

## 5 Day Training Program on “Scanning Electron Microscopy (SEM)”

(March 28<sup>th</sup> - April 1<sup>st</sup>, 2017)

Organized by

Material Research Centre, Malaviya National  
Institute of Technology  
J.L.N. Marg, Jaipur- 302017  
Rajasthan-India  
<http://www.mnit.ac.in/>



### Scope of the Program:

Scanning Electron Microscopy (SEM) is one of the most versatile analytical instruments for investigating the microstructure of materials. SEM is a type of electron microscope which provides the investigator with a highly magnified image of the surface of a material that is very similar to what one would expect of one could actually “see” the surface visually. The resolution of the SEM can approach of few nm and it can operate at magnifications that are easily adjusted from 10 to 300,000. Besides topographical

information, elemental composition details near surface regions of the sample can also be obtained by using SEM. SEM with EBSD attachment can also give information related to the orientations of the grains or phases constituting the sample. A number of variants of instruments closely related to the SEM are being used for material analysis.



### Aim of the Program:

The content and quality of this training program is designed in a manner that a trainee will readily meet the laboratory research and industrial requirements. The training program is divided into two parts: (1) Theoretical exposure and (2) Practical demonstration. During the training, ample time is provided to every trainee for hands-on experiences on the instrument to become well versed with all the practical aspects of instruments and its mechanical functioning. After the training, the trainees should understand the principles, construction and function of SEM, should be able to prepare good sample for SEM, should be confident to set up sample in SEM

and suitable mode of operation conditions (i.e., secondary and back scattered modes of operation), should be able to interpret SEM micrographs.

### Training Module for 5 Days:

#### Day 1: Time 5:00-7:00 PM

Theoretical session on introduction to SEM, its basic principle and its applications in various fields via power point presentation (2 hours)

#### Day 2: Time 5:00-7:00 PM

Theoretical session on the capabilities of SEM, signals and functions of a normal SEM, basic mode of operation of SEM (Secondary electron mode, Back scattered electron mode and elemental X-ray maps). (2 hours)

#### Day 3: Time 5:00-7:00 PM

Theoretical session on typical attachments with SEM, main component of SEM, image interpretation of different types of samples of materials such as organic materials, electronic materials, biomaterials, fracture/failure analysis and forensic analysis, sample preparation for SEM. (2 hours)

#### Day 4: Time 4:00-7:00 PM

Training session on microscope (practical demonstration on alignment of microscope, sample loading, scanning of sample and micrographs/data acquisition along with precautions to be taken while working on SEM. (3 hours)

#### Day 5: Time 10:00 AM-1:00 PM and 2:00-5:PM

Practice session on microscope. (6 hours)

### Who should Attend?

Researchers, PhD, master's and honours students in the physical, earth, biological, chemical, materials and metallurgical engineering/science.

### About Materials Research Centre (MRC):

The Materials Research Centre aims to harness the talent resources of MNIT for promoting interdisciplinary research in appropriate materials technologies. It has been created with an objective of providing a central facility of latest and advanced analytical instruments for research in the application areas of physical, environmental, chemical, allied and interdisciplinary sciences and Technology.

### Registration Form:

5 day training program on Scanning Electron Microscopy  
(March 28<sup>th</sup> – April 1<sup>st</sup>, 2017)

Name .....

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(In Block Letters)

Designation.....

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Organization.....

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Academic  
Qualification.....

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Specialization.....

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Mailing  
address.....

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Contact ..... No.

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E.mail  
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Accommodation Required Yes/No

Details of Registration Fee-

DD no.....

Date .....

Bank  
Name.....

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Amount  
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Date .....

Signature of Applicant

Signature of Sponsoring Authority with seal

### Organizing Committee

The training program will be co-ordinate by MRC, faculty Members, Contact: [ksachdev.phy@mnit.ac.in](mailto:ksachdev.phy@mnit.ac.in) [Rgupta.chv@mnit.ac.in](mailto:Rgupta.chv@mnit.ac.in), [asmniti@gmail.com](mailto:asmniti@gmail.com).

### Registration Fees:

Participants from Industry	: Rs 5000
Institutional Participants Faculty Members	:Rs 3000
Students and Research Fellow	:Rs 1500
Students of MNIT	:Rs 1000
Faculty of MNIT	:Rs 1500