

Rayat Shikshan Sanstha's
Dahiwadi College Dahiwadi
Tal. Man, Dist. Satara

Department of Mathematics

Program Outcomes (POs)

Upon completion of B.Sc. Mathematics, the graduates of Mathematics will be able to:

PO - 1	Knowledge domain: Demonstrate an understanding of the basic concepts in Mathematics and their importance in the solution of some real- world problems.
PO - 2	Problem analysis: Analyze and solve the well-defined problems in Mathematics. Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decision. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
PO - 3	Presentation and Interpretation of Data: Demonstrate the ability to manipulate and visualize data and to compute standard statistical summaries.
PO - 4	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources and computing tool such as Excel, C, C++, Scilab, Python etc. with an understanding of the limitations.
PO - 5	Ethics: Analyze relevant academic, professional and research ethical problems and commit to professional ethics and responsibilities with applicable norms of the data analysis and research practices.
PO - 6	Communication: Effectively communicate about their field of expertise on their activities, with their peer and society at large. Such as, being able to comprehend and write effective reports and design documentation, make effective presentations.
PO - 7	Project Management: Apply Knowledge and understanding of principles of Mathematics effectively as an individual, and as a member or leader in diverse teams to manage projects in multidisciplinary environment.
PO - 8	Research Proposal: Define, Design and Deliver a significant piece of research work that is clear and concise. Demonstrate the necessary skills and knowledge of deeper understanding of their chosen research area. Understand the philosophy of research in mathematical sciences and appreciate the value of its development.

Programme Specific Outcome (PSOs)

Upon completion of B.Sc. Mathematics, the graduates will be able to:

PSO -1	Acquire a strong foundation in various branches of mathematics to formulate real life problems into mathematical models.
PSO - 2	Develop problem solving skills, cultivating logical thinking, and face competitive examinations with confidence.
PSO - 3	Enhance numerical ability and address problems in interdisciplinary areas which would help in project and field works.
PSO - 4	Apply the mathematical knowledge and skills to face competitive examination with confidence.
PSO - 5	Pursue higher studies which in turn will offer them job opportunities in government and public sector undertakings, banks, central government institutes etc.
PSO - 6	Develop entrepreneurial skills, become empowered and self dependent in society.
PSO - 7	Understand the professional, ethical, legal, security, social issues and responsibilities.
PSO - 8	Apply knowledge of principles, concepts and results in specific subject area to analyze their local and global impact.
PSO - 9	Communicate appropriately and effectively, in a scientific context using present technology and new findings.

Course Outcomes (COs)

Course Outcomes B. Sc. Mathematics		
Semester III		
Course	Outcomes	
	Upon successful completion of this course, the student will be able to:	
DSC-5C : Paper V Real Analysis I	CO-1	Understand types of functions and how to identify them.
	CO-2	Use mathematical induction to prove various properties.
	CO-3	Understand the basic ideas of Real Analysis.
	CO-4	Prove order properties of real numbers, completeness property and the Archimedean property.
Course	Outcomes	
	Upon successful completion of this course, the student will be able to:	
DSC-6C : Paper VI Algebra I	CO-1	Understand properties of matrices
	CO-2	Solve System of linear homogeneous equations and linear non-homogeneous equations.
	CO-3	Find Eigen values and Eigen vectors.
	CO-4	Construct permutation group and relate it to other groups.
	CO-5	Classify the various types of groups and subgroups.
Semester IV		
Course	Outcomes	
	Upon successful completion of this course, the student will be able to:	
DSC-5C : Paper VII Real Analysis II	CO-1	Understand sequence and subsequence.
	CO-2	Prove The Bolzano-Weierstrass Theorem.
	CO-3	Derive Cauchy Convergence Criterion.
	CO-4	Find convergence of series.
	CO-5	Apply Leibnitz Test.
Course	Outcomes	
	Upon successful completion of this course, the student will be able to:	
DSC-6C : Paper VIII Algebra II	CO-1	Understand properties of matrices
	CO-2	Solve System of linear homogeneous equations and linear non-homogeneous equations.
	CO-3	Find Eigen values and Eigen vectors.
	CO-4	Construct permutation group and relate it to other groups.
	CO-5	Classify the various types of groups and subgroups.
Semester V		
Course	Outcomes	
	Upon successful completion of this course, the student will be able to:	
DSE-E9 : Paper IX Mathematical Analysis	CO-1	The integration of bounded function on a closed and bounded interval
	CO-2	Some of the families and properties of Riemann integrable functions
	CO-3	The applications of the fundamental theorems of integration

	CO-4	Extension of Riemann integral to the improper integrals when either the interval of integration is infinite or the integrand has infinite limits at a finite number of points on the interval of integration
	CO-5	The expansion of functions in Fourier series and half range Fourier series
Course	Outcomes Upon successful completion of this course, the student will be able to:	
DSE-E10 : Paper X Abstract Algebra	CO-1	Basic concepts of group and rings with examples
	CO-2	Identify whether the given set with the compositions form Ring, Integral domain or field.
	CO-3	Understand the difference between the concepts Group and Ring.
	CO-4	Apply fundamental theorem, Isomorphism theorems of groups to prove these theorems for Ring.
	CO-5	Understand the concepts of polynomial rings, unique factorization domain
Course	Outcomes Upon successful completion of this course, the student will be able to:	
DSE-E11 : Paper XI Optimization Techniques	CO-1	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.
	CO-2	Formulate and apply suitable methods to solve problems.
	CO-3	Identify and select procedures for various sequencing, assignment, transportation problems.
	CO-4	Identify and select suitable methods for various games.
	CO-5	To apply linear programming and find algebraic solution to games.
Course	Outcomes Upon successful completion of this course, the student will be able to:	
DSE-E12 : Paper XII Integral Transforms	CO-1	Understand concept of Laplace Transform.
	CO-2	Apply properties of Laplace Transform to solve differential equations.
	CO-3	Understand relation between Laplace and Fourier Transform.
	CO-4	Understand infinite and finite Fourier Transform.
	CO-5	Apply Fourier transform to solve real life problems.
Semester VI		
Course	Outcomes Upon successful completion of this course, the student will be able to:	
DSE-F9 : Paper IX Metric Spaces	CO-1	Acquire the knowledge of notion of metric space, open sets and closed sets.
	CO-2	Demonstrate the properties of continuous functions on metric spaces,
	CO-3	Apply the notion of metric space to continuous functions on metric spaces.

	CO-4	Understand the basic concepts of connectedness, completeness and compactness of metric spaces,
	CO-5	Appreciate a process of abstraction of limits and continuity to metric spaces
Course	Outcomes Upon successful completion of this course, the student will be able to:	
DSE-F10 : Paper X Linear Algebra	CO-1	Understand notion of vector space, subspace, basis.
	CO-2	Understand concept of linear transformation and its application to real life situation.
	CO-3	Work out algebra of linear transformations.
	CO-4	Appreciate connection between linear transformation and matrices.
	CO-5	Work out eigen values, eigen vectors and its connection with real life situation.
Course	Outcomes Upon successful completion of this course, the student will be able to:	
DSE-F11 : Paper XI Complex Analysis	CO-1	Learn basic concepts of functions of complex variable.
	CO-2	Be introduced to concept of analytic functions.
	CO-3	Learn concept of complex integration and basic results thereof.
	CO-4	Be introduced to concept of sequence and series of complex variable.
	CO-5	Learn to apply concept of residues to evaluate certain real integrals.
Course	Outcomes Upon successful completion of this course, the student will be able to:	
DSE-F12 : Paper XII Discrete Mathematics	CO-1	Use classical notions of logic: implications, equivalence, negation, proof by contradiction, proof by induction, and quantifiers.
	CO-2	Apply notions in logic in other branches of Mathematics.
	CO-3	Know elementary algorithms: searching algorithms, sorting, greedy algorithms, and their complexity.
	CO-4	Apply concepts of graph and trees to tackle real situations.
	CO-5	Appreciate applications of shortest path algorithms in computer science.