

One-week Hands-on Training Workshop on "Advanced Analytical and Simulation Techniques in Chemical Engineering Applications"

21st to 27th November 2022

Organised by

DEPARTMENT OF CHEMICAL ENGINEERING

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

Under

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

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



BIT MESRA



IIT(ISM) DHANBAD



DEPARTMENT OF

SCIENCE & TECHNOLOGY



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About the Program

The Department of Science and Technology (DST) intends to build human resources and knowledge capacity by arranging training programs through open access science and technology infrastructure across the country under the banner of 'Synergistic Training program Utilizing the Scientific & Technological Infrastructure (STUTI)'. Each training session will be for seven (7) days and thirty (30) participants can be accommodated. All the training expenditures (travel by train, food and accommodation, training materials) will be borne by the DST. The present proposed program will be organized by the Department of Chemical Engineering, Birla Institute of Technology Mesra, Under DST-STUTI Programme of Indian Institute of Technology (ISM) Dhanbad to impart knowledge on some advanced instrumental and simulation techniques used for chemical engineering applications. 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 training program will be arranged from 21st November to 27th November' 2022. The participants may be allowed to bring their samples, if any, for hands-on analysis.

Eligibility Criteria for Participants of the Training Program:

- Person of Indian origin;
- Minimum qualification should be Post Graduate (Science) or B.Tech. (Technology), involved in research.
- Professors/Scientists/ Post-Doc Fellows/ Ph.D. fellows/ Industry persons who are actively involved in research and development (R&D);
- Not more than 3 participants from one institute per training should be allowed from outside the host institute.

About The Department

The Department of Chemical Engineering with well qualified faculty provides high standard of education in the diversified fields of Chemical Engineering. The Department has immense strength in the area of Polymer Engineering. The Department received national recognition by winning the Gold Trophy for Plastics Award 2012 in the category of Best Educational Institution Contributing to Plastics. The Plastics Award was conferred on 1st February 2012, at 8th International Plastics Exhibition and conference. The programme was supported by Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Government of India. Faculty members are working on sponsored projects and collaborative research with various organizations. The Department is also recognized under DST-FIST.

The Department has modern and sophisticated laboratories and workshop facilities such as Chemical Engineering Unit Operation laboratory, Chemical Reaction Engineering Laboratory, Process Control Laboratory, Synthesis Laboratory, Energy Engineering Laboratory, Polymer Characterization Laboratory etc. The students are trained in various CAE applications in the field of product and process design with various software such as ASPEN PLUS, MATLAB, PROENGINEER, ANSYS, CATIA, FLUENT.

There are several Projects sponsored by DST, CSIR, ICMR, DRDO, Ministry of New and Renewable Energy, Coir Board etc. to the credit of the Department. Major research areas are: Nanotechnology, Advanced Polymer Composites, Alternative Energy, Energy storage, Bio-resources Utilization, Pollution Control, Water Treatment Technologies, Polymer Blends and Interpenetrating Polymer Networks, Nano filtration Membrane, Recycling of Polymer Waste, Specialty Polymer, Colloids and Interfacial Science, Tissue Engineering, Sensors, Fuel Cell Membrane & Food Process Engineering.

About The Institute

Established in 1955 by the visionary industrialist Late Sri B.M. Birla, BIT Mesra was founded with a clear vision to offer its young minds a space, where their imagination could take wings and their ideas fruition. The first institution to be granted autonomous status in 1972 under UGC Act, BIT initiated the concept of small manufacturing enterprises in 1970 by establishing the Small Industries Research and Development Organization (SIRDO). The first example of Science and Technological Entrepreneurs Park (STEP) in the country subsequently conceptualized and established by the Government of India in several IITs. The main campus of BIT in the outskirts of Ranchi at Mesra is spread over approximately 780 acres of a well laid out township with adequate civil infrastructure of buildings, metallic roads, parks and social amenities in the midst of a generous spread of lush green natural Sal forest located at the confluence of Subarnarekha and Jumar rivers.

The academic program of the Institute comprises 17 Departments and Centers with active support from modern and sophisticated research facilities like High Performance and Desktop Computing Laboratory, Central Instrumentation Facility, Central CAD Laboratory, Central Workshop with machine, foundry and fabrication facilities, Design and Architecture Studios, Teaching and Specialized Research Laboratories and Language laboratory. BIT Mesra has a strong foothold in research activities with a large number of sponsored research projects with funding from ISRO, SERB, DST, DRDO, BRNS, ICMR, CSIR, AICTE, ICSSR, Rural Development, etc.

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Local Organizing Committee

Patron	: Prof. Indranil Manna, Vice Chancellor, BIT Mesra
Chairman	: Prof Kunal Mukhopadhyay, Dean of Faculty Affairs
Convenor	: Dr. Akhil K Sen, Head, Department of Chemical Engineering
Program Coordinator	: Prof. Gautam Sarkhel, Department of Chemical Engineering
Organizing Secretary(s)	: Dr. Anand Bharti and Dr. (Mrs) Debasree Ghosh
Registration Committee	: Dr. Pulak Dutta, Dr. B C Ruidas
Accommodation and Food	: Dr. Amit Tiwari, Dr. J Sudeepan
Transport	: Dr. Y N Prajapati, Dr. S K Jana
Press, Web, Media	: Dr. A N Mishra, Dr. Abhijit Mondal
Venue Management	: Prof. (Mrs) S Goswami, Dr. Arup Choudhury, Dr. G T Mohanraj Dr. A Karmakar, Dr. Anupam Roy

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ACTIVITY	DELIVERABLES
Rheological Analysis	Rheology deals with the deformation and flow behavior of materials. Regarding viscosity and viscoelastic behavior, Rheology plays a significant role in many aspects of materials and products production, processing, transportation, and consumption. The current workshop deals with the basics of rheology, focusing on the real-life application of rheology.
BET Surface Area Analyzer	This module aims to educate the participants on various aspects of porous material characterization, including experimental and theoretical methods to study the structural, adsorption, wetting, and transport properties of various classes of porous solids. This workshop will benefit users of BET surface area and pore volume analyzers measuring porous nanostructures, biomaterials, adsorbents, catalysts, membranes, batteries, pharmaceuticals, filters, fibrous materials, textiles, paper, and soil.
ChemBET PULSAR TPR/TPD Chemisorption Analyzer	The ChemBET Pulsar TPR/TPD represents the very best in catalyst characterization using automated flow methods of analysis.
Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES)	Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES) training program is well designed for those who want to obtain theoretical and practical knowledge about the principle, working and application of these instruments. During the program, the trainee learns the aspects of method development, sample preparation, sample handling, operating and the technology being used
Atomic Force Microscopy (AFM)	Fundamental Aspects of AFM and its applications is designed to develop many key concepts-both theoretical and experimental-which allow a better understanding of the principles underlying the AFM.
CFD for fluid flow and heat transfer	CFD simulation plays an important role for solving fluid flow problems and associated energy transfer. In this session application CFD simulation for various engineering application will be discuss and hands-on training ANSYS-fluent will be conducted.
Molecular Simulation	Molecular Simulation is a powerful tool for understanding the chemical and biological systems at the microscopic level. This module introduces the participant's various molecular simulation techniques and engineering applications. The module will cover the following topics: Fundamentals of statistical mechanics, Basics of Molecular Dynamics Simulations, and Hands-on Training in open-source Molecular Simulation code – GROMACS.