

## Program Name: - B.Sc. Mathematics 2023-2024

Programme Out Come	
<b>PO1</b>	Scientific temper will be developed in Students
<b>PO2</b>	Students will acquire basic Practical skills like scilab,python software & Technical knowledge along with domain knowledge of different subjects in the science stream.
<b>PO3</b>	Students will become employable; they will be eligible for career opportunities in Industry, or will be able to opt for entrepreneurship.
<b>PO4</b>	Students will possess basic subject knowledge required for higher studies, professional and applied courses like Management Studies, Law etc.
<b>PO5</b>	Students will be aware of and able to develop solution oriented approach towards various Social and Environmental issues
Programme Specific Out Come	
<b>PSO1</b>	A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations , terminology.
<b>PSO2</b>	A student should get adequate exposure to global and local concerns that explore them many aspects of mathematical sciences.
<b>PSO3</b>	Student is equipped with mathematical modeling ability, problem solving skills, creative talent and power of communication necessary for various kinds of employment.
<b>PSO4</b>	Student should be able to apply their skills and knowledge that is translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion
<b>PSO5</b>	Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.
Course Out Come	
<b>B.Sc.-I Mathematics Sem-I Paper-I Calculus</b>	By the end of course, the student will be able to: CO1. Evaluate the limit and examine the continuity of a function at a point. CO 2 Understand the consequences of mean value theorem for differential function CO 3. Apply Leibniz's theorem to obtain higher derivatives of product of two differentiable functions.
<b>B.Sc.-I Mathematics Sem-IPaper-II (Differential Equation)</b>	CO 1. Understand types of differential equations. CO 2. Solve different types of ordinary differential equations. CO 3. Understand application of differential equations.
<b>B.Sc.-I Mathematics Sem-IIPaper-III Multivariable Calculus</b>	CO 1.1. Learn conceptual variation while advancing from one variable to several variables in calculus. CO2. Set up and solve optimization problems involving several variables. CO3. Learn the concept of Jacobian of a transformation.
<b>B.Sc.-I Mathematics Sem-IIPaper-IV Basic Algebra</b>	CO1. 1.Use fundamental concepts in Mathematics like sets, relation and functions. CO2. Use fundamental concepts in Number theory. CO3. Solve examples on congruence. CO4. Determine nth roots of unity. CO5. Understand various properties of hyperbolic functions.

<b>B.Sc.-II Mathematics Sem-III Elements of Differential Equations</b>	CO1: identify types of higher order ordinary differential equations. CO2: solve different types of higher order ordinary differential equations. CO3: understand geometrical interpretation of simultaneous and total differential equations.
<b>B.Sc.-II Mathematics Sem-III Numerical Methods</b>	CO1: find numerical solutions of algebraic, transcendental and system of linear equations. CO2: learn about various interpolating methods to find numerical solutions. CO3: find numerical solutions of integration and ODE by using various methods. CO4: apply various numerical methods in real life problems.
<b>B.Sc.-II Mathematics Sem-IV Vector Calculus</b>	CO1: understand and evaluate the concepts of gradient, divergence and curl of point functions in terms of cartesian co-ordinate system. CO2: understand and evaluate different types of line, surface & volume integrals and the two integral transformation theorems of Gauss and Stokes.
<b>B.Sc.-II Mathematics Sem-IV Integral Calculus</b>	CO1: understand special functions. CO 2: understand types of multiple integrals. CO 3: apply special functions in applications. CO 4: apply multiple integrals in real life problems.
<b>B.Sc.-III Mathematics Sem-V DSE – E9 Mathematical Analysis</b>	CO1. The integration of bounded function on a closed and bounded interval CO2. Some of the families and properties of Riemannintegrablefunctions CO3. The applications of the fundamental theorems of integration CO4. Extension of Riemann integral to the improper integrals when either the interval ofintegration is infinite or the integrand has infinite limits at a finite number of pointson theinterval of integration CO5. The expansion of functions in Fourier series and half range Fourier series
<b>B.Sc.-III Mathematics Sem-V DSE – E10 Abstract Algebra</b>	CO1. Basic concepts of group and rings with examples CO2. Identify whether the given set with the compositions form Ring, Integral domain or field. CO3. Understand the difference between the concepts Group and Ring. CO4. Apply fundamental theorem, Isomorphism theorems of groups to prove these theorems for Ring. CO5. Understand the concepts of polynomial rings, unique factorization domain.
<b>B.Sc.-III Mathematics Sem-V DSE – E11 Optimization Techniques</b>	CO1. provide student basic knowledge of a range of operation research models and techniques, which can be applied to a variety of industrial and real life applications. CO2. Formulate and apply suitable methods to solve problems. CO3. Identify and select procedures for various sequencing, assignment, transportation problems. CO4. Identify and select suitable methods for various games. CO5. To apply linear programming and find algebraic solution to games.
<b>B.Sc.-III Mathematics Sem-V DSE – E12 Integral Transforms</b>	CO1. Understandconcept of Laplace Transform. CO2. Apply properties of Laplace Transform to solve differential equations. CO3. Understand relation between Laplace and Fourier Transform. CO4. Understand infinite and finite Fourier Transform. CO5. apply Fourier transform to solve real life problems

<b>B.Sc.-III Mathematics Sem-VI</b>  <b>DSE – F9 Metric Spaces</b>	CO1. Acquire the knowledge of notion of metric space, open sets and closed sets. CO2. Demonstrate the properties of continuous functions on metric spaces, CO3. Apply the notion of metric space to continuous functions on metric spaces. CO4. Understand the basic concepts of connectedness, completeness and compactness of metricspaces, CO5. appreciate a process of abstraction of limits and continuity to metric spaces,
<b>B.Sc.-III Mathematics Sem-VI</b> <b>DSE – F10 Linear Algebra</b>	CO1. Understand notion of vector space, subspace, basis. CO2. Understand concept of linear transformation and its application to real life situation. CO3. Work out algebra of linear transformations. CO4. Appreciate connection between linear transformation and matrices. CO5. Work out eigen values, eigen vectors and its connection with real life situation.
<b>B.Sc.-III Mathematics Sem-VI</b> <b>DSE – F11 Complex Analysis</b>	CO1. Learn basic concepts of functions of complex variable. CO2. Be introduced to concept of analytic functions. CO3. Learn concept of complex integration and basic results thereof. CO4. Be introduced to concept of sequence and series of complex variable. CO5. Learn to apply concept of residues to evaluate certain real integrals.
<b>B.Sc.-III Mathematics Sem-VI</b> <b>DSE – F12 Discrete Mathematics</b>	CO1. Use classical notions of logic: implications, equivalence, negation, proof by contradiction, proof by induction, and quantifiers. CO2. Apply notions in logic in other branches of Mathematics. CO3. Know elementary algorithms : searching algorithms, sorting, greedy algorithms, and their complexity. CO4. Apply concepts of graph and trees to tackle real situations. CO5. Appreciate applications of shortest path algorithms in computer science.