

# TRAINING PROGRAM ON Mechanical Testing of Advanced Materials for Mining and Mineral Industries



## ABOUT THE COURSE

The mechanical response of materials to different external loadings is of great importance to many fields of science, engineering, and industry. Structural failure is realized when the functionality of engineering components has been depleted. In general, there are three main reasons for a component to become dysfunctional—excessive (elastic or inelastic) deformation, fracture, and wear. Excessive elastic deformation is controlled by the elastic properties of the material, such as elastic modulus, and may occur under loading conditions of stable equilibrium (e.g., excessive deflection of a beam), unstable equilibrium (e.g., buckling of a column), and brittle fracture. Excessive inelastic deformation depends on plastic material properties, such as ultimate tensile strength, strain hardening, and hardness, and may occur under loading conditions conducive to fatigue (a process involving alternating stresses (or strain) that induce crack initiation from stress raisers or defects in the material followed by crack growth), ductile fracture due to excessive accumulation of plastic deformation, and creep (a time-dependent deformation process encountered with viscoelastic materials and elastic-plastic materials at elevated temperatures subjected to a constant stress). Material degradation may also occur as a result of mechanical wear arising at contact interfaces of load-bearing components when the transmitted contact stresses are comparable of the material hardness. It is therefore important to not only know how the mechanical properties control the material response to a certain external force, but also have knowledge of standard mechanical testing methods for measuring different material properties.



## COURSE CONTENTS

The main objective of the course is to bridge the gap between academia, R & D institutions and industries. Theoretical sessions will include lectures on

- **Importance of mechanical testing**
- **Different types of testing methods**
- **Testing parameters and their limitations**
- **Testing and performance of engineering materials**



## COORDINATOR

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## ABOUT THE INSTITUTE



The Indian National Congress at its XVII Session of December 1901 passed a resolution stating that “in view of the fact that the tendency of recent legislation namely, The Indian Mines Act VII of 1901, is that all Indian mines must be kept under the supervision of mining experts, the Congress is of opinion that a Government College of Mining Engineering be established in some suitable place in India on the models of the Royal School of Mines in England, Mining Colleges of Japan and at other places in the continent”. The McPherson Committee formed by Govt. of India, recommended the establishment of an institution for imparting education in the fields of Mining and Geology, whose report, submitted in 1920, formed the main basis for establishment of the **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. Since its establishment, **IIT(ISM)** has undergone considerable expansion of its activities, and presently it can be considered as a total technology education institute.

## How to reach IIT(ISM)

*Indian Institute of Technology (ISM) is located in the heart of the country's prime coking coal belt at Dhanbad, Jharkhand, 260 Km away from Kolkata on Howrah- New Delhi Grand Chord Railway route. It takes 3 hours from Howrah/Kolkata to reach Dhanbad by Shatabdi/Rajdhani Express trains. The nearest air port is Kolkata Netaji Subhas International Airport -280 kms.*



### VENUE, DATE AND DURATION

*EDC, IIT(ISM) Dhanbad, three days, form 12-14th May, 2017, 5-6 hours daily.*

### BOARDING AND LODGING

*Limited budget boarding and lodging will be provided to the participants in the Institute Hostel and Guest House on extra payment basis.*

**NOTE: First 20 participants will be provided free boarding and lodging.**

## ABOUT THE DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Engineering was started at IIT (ISM), Dhanbad, since the inception of the School in the year 1926. In recognition of the expanding activities of the department, the school renamed the department as Department of Engineering & Mining Machinery in the year 1973. With the availability of basic infrastructure and expertise, the Institute recognized and felt the necessity to start the B.Tech. course in Mechanical Engineering in the year 1999. Subsequently the name of the department was changed to the Department of Mechanical Engineering & Mining Machinery Engineering in the year of 2002. Since the year 2003 this department started offering two B.Tech. courses, one in Mechanical Engineering and the other in Mining Machinery Engineering in its convocation in 2004. The need of the present manufacturing scenario the department of Mechanical Engineering come in existence on its own name i.e. Department of Mechanical Engineering on 26th June, 2013. Besides the undergraduate programme in Mechanical Engineering, presently department is also offering four post graduate programmes in the following discipline:

- ❖ Mechanical Engineering ( specialization in Manufacturing Science)
- ❖ Mechanical Engineering ( specialization in Thermal Engineering)
- ❖ Mechanical Engineering ( specialization in Design Engineering)
- ❖ Mechanical Engineering (Maintenance Engineering & Tribology)

## REGISTRATION FORM

Training program on  
Mechanical Testing of Advanced Materials for  
Mining and Mineral Industries  
12-14<sup>th</sup> May, 2017

1.Name: \_\_\_\_\_

(Capital Letters)

2.Mailing Address: \_\_\_\_\_

\_\_\_\_\_

3.Branch & Department: \_\_\_\_\_

\_\_\_\_\_

4.Contact/MobileNo.: \_\_\_\_\_

5.Email Id:

6.Category: \_\_\_\_\_

(Student/Faculty/Scientist/Industrial Person)

7.Mode of Payment & details: \_\_\_\_\_

8.WhetherBoardingandLodgingrequired: YES/NO

Date:

SIGNATURE

## **REGISTRATION**

Number of participation is limited on first- come-first-serve-basis. The registration fees without boarding and lodging are as follows:

- INR 4,000/- for students / research scholar/ Faculties and Scientists from Academic Institutes/Research Organization .
- INR 500/- for IIT-(ISM) Dhanbad students.
- INR 10,000/- for persons from Industries .
- 200\$ for International participants.

The payment in the form of account payee Demand Draft drawn **in favour of “Registrar, IIT (ISM), Dhanbad”** payable at **SBI, IIT (ISM) Campus Branch, Dhanbad** (Branch Code – 1641) and duly filled registration form should be sent to the coordinator on or before 10<sup>th</sup> May, 2017.

**OR**

### **Electronic Payment:**

A/C holder: Registrar, Indian School of Mines, Dhanbad Bank Name: Canara Bank Saraidhela, Dhanbad

Branch Code: 0986

A/C No.: 0986101009746 (IFSC: CNRB0000986)

Advanced copy of the filled registration form should be sent by email. The fee is inclusive of course kit, course material etc. The payment can also be made through RTGS. The course fee is refundable if the course is cancelled for unavoidable circumstantial reasons. Certificates would be issued after the completion of the program. (For some more information, please contact Mr. Dhiraj Kumar- 08271249168, Mr. Prashant Rawat- 09472745795 and Mr. Anand Gaurav- 08969961899).

**(NOTE: First 20 participants will be provided free boarding and lodging.)**

## SPONSORSHIP AND ADVERTISEMENT

Industries from Core Sectors, Government and Semi-Government Organizations, Manufacturers, Institutions are invited for sponsoring this course. The sponsoring organizations will be entitled for free delegates as indicated below:

- **Platinum Sponsorship : INR 1,00,000 (7 Delegates free)**
- **Diamond Sponsorship: INR 75,000 (5 Delegates free)**
- **Gold Sponsorship: INR 50,000 (3 Delegates free)**
- **Silver Sponsorship: INR 25,000 (2 Delegates free)**
- **Event Sponsorship: INR 15,000 (1 Delegates free)**

A Souvenir will be published on this occasion. Advertisements are invited, for which the tariffs are:

- ❖ **Back Cover (color): INR 50,000**
- ❖ **Front Inside (color): INR 35,000**
- ❖ **Back Inside (color): INR 30,000**
- ❖ **Full Page (color): INR 20,000**
- ❖ **Full Page (B/W): INR 15,000**
- ❖ **Half Page (color): INR 10,000**