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.

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 nth 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

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.

