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 multilingustic 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.

<p style="text-align: center;">DEPARTMENT MATHEMATICS</p>

<p style="text-align: center;">Course Outcomes</p>

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.

DSE- E9 Mathematical Analysis

1. Understand the integration of bounded function on a closed and bounded interval

2. Understand some of the families and properties of Riemann integrable functions

3. Understand the applications of the fundamental theorems of integration

4. 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

5. Understand the expansion of functions in Fourier series and half range Fourier series

DSE- E10 Abstract 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.

DSE- E11 Optimization Techniques

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.

2. Formulate and apply suitable methods to solve problems.

3. Identify and select procedures for various sequencing, assignment, transportation problems.

4. Identify and select suitable methods for various games.

5. To apply linear programming and find algebraic solution to games.

DSE- E12 Integral Transforms

1. Understand concept of Laplace Transform.

2. Apply properties of Laplace Transform to solve differential equations.

3. Understand relation between Laplace and Fourier Transform

4. Understand infinite and finite Fourier Transform.

5. Apply Fourier transform to solve real life problems.

B.Sc. Part-III Semester-VI

DSE- F9 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.

DSE- F10 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.

DSE- F11 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.

DSE- F12 Discrete Mathematics

1. Use classical notions of logic: implications, equivalence, negation, proof by contradiction, proof

   by induction, and quantifiers.

2. Apply notions in logic in other branches of Mathematics.

3. Know elementary algorithms: searching algorithms, sorting, greedy algorithms, and their complexity.

4. Apply concepts of graph and trees to tackle real situations.

5. Appreciate applications of shortest path algorithms in computer science.