Malaviya Mission Teacher Training Programme (MMTTP)

Indian Institute of Technology Mandi
Kamand, Mandi, Himachal Pradesh

12 Days Refresher Course on Core Subject & Interdisciplinary

On

Processing–Structure–Property Relationships in Advanced Engineering Materials

(Online Mode)

March 16 – March 30, 2026

About the Course:

Understanding the intrinsic relationship between **processing, microstructure, and properties** lies at the core of materials science and engineering and governs the performance of materials across structural and functional applications. Recent advances in processing routes, characterization techniques, and analytical tools have greatly enhanced our ability to engineer materials with tailored microstructures and properties for demanding sectors such as aerospace, energy, transportation, biomedical, and advanced manufacturing.

This **12-working day online Refresher Course** is designed to provide faculty members with a **coherent and in-depth understanding of processing–structure–property (PSP) relationships** in **advanced engineering materials**. The programme systematically revisits fundamental concepts—such as **thermodynamics and kinetics of materials, phase transformations, and mechanical behaviour**—and builds upon them to explain microstructural evolution during deformation, heat treatment, and manufacturing. Contemporary topics including **severe plastic deformation, grain boundary engineering, crystallographic texture development, conventional and advanced manufacturing techniques**, and **additive manufacturing as an emerging processing route** are integrated within the PSP framework.

Emphasis is placed on **linking processing conditions to microstructure and, in turn, to mechanical,**

functional, and degradation properties, supported by insights from **advanced characterization techniques** such as **SEM, XRD, EBSD, and TEM**. Adopting a **fundamentals-to-advanced pedagogical approach**, the course enables participants to strengthen conceptual clarity while gaining a unified perspective on modern materials processing and characterization, thereby supporting effective teaching, curriculum development, and research in materials and mechanical engineering.

Participants Eligibility Criteria

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 apply only to Residential Training Programmes/Courses.

Application/Registration Procedure

- The participants should first register at https://mmc.ugc.ac.in/ and create an account.
- After logging in as participant using User ID and Password, from the dashboard, click on "Apply for Guru Dakshta (FIP), Refresher Course and Short-Term Programme/Faculty Development Programme", next start filling the application form.
- In the application form, select "Apply for" as "Refresher Course on Core Subject & Interdisciplinary (online)", next give details of your earlier participation in FIP, next select "Programme Name & Centre Name" as "Indian Institute of Technology Mandi", later fill in the remaining items and submit the application form.

Salient Features of the Course

- The programme will be conducted over **12 working days**, with a minimum of **72 contact hours** (six hours per day, six days a week).
- The course will comprise **48 expert lectures**, along with discussions, illustrative sessions, and academic interactions.
- **Participant evaluation** will be conducted through **MCQ-based assessments**. Successful completion of the programme will be considered towards the **Career Advancement Scheme (CAS)** requirements as prescribed by the **UGC**.
- **No application or registration fee** will be charged for participation.
- A Certificate will be issued to those who have attended all the sessions and have qualified the Assessment examination.

This refresher course is intended to **strengthen conceptual clarity, pedagogical depth, and research capability** of participating faculty members. On completion of the programme, participants will be better equipped to **teach core materials science courses, design experiments, and pursue research grounded in robust processing–structure–property understanding**.

Programme Director	Resource Person(s)
Prof. Atul Dhar	Dr. Sandeep Sahu Dr. Suntharavel Muthaiah V.M.

Important Dates	Contact
Application Deadline Date: 9th March, 2026	mmttp@iitmandi.ac.in
Programme Start Date: 16th March, 2026 End Date: 30th March, 2026	

Relevant Important Links:

- **Step-by-Step Process:**

https://docs.google.com/document/d/1aDlych9pLGEktIeYq2Z_w_DPRbKK9OjB/edit?usp=sharing&ouid=107195621035338052957&rtpof=true&sd=true

- **User Participant Manual Link:**

https://mmc.ugc.ac.in/S/MMTTP%20User%20Manual%20Participants.pdf

- **MMTTP Website:** https://mmc.ugc.ac.in/