

PROFESSIONAL DEVELOPMENT PROGRAMME  
ON  
'Hydraulics in Underground Mining Equipment'  
AT IIT (ISM) DHANBAD

### BACKGROUND

In the recent past, there has been a significant increase in the use of hydraulics in underground mining equipment' such as loaders, drills and free-steered vehicles and cutter loaders. It is the muscle power of modern electro-hydraulic equipment. Presently there exists a big gap between the availability and requirement of trained manpower in this particular vital field for its efficient operation, effective maintenance and troubleshooting. To bridge the gap, it is essential that the application engineers and maintenance personnel should have the first hand theoretical knowledge to enable them to tackle practical problems encountered during installation, operation and maintenance of hydraulic equipment. Such knowledge will be useful to operate the hydraulically operated machines as prime source of power transmission at optimum level.

### WHO SHOULD ATTEND

All application engineers / supervisors in E&M / Maintenance Engg. Cadre working in underground mines who need to know about the Maintenance & Troubleshooting aspects of Hydraulic Systems used in underground machineries will be benefited from this program.

### OBJECTIVE

To provide:

- A basic knowledge about Hydraulics and pneumatics.
- The knowledge about the construction and operational aspects of Hydraulic equipment deployed in underground mines.
- Fire-Resistant Hydraulic Fluid
- The basic requirements for safer operation of hydraulic system used in underground mines.
- The knowledge about the hydraulic transmission system in underground mining equipment especially LHD, SDL and Powered support.
- The knowledge about the maintenance aspects of hydraulic systems.

- The knowledge about the troubleshooting aspects of hydraulic systems.
- Practical exposure to the modern hydraulic systems in the laboratory.

### COURSE CONTENTS

- Basics of Hydraulics & Pneumatics.
- Open-loop and closed loop hydraulic systems
- Hydraulic oil – Types, Selection and maintenance –used in u/g mining equipment with special reference to Fire-Resistant-Fluid (FRF).
- Hydraulic transmission used in LHD and free steered vehicles
- Filtration of Hydraulic Fluid, Filter location and Filter change intervals in HEMM
- Oil sampling and Analysis
- Schedule component change –out
- Premature failure of hydraulic components and How to prevent them
- Troubleshooting:
  - Hydraulic Cylinder problems
  - Hydraulic pump problems
  - Hydraulic motor problems
  - Overheating problems
  - Hydraulic accumulator, solenoid valve problems
  - Hydraulic drives / transmission problems
- Tutorials on Trouble shooting of Hydraulic Systems with reference to drills, SDL, LHD, Shuttle car, continuous miner, ram car and powered support and shearer.
- Maintenance of Hydraulic systems used in u/g loaders, drills and free-steered vehicles
- Practical classes will be held on following topics:
  - Performance investigation of computer controlled hydrostatic transmission system through swashplate controlled variable displacement pump.
  - Performance investigation of hydrostatic transmission system with bent axis motor drive using proportional valve.
  - Performance investigation of energy saving hydraulic system using hydraulic accumulators.
  - Construction of different hydraulic circuits using hydraulic trainer.

### METHODOLOGY

The experienced faculty members of the Department of Mining Machinery Engg., IIT (ISM), Dhanbad will deliver lectures in this course. The experts from industries may also be hired. The practical classes will be conducted in the basic and advanced Power hydraulics and Pneumatics laboratories.

### DURATION

5 (Five) days, from 12<sup>th</sup> June – 16<sup>th</sup> June, 2017

### COURSE CO-ORDINATOR AND CONTACT ADDRESS

All nominations should be addressed to:

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### OTHER DETAILS

IIT (ISM) Dhanbad is an educational institution. It has Executive Development Center (EDC) where following facilities are available:

- Double seated A/C furnished room, with television, computer with Internet facilities, indoor and outdoor games.
- It has A/C class rooms with LCD projectors for power point presentation.

## COURSE FEE

- **Rs. 33,000/- (+15% taxes)** per resident participant  
The fee includes: comprehensive course materials with Boarding and lodging.  
Accommodation will be provided in twin sharing basis a/c room.
  - **Rs. 31,000/- (+15% taxes)** per non-resident participant  
The fee includes: comprehensive course material with breakfast and lunch (no accommodation will be provided)
- **Note:**  
*Discount for more than 4 (four) participants nominated from an organization is as follows:*  
Rs. 31,000/- (+ 15% taxes) per resident participant  
Rs. 30,000/- (+15% taxes) per non-resident participant

## REGISTRATION

Draft in favour of Registrar, Indian Institute of Technology (Indian School of Mines), Dhanbad – 826004 should be sent along with the nominations latest by 2<sup>nd</sup> June, 2017.

For net banking transaction:

**Account Number** : 0986101009746  
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# INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD

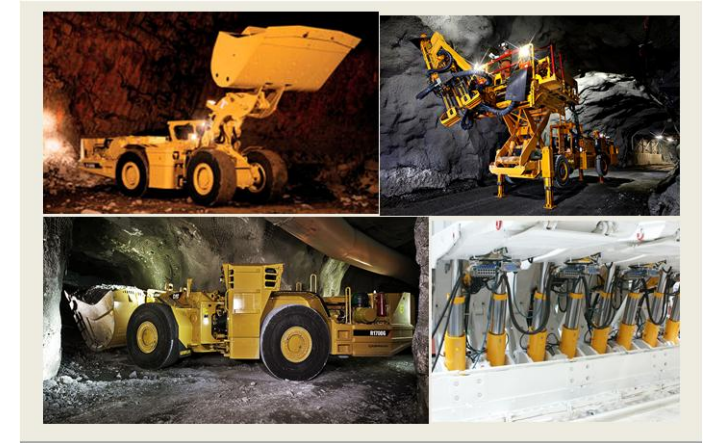
DEPARTMENT OF MINING MACHINERY ENGINEERING

*Announces*

EXECUTIVE DEVELOPMENT PROGRAMME

ON

## HYDRAULICS IN UNDERGROUND MINING EQUIPMENT



AT

IIT (ISM) DHANBAD

DATE : 12<sup>TH</sup> JUNE - 16<sup>TH</sup> JUNE 2017