

Maji Aamdar Shri Babasaheb Patil Sarudkar Shikshan Sansthas's

SHRI SHIV-SHAHU MAHAVIDYALAYA, SARUD

Tal. Shahuwadi , Dist. Kolhapur

Programme Outcomes, Programme Specific Outcomes and Course Outcomes

DEPARTMENT OF MATHEMATICS

Programme Outcomes

Bachelor of Science (B.Sc.) :

After completion of the **B.Sc.** Programme, the students will develop ability:

- To develop problem-solving skills and apply them independently to problems in pure and applied
- To develop abstract mathematical thinking.
- To improve the abilities of students which will be helpful to qualify competitive examinations.
- Apply knowledge of Mathematics, in all the fields of learning including higher research.
- Work effectively as an individual, and also as a member or leader in multilinguistic and multi-
- disciplinary teams.
- To qualify lectureship and fellowship exams such as NET, GATE, SET etc.
- Understand the basic concepts, fundamental principles and mathematical theories related to various courses and their relevance to other sciences

DEPARTMENT OF MATHEMATICS

Programme Specific Outcomes

B.Sc. PROGRAMME

- To develop numerical aptitude among students.
- To develop preciseness and thinking abilities in students.
- To develop their logical reasoning.
- To develop research aptitude among the students
- To develop abstract thinking
- To solve the problems in mass and heat transfer by using the methods on partial differential equations.
- To train the students to handle the differentiation and integration in higher dimensions.
- To solve real-life problems using numerical analysis.
- To study abstract structures.

DEPARTMENT MATHEMATICS

Course Outcomes

Course Outcomes After completion of this course, the student will be able to

B.Sc. Part-I Semester-I

DSC- 5A Differential Calculus

1. Understand the various properties of hyperbolic functions.
2. Apply Leibnitz theorem to obtain higher order derivatives of product of two differentiable functions.
3. Determine n^{th} roots of unity.

DSC-6 A Calculus

1. Understand the consequences of mean value theorems for differentiable functions.
2. Evaluate the limit and examine the continuity of a function at a point.

B.Sc. Part-I Semester-II

DSC- 5B Differential equations

1. Understand types of differential equations.
2. Solve different types of ordinary differential equations.
3. Understand applications of differential equations.

DSC-6B Higher Order Ordinary differential equations and Partial Order differential equations

1. Learn conceptual variations while advancing from one variable to several variables in calculus.
2. Understand the geometrical interpretation of Simultaneous and Total differential equations.
3. Solve different types of higher order Ordinary differential equations.

B.Sc. Part-II Semester-III

DSC- 5C Real Analysis-I

1. Understand types of functions and how to identify them.
2. Use mathematical induction to prove various properties.
3. Understand the basic ideas of Real Analysis.
4. Prove order properties of real numbers, completeness property and the Archimedean property.

DSC-6C Algebra-I

1. Understand properties of matrices.
2. Solve System of linear homogeneous equations and linear non-homogeneous equations.
3. Find Eigen values and Eigen vectors.
4. Construct permutation group and relate it to other groups.
5. Classify the various types of groups and subgroups.

B.Sc. Part-II Semester-IV

DSC-5D Real Analysis-II

1. Understand sequence and subsequence.
2. Prove The Bolzano-Weierstrass Theorem.
3. Derive Cauchy Convergence Criterion.
4. Find convergence of series.
5. Apply Leibnitz Test.

DSC-6D Algebra-II

1. Prove Lagrange's theorem.
2. Derive Fermat's theorem.
3. Understand properties of normal subgroups, factor group.
4. Define homomorphism and isomorphism's in group and rings.
5. Derive basic properties of rings and subrings.

B.Sc. Part-III Semester-V

Paper-IX Real Analysis

1. Understand the basic ideas of Real analysis.
2. Understand some of the families and properties of Riemann integrable functions
3. Understand the applications of the fundamental theorems of integration
4. Understand the types of functions and how to identify them, sequence and subsequence,
5. Understand 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.

Paper -X Modern Algebra

1. Understand Basic concepts of group and rings with examples
2. Identify whether the given set with the compositions form Ring, Integral domain or field.
3. Understand the difference between the concepts Group and Ring.
4. Apply fundamental theorem, Isomorphism theorems of groups to prove these theorems for Ring
5. Understand the concepts of polynomial rings, unique factorization domain.

Paper -XI Partial Differential equations

1. Understand the formation and solutions of partial derivatives of first order.
2. Solve first order linear and non-linear partial derivative equations using the method of characteristics.
3. To develop an understanding of numerical methods for partial differential equations

Paper-XII Numerical methods-I

1. Find numerical solutions of algebraic, transcendental and system of linear equations.
2. Apply various numerical methods in real life problems.

B.Sc. Part-III Semester-VI

Paper -XIII Metric Spaces

1. Acquire the knowledge of notion of metric space, open sets and closed sets.
2. Demonstrate the properties of continuous functions on metric spaces,
3. Apply the notion of metric space to continuous functions on metric spaces.
4. Understand the basic concepts of connectedness, completeness and compactness of metric spaces.
5. Appreciate a process of abstraction of limits and continuity to metric spaces.

Paper -- XIV Linear Algebra

1. Understand notion of vector space, subspace, and basis.
2. Understand concept of linear transformation and its application to real life situation.
3. Work out algebra of linear transformations.
4. Appreciate connection between linear transformation and matrices.
5. Work out Eigen values, Eigen vectors and its connection with real life situation.

Paper-XV Complex Analysis

1. Understand basic concepts of functions of complex variable.
2. Understand concept of analytic functions.
3. Understand concept of complex integration and basic results thereof.
4. Understand concept of sequence and series of complex variable.
5. Understand concept of residues to evaluate certain real integrals.

Paper-XVI Numerical methods -II

1. Learn about the various interpolating methods to find numerical solutions.
2. Find numerical solutions of integration and ordinary differential equations by using the various methods.
3. Apply various numerical methods in real life problems.

