



## One-Week Training Program

On

“Uses of Sophisticated Mechanical Characterization Instruments”

Under

Synergistic Training program Utilizing the Scientific & Technological Infrastructure

An initiative of Department of Science & Technology (DST), Govt. Of India

Organized by

Department of Mechanical Engineering, IIT (ISM) Dhanbad, Jharkhand-826004, India



One-Week Training Program on “Uses of Sophisticated Mechanical Characterization Instruments” (04<sup>th</sup> July – 10<sup>th</sup> July, 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)*". In this regard, the Department of Mechanical Engineering, IIT (ISM) Dhanbad, organized a one-week training program on "*Uses of Sophisticated Mechanical Characterization Instruments*" from 04<sup>th</sup> July to 10<sup>th</sup> July, 2022 at IIT (ISM) Dhanbad.

This training program was coordinated by Prof. Amit Rai Dixit, Department of Mechanical Engineering, IIT (ISM) Dhanbad. This program includes thirty participants (Faculty/Research Scholar) from various universities/colleges in India, with no more than three from the same university/college.

### Highlights of the Day-1 (Dated: 04<sup>th</sup> July, 2022)

The first day of the training program began with a brief introduction to the program's purpose and significance. The introduction energized the participants' interest in science and engineering. The participants were then given a welcome kit that included a bag, a note pad, a power kit (pen, pencil, eraser, sharpener), and a program pamphlet.

Following that, two consecutive lectures were scheduled, with a relatively short tea break in between. The first lecture (from 10:00 AM to 11:15 AM) was based on mechanical measurement using UTM and was delivered by Prof. S. S. Singh. The second lecture (from 11:30 AM to 12:45 PM) was based on data acquisition and analysis and was delivered by Prof. K. P. Ajit.

Next, after the lunch break, a laboratory demonstration (from 2:00 PM to 5:00 PM) on the universal testing machine was provided by Prof. K. P. Ajit and Mr. Md. Ramjan.

### Highlights of the Day-2 (Dated: 05<sup>th</sup> July, 2022)

On the second day, two lectures were given based on the basic principles of thin film measurement and data analysis. These two lectures (the first one from 10:00 AM to 11:15 AM and the second one from 11:30 AM to 12:45 PM) were delivered by Prof. P. K. Singh.



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Next, after the lunch break, a practical demonstration (from 2:00 PM to 5:00 PM) of the thin film measurement lab was provided by Prof. P. K. Singh, Mr. Ritesh Dwivedi, and Ms. Soumya Singh.

**Highlights of the Day-3 (Dated: 06<sup>th</sup> July, 2022)**

On the third day, two lectures were conducted based on the surface morphology using non-contact surface profilometer and data acquisition and analysis. These two lectures (the first one from 10:00 AM to 11:15 AM and the second one from 11:30 AM to 12:45 PM) were delivered by Prof. V. Bajpai.

Following the lunch break, a practical demonstration (from 2:00 PM to 5:00 PM) on the non-contact profilometer-metrology lab was provided by Prof. V. Bajpai, Mr. Pran, Mr. Rajesh Sahoo, and Mr. Arnab Das.

**Highlights of the Day-4 (Dated: 07<sup>th</sup> July, 2022)**

On the fourth day, two lectures were given based on the basic principles of viscometer, ferro graph make rand flash point apparatus, and data analysis. These two lectures (the first one from 10:00 AM to 11:15 AM and the second one from 11:30 AM to 12:45 PM) were delivered by Prof. Subrata Kumar Ghosh.

Next, after the lunch break, a practical demonstration (from 2:00 PM to 5:00 PM) on the viscometer and ferro graph make rand flash point apparatus-tribology lab was provided by Prof. Subrata Kumar Ghosh, Mr. Palit, Mr. Shiva Singh, Mr. Ashutosh Pare, and Mr. Santosh Kumar.

**Highlights of the Day-5 (Dated: 08<sup>th</sup> July, 2022)**

Similarly, on the fifth day, two lectures were conducted based on the basic principles of TAN/TBN, moisture content apparatus, and data analysis. These two lectures (the first one from 10:00 AM to 11:15 AM and the second one from 11:30 AM to 12:45 PM) were delivered by Prof. Subrata Kumar Ghosh.

Next, after the lunch break, a practical demonstration (from 2:00 PM to 5:00 PM) on TAN/TBN and moisture content apparatus-tribology lab was provided by Prof. Subrata Kumar Ghosh, Mr. Palit, Mr. Shiva Singh, Mr. Ashutosh Pare, and Mr. Santosh Kumar.



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### Highlights of the Day-6 (Dated: 09<sup>th</sup> July, 2022)

Similarly, on the sixth day, two lectures based on the basic principles of surface hardness measurement and data analysis were given. These two lectures (the first one from 10:00 AM to 11:15 AM and the second one from 11:30 AM to 12:45 PM) were delivered by Prof. Amitava Mandal.

Next, after the lunch break, a laboratory demonstration (from 2:00 PM to 5:00 PM) on the micro hardness tester was provided by Prof. Amitava Mandal, Mr. Mukul, and Mr. Kumar Ujjawal.

### Highlights of the Day-7 (Dated: 10<sup>th</sup> July, 2022)

Similarly, two lectures based on the importance of mechanical characterization and tribology were given on the seventh day (the last day of the training program). These two lectures (the first one from 10:00 AM to 11:15 AM and the second one from 11:30 AM to 12:45 PM) were delivered by Prof. A. R. Dixit.

Next, after the lunch break, a practical demonstration (from 2:00 PM to 5:00 PM) on the universal tribometer was provided by Prof. A. R. Dixit, Mr. Suryank Dwivedi, and Mr. Akash Nag.

The participants performed hands on training on these above mentioned instruments and collected the data of their own samples. Approximately 100 samples were processed during the training program.

Following that, the certificate distribution took place, followed by a closing speech. Throughout the training programme, a formal discussion environment was established for the exchange of scientific and technological knowledge.

**Prof. Sagar Pal**  
Coordinator (STUTI)

**Prof. Ravi Kumar Gangwar**  
Co-Coordinator (STUTI)

**Prof. Amit Rai Dixit**  
Program Coordinator

