

Bapumiya Sirajoddin Patel Arts, Commerce and Science College, Pimpalgaon Kale

Department of Mathematics

COURSE OUTCOME, PROGRAM SPECIFIC OUTCOME, PROGRAM OUTCOME OF SCIENCE

Program Code	Program Name	Course code	Course Name	Course Outcome	Program Specific Outcome	Program Outcome
B. Sc.		S MTH Paper-I	Algebra and Trigonometry	Ability to - 1)Represent complex numbers algebraically and geometrically. 2) Separate real and imaginary parts of the circular and hyperbolic functions of complex variable. 3)Sum the series based upon exponential series, logarithmic series and Gregory series. 4) Define Quaternion and its properties, like equality and addition, multiplication, complex conjugate, norm. 5) Find rank of matrix, row rank & column rank, characteristic of matrix, eigen values and eigen vectors.	After successful completion of this Programme, the student will demonstrate basic knowledge in each of the following: 1. Students will be able to select and utilize appropriate mathematical technology with which to analyze mathematical problems in a wide variety of areas.	
B. Sc.		S MTH Paper-II	Differential and Integral Calculus	Ability to - 1) Determine the continuity and differentiability of a function at a point and on a set. 2) Examine various techniques of integration and apply them to definite and improper integrals. 3) Compute limits, derivatives, and definite & indefinite integrals of algebraic, logarithmic and exponential functions, 4)Apply the Rolle's theorem, Mean Value Theorem and the Fundamental Theorem of	2. Students will be able to make rigorous mathematical arguments including how to both prove and disprove conjectures. 3. Student will be able to construct multiple representations for selected topics	

B. Sc.		2S MTH Paper-III	Differential Equations: Ordinary and Partial	<p>Ability to:</p> <ul style="list-style-type: none"> • Solve linear differential equation of first order and exact differential equation. • Solve differential equations of first order using graphical, numerical, and analytical methods, • Solve and apply linear differential equations of second order (and higher) with constant coefficient. • Be competent in solving linear PDEs using classical solution methods, Lagrange's method and Charpit's general method 	<p>from arithmetic, algebra, geometry, trigonometry, matrices and linear transformation.</p> <p>4. Students will be able to use the concepts of Analysis in solving problems. The fundamental concepts include sets, numbers, functions, and convergence.</p>	
B. Sc.		2S MTH Paper-IV	Vector Analysis and Solid Geometry	<ul style="list-style-type: none"> • Competence to apply Scalar and vector product to determine angles between vectors, orientation of axes, areas of triangles and parallelograms in space, scalar and vector projections and volumes of parallelepipeds. • Knowledge of integral curves of vector fields and solving differential equations to find such curves, • Knowledge of the differential ideas of divergence, curl along with their physical interpretations, using differential forms or tensors to represent derivative operations, • Ability to compute equation of cone with a guiding curve, cone with vertex and origin, equation of right circular cone and right circular cylinder. 	<p>5. Students will be able to use the concepts of Algebra in solving problems. The fundamental concepts include equations, numbers, and algebraic structures. Students will be able to use the concepts of sequence, series, number theory in various competitive exam</p>	
B. Sc.		3S MTH Paper-V	Advanced Calculus	<p>Competence to:</p> <ul style="list-style-type: none"> • Distinguish between the concepts of sequence and series, and determine limits of sequences and convergence and approximate sums of series. • Check Convergence of sequence by using various tests 		

				<ul style="list-style-type: none"> • Use of intermediate value property and fixed point property for function of two variables. • Apply derivative concepts to find tangent lines to level curves and to solve optimization problems. • Evaluation technique for double and triple integrals for area and volume. 		
B. Sc.		3S MTH Paper-VI	Number Theory	<p>Competence to:</p> <ul style="list-style-type: none"> • Define and interpret the concepts of divisibility, congruence, greatest common divisor, prime, and prime-factorization, • Apply the Law of Quadratic Reciprocity and other methods to classify numbers as primitive roots, quadratic residues, and quadratic non-residues, • Formulate and prove conjectures about numeric patterns, and 		
B. Sc.				<ul style="list-style-type: none"> • Produce rigorous arguments (proofs) centered on the material of number theory, most notably in the use of Mathematical Induction and/or the Well Ordering 		
B. Sc.		4S MTH Paper-VII	Modern Algebra : groups & rings	<p>Principal in the proof of theorems. Competence to:</p> <ul style="list-style-type: none"> • Assess properties implied by the definitions of groups and rings, • Use various canonical types of groups (including cyclic groups and groups of permutations) and canonical types of rings (including polynomial rings and modular rings), • Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups, • Analyze and demonstrate examples of ideals and quotient rings, 		

B. Sc.		4S MTH Paper-VIII	Classical Mechanics	<ul style="list-style-type: none"> • Use the concepts of isomorphism and homomorphism for groups and rings, and Ability to - • Interpret Lagrange's equations of motion for system of particles • Use Euler's equation to Geodesic on any surface and to solve Brachistochrone problem • Compute Euler-Poisson equations for a functional dependent on higher derivatives • Discuss the linear motion of systems of Solve orbit problems using the conservation of angular momentum and total energy • Find normal modes for systems with many degrees of freedom by applying symmetry arguments and boundary conditions. 		
B. Sc.		5S MTH Paper-IX	Mathematical Analysis	<p>Competence to:</p> <p>Solve Legendre's equation and Bessel's equation and interpret various recurrence formulae for $P_n(x)$ and $J_n(x)$.</p> <p>Evaluate Fourier series, Fourier series for odd and even functions, half-range Fourier sine series and half-range Fourier cosine series.</p> <p>Find Laplace Transform of function of one variable and to find inverse Laplace Transform by various methods</p> <p>Solution of ordinary and partial differential equation by using Laplace Transform and Fourier Transform</p>		
B. Sc.		5S MTH Paper-X	Mathematical Methods	<p>Competence to:</p> <ul style="list-style-type: none"> • Analyze finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces. 		

				<ul style="list-style-type: none"> Recognize the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces. Use the definition and properties of linear transformations and matrices of linear transformations and change of basis, including kernel, range and isomorphism. Compute inner products and determine orthogonality on vector spaces, including Gram-Schmidt orthogonalization process. 		
B. Sc.		6S MTH Paper-XI	Linear Algebra	<p>Ability to :</p> <ul style="list-style-type: none"> Analyze finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces. Recognize the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces. Use the definition and properties of linear transformations and matrices of linear transformations and change of basis, including kernel, range and isomorphism. Compute inner products and determine orthogonality on vector spaces, including Gram-Schmidt orthogonalization process. 		