

**Programme Outcomes, Programme Specific Outcomes (PSO) & Course Outcomes (CO)
of B.Sc. Mathematics: (Department of Mathematics)**

Program Outcome:

1. Enabling student to develop a positive attitude towards mathematics as an interesting and valuable subject of study.
2. A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.
3. Ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution.
4. Introduction to various courses like Matrices, Group theory, Riemann integration, Graph theory, number theory.
5. Enhancing students' overall developments and to equip them with mathematical modeling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment.
6. Ability to pursue advanced studies and research in pure and applied mathematical science.

Programme Specific Outcome of B.Sc. Mathematics

1. Think in critical manner.
2. Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
3. Formulate and develop mathematical arguments in a logical manner.
4. Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the students from the given courses.
5. Understand, formulate and use quantitative models arising in social science, Business and other contexts.

Course Outcomes:

DSC1:- BMDSC1T:Algebra- I and Calculus-I	CO1. To learn basic matrix algebra and method to find solutions to system of linear equations. CO2. To learn Symmetric and skew symmetric matrices, Hermitian, Skew-Hermitian matrices. CO3. Prove Cayley- Hamilton theorem, Verification of Cayley Hamilton Theorem and Determination of A^{-1}, A^2, A^3 . CO4. To learn Standard formula for n^{th} derivative of the functions
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	<p>$(ax + b)^n$, $\log(ax+b)$, e^{ax} ,$\sin(ax+b)$,$\cos(ax+b)$, $e^{ax} \sin(bx+c)$, $e^{ax} \cos(bx+c)$,Leibnitz's Theorem and Applications.</p> <p>CO5.Learn the basic skills of successive differentiation</p> <p>CO6. To Prove Standard theorems including .Rolle's Theorem ,Lagrange's and Cauchy's Mean Value Theorem, Taylor's and Maclaurin's Series and related examples.</p>
<p>DSC2:-BMDSC2T: Real analysis-I and Calculus-II</p>	<p>CO1. Describe fundamental properties of the real numbers that lead to the formal development of real analysis.</p> <p>CO2.Demonstrate an understanding of limits and how they are used in sequences, series, Construct rigorous mathematical proofs of basic results in real analysis.</p> <p>CO3. To study concept of sequence and series and hence find sum of infinite terms with different methods.</p> <p>CO4.Demonstrate an understanding of limits and how they are used in sequences, series, Construct rigorous mathematical proofs of basic results in real analysis</p> <p>CO5.Understand the basic ideas of convergence and divergence of sequences and series and the methods used for their tests. Basic knowledge of summation of series.</p> <p>CO6.To Study PolarCo-ordinate, Angle between the radius vector and the tangent to the curve, length of the perpendicular from the pole to the tangent to the curve, pedal equation of the curves.</p>
<p>DSC3:-BMDSC3T: Algebra-II, Real analysis-II and Calculus-III</p>	<p>CO1 To learn fundamental properties and mathematical tools such as closure, identity, inverse and generators.</p> <p>CO2.To learn to compare two different algebraic structures and study transfer of properties inbetween these structures through homomorphism and isomorphism</p> <p>CO3.To study algebraic structure 'Groups' in detail which is useful in study of Rings, Modules, Algebraic topology, Analysis</p> <p>CO4.Develop an understanding of Order of an element of a group, order of a group, Cyclic group, coset decomposition of a group leading to the proof of Lagrange's theorem on finite groups and it's applications.</p> <p>CO5.Understand Integrability and theorems on integrability.</p>

	<p>CO6. To learn Polar Co-ordinate , Angle between the radius vector and the tangent to the curve , length of the perpendicular from the pole to the tangent to the curve , pedal equation of the curves.</p>
<p>DSC4:-BMDSC4T: Differential Equation</p>	<p>CO1. .Compute all the solutions of second and higher order linear differential equations with constant coefficients, linear equations with variable coefficients. Solve simultaneous linear equations with constant coefficients and total differential equations.</p> <p>CO2. Find a solution of differential equations of the first order and of a degree higher than the first by using methods of solvable for p, x and y.</p> <p>CO3. Solve simultaneous linear equations with constant coefficients and total differential equations.</p> <p>CO4. To learn Formulation of Partial Differential Equations, Lagrange's equation $Pp + Qq = R$,</p> <p>CO5. To understand the concept of Ordinary differential Equations in more than two variables.</p> <p>CO6.: Introduction of first order Partial Differential Equations, Learn methods to solve first order Partial Differential Equations.</p>
<p>DSC5B:- BMDSE5BT: Graph Theory-I</p>	<p>CO1. To introduce the Basic concept of Graphs, which is an important tool for Mathematical Modeling.</p> <p>CO2. Explain Sub graphs, Spanning and Induced Sub graphs, the shortest path problems, Bipartite graphs, Characterization of Bipartite Graphs in terms of its cycles.</p> <p>CO3. To learn Matrix Representation of Graph and connectivity, Vertex Connectivity and Edge Connectivity, Separability, Whitney's Inequality: $\kappa(G) \leq \lambda(G) \leq \delta(G)$, Menger's Theorem.</p> <p>CO4. To learn Cut vertex ,Bridge, Block, Trees, Spanning Trees, Rooted and Binary Trees . Properties of Trees and Characterizations, Forests, centres and Centroids.</p> <p>CO5. To study the concept of trees in detail.</p>

<p>SEC5B:-BMSEC5B: Laplace Transforms</p>	<p>CO1. To learn the evaluation of Laplace transform of different types of functions, their derivatives and integrations.</p> <p>CO2. To learn the evaluation of Inverse Laplace transform of functions, their derivatives and integrations, and to learn application of Convolution theorem.</p> <p>CO3. : To learn to apply Laplace Transform to solve Ordinary Differential equations with constant coefficients.</p>
<p>DSC6B:- BMDSC6BT: Graph Theory-II</p>	<p>CO1.Introducing The Königsberg Bridge Problem, Eulerian Graphs and Travelling Salesman Problem, Applications.</p> <p>CO2. Introduction, Plane and Planar Graphs, Euler’s Formula, Outer planar Graphs, Kuratowski’s Theorem, other Characterization of planar Graphs, Crossing Numbers</p> <p>CO3.To learnColorability Coloring of a Graph, Chromatic Number of some of the familiar graphs, Four Color Conjecture</p> <p>CO4. To study Directed Graphs and its applications</p>
<p>SEC6B:-BMSEC6B:</p>	<p>CO1.Understand the concept of fourier Series which gives the idea of expanding the sectional continuous functions in to infinite series.</p> <p>CO2.Derivation of the Fourier transform and the Fourier inverse transform. The Fourier cosine transformation and the Fourier sine transformation.</p>