

# WORKSHOP ON MATLAB AND PYTHON PROGRAMMING

(MPP 2025)

Organized by

Department of Mathematics, National Institute of Technology Jamshedpur

May 19 - 23, 2025 (Online / Virtual Mode)

## Schedule (Tentative)

Time / Date	19-05-2025	20-05-2025	21-05-2025	22-05-2025	23-05-2025
10:00-11:00	<b>Inaugural Session (OPENING)</b> [Chief Guest: Prof. A. Swaminathan]	LECT04 (RKB)	LECT08 (RT)	LECT12 (RKM)	LECT16 (BS)
11:00-11:15	BREAK				
11:15-12:45	LECT01 (AS)	LECT05 (RKB)	LECT09 (RT)	LECT13 (RKM)	LECT17 (BS)
12:45-14:00	BREAK				
14:00-15:30	LECT02 (SD)	LECT06 (MKG)	LECT10 (RKM)	LECT14 (IPT)	LECT18 (VS)
15:30-15:45	BREAK				
15:45-17:15	LECT03 (SD)	LECT07 (RK)	LECT11 (RKM)	LECT15 (BS)	<b>Valedictory Session (CLOSING)</b>  <b>START AT 04:30 PM</b>

**AS:** Prof. A. Swaminathan, Indian Institute of Technology (IIT), Roorkee.

**RKB:** Dr. Ratikanta Behera, Indian Institute of Science (IISc), Bangalore.

**MKG:** Dr. Mahendra Kumar Gupta, Indian Institute of Technology (IIT), Bhubaneswar.

**RK:** Dr. Rajat Kaushik, Regional Institute of Education, NCERT, Bhopal.

**RT:** Dr. Rajat Tripathi, National Institute of Technology Jamshedpur.

**RKM:** Dr. Rakesh Kumar Meena, Jawaharlal Nehru University (JNU).

**BS:** Dr. Birendra Singh, AIMT, Lucknow.

**IPT:** Dr. Indira P Tripathi, S. V. National Institute of Technology (SVNIT), Surat.

**VS:** Dr. Vikas Srivastava, Indian Institute of Technology Madras.

**SD:** Dr. Saikat Das, Indian Institute of Technology Madras.

**NOTE:** Details of the Lectures is available on the next page.

# **CONTENTS**

**LECT01:** Introduction to MATLAB, Basic operations, MATLAB as Calculator (Finite and Infinite Sums, Derivatives, Antiderivatives, Integrals, etc.),

**LECT02-03:** Handling Variables, Data Input / Output in Various Format, Expressions, Conditional / Logical Statements, Execution Control, Loops, Writing Functions

**LECT04:** Matrix operations and Linear equations

**LECT05:** Basic plotting (overview, creating simple plots, adding titles, axis labels, and annotations Multiple data sets in one plot, specifying line styles and colors)

**LECT06:** Analytical and Numerical Solutions of ODE's

**LECT07:** Assignment Solving (REVIEW and Practice)

**LECT08:** Analytical and Numerical Solutions of PDE's

**LECT09:** Machine Learning using Toolbox of MATLAB

**LECT10:** Introduction to Python Programming: Basic syntax and operations, handling variables, Data types, writing and evaluating expressions.

**LECT11:** Control Structures, Functions: Conditional and logical statements, Control structures: if-else, loops (for, while), User-defined functions.

**LECT12:** Python libraries (math, NumPy, SymPy, SciPy, and Matplotlib).

**LECT13:** Plotting in Python: Creating plots using Matplotlib; Customizing plots: titles, labels, legends, colors, and styles; working with subplots and figure layouts; Introduction to 3D plotting.

**LECT 14:** Support Vector Machine using PYTHON (Indira)

**LECT15:** Solving Differential Equations Using Python: Introduction to numerical and symbolic solutions of differential equations, solving initial value problems (IVPs): Euler's method and Runge-Kutta 4th order method.

**LECT16:** Using IDLE IDE, Debugging Python Code

**LECT17:** Object Oriented Approach: Classes and Objects

**LECT18:** Machine Learning using PYTHON

- NOTE:** 1. Lectures LECT01-LECT18 are not in order. It will be adjusted according to the speakers.  
2. Link for the ONLINE LECTURES has been sent through email to the registered participants.