

Course Information:

- **Subject Code:** MA29202
- **Subject Name:** Numerical Methods Laboratory
- **Credit Hours:** 2
- **Lecture, Tutorial, Practical (LTP) Distribution:** 0-0-3

Laboratory Objectives:

The Numerical Methods Laboratory aims to provide hands-on experience in implementing and understanding various numerical methods for solving linear and non-linear systems, eigenvalue computation, finite difference methods, and the solution of hyperbolic partial differential equations.

Laboratory Syllabus:

1. Linear System Solvers:

- Implementation of Direct Methods
- Implementation of Iterative Methods

2. Non-linear Systems:

- Implementation of Picard's Method
- Implementation of Newton-Raphson Method for Vector Case

3. Eigenvalue Computation:

- Implementation of Power Method

4. Finite Difference Methods:

- Application to Various Linear and Non-linear Partial Differential Equations (PDEs)

5. System of Hyperbolic PDEs:

- Implementation and Solution

Programming Language/Tool:

- Any programming language (e.g., C, C++, Python) or MATLAB

Evaluation Criteria:

Students will be assessed based on their ability to:

- Write and implement numerical methods code.
- Understand the principles behind the methods.
- Analyze and interpret the results obtained from the implementations.

Note:

The laboratory sessions will involve practical coding exercises, debugging, and experimentation with numerical methods. Students are expected to gain proficiency in programming and applying numerical techniques to solve mathematical problems. The choice of programming language is flexible, allowing students to use the one they are most comfortable with or as directed by the instructor.

