

**D. P. Bhosale College, Koregaon**  
**Department of Mathematics  
and Statistics**



**Program Outcomes:**

- Problem Analysis: identify, formulate, review and analyze complex problems using various techniques.
- Modern Tool Usage: create, select and apply appropriate techniques, resources and modern tools.
- Communication: Communicate effectively on complex activities and with the society at large and write effective documentation, make effective presentation and give and receive clear instructions.
- Individual and team work: Function effectively as an individual and as a member or leader or project manager in project team.
- Project Management: Effectively manage project work according to time scheduling, cost scheduling.

**Program Specific Outcomes:**

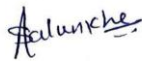
B.Sc. Mathematics programme has been designed to prepare graduates for attaining the following specific outcomes:

- Develop numerical abilities of student.
- Introduce recent trends in mathematics
- An ability to apply knowledge of mathematics, computer science and management in practice.
- Acquire practical skills related to different fields such as business, banking, etc.
- An ability to enhance not only comprehensive understanding of the theory but its application too in diverse field.
- An ability to communicate effectively.

## Course Outcomes:

Upon graduation, students will be have:

- The necessary technical, scientific as well as basic managerial and financial procedures to analyze and solve real world problems within their work domain.
- Implement various programming languages like Python, Construct in the right way.
- Analyze a given problem and to solve the problem.
- Improved communication and business management skills, especially in providing tech support.
- The ability to master the basic concept and understand to solve the problem.
- The ability and the mindset to continuously update and innovate.



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## B. Sc.-I

Course Name	Course Outcomes	
Basic Algebra	<ul style="list-style-type: none"> <li>■ Apply De- Moivre's theorem.</li> <li>■ Find rank, eigen values, eigen vectors of the matrix</li> <li>■ Solve system of linear homogeneous and non- homogeneous equations.</li> <li>■ Understand Hermitian and Skew Hermitian</li> </ul>	
Calculus	<ul style="list-style-type: none"> <li>■ Find higher derivatives of product two differentiable function using Leibnitz theorem.</li> <li>■ Learn Conceptual variations while advancing from one variable to several variable in calculus</li> <li>■ Understand the consequence of mean value theorem for differentiable functions</li> <li>■ Apply L- hospital's rule to various indeterminate form</li> </ul>	
Differential equation	<ul style="list-style-type: none"> <li>■ Classify differential equations.</li> <li>■ Solve different types of differential equations</li> <li>■ Find orthogonal trajectories</li> <li>■ Apply the knowledge of differential equations to tackle problems occurring in physics and engineering.</li> </ul>	
Discrete Mathematics	<ul style="list-style-type: none"> <li>■ Analyse the logical structure of statements symbolically, including proper use of logical connectives, quantifiers.</li> <li>■ Construct truth tables, prove or disprove a hypothesis and evaluate the truth of statement using the principles of logic.</li> <li>■ Understand and apply fundamental concepts in graph theory.</li> <li>■ Acquire the basic knowledge of graph namely vertex ages, special types of graphs, isomorphic graph, matrix representation of graph.</li> </ul>	■

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## B.Sc.-II

Course Name	Course Outcomes
Elements of Differential equation	<ul style="list-style-type: none"><li>▪ Identify types of higher order ordinary differential equations .</li><li>▪ Solve different types of ordinary differential equations .</li><li>▪ Understand geometrical interpretation of simultaneous and total differential equations .</li></ul>
Numerical Methods	<ul style="list-style-type: none"><li>▪ Find numerical solutions of algebraic ,transcendental and system of linear equations .</li><li>▪ Learn about various interpolating methods to find numerical solutions .</li><li>▪ Find numerical solutions of integration and ODE by using various various methods .</li><li>▪ Apply various numerical methods in real life problems .</li></ul>
Vector Calculus	<ul style="list-style-type: none"><li>▪ Understand and Evaluate the concepts of gradient,divergence and curl of point functions in terms of cartesian coordinate system .</li><li>▪ Understand and Evaluate different types of line,surface and volume integrals and two integral transformation theorems of Gauss and stokes.</li></ul>
Integral Calculus	<ul style="list-style-type: none"><li>▪ Understand special functions</li><li>▪ Understand types of multiple integrals</li><li>▪ Apply special functions in applications</li><li>▪ Apply multiple integrals in real life problems</li></ul>

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### B. Sc.III

Course Name	Course Outcomes
Real Analysis	<ul style="list-style-type: none"><li>▪ understand the basic facts about functions and countability of sets</li><li>▪ recognize bounded, convergent, divergent, Cauchy and monotonic sequences.</li><li>▪ calculate limit superior, limit inferior, and the limit (when exists) of a sequence..</li><li>▪ use different tests for convergence and absolute convergence of an infinite series of real numbers. Unit 1: Functions and Sequence of real numbers.</li></ul>
Modern Algebra	<ul style="list-style-type: none"><li>▪ learn Group structure and its properties.</li><li>▪ learn Ring structure and its properties.</li><li>▪ describe the difference between concepts Group and Ring.</li><li>▪ understand fundamental theorem of homomorphism, isomorphism for Group and Ring.</li></ul>
Partial differential equations	<ul style="list-style-type: none"><li>▪ understand the basic concepts of partial differential equations (PDEs) and their classification</li><li>▪ analyze and solve linear and some nonlinear partial differential equations using analytical methods.</li><li>▪ apply critical thinking skills to select appropriate solution methods for different types of PDEs.</li><li>▪ able to apply various solution techniques to solve linear partial differential equations of both first and second order</li></ul>
Integral transform	<ul style="list-style-type: none"><li>▪ understand meaning of Laplace Transform</li><li>▪ apply properties of LT to solve differential equations.</li><li>▪ understand relation between Laplace and Fourier Transform.</li><li>▪ understand infinite and finite Fourier Transform.</li></ul>
Metric Spaces	<ul style="list-style-type: none"><li>▪ acquire the knowledge of notion of metric space, open sets and closed sets.</li><li>▪ demonstrate the properties of continuous functions on metric spaces,</li><li>▪ apply the notion of metric space to continuous functions on metric spaces.</li><li>▪ understand the basic concepts of connectedness, completeness and</li></ul>

	compactness of metric spaces,
Linear Algebra	<ul style="list-style-type: none"> <li>▪ understand the fundamental concepts in linear algebra, enabling them to analyze and manipulate vector spaces, linear transformations.</li> <li>▪ relate matrices and linear transformations</li> <li>▪ acquire skills to perform computations related to inner product and orthogonalization techniques.</li> <li>▪ compute Eigen values and Eigen vectors of a linear transformations.</li> </ul>
Complex Analysis	<ul style="list-style-type: none"> <li>▪ understand the fundamental concepts in linear algebra, enabling them to analyze and manipulate vector spaces, linear transformations.</li> <li>▪ relate matrices and linear transformations</li> <li>▪ acquire skills to perform computations related to inner product and orthogonalization techniques.</li> <li>▪ compute eigen values and eigen vectors of a linear transformations.</li> </ul>
Operation research	<ul style="list-style-type: none"> <li>▪ define and explain the fundamental concepts of Operations Research.</li> <li>▪ identify and develop operations research model describing a real-life problem.</li> <li>▪ understand the mathematical tools that are needed to solve various optimization problems.</li> <li>▪ solve various linear programming, transportation, assignment problems related to real life.</li> </ul>

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