MALAVIYA MISSION TEACHER TRAINING CENTRE
INDIAN INSTITUTE OF TECHNOLOGY MANDI

MALAVIYA MISSION SCHEME
TEACHER'S
TRAINING PROGRAMME

Starting Date: 18th September 2026
Ending Date: 1st October 2026
Last Application Date: 15th September 2026

REFRESHER COURSE
ON

"Graphs, Algorithms and Computational Intractability: Theory, Methods and Applications"

MODE	DURATION	ORGANIZER
ONLINE	12 Days	IIT MANDI

About The Course –

The programme is designed to provide participants with a comprehensive understanding of graph-theoretic methods, algorithmic techniques, and the theory of computational intractability. The course aims to equip teachers and researchers with both the foundational and advanced tools required to study challenging combinatorial and algorithmic problems arising in mathematics and computer science. The programme will cover fundamental and advanced topics in graph theory, algorithm design, computational complexity and combinatorial optimization, with a particular emphasis on understanding the limits of efficient computation and the methods used to address computationally hard problems.

The course begins with foundational concepts in graph theory and algorithms, followed by an in-depth treatment of computational complexity, including the classes P, NP, and NP-complete problems. Participants will be introduced to techniques for proving NP-hardness and NP-completeness through polynomial-time reductions and other complexity-theoretic tools. The programme will also explore a variety of important combinatorial and algorithmic problems, including graph coloring, matching, covering, scheduling, and optimization problems.

Advanced topics will include approximation algorithms, randomized algorithms, probabilistic methods, parameterized complexity, fixed-parameter tractability, and modern algorithmic approaches for dealing with computationally intractable problems. Theoretical developments will be complemented by discussions of applications in network science, operations research, data analysis, communication networks, and other domains where large-scale combinatorial optimization problems arise.

The programme will also highlight contemporary research directions in graph theory and theoretical computer science, exposing participants to current challenges and open problems in the field. Through lectures, problem discussions, and interactive sessions, participants will gain a deeper understanding of both the power and limitations of algorithmic methods. Overall, the course aims to provide a broad and rigorous introduction to graphs, algorithms, and computational intractability, while fostering research interest in this vibrant and rapidly evolving area.

Participants Eligibility Criteria –

1. Faculty members working in universities and colleges that are included under Section 2(f) of the UGC Act. The teachers of colleges that do not yet come within the purview of Section 2(f), but have been affiliated to a university for at least three years, will be permitted to participate in the courses. These conditions are applicable only for Residential Training Programmes/Courses

2. For the Refresher course, participation in the **FIP is a prerequisite for admission**. The teacher may opt for a refresher course after a one-year gap following FIP. For residential RCs, there should be a minimum gap of one year between two refresher courses, though it maybe relaxed if an adequate number of participants are not available, or it is essential for the teacher to fulfill eligibility conditions for career advancement as prescribed by UGC from time-to-time.

Salient Features of the Course –

1. The Refresher course will be of **12 working days and 72 contact hours (six hours a day, six days a week).**
2. The course will comprise **48 expert lectures**, along with discussions, illustrative sessions and academic interactions.
3. Participant evaluation will be conducted through MCQ-based assessments and presentations.
4. A Certificate will be issued to those who have attended all the sessions and have qualified the Assessment examination.

Important Dates –

Starting Date	Ending Date	Application Deadline Date
18th September 2026	1st October 2026	15th September 2026

NOTE –

1. No Registration Fees.
2. Fill the NOC in the prescribed format.
3. Attendance is mandatory in all the sessions.

Course Coordinator-

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MMTTC Contact Details-

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Registration Links –

MMTTP Website: Link

Step by Step Process: Link

Noc Format: Link