



BIT MESRA



DEPARTMENT OF
SCIENCE & TECHNOLOGY



IIT(ISM) DHANBAD

One-Week Training Program on

Advanced Instrumental Techniques in Chemistry and Material Sciences (AITCMS22)



09th -15th May 2022

Conducted by



DEPARTMENT OF CHEMISTRY

BIRLA INSTITUTE OF TECHNOLOGY MESRA (BIT MESRA) RANCHI-835215

Under

DST-STUTI PROGRAMME OF INDIAN INSTITUTE OF TECHNOLOGY (ISM) DHANBAD-826004

Funded by: Department of Science & Technology (DST), Govt. of India

The one-week training program on **Advanced Instrumental Techniques in Chemistry and Material Sciences (AITCMS22)** will be conducted by the Department of Chemistry, Birla Institute of Technology (BIT Mesra) Ranchi under the banner of 'Synergistic Training Program Utilizing the Scientific & Technological Infrastructure (STUTI)' project of Department of Science and Technology (DST), Government of India. The training content is considered to impart knowledge on some advanced instrumental techniques used for characterization in Chemistry, Physics, Polymers, Environment and other all areas of material sciences. This module will be beneficial for the researchers actively engaged in research or consultancy work. Participants will have to go through the classroom teaching which will be followed by the laboratory demonstration on each instrument. So, the practical operation procedures, interpretation of analysis results of each instrumental technique will be discussed in detail. The theory session will be followed by a hands-on laboratory demonstration for a better understanding of the principle and operation of the instruments and the use/ interpretation of the data. Following schedule and topics shall be covered within this module.

ACTIVITY

DELIVERABLES

NMR
(DST FIST Supported)

Most widely used instrument in determining molecular structure of the material when placed in a magnetic field. We will learn about NMR, its concepts, operation and interpretation of spectra using a 400 MHz NMR facility in the department.

FTIR & Computational
Chem Lab
(DST FIST Supported)

FTIR is one of the first hands instruments used for characterization of samples, know about the functional groups present in it. We will learn analysis, operation and interpretation of spectra using FTIR. Computational chemistry lab will give an exposure to molecular modeling softwares.

Flame Photometer,
AAS & ICPOES

Flame photometry, Atomic absorption spectroscopy and Inductively coupled plasma optical emission spectroscopy will help to determine the concentration of metals in various samples in aqueous forms. Here, we will learn sample preparation, principles and operation of these instruments.

HPLC &
Flash Chromatography

Liquid Chromatography is one of the prominent separation techniques. Here, we will learn concepts, operation and working of HPLC and Flash Chromatography used at industrial level.

FESEM & XRD

FESEM is used to determine the morphology of samples. We will learn principle, operation, sample preparation and various case studies of analysed samples. XRD is a technique used for determination of nature and structure of a molecule. We will learn about Xray diffraction & Bragg's law, crystal systems and structures.

Electrochemical Analyzer &
Mass Spectrometer

Electrochemical analyzer is used for electrochemical measurements. This is largely used for determination of potential, current, applications in cells, batteries etc. We will learn basic principles, operation and applications of Mass Spectrometer.

UV Vis &
Spectrofluorometer

UV-Vis Spectroscopy is an indispensable analysis to know about sample information and its concentration. Spectrofluorometer uses fluorescent properties of compounds in order to provide information regarding their concentration and chemical environment in a sample. We will learn basic principles, sample preparation, operation procedure and applications of both these instruments.

Contact Persons

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