.
8. Learn the area and volume by applying the techniques of double and triple integrals
9. Deal with tracing of curves, reduction formulae, rectification, quadrature and volume of solids of revolution.
10. Use graphical and numerical evidence to estimate limits, and to identify situationswhere limits fail to exist..

11.Learn about first-and second order differential equations.

12.Learn Rules for powers (including exponent +1) and exponentials, the six trigonometric functions and the inverse sine, tangent and secant.

13.Use integration to find the area under curves and the area between curves.

Paper-III Vector Calculus &Geometry

Vector Calculus: After completing this course the learner should be able to ·

1Represent vectors analytically and geometrically, and compute dot and cross products of two , three and four vectors .

2. Analyze vector functions to find derivatives, tangent lines, integrals, arc length, and curvature, · Compute limits and derivatives of functions of 2 and 3 variables, ·

3. Apply derivative concepts to find tangent lines to level curves and to solve optimization problems, ·

4. Evaluate double and triple integrals for area and volume, ·

5. Differentiate vector fields · Determine gradient vector fields and find potential functions · 6.Analyse the fundamental theorem of calculus and see their relation to the fundamental theorems of calculus in calculus,

7. leading to the more generalized version of Green"s, Gauss, and Stokes' theorem.

Geometry :

1. Geometry is important for the students to knowledge about the concepts of lines,points, shapes, size, relative position of figures, and properties of space.

2. To make students understand about the equation plan using two point forms, threepoint form

3. Laws of point that is equidistant to two given points

4. Students learn that how to determine equation of Sphere, Cone, Cylinder straight line,co-axial limiting point of sphere etc.

B. Sc. II year

Paper- I Advanced Calculus: Advanced Calculus is of outmost importance because of its huge applicability. Calculus is not restricted to mathematics and analysis, it is used pretty much everywhere - Physics, Chemistry, Economics, Biology, Engineering, Dynamic systems and so much more.

1. To have full knowledge of calculus involving the fundamental tools such as continuity and differentiability of two variables.
2. To understand the maximum and minimum behavior of a function of two variables.
3. To understand different indeterminate form of limit.
4 This course aims to introduce the notion of differentiation and integration in general, and sets, functions (and their graphs), limits and continuity of functions in particular.
5. Techniques of derivatives and integration and solving various examples to grasp theidea of each technique are the main objective this course aims to deliver.
6. Calculate the limit of a function at a point numerically and algebraically using appropriate techniques including L"Hospital" rule.
7. Find points of discontinuity for functions and classify them.
8. Understand the consequences of the intermediate value theorem for continuous functions.

Paper- II Differential Equations

1. To make them learn Power series method to solve differential equation
2. Solve Ordinary partial differential equation
3. Select the appropriate method for any particular problem
4. Assess the reliability of the partial differential technique Ordinary differential equations
5. Ordinary differential equations have important applications and are a powerful tool inthe study of many problems in natural science and in technology.
6. They are extensively employed in mechanics, astronomy, physics & in many problems of Chemistry and Biology.

Paper – III Mechanics:

In mechanics students study statics & dynamics and learn about Newton"s Law of motion, Projectiles, Work Power and Energy. Students also learn about simple harmonic motion null lines, equilibrium of coplanar forces acting on rigid body, moments and parallel forces.

1. The primary purpose of the study is to develop the capacity to predict the effect of force & motion while carrying out the creative design function of science.
2. This capacity requires more than a mere knowledge of physical & mathematical principles of mechanics.
3. One of primary objectives in a mechanics course is to help the student develop theability to visualize which is so vital to problem formulation maximum progress is made when the principles & their limitations are learned together with in the context of us application.
4. . Newton"s Law of Mechanics makes it possible to reduce the description of motion of mass points or solid bodies to solve ordinary differential equations.

B. Sc. III year

Paper- I Analysis: Real analysis is an area of analysis that studies concepts such as sequences and their limits, continuity, differentiation, integration and sequence of functions, focuses on the real numbers, often including positive and negative infinity to form the extended real line.

1. Students will be able to work with variety of functions.
2. Students will easily understand the relationship between the derivative and theintegral.
3. Enhance the knowledge of partial derivative.
4. Student will learn how to work with the polynomial functions.

Students get theknowledge to determine analyticity of a function.

5. Subsets of a metric space, open, closed, connected, bounded, totally bounded andcompact sets.
6. Function on a metric space, discontinuous, continuous, or uniformly to continuous
7. Students will be able to understand about the events which can be independent, exhaustive & exclusive.
8. They will learn the difference between discrete and continuous random variables.
9. They will also get rough idea about an occurrence and outcomes.
10. To understand how to solve the questions with the help of expectations and moments generating functions.

Paper- II Abstract Algebra

Abstract Algebra: A major objective is to introduce students to the language and precision of modern abstract algebra. This means that the course will be proof-based, in the sense that students will be expected to understand, construct, and write proofs.

1. The focus of the course will be the study of certain structures called groups, rings, fields and some related structures.
2. Abstract algebra gives to student a good mathematical maturity and enables to build mathematical thinking and skill.
3. To educate about Ring, Field, Ideals, Modules etc and its applications
4. Learn about Vector Space, Rational Canonical form , Norms etc.
5. Studies of Polynomial Rings and applies polynomials to the construction and analysis of error- correcting and error-detecting codes.

Paper-III Discrete Mathematics : Discrete mathematics is very useful branch of mathematics in computer Science, digital computing, Data programming, and data communication in modern cosmos.

1. Simplify and evaluate basic statements including compound statements, implications,inverses, converses and contra positives using truth tables and properties of logic

2. Apply the operations of sets and venn diagrams to solve applied problems using theprinciple of inclusion-exclusion

3. Evaluate Boolean functions and simplify expression using the properties of Booleanalgebra, apply Boolean algebra to circuits and gating networks

4. To impart the basic principles of Boolean algebra, logic, set theory Permutations & Combinations and graph Theory. Be able to understand logical arguments and logical constructs

5. The course will extend students logical and mathematical maturity and ability to deal with abstraction and introduce most of the basic terminologies used in computer science and applications.

6. Determine the domain and range of a discrete or non-discrete function, graph functions, identify one-to-one functions, perform the composition of functions, find graphthe inverse of a function, and apply the properties of functions to application problems.