



# 6 DAY FACULTY DEVELOPMENT PROGRAM ON SURFACE ENGINEERING: PRINCIPLES, TECHNIQUES, AND CHARACTERIZATION

**22-27 June 2025**

Organized By

**FMME Department**

**Indian Institute of Technology (Indian  
School of Mines) Dhanbad**



**ICME Lab**  
FMME/IIT(ISM) Dhanbad

**Under the aegis of**



**University Grants Commission**



**सत्यमेव जयते**  
**Ministry of Education**  
Government of India

**MALAVIYA MISSION  
TEACHER  
TRAINING PROGRAMME**

## ABOUT THE INSTITUTE

Indian Institute of Technology (ISM) Dhanbad, earlier known as Indian School of Mines Dhanbad. The Indian School of Mines was formally opened on 9th December 1926, by Lord Irwin, the then Viceroy of India to address the need for trained manpower related to mining activities in the country with disciplines of Mining and Applied Geology. In 1967 it was granted the status of a deemed to be university under Section 3 of UGC Act, 1956. In 2016, ISM Dhanbad has got the status of IIT. Since its establishment, IIT(ISM) Dhanbad has undergone considerable expansion of its activities, and presently it can be considered as a total technology education institute. At present, the Institute has 17 departments and several centres, which are equipped with all necessary infrastructure and worldclass faculties to undertake all kinds of fundamental and applied research problems.

**Online Mode**

**No Registration Fee**



AREAS COVERED:

Surface Engineering, Coatings, Cold spray, Thermal spray, Laser surface modifications, Additive manufacturing, Surface Characterization

OVERVIEW:

Surface Engineering plays a critical role in enhancing the performance and longevity of materials across industries such as aerospace, automotive, biomedical, and energy sectors. The field encompasses various surface engineering techniques that tailor the surface properties to meet specific functional requirements. This FDP aims to provide participants with a comprehensive understanding of surface engineering principles, contemporary techniques, and advanced characterization methods. This FDP will enable faculty members and researchers to incorporate modern surface engineering concepts into their teaching and research.

COURSE CONTENT:

- 1.Fundamentals of Surface Engineering Techniques
- 2.Surface Modification Methods – Coatings (e.g., thermal spray), compositional changes, and microstructural tailoring
- 3.Surface Strategies for Corrosion and Wear Resistance
- 4.Advanced Characterization Tools – SEM, XRD, tribology, optical profilometry, etc.
- 5.ICME Approaches in Surface Engineering
- 6.Surface Engineering for Sustainable and Green Technologies

SPEAKERS:

Industry experts and academicians will provide insights into the latest trends in surface engineering, emphasizing practical applications and emerging technologies. Eminent list of experts accepted to be featured in this FDP:

- 1.Dr. Anand K, IITM
- 2.Prof. Harpreet Singh, IITRPR
- 3.Prof. Anup Kumar Keshri, IIT Patna
- 4.Dr. Sisir Mantri, IMMT Bhubhaneswar
- 5.Prof. Partha Pratim Bandopadhyay, IITKGP
- 6.Prof. Kantesh Balani, IITK
- 7.Prof. Lakshminarayan Subramanian, IITD
- 8.Prof. G M Karthik, IIT(BHU)

WHO CAN ATTEND:

- This FDP is designed for faculty members, and educators from the following disciplines (not limited to):
- Metallurgical & Materials Engineering and allied areas
  - Mechanical Engineering and allied areas
  - Chemical Engineering and allied areas
  - Nanotechnology and allied areas
  - Physics & Applied Sciences

PROGRAM COORDINATORS:

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ABOUT THE MISSION:

The National Education Policy (NEP) 2020 highlights the importance of motivated and capable faculty in higher education, emphasizing continuous professional development. To strengthen teacher training, the Malaviya Mission Teacher Training Programme (MMTTP) has been re-launched by restructuring existing initiatives like UGC-HRDCs and PMMMNMTT. The mission aims to enhance faculty capacity and integrate Indian values into teaching, research, and institutional development.

## ABOUT FMME DEPARTMENT

The Department of Fuel Minerals and Metallurgical Engineering is one of the oldest departments in the institute, established in 1976, to address the processing issues of metallic, non-metallic and fuel minerals. Keeping up with the recent research trends, industrial requirements and facilitating high-end interdisciplinary research, Metallurgical Engineering was introduced to the department in the year of 2019. The department currently offers BTech program in Mineral and Metallurgical Engineering, two-years MTech and PhD programs in Metallurgical, Fuel and Energy and Mineral Engineering. The department currently has 22 faculty members, and one visiting professor. Sixteen fully functional laboratories with state-of-the art research facilities are integral part of the department.

## ABOUT SURFACE & COATINGS LAB AND ICME LAB @IIT(ISM)

**Surface and Coatings Lab focuses on Surface Engineering of varied material systems for diverse applications. The lab works on two key verticals:**

### SURFACE AND COATINGS LAB

Surface Engineering in Coatings and Additive Manufacturing (Thermal Spray Based Technologies)

- Functional coatings
- AI-applications
- Coatings for wear & tear
- Repair and remanufacturing
- Additive manufacturing
- Coatings for bio-medical implants



Surface Modifications of Polymeric Surfaces for Functional Applications

- FGMs for structural applications
- Engineered polymer surfaces for environmental applications
- Engineered polymer surfaces for battery applications
- Polymer coatings for environmental applications



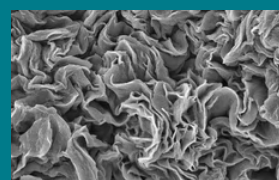
Metal 3D Printing

Cracked GI pipe

Repaired GI pipe



Repair and remanufacturing



Surface modifications of polymer surfaces

**Integrated Computational Materials Engineering Lab works on new material design and development using computational and experimental facilities for various advanced applications with these verticals:**



Materials and microstructure informatics



Welding and additive manufacturing simulations



Thermo-mechanical processing of materials



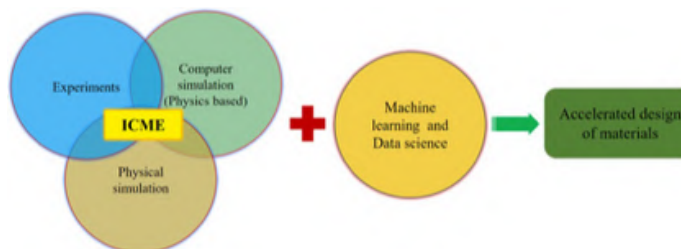
Physical simulation of manufacturing process



Physical simulation of manufacturing process



Microstructure simulation



<https://www.linkedin.com/in/icme-lab-at-iit-ism-dhanbad-5a9b86363/>

## HOW TO REGISTER

1. The participants should first register at <https://mmc.ugc.ac.in/> using their email ID.
2. Use the Login credentials received over the registered Email Id to LOGIN as PARTICIPANT.
3. From the Dashboard click on “Apply for Other Programmes”
4. Click on Apply for and Select “Short Term Programme/ Faculty Development Programme”
5. Click on Centre & Programme Date and Select “Indian School of Mines (Jharkhand) (22/06/25 - 27/06/25)”
6. Click on Title and select the Programme title that automatically comes from the dropdown option.
7. Next, Fill in the other required details like Your Subject Area Specialization; Year of Joining; Teaching Experience and others
8. Upload the NOC duly signed and approved by the Head of your Institution by clicking on the “Choose File” Button. (Sample NOC format is available at [https://mmc.ugc.ac.in/Uploads/MMTTP\\_Nomination%20Letter\\_Format.pdf](https://mmc.ugc.ac.in/Uploads/MMTTP_Nomination%20Letter_Format.pdf))
9. Finally, click on the Submit button.
10. Last date to register is 20.06.2025, but please register well in advance to avoid last-minute rush and plan your travel accordingly.
11. The participants will get a confirmation Email after registration.

**LAST DATE OF REGISTRATION:**  
**20.06.2025**