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**
09:30-11:00	**Inaugural Session (OPENING)** **[Chief Guest: Prof. A. Swaminathan]**	LECT04 (RKB)	LECT08 (RT)	LECT12 (BS)	LECT16 (RKM)
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 (IP)	LECT18 (VS)
15:30-15:45	BREAK				
15:45-17:15	LECT03 (SD)	LECT07 (RK)	LECT11 (RKM)	LECT15 (BS)	**Valedictory Session (CLOSING)** **START AT 04:30 PM**

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.

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: Using IDLE IDE, Debugging Python Code

LECT16: 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.

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.