


## Faculty of Science


### B.Sc. (Maths Group) : Three Year Graduation Programs

#### Programme Outcome (PO)

Programme Name	Programme outcome
B.Sc. (Maths group)	<p style="text-align: center;">PO1</p> <p>The undergraduate programme in Mathematics / Physics / Chemistry is aimed at providing the students necessary inputs so as to set forth the task of bringing about new and innovative ideas/concepts so that the formulated model curricula in Mathematics / Physics / Chemistry becomes in tune with the changing scenario and incorporate new and rapid advancements and multi-disciplinary skills, societal relevance, global interface, self-sustaining and supportive learning.</p>
	<p style="text-align: center;">PO2</p> <p>It is desired that undergraduate programme in Mathematics / Physics / Chemistry besides teaching the basic concepts of Mathematics / Physics / Chemistry should in addition have broader vision for students so that the students therefore be exposed to societal interface of Mathematics / Physics / Chemistry and the role of Mathematics / Physics / Chemistry in the development of physical, chemical and mathematical sciences &amp; technologies.</p>
	<p style="text-align: center;">PO3</p> <p>The students will be able to think critically and take informed decisions after identifying the accuracy and validity of their assumptions and ideas from intellectual, organizational, and personal perspectives.</p>
	<p style="text-align: center;">PO4</p> <p>The students will be able to communicate effectively through speaking, reading, writing and listening clearly in one Indian language and thereby express themselves to the world by connecting with different ideas, books, people, media and technology.</p>
	<p style="text-align: center;">PO5</p> <p>The students will be able to demonstrate compassionate social concern and act with awareness of issues to contribute in civil life by volunteering impartially towards national development and thereby deliver effective citizenship.</p>
	<p style="text-align: center;">PO6</p> <p>The students will be able to interact socially and stimulate views, reconcile disagreements and help reach consensual conclusions.</p>

  
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Programme Name		Programme outcome
	PO7	The students will be able to recognize the issues of environmental perspectives and appreciate sustainable development for long term environmental sustainability
	PO8	The students will be able to engage themselves in life-long self-determining and learning in the comprehensive background of socio-technological changes for continued self-directed and life-long learning.
	PO9	Apply the knowledge of Life Science, Physical and Chemical Science, Mathematics, statistics, and humanities for the attainment of solutions to the problems that come across in our day-to-day life/activities.
	PO10	Capability to apply, analyze and evaluate evidence, arguments, claims, policies, beliefs and theories on the basis of experiential evidence.
	PO11	Identify and analyse the problem and formulate solutions for problems using the principles of mathematics, natural sciences with appropriate consideration for the public health, safety and environmental considerations.
	PO12	Life-Long Learning Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PO13	Commitment to principles, codes of conduct and social responsibility in order to behave consistently with personal respect. Acquire the responsibility to contribute for the personal development and for the development of the community. Respect the ethical values, social responsibilities and diversity.
	PO14	Function as an individual, and as a member or leader in diverse teams and in multidisciplinary settings. Become an entrepreneur by acquiring technical, communicative, problem solving, intellectual skills.


  
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**Department of Mathematics**  
**B.Sc. (Maths Group) : Three Year Graduation Program**  
Programme Specific Outcome (PSO)

Programme Name	Programme Specific Outcome
B.Sc. (Maths group)	PSO1 The students after the completion of this programme will be able to understand and apply the fundamentals of Algebra & Trigonometry.
	PSO2 The students after the completion of this programme will be able to understand and apply the fundamentals of Calculus.
	PSO3 The students after the completion of this programme will be able to understand and apply the fundamentals of Vector Analysis & Geometry.
	PSO4 The students after the completion of this programme will be able to understand and apply the fundamentals of Advanced Calculus.
	PSO5 The students after the completion of this programme will be able to understand and apply the fundamentals of Differential Equations.
	PSO6 The students after the completion of this programme will be able to understand and apply the fundamentals of Mechanics.

  
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Programme Name	Programme Specific Outcome
PSO7	The students after the completion of this programme will be able to understand and apply the fundamentals of Analysis.
PSO8	The students after the completion of this programme will be able to understand and apply the fundamentals of Abstract Algebra.
PSO9	The students after the completion of this programme will be able to understand and apply the fundamentals of Advanced Discrete Mathematics.
PSO10	The students after the completion of this programme will be able to understand and apply the fundamentals of Mechanics, Oscillation and Properties of Matter.
PSO11	The students after the completion of this programme will be able to understand and apply the fundamentals of Electricity, Magnetism and Electromagnetic Theory.
PSO12	The students after the completion of this programme will be able to understand and apply the fundamentals of Thermodynamics, Kinetic Theory and Statistical Physics.
PSO13	The students after the completion of this programme will be able to understand and apply the fundamentals of Wave, Acoustics and Optics.
B.Sc. (Maths group)	PSO14 The students after the completion of this programme will be able to understand and apply the fundamentals of Relativity, Quantum Mechanics, Atomic, Molecular and Nuclear Physics.
	PSO15 The students after the completion of this programme will be able to understand and apply the fundamentals of Solid State Physics, Solid State Devices and Electronics.

  
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Programme Name		Programme Specific Outcome
	PSO16	The students after the completion of this programme will be able to understand and apply the fundamentals of Inorganic Chemistry.
	PSO17	The students after the completion of this programme will be able to understand and apply the fundamentals of Organic Chemistry.
	PSO18	The students after the completion of this programme will be able to understand and apply the fundamentals of Physical Chemistry.

  
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**Department of Mathematics**  
**B.Sc. (Maths Group) : Three Year Graduation Program**

**Course Outcome (CO)**

Class	Paper name and paper code	Course outcome number	Course Outcome
B.Sc First year	Trigonometry and algebra, Paper Code : 0798	CO1	Student are understand the concept of matrix, Eigen value, Eigen vector, Casey Hamilton theorem and Characteristic equation of matrix
		CO2	Student are understand the concept of application of matrix, system of linear equation, Solution of cubic equation, Descart's method.
		CO3	Student are understand the concept of mapping equivalence relation and partition, mappings, equence relation,
		CO4	Student are understand the concept of group theory, Isomorphism, homomorphism , fundamental theory of homomorphism, subring, Integral domain, field theory.
		CO5	Student are understand the concept of use of De-Moiver's theorem and its application, expansion of trigonometry function. Gregory series, summation of series
B.Sc. First year	Calculus, Paper Code : 0799 Calculus, Paper Code : 0799	CO1	Student are understand the concept of define the basic concepts and principles of differential and integral calculus of real functions and sequences and series.
		CO2	Student are understand the concept of interpret the geometric meaning of differential and intergral calculus
		CO3	Student are understand the concept of apply the concept and principles of differential and integral calculus to solve geometric and physical problems
		CO4	Student are understand the concept of organiz solving of complex problems by combining the acquired mathematical concepts and principles
		CO5	Student are understand the concept of expand functions using Taylor's and Maclaurin's series, Leibritz theorem and use their applications
		CO6	Student are understand the concept of acquire the concept of asymptotes and envelopes

  
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Class	Paper name and paper code	Course outcome number	Course Outcome		
		CO7	Student are understand the Extract the solution of differential equations of the first order and of the first degree by variables separable, Homogeneous and Non-Homogeneous methods.		
		CO8	Student are understand the 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.		
		CO9	Student are understand the Solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases.		
		CO10	Student are understand the Able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution.		
		CO11	Student are understand the Introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients.		
		CO12	Student are understand the Able to find the complete solution of a differential equation with constant coefficients by variation of parameters.		
		B.Sc. First year	Vector analysis and Geometry, Paper code (0800)	CO1	Student are understand the Acquire the basic knowledge of vector differentiation and vector integration
				CO3	Student are understand the Determine and apply, the important quantities associated with scalar fields, such as partial derivatives of all orders, the gradient vector and directional derivative
				CO4	Student are understand the Determine and apply, the important quantities associated with vector fields such as associated with vector fields such as the divergence, curl, and scalar potential
				CO5	Student are understand the Calculate line integrals along piecewise smooth paths; interpret such quantities as work done by a force
				CO6	Student are understand the Evaluate line, surface, double and triple integrals and use these integrals to verify the seminal integral theorems (Green's theorem in the plane, Gauss' divergence theorem and Stokes' theorem)
				CO7	Student are understand the Apply vector algebra techniques to analyze problems involving two and three dimensional entities- lines, planes and surfaces
CO8	Student are understand the Use Green's theorem to evaluate line integrals along simple closed contours on the plane				


  
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Class	Paper name and paper code	Course outcome number	Course Outcome
B.Sc. Second year	Advance Calculus, Paper code:	CO9	Student are understand the Compute the curl and the divergence of vector fields
		CO10	Student are understand the Employ the techniques of the higher dimensional differential calculus in problems of physical interest
		CO11	Student are understand the Compute the area of parametric surfaces in 3-dimensional space
		CO12	Student are understand the Apply Stokes' theorem to give a physical interpretation of the curl of a vector field
		CO13	Student are understand the Use Stokes theorem to give a physical interpretation of the curl of a vector field
		CO14	Student are understand the Use the divergence theorem to give a physical interpretation of the divergence of a vector field
		CO15	Student are understand the Analyze the structure and nature of surfaces
		CO1	Student are understand the Acquire the concept of finding partial derivatives and associated rules
		CO2	Student are understand the Develop competency in applying the idea of partial derivatives
		CO3	Student are understand the Acquire the basic ideas of double and triple integral
B.Sc. Second Year		CO4	Student are understand the Apply the techniques of double and triple integral to various problems of finding length of plane curves, surface areas and volumes of surface of revolution
		CO5	Student are understand the Change variables in multiple integrals
		CO6	Student are understand the Familiarized with different three dimensional surfaces and their properties
		CO7	Student are understand the Develop skill in finding the partial derivatives of functions of several variables and various rules associated
		CO8	Student are understand the Apply the chain rule for functions of several variables
		CO9	Student are understand the Use the Lagrange multiplier method to find extrema of functions with constraints
		CO10	Student are understand the Apply the knowlege of lagrange multipliers in finding the extreme values of functions.


  
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Class	Paper name and paper code	Course outcome number	Course Outcome
		CO11	Student are understand the Make a comparative study of the extreme values of functions of a single independent variable with functions
	Differential Equation, Paper code :	CO1	Student are understand the Form partial differential equations and find the solution of first order partial differaential equations for some standard types.
		CO2	Student are understand the Use inverse Laplace transform to return familiar functions and apply Laplace transform to solve second order linear differential equation and simultaneous linear differential equation
		CO3	Student are understand the Apply various power series methods to obtain series solutions of differential equation
		CO4	Student are understand the Compute all the solutions of second and higher order partial differential equations with constant coefficients
		CO5	Student are understand the Understand the concept of functional
		CO6	Student are understand the Understand the concept and applications of eigen value problems.
		CO7	Student are understand the Understand differential equation of strum Liouville type.
	Mechanics, Paper Code :	CO1	Student are understand the Define Resultant, Component of a Force, Coplanar forces, like and unlike parallel forces, Moment of a force and Couple with examples.
		CO2	Student are understand the Prove the Paralielogram of Forces, Trianlge of Forces, Converse of the triangle of Forces, Polygon of Forces, Laml's Theorem, Varignon's theorem of moments.
		CO3	Student are understand the Find the resultant of coplanar couples, equilibrium of couples and the equation to the line of action of the resultant.
		CO4	Student are understand the Discuss friction, Forces of Friction, cone of Friction, Angle of Friction and Laws fo friction.
		CO5	Student are understand the Define catenary and obtain the equation to the common catenary.
		CO6	Student are understand the Find the tension at any point and discuss the geometrical properties of a catenary.
		CO7	Student are understand the Define Projectile, impulse, impact and laws of impact and prove that the path of a projectile is a parabola.

  
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Class	Paper name and paper code	Course outcome number	Course Outcome
B.Sc. 3rd Year	Analysis	CO8	Student are understand the Define Simple Harmonic Motion and find its Geometrical representation and find the Composition of Simple Harmonic Motion and the dirrerential equation of a central orbit.
		CO1	Student are understand the Apply the fundamental concepts of Fourier series, Fourier Sine series, Fourier Cosine series to find series representation of irrational numbers.
		CO2	Student are understand the Learn the basic abstract ideas of analysis
		CO3	Student are Learn the basic ideas open sets, closed sets, limit point, isolated points, boundary points, subspace, product metric spaces and apply them to study the nature of sets.
		CO4	Student are Learn the theorems identify the continuity of a function which is defined on metric spaces, at a given porit and identify the set of points on which a function is continuous by using different theorems
		CO5	Student are Learn about analytic functions, Cauchy-Riemann differential equations, harmonic functions Mobius transformations.
		CO6	Student are Learn about Rimann integral
		CO7	Student are Ability to test the convergence of improper integrals.
	Abstract Algebra, Paper Code:	CO1	Student are Introduction to vector space and subspace
		CO2	Student are Use the concept of basis and dimension of vector spaces linear dependence and linear independence to solve problems.
		CO3	Student are Use the concept of inner product spaces to find norm of vectors, distance between vectors, check the orthogonality of vectors, to find the orthogonal and orthonormal basis.
		CO4	Student are Apply the properties of linear transformations to linearity of transformations, kernel and rank of linear transformations, inverse transformations to solve the problems of matrix transformations, change of basis.
		CO5	Student are Identify the concept of Normal groups and Quatients groups.
		CO6	Student are Analyze Permutation groups and Counting principle.
		CO7	Student are Explain Sylow theorem and its applications.
		CO8	Student are Use the concept of homomorphism and homomorphis for rings.

  
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Class	Paper name and paper code	Course outcome number	Course Outcome
	Discrete Mathematics, Paper Code :	CO9	Student are Provide information on ideals and Quotient rings, Field of Quotient of an integral Dormain.
		CO1	Student are Basic set theory, cardinal numbers, different concepts of infinity.
		CO2	Student are Basic combinatorics, induction, inclusion exclusion, pigeion hole principle
		CO3	More advance to place in combinatorics : recurrence relations, generating functions, graphs, trees, planar graphs, trees, planar graph
		CO4	Student are Describe the TF statements, connectives, atomic and compound statements.
		CO5	Student are Illustrate tautology, Tutological, truth tables, Normal Forms, Principal Normal Forms.
		CO6	Student are understand Interpret Lattices, Boolean Algebra, Switching circuits
		CO7	Understand the language and grammer
		CO8	Student are understand Use of finite state machine as language recogrizers

  
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