

Department of Mathematics

PROGRAMME OUT COMES (POs)

On successful completion of Graduate Program, Graduating Students / Graduates will be able to:

PO1	Domain Expertise: Able to demonstrate a thorough understanding and grasp more academic subjects that are part of an undergraduate program of study.
PO2	Effective Communication Skills: Effectively convey thoughts and ideas. Enhance the ability to present note worthy information in a clear and concise manner to various groups
PO3	Critical Thinking: Evaluating and analyzing arguments, assertions, and opinions using empirical data. The ability to identify relevant assumptions or implications and construct logical arguments. Critically analyze practices ,policies, and theories by utilizing a scientific approach to knowledge acquisition.
PO4	Critical Problem Identification &Solving: The ability to apply one's competences to solve unfamiliar challenges based on what has been learn Apply one's learning to real-life scenarios.
PO5	Teamwork/Coordination: Being able to facilitate a group's cooperative effort and act together as a group or team to achieve a common goal. Work effectively as an individual as well as a member of the team.
PO 6	IT literacy skills: The ability to utilize ICT in various learning situations. Using ICT tools to access, retrieve, and modify authenticated data using data analysis

PO 7	Life-long learning and Research related skills: Ability to habitualize self-learning and self-motivation Acclimate to the ever-increasing demands of the workplace and life. Skill in planning, conducting, and reporting the outcomes of an experiment or investigation. Ability to define a problem, test the problem, pose appropriate questions, and synthesize and articulate the problem
PO 8	Environmental Longevity: Get environmental awareness and follow eco-friendly practices to create a clean environment.
PO 9	Moral and Ethical Consciousness: Ability to live moral and ethical ideals and to use ethical practices in all aspects of one's job. Capable of demonstrating the ability to recognize ethical issues relevant to one's work, abstain from unethical behavior, show respect for environmental and sustainability issues, and act impartially and truthfully in all aspects of one's work.
PO 10	Effective Project Management: Determine the project's goals, objectives, and components, as well as the appropriate completion date. Plan and organize in such a ways to meet the target s on time. Be capable of recognizing opportunities and developing counting encyplans.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

Students will be able to apply critical thinking skills to solve problems that can be modelled mathematically, to critically interpret numerical and graphical data, to read and construct mathematical arguments and proofs, to use computer technology appropriately to solve problems and to promote understanding, to apply mathematical knowledge to a career related to mathematical sciences thus cultivating a proper attitude for higher learning in mathematics. Students will be able to

PSO1	Think in a critical manner
PSO 2	Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue

PSO3	Formulate and develop mathematical arguments in a logical manner.
PSO 4	Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses.
PSO5	Understand, formulate and use quantitative models arising in social science, Business and other contexts.
PSO6	A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations , terminology.
PSO7	Enabling students to develop a positive attitude to wards mathematics as an interesting and valuable subject of study.
PSO8	Students equipped with mathematical modeling ability, problem solving kills, creative talent and power of communication necessary for various kinds of employment

PSO-PO MAPPING

		Pos									
PSOs		1	2	3	4	5	6	7	8	9	10
	1	*	*	*		*	*		*		*
	2	*		*	*		*			*	*
	3	*	*	*		*			*	*	
	4	*	*	*	*	*			*		
	5	*		*							*
	6	*	*	*			*	*		*	
	7	*		*				*			
	8	*	*	*	*		*		*	*	*

COURSE OUTCOMES (Cos)

Course Name: **Differential Equations**

Upon completion of this course, students would be able to		PSO	PO
CO1	Extract the solution of differential equations of the first order and of the first degree by variables separable, Homogeneous and Non-Homogeneous methods	3,8	3,5,9
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.	3	3,4,8
CO3	Compute all the solutions of second and higher order linear differential equations with constant coefficients, linear equations with variable coefficients.	3	1,6
CO4	Solve higher order linear differential equations with constant coefficients	3	1,5,9
CO5	Solve higher order linear differential equations with non constant coefficients	3,8	1,6,7

Course Name: **Solid Analytical Geometry**

Upon completion of this course, students would be able to		PSO	PO
CO1	Describe the various forms of equation of a plane, straight line, Sphere, Cone and Cylinder.	2	1,4,6
CO2	Find the angle between planes, Bisector planes, Perpendicular distance from a point to a plane, Image of a line on a plane, Intersection Of two lines	3	4,7,9
CO3	Define coplanar lines and illustrate	7	5,8,9
CO4	Compute the angle between a line and a plane, length of Perpendicular from a point to a line	7	4,3
CO5	Student will learn geometry of line, plane and sphere and their equations in various forms in detail.	3	5,7,9
CO6	Student will learn geometry of two dimensions and three dimensions	2	4,8,9

Course Name: Abstract Algebra

Upon completion of this course, students would be able to		PSO	PO
CO1	Demonstrate understanding of and the ability to verify Relationships between operations satisfying various properties (e.g. commutative property)	4	1,7,8
CO2	Demonstrate understanding of and the ability to work with in Various algebraic structures	5	2,4,6
CO3	Acquire the basic knowledge and the structure of Group, Subgroup and Cyclic Groups	2	1,2,3
CO4	Explain the significance of the notion of a normal subgroup, and of a simple group	1	4,7
CO5	Analyze and demonstrate examples of subgroups, normal Subgroups and quotient groups	1	4,6
CO6	Acquire the notion of permutations and operations on them	4	3,5,6
CO7	Explain the terms isomorphism and homomorphism	3	2,4,8
CO8	Describe the characteristics of a ring, quotient rings and ideals	1	1,5,9
CO9	Familiarize with Rings, Integral Domains, Fields and Divisors of Zero	2	7,9

Course Name: Real analysis

Upon completion of this course, students would be able to		PSO	PO
CO1	Learn the basic facts in logic and set theory.	1	1,4,6
CO2	Learn to define sequence in terms of functions from \mathbb{N} To a subset of \mathbb{R} and to understand several properties of the real line.	2	1,5,6
CO3	Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.	4	2,3,9
CO4	Use the ratio, root, and alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.	5	4,8,10
CO5	Real-valued functions defined on an interval, limit and Continuity of a function. Algebra of limits. Differentiability of a function.	3	2,4,6

CO6	Statement of Rolle's Theorem and its geometrical interpretation. Mean value theorems of Lagrange and Cauchy. Statements of Taylor's and Maclaurin's theorems with Lagrange's and Cauchy's forms of remainders. Taylor's and Maclaurin's infinite series of various functions.	2	3,6,7
CO7	Riemann integration properties, Fundamental theorem of integral calculus	8	3,4,9

Course Name: Linear algebra

Upon completion of this course, students would be able to		PSO	PO
CO1	Define Vector Space, Quotient space Direct sum, linear Span and linear independence, basis and inner product.	2	1,3,5
CO2	Discuss the linear transformations, rank, nullity.	5,7	2,5,6
CO3	Find the characteristic equation, eigen values and eigen vectors of a matrix	5,6	1,5,8
CO4	Prove Cayley-Hamilton theorem, Schwartz inequality, Gram Schmidt orthogonalization process	5,7	2,3,8
CO5	Solve the system of simultaneous linear equations	2	4,5,6
CO6	To learn basic concepts of vector space which is used in other pure mathematical subjects and engineering	2	1,4,8

Course Name: Ring Theory and Vector Calculus

Upon completion of this course, students would be able to		PSO	PO
CO1	To write precise and accurate mathematical objects in ring theory	6	1,3,5
CO2	For checking the irreducibility of higher degree polynomials over rings	8	3,7,8
CO3	To understand the concepts like ideals and quotient rings.	4	2,9
CO4	To understand the concept of ring homomorphism.	5	4,6
CO5	Find and interpret the gradient curl, divergence for a function data given point.	1	1,3,5
CO6	Interpret line, surface and volume integrals	1	2,9,10

CO7	Evaluate integrals by using Green's Theorem, Stokes theorem, Gauss Theorem	1	3,4,9
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Course Name: Laplace transforms

Upon completion of this course, students would be able to		PSO	PO
CO1	Able to understand the Laplace transform of elementary functions.	3,5	1,3,5,8
CO2	Able to use the rules of integration& definition of Laplace transform students to prove the properties of Laplace transform.	5,7	2,4,10
CO3	Learns the topics inverse Laplace transform, application of Laplace transform helps to Solve linear higher order differential equation ,system of differential equations.	3,5	1,5,7,10