Department of Mathematics	
B.Sc.	
Sr. No.	**Program Specific Outcome** **By the end of this program, the students will be able to:**
PSO 1	Analyze basic concepts of Mathematics.
PSO 2	Discover applications of pure and applied subjects.
PSO 3	Solve problems in competitive related to logic and aptitude.
PSO 4	Form and find a solution through mathematical modeling related to real world phenomenon.
PSO5	Eligible for specific government post related with mathematics.

Program Name – B.Sc. I	
Course Name/ paper	**Course Outcome** **By the end of each of the following course, the students will be able to:**
Paper I – Differential Calculus	CO 1: Understand De Moivre's Theorem and its applications. CO 2: Solve hyperbolic equations using its properties. CO 3: Find successive differentiation and its applications. CO 4: Analyze concept of partial differentiation with some properties and its applications to maxima and minima.
Paper II - Calculus	CO 1: Apply MVT to study properties of functions CO2: Find Taylors and Maclaurins series expansion of functions. CO 3: Understand L'Hospital Rule and its applications to evaluate limits. CO 4: Discover properties of continuous function.
Paper III – Differential Equations	CO 1: Formation of differential equations. CO2: Solve first order differential equations and its application to find orthogonal trajectories. CO 3: find a solution of first order higher degree equations. CO 4: Solve linear differential equations with constant coefficients and homogeneous differential equations.
Paper IV – Higher order ordinary differential equations and partial order differential equations	CO 1: Apply different methods to solve second order differential equations. CO 2: Solve total differential equation. CO3: Solve ordinary simultaneous differential equations. CO4: Form, Categorize partial differential equations and solve PDE using Charpits method.

Practical Course: CCPM –I	CO 1: Apply Leibnitz's theorem, Euler's theorem and De Moivre's Theorem to solve problems. CO 2: Analyse Maxima and Minima of functions of two variables and trace curves in polar form. CO 3: Solve problems related to radius of curvature. curve, parametric and polar curve. CO 4: Apply Lagrange's Mean Value theorem, Cauchy's Mean Value theorem and Hospital Rule.

Program Name – B.Sc. II	
Course Name/ paper	**Course Outcome** **By the end of each of the following course, the students will be able to:**
Paper V Analysis- I	CO 1: Analyze functions and its properties. CO 2: Apply mathematical induction to derive specific formulae related to integers. CO 3: Understand the basic ideas countibility of sets. CO 4: Analyse order properties of real numbers, completeness property and the Archimedean property.
Paper VI Algebra- I	CO 1: Understand properties of matrices. CO 2: Solve System of linear homogeneous equations and linear non-homogeneous equations. CO 3: Extract eigen values and eigen vectors. CO 4: Verify different binary structures and their properties.
Paper VII – Real Analysis II	CO 1: Understand the concepts and different structures, properties of sequence and subsequence of real numbers . CO 2: Make use of different properties to check the convergence of sequence. CO 3: Analyze series of real numbers with properties. CO 4: Make use of different type test to study convergence of series.
Paper VIII Algebra - II	CO 1: Make use of Lagrange's theorem to study subgroup. CO 2: Make use of Fermat's theorem to find remainder. CO 3: Explore properties of normal subgroups, factor group. CO 4: Form homomorphism and isomorphisms.

Practical Course II CCPM - II	CO 1: Solve problems on Eigen values, Eigen vectors and Cayley Hamilton theorem. CO 2: Analyse functions and apply Mathematical Induction. CO 3: Discover convergence of series using Comparison test Cauchy's root test, D' Alembert's ratio test and Rabbi's test. CO 4: Understand group, cyclic subgroup, permutation group and homomorphism and Kernel.
Practical Course III CCPM - III	CO 1: Understand basic concepts in scilab programming and use Scilab as a calculator. CO 2: Use looping structures in Scilab programming. CO 3: Solve linear equations by Gauss Elimination, Gauss Jordan methods. CO 4: Solve linear differential equations by Euler, Euler modified, Runge Kutta 2nd and 4th order methods.

Program Name – B.Sc. III	
Course Name/ paper	**Course Outcome** **By the end of each of the following course, the students will be able to:**
Paper IX – Mathematical Analysis	CO 1: Understand and learn about Riemann integration. CO 2: Find Riemann integral of special types of functions. CO 3: Solve improper integrals of different types. CO 4: Find Fourier series expansion of given functions over given interval.
Paper X– Algebra	CO 1: Understand concepts of group and rings. CO 2: Analyze the different structures of Groups and Rings. CO 3: Understand the different fundamental theorems and its applications. CO 4: Understand the concepts of polynomial rings, unique factorization domain.
Paper XI – Optimization Techniques	CO 1: Understand range of operation research models and techniques, which can be applied to a variety of industrial and real-life applications. CO 2: Formulate and apply suitable methods to solve problems. CO 3: Identify and select procedures for various sequencing, assignment, transportation problems. CO 4: Identify and select suitable methods for various games.

Paper XII – Integral Transforms	CO 1: Understand the concept of Laplace Transform. CO 2: Apply properties of Laplace Transform to solve differential equations. CO 3: Understand the relation between Laplace and Fourier Transform. CO 4: Apply infinite and finite Fourier Transform to solve real life problems.
Paper XIII – Metric Spaces	CO 1: Form different types of metric space. CO 2: Understand the basic concepts of Open sets, Closed sets and connectedness, completeness and compactness of metric spaces. CO3: Define homeomorphism to study properties of metric spaces. CO 4: Apply knowledge to study Banach and Hilberts spaces.
Paper XIV – Linear Algebra	CO 1: Form different vector spaces and subspaces. CO 2: Form different norm linear space. CO 3: Analyse the concept of linear transformation and connection between linear transformation and matrices. CO 4: Apply concepts of eigenvalues, eigen vectors and its connection with real life situations.
Paper XV – Complex Analysis	CO 1: Understand basic concepts and theorems related to functions of complex variable, its differentiability and integrability. CO 2: Form an analytic functions. CO 3: Evaluate complex integration and differentiations. CO 4: Evaluate real integrals using Cauchy residue theorems.
Paper XVI – Discrete Mathematics	CO 1: Understand classical notations of logic: implications, equivalence, negation, proof by contradiction, proof by induction, and quantifiers. CO 2: Apply notions in logic in other branches of Mathematics. CO 3: Analyze elementary algorithms: searching algorithms, sorting, greedy algorithms, and their complexity. CO 4: apply concepts of graphs and trees to tackle real situations.
Practical Course IV CCPM – IV	CO 1: Use Graphical method for linear programming problems. CO 2: Solve Transportation Problems. CO 3: Solve Assignment Problems. CO 4: Solve game strategies problems.

Practical Course V CCPM – V	CO 1: Find Laplace transforms of elementary functions. CO 2: Evaluate integrals using properties of Laplace transform. CO 3: Find Laplace transforms of integrals and periodic functions. CO 4: Find Inverse Laplace by using standard results.
Practical Course VI CCPM – VI	CO 1: Understand basic Python programming. CO 2: Solve systems of linear algebraic equations using Python programming. CO 3: Solve Initial Value Problems using Python programming. CO 4: Analyze data using Python Libraries.
Practical Course VII CCPM – VII	CO 1: Read, collect, understand the culture of Mathematics. CO 2: Understand historic development of mathematics. CO 3: Understand the new concept of mathematics, innovations. CO 4: Analyze relevance of Mathematics.