INDIAN INSTITUTE OF TECHNOLOGY INDORE
DISCIPLINE OF MATHEMATICS
Organizes
KIT-IITI-TEQIP-III e-training (FDP)
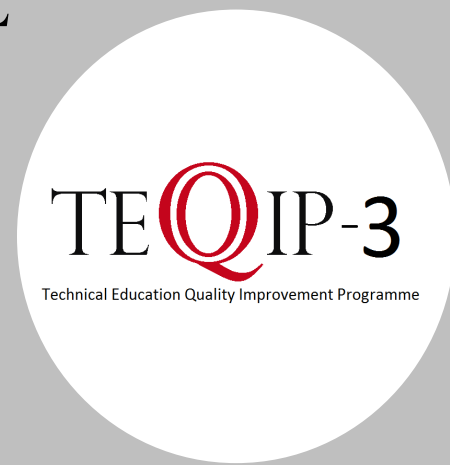### Online Faculty Development Programme (FDP)
on
MATHEMATICAL APPROACHES IN MECHANICS
DECEMBER 24-31, 2020
Sponsored by Technical Education Quality Improvement Programme (TEQIP-3, NPIU)

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/.

COURSE OBJECTIVES

The course plays an important role in solving advanced problems encountered in the fields of solid and fluid mechanics. This short-term course will introduce participants to the concepts, methods and tools for solving problems in applied mechanics as well. The course will cover the full spectrum of the development of the theory of elasticity, solid and fluid mechanics including the solution of boundary value problems along with their numerical aspects. We shall also discuss the elastic wave scattering and tomographic analysis in fluid and solid media.

TARGET PARTICIPANTS

This course is tailor-made for the faculty members and scientists from the disciplines of Applied Mathematics, Physical Sciences, Mechanical Engineering, Civil Engineering, and Biomechanical Engineering, etc. People working in other related areas may also apply.

REGISTRATION FEE:

- **There is no fee for faculty/scientist participants from the TEQIP-sponsored colleges/institutes.**
- **The nominations along with the soft copy of the registration forms should be sent by email to santanu@iiti.ac.in on or before November 30, 2020**

- Non-TEQIP Colleges: ₹4000 for faculty members/ scientists and ₹5000 for participants from industries.
- For Online Payment : 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; IFS Code: CNRB0006223
- A 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 santanu@iiti.ac.in on or before November 30, 2020

ONLINE REGISTRATION LINK:

https://docs.google.com/forms/d/14RLjfExFP9UIdKwSkcwLJTblorRKzkYgYo-ELBVa6Sw/edit

REGISTRATION DEADLINE: November 30, 2020

MODE OF THE PROGRAM: Completely Online Mode

COURSE FACULTY

- **Prof. Premananda Bera (IIT Roorkee)**
- **Dr. Santimoy Kundu (IIT (ISM) Dhanbad)**
- **Dr. Priyanka Shukla (IIT Madras)**
- **Dr. Santanu Manna (IIT Indore)**
- **Dr. Vinay Kumar Gupta (IIT Indore)**

COURSE MODULE

This is an active learning-based course that comprises lectures, and tutorials.

MODULE 1:

Introduction: Derivation of Navier-Stokes Equations; Exact solution of some wall-bounded problems, i.e. channel flow, pipe flow, annular flow (Isothermal and non-isothermal); Stability analysis (linear and weakly nonlinear) of these flows.

MODULE 2:

Thermal instability; Instability of continuously stratified fluid; Inviscid stability of parallel flows; Kelvin– Helmholtz instability.

MODULE 3:

Dynamic similarity; Similarity solution of Impulsively started plate.

MODULE 4:

Analysis of stress, principal stresses & planes, Mohr's circle diagram, equations of deformation and strain, strain in the form of displacement, compatibility concept, need and physical significance, stress-strain relation, Generalized Hook's Law, different types of symmetry.

MODULE 5:

Introduction to wave propagation in solid media, waves on strings & membranes; longitudinal waves in bars and springs; waves in liquids, waves in Unbounded media, waves in a semi-infinite media, waves in a layered medium, attenuation of stress waves.

MODULE 6:

Some advance problems.

CERTIFICATE

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

ADDRESS FOR CORRESPONDENCE

Dr. Santanu Manna
Assistant Professor
Discipline of Mathematics
IIT Indore
Indore 453552, M.P., India
E-mail: santanu@iiti.ac.in
Mob. No.: 9504080024

Dr. Vinay Kumar Gupta
Assistant Professor
Discipline of Mathematics
IIT Indore
Indore 453552, M.P., India
E-mail: vkg@iiti.ac.in
Mob. No.: 9901215325

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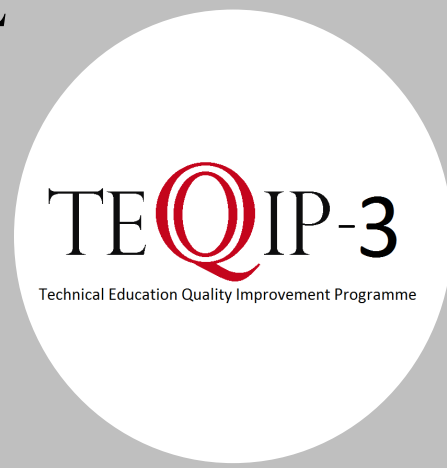### KIT-IITI-TEQIP-III e-training (FDP)
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1.	Name of the Person:	
2.	Designation:	
3.	Academic Qualification:	
4.	Name of the Institution/Organization:	
5.	Are you a faculty member from TEQIP Institute? (Yes or No):	
6.	Address for Communication:	
7.	Phone:	
8.	Email:	
9.	**Payment details (for participants from non TEQIP institutes)**	
	Amount:	
	Payment Ref. No:	
	Transaction Data:	
	Bank etc. Details:	

Place: Date:

Signature of Participant:

Approval /Permission from the Institution/Organization:
We approve the above application as participant for the above short course, which is being organized by IIT Indore on 24th to 31st December 2020.

  Authorized Signature   Institute/Organization seal

Note: To confirm the participation in advance, scan copy of the filled form can be emailed to **santanu@iiti.ac.in**