

**Bharati Vidyapeeth's
Dr. Patangrao Kadam Mahavidyalaya, Sangli**

Department of Mathematics

Program Specific Outcomes

1. Students gain a sound knowledge in foundational subjects related to pure and applied mathematics.
2. Acquire various skills related to computational techniques and related software's.
3. Being able to analyze the problem and propose a solution method and finalize the solution
and the process of solution in consultation with the peer group and faculty.
4. Develop the solution methodology and necessary software if required and prepare the report.

| Course | Outcomes |
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| B.Sc. I (Mathematics) | |
| Theory paper: 5A Differential Calculus | <ol style="list-style-type: none"> 1. Students acquaint themselves with the idea of complex numbers. 2. Understand Meaning and significance of Hyperbolic functions and their relation with circular functions 3. Get to know the significance of Leibnitz's theorem, De Moivre's Theorem, Euler's Theorem. 4. Understand the concept of partial differentiation and learn to apply it for various problems in science and engineering. |
| Theory paper: 6A Calculus | <ol style="list-style-type: none"> 1. Students grasp the concept of mean value theorems and its significance. 2. Study the special case of Taylor's expansion 3. Learn the meaning and significance of Indeterminate forms and learn to apply it for various indeterminate limiting cases |
| Theory paper: 5B Differential Equations | <ol style="list-style-type: none"> 1. Understand the meaning, motivation and significance of differential equations. |

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| | <ol style="list-style-type: none"> 2. Learn how to form and solve first order first degree ordinary differential equations. 3. Learn the methods of solving equations of first order and higher degree. 4. Solving higher order ordinary linear differential equations and homogeneous linear differential equations with constant coefficients. |
| <p>Theory paper: 6B Higher order Ordinary Differential Equations and Partial Differential equations.</p> | <ol style="list-style-type: none"> 1. Study the method of solution of general second order differential equation with variable coefficients. 2. Understand the concept, formation, and method of solution of ordinary simultaneous equations. 3. Study the motivation and concept of partial differential equations. Learn methods of solving Lagrange's equation and Charpit's method. |
| <p>Practical: CML-I (Computational Mathematics Laboratory - I)</p> | <ol style="list-style-type: none"> 1. Students get acquainted with the field of numerical computational methods and various areas covered within the subject of numerical computations with a bird's eye view of applications. 2. Learn to use electronic calculators and computers for simple calculations of algebraic and transcendental functions that are frequently required in science and technology. 3. Teacher gets to know student specific queries and helps students solve their individual problems with personal attention. |
| B.Sc. II (Mathematics) | |
| <p>Theory Paper: 5C Real Analysis - I</p> | <ol style="list-style-type: none"> 1. Learning basic concepts of set theory. 2. Study the principle of mathematical induction and apply it for proving results. 3. Acquire the concept of countability and determine countable and uncountable sets. |
| <p>Theory Paper : 6C Algebra - I</p> | <ol style="list-style-type: none"> 1. Understanding of the concept of Hermitian and Skew-Hermitian Matrix and their properties. |

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| | <ol style="list-style-type: none"> 2. Grasp the concept of normal form and convert given matrix to Normal form. 3. Learn the concept of Eigen value and Eigen vector . To find Eigen values and Eigen vectors. |
| Theory Paper: 5D Real Analysis – II | <ol style="list-style-type: none"> 1. Study the concept of monotonic and bounded sequences. 2. Understand Epsilon-Delta concept of convergence of a sequence. 3. Study the methods of testing convergence of series. |
| Theory Paper : 6D Algebra – II | <ol style="list-style-type: none"> 1. Understand the concept of Cosets. 2. Learn the meaning of Normal subgroups of a group with examples. 3. Study the concept of a Permutation group with examples. |
| Practical : CML – II (Computational Mathematics Laboratory – II) | <ol style="list-style-type: none"> 1. Learn to solve linear systems of equations by Gauss-Elimination , Gauss-Jordan , Gauss Jacobi and Gauss-Seidel methods manually with use of electronic calculators . 2. Learn root finding methods viz. Newton-Raphson method, Bisection method. 3. Learn methods for evaluating numerical values of integrations using trapezoidal rule, simpson's 1/3 rd rule , simpson's 3/8 th rule. |
| Practical : CML – III (Computational Mathematics Laboratory – III) | <ol style="list-style-type: none"> 1. Learn the basic keywords of C programming language and practice them in computer lab. 2. Studying basic data types and input output methods in C and practice it in computer laboratory 3. Apply the knowledge of C programming for preparing C programs for the solution of various numerical methods learned in the paper CML-II |