



**NITTR  
BHOPAL**

**MH-12/2026-2027**

**Mathematics: A Computational Approach**

**15-06-2026 to 19-06-2026**

**COEP Technological University, Pune**



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## Rationale

In the era of rapidly advancing computational technologies, data-driven decision-making, and interdisciplinary research, the field of mathematics is undergoing a significant transformation. Modern mathematical practice increasingly relies on computational tools and numerical methods to analyze complex systems, simulate real-world phenomena, and extract meaningful insights from data. As a result, there is a growing need to equip faculty members and researchers with the skills required to effectively integrate open-source computational tools like Sage Math, R Software, SymPy, Octave, etc., with web-based & Interactive Platforms like Jupyter Notebooks, CoCalc, GeoGebra, Desmos into mathematical teaching and research.

Recognizing this need, the Faculty Development Program (FDP) titled "Mathematics: A Computational Approach" is designed to enhance the computational proficiency and pedagogical capabilities of participants. The program focuses on developing a strong foundation in core mathematical areas such as linear algebra, calculus, numerical methods,

## Programme Outcomes

- ? Apply fundamental concepts of linear algebra, calculus, numerical methods, probability, and statistics using computational tools.
- ? Integrate theoretical mathematical knowledge with practical implementation through numerical and computational techniques.
- ? Utilize appropriate computational software (SageMath) and programming tools (R Software) for solving mathematical problems and simulations.
- ? Design and implement computational experiments, assignments, and mini projects based on mathematical concepts.
- ? Incorporate computational thinking and visualization techniques to enhance teaching-learning processes in

## Programme Content

Linear Algebra - Vector spaces and linear maps; matrices, eigenvalues, PCA, SVD,

Calculus -LMVT, Taylor series, Multivariable Calculus, Chain rule and Jacobians in Vector Calculus, and integral calculus, Differential Equations and, Laplace transforms.

Numerical Methods -Root finding, Interpolation, Numerical solution of ODE

Probability and Statistics - Random variables, Probability distributions, CLT, Sampling, Estimation Theory, Hypothesis Testing, and Regression Analysis.

## Target Group

Faculty of all disciplines

## Coordinator & Co-Faculty

Prof. Coordinator(EC)-PUNE  
Professor

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Expert



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