

# INDIAN INSTITUTE OF TECHNOLOGY INDORE

## DISCIPLINE OF MATHEMATICS

Organizes

**KIT-IITI-TEQIP-III e-training (FDP)**

**Short-term Online Training Programme for Faculty Members**

On

**MATHEMATICS WITH MATLAB AND MATHEMATICA**

**November 23-28, 2020**



TEQIP-3  
Technical Education Quality Improvement Programme

### ABOUT IIT INDORE

Indian Institute of Technology Indore, located in Madhya Pradesh, known as IIT Indore, is an institute of national importance established by the Government of India in 2009. Recently, IIT Indore debuted with a rank of 351-400 in the Times Higher Education World University Rankings 2019, 2nd among Indian institutes. The discipline of mathematics at IIT Indore had been started in July 2009. The faculty members of the discipline are well equipped to conduct high-quality research in both pure and applied mathematics, and are also engaged in interdisciplinary research activities. For collaborative research, interested researchers are encouraged to contact the concerned faculty. The discipline is actively engaged in organizing various research activities. For more details, please visit: [math.iiti.ac.in/](http://math.iiti.ac.in/).

### COURSE OBJECTIVES

Application of MATLAB & Mathematica play an important role in solving problems encountered in various fields of science and engineering. Efficient tools and techniques from MATLAB & Mathematica are helpful in solving real-life problems. This short-term course will introduce participants to the concepts, methods and tools for solving real mathematical models. This TEQIP training programme will cover the full spectrum of various numerical aspects. We shall also discuss how one can explore MATLAB & Mathematica softwares in Applied Mechanical problems.

### REGISTRATION FEE

- **There is no fee for faculty/scientist participants from TEQIP-sponsored colleges/institutes.**
- The nomination along with a soft copy of the registration form should be sent by email to [vkg@iiti.ac.in](mailto:vkg@iiti.ac.in) on or before November 15, 2020.
- Non-TEQIP Colleges: ₹ 4000 for faculty members/scientists and ₹ 5000 for participants from industries.
- For Online Payment, please visit <http://www.iiti.ac.in/page/e-payments>
- Bank Transfer: Beneficiary Name: Registrar IIT Indore; Bank Name: Canara bank; Branch: IIT Indore, Khandwa Road, Simrol, Indore  
A/C: 1476101027440; IFSC Code : CNRB0006223
- The soft copy of the completely filled registration form (along with online payment slip, if any, for the course fee) should be sent by email to [vkg@iiti.ac.in](mailto:vkg@iiti.ac.in) on or before November 15, 2020.

### ONLINE REGISTRATION LINK:

<https://docs.google.com/forms/d/11xalUdDsKKf7LRos1HHuatv-L2P0V5Pj6tWjds7L58c/edit>

**REGISTRATION DEADLINE: November 15, 2020**

**MODE OF THE PROGRAM: Completely Online Mode**

### COURSE MODULE

This is an active learning-based course that comprises lectures, tutorials, and hands-on training/demonstrations.

#### MODULE 1:

Introduction to Mathematica: Interface, Basic commands and syntaxes; Visualization, Setting directory and saving figures; Manipulations, Vectors and Matrices; Interpolation

#### MODULE 2:

Linear Algebra and Differential Equations using Mathematica: Eigenvalues, Eigensystem, Nullspace, Inverse, Basis and Dimension, Orthogonality, Norm; Solving linear and nonlinear algebraic equations; Solving differential equations analytically and numerically

#### MODULE 3:

Plotting, Writing functions and Complex Analysis in Mathematica: 2D, 3D and data plotting; dynamic and interactive graphics; For, Do and While loops; Writing functions manually; basics of complex analysis.

#### MODULE 4:

Introduction to MATLAB: Basics, calculations with MATLAB, writing scripts and functions, loops, arrays and conditional statements in MATLAB.

#### MODULE 5:

Linear Algebra using MATLAB: Implementation of matrix operations, the rank of a matrix, linear system of equations, row reduced echelon matrices, the inverse of a matrix, eigenvalues and eigenvectors, diagonalisation of matrices, Caley-Hamilton theorem.

#### MODULE 6:

Numerical Methods using MATLAB

### CERTIFICATE

Participants completing the course successfully will be awarded e-Certificate.

### TARGET PARTICIPANTS

This course is tailor-made for the faculty members and scientists from the disciplines of Mathematics, Computer Science, Electrical Engineering, Mechanical Engineering and Civil Engineering. The course will enhance the understanding of numerical implementation using MATLAB and Mathematica and their latest advancements. The course is mainly designed for a faculty development program. Based on the availability of seats, research scholars and post-docs may be allowed.

### ADDRESS FOR CORRESPONDENCE

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1.	<b>Name of the Person:</b>	
2.	<b>Designation:</b>	
3.	<b>Academic Qualification:</b>	
4.	<b>Name of the Institution/Organization:</b>	
5.	<b>Are you a faculty member from TEQIP Institute? (Yes or No):</b>	
6.	<b>Address for Communication:</b>	
7.	<b>Phone:</b>	
8.	<b>Email:</b>	
<b>Payment details (for participants from non TEQIP institutes)</b>		
9.	<b>Payment Details:</b>	
	<b>Amount:</b>	
	<b>Payment Ref. No:</b>	
	<b>Transaction Data:</b>	
	<b>Bank etc. Details:</b>	
<b>Place:</b>		<b>Date:</b>
<b>Signature of Participant:</b>		
<b>Approval /Permission from the TEQIP Institution/Organization:</b> We approve the above application as participant for the above FDP course, which is being organized by IIT Indore on 23 <sup>rd</sup> to 28 <sup>th</sup> November 2020.		
<b>Authorized Signature</b>		<b>Institute/Organization seal</b>

**Note:** To confirm the participation in advance, scan copy of the filled form can be emailed to [vkg@iiti.ac.in](mailto:vkg@iiti.ac.in)

**Participants are required to attend the course with their own laptops having Mathematica and MATLAB installed**