One-Week Hands-On Training Program on "Emerging Technologies in Chemical Engineering: From Theory, Experiments to Industry Applications" (22nd – 28th August, 2022)

The Department of Science and Technology, Government of India, has given the responsibility to IIT (ISM) Dhanbad to build human resources and its knowledge capacity using open access science and technology infrastructure through the scheme ***"Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI)"***. Thus, under the DST-STUTI programme of IIT (ISM) Dhanbad, a one-week hands-on training program on ***"Emerging Technologies in Chemical Engineering: From Theory, Experiments to Industry Applications"*** was organized from 22nd August to 28th August, 2022 at Department of Chemical Engineering, NIT Durgapur, West Bengal.

This training program was coordinated by Dr. Bimal Das, NIT Durgapur and Dr. Bikash Kumar Mondal,NIT Durgapur. This program includes thirty participants (Faculty/Research Scholar) from various universities/colleges in India.

Highlights of the Day-1 (Dated: 22nd August, 2022)

Before the formal inauguration of the program the participants were provided a welcome kit that included a note pad, a power kit (pen, pencil, eraser, and sharpener), and a program pamphlet. Then the training program was inaugurated by Dr. Jaya Sikder, Head, Department of Chemical Engineering, NIT Durgapur. The local Program Coordinator, Dr. Bimal Das, Department of Chemical Engineering, welcomed all the participants and speakers. The introduction energized the participants' interest in science and engineering. Following that, two consecutive lectures were scheduled. The first lecture (from 09:30 AM to 10:45 AM) was based on the abatement of fluoride from ground water and was delivered by Prof. Susmita Dutta. The second lecture (from 11:00 AM to 12:15 PM) was based on the technological advancement of membrane technology from the lab to land applications and was delivered by Dr. Jaya Sikder.

Next, after the lunch break, an advanced analytical instrumentation laboratory demonstration (from 02:30 PM to 05:00 PM) on the basics of UV spectroscopy, fluorescence spectroscopy, HPLC, BET, and GCMS was provided under the guidance of Prof. Susmita Dutta and Dr. Jaya Sikder.

Highlights of the Day-2 (Dated: 23rd August, 2022)

Similarly, on the second day, two lectures were scheduled. The first lecture (from 09:30 AM to 10:45 AM) was based on biofuel and was taught by Prof. Gopinath Halder. The second lecture (from 11:00 AM to 12:15 PM) was based on the treatment of coke-oven wastewater through microbial route as a polishing step and was taught by Prof. Susmita Dutta.

Next, after the lunch break, an advanced analytical instrumentation laboratory demonstration (from 02:30 PM to 05:00 PM) on the basics of atomic absorption spectrometer was provided under the guidance of Prof. Gopinath Halder and Prof. Susmita Dutta.

Highlights of the Day-3 (Dated: 24th August, 2022)

On the third day, two lectures were delivered. The first lecture (from 09:30 AM to 10:45 AM) was based on nanomaterials and was taught by Dr. Rajib Ghosh Chaudhuri. The second lecture (from 11:00 AM to 12:15 PM) was focused on modelling and simulation at different lenth and time scale. The second lecture was taught by Dr. Abhiram Hens.

Following the lunch break, a CFD laboratory demonstration (from 02:30 PM to 05:00 PM) was provided under the guidance of Dr. Rajib Ghosh Chaudhuri and Dr. Abhiram Hens.

Highlights of the Day-4 (Dated: 25th August, 2022)

On the fourth day, two lectures were given. The first lecture (from 09:30 AM to 10:45 AM) was focused on the carbon dioxide capture process development and was delivered by Dr. Bikash Mondal. The second lecture (from 11:00 AM to 12:15 PM) was focused on the overview of thin film membrane separation processes and was delivered by Dr. Mrinal Kanti Mandal.

Next, after the lunch break, a few laboratory demonstration (from 02:30 PM to 05:00 PM) on field emission scanning electron microscope with EDX analyser, atomic force microscope, X-ray diffractometer, and solar simulator was provided under the guidance of Dr. Bikash Mondal and Dr. Mrinal Kanti Mandal.

Highlights of the Day-5 (Dated: 26th August, 2022)

Similarly, on the fifth day, two lectures were conducted. The first lecture (from 09:30 AM to 10:45 AM) was focused on the application of green materials in petroleum industries and was delivered by Dr. Tarun Kumar Naiya. The second lecture (from 11:00 AM to 12:15 PM) was focused on the recent advancement in absorptivity remediation of wastewater and was delivered by Dr. Sankha Karmakar.

Next, after the lunch break, a practical demonstrations (from 02:30 PM to 05:00 PM) on membrane synthesis and application laboratory were provided under the guidance of Dr. Tarun Kumar Naiya and Dr. Sankha Karmakar.

Highlights of the Day-6 (Dated: 27th August, 2022)

On the sixth day, two lectures were given. The first lecture (from 09:30 AM to 10:45 AM) entitled 'Aspen modelling and simulation for the chemical industry' was delivered by Dr. Sandip Kumar Lahiri. The second lecture (from 11:00 AM to 12:15 PM) was based on the development of green packaging material for the next era and was taught by Dr. Deepshikha Datta.

Next, after the lunch break, some laboratory demonstrations (from 02:30 PM to 05:00 PM) on artificial intelligence and machine learning were provided under the guidance of Dr. Sandip Kumar Lahiri and Dr. Deepshikha Datta.

Highlights of the Day-7 (Dated: 28th August, 2022)

Similarly, on the seventh day (the last day of the training program), two lectures (the first lecture was from 09:30 AM to 10:45 AM and the second lecture was from 11:00 AM to 12:15 PM) were conducted based on the lubricant oil and development of next generation sodium-ion batteries. These two lectures were delivered by Dr. Bimal Das and Dr. Ananta Sarkar, respectively.

Next, after the lunch break, the valediction program was conducted. Following that, the certificate distribution ceremony took place. In general participants enjoyed the accommodation and food during their stay at NIT Durgapur. Some of them have also requested to continue such program at the Institute.

Throughout the training program, a formal and healthy discussion environment was established for the exchange of scientific and technological knowledge.

Prof. Sagar Pal	**Prof. Ravi Kumar Gangwar**	**Prof. Bimal Das**
Coordinator (DST-STUTI)	Co-Coordinator (DST-STUTI)	Program Coordinator

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