



## SERB sponsored workshop on **MECHANICALLY ASSISTED SURFACE TREATMENT**

(Through Virtual Mode)

28 - 29 June 2022

Organized by

Dept. of Metallurgical and Materials Engineering

National Institute of Technology Rourkela

Rourkela-769008 Odisha

## Registration

The workshop does not have any registration fees. However, a GOOGLE form has to be filled within 10th June 2022. Without registration, one will not be allowed in the online sessions. The selected candidates will be intimated by email before the workshop with details elaborating on the joining process in the virtual program.

Link for registration (google form): <https://bit.ly/3KMs4kE>

## Resource Persons

**Prof. Anindya Basu**, Department of Metallurgical and Materials Engineering, NIT Rourkela.

**Prof. Krishna Dutta**, Department of Metallurgical and Materials Engineering, NIT Rourkela.

**Prof. Kausik Chattopadhyay**, Department of Metallurgical Engineering, IIT BHU.

## Contact Details

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## Scope of the course

Surface treatment is a generic name for a group of processes covering addition, removal, and modification of the surface to obtain a set of properties mainly to improve physical (colour, luster, texture, roughness etc.), structural (grain size, crystallographic texture, dislocation density etc.), surface-mechanical (hardness, wear, residual stress etc.) and electrochemical (corrosion, oxidation etc.) properties. Other core properties like tensile strength, fatigue life etc. can also be improved by such treatments. Mechanically assisted surface treatments, a special group of surface modifications, are already in the potential use for many industrial applications.

Shot peening is one such proven method heavily used in automobile industries mainly to improve the fatigue life of gear/shaft components. Ultrasonic shot peening (USSP) is a modern derivative of conventional shot peening and slowly creeping into the market. Laser shock peening (LSP) is another emerging peening process where surface roughness is controlled efficiently with improved fatigue life. These peening techniques can also be used as a secondary surface-modification treatment applied on electrodeposited coatings to provide better adherence along with other beneficial effects mentioned above. All such aspects will be covered in this workshop with a laboratory visit to demonstrate the USSP process.

## About the Department

Established in 1963, the Department of Metallurgical and Materials Engineering of NIT Rourkela has emerged as a powerhouse for academics, scientific research, and cutting-edge technologies. With time, the department grew noticeably and established new areas of research and teaching in materials engineering, while retaining its strength in traditional areas in metallurgical engineering. The well-developed infrastructure and diversified expertise of the faculties have provided the department a global acceptance. The department is actively involved in research activities in the front-line areas of metallurgical and materials engineering in collaboration with reputed R&D organizations and industries throughout the country.

## Venue

The course will be organized online to avoid any unforeseen conditions.

## Course deliverables

28 <sup>th</sup> June	<b>Surface modification: mechanically assisted routes, types, and promises (Prof. A. Basu)</b>
	<b>Surface characterization in peening related studies (Prof. A. Basu)</b>
	<b>USSP: Microstructural modification and its effect on Corrosion and cell growth (Prof. K. Chattopadhyay)</b>
	<b>Microstructural and sub-structural modification by LSP (Prof. K. Dutta)</b>
29 <sup>th</sup> June	<b>Fatigue life enhancement by LSP (Prof. K. Dutta)</b>
	<b>Enhanced fatigue life through USSP in metals and alloys (Prof. K. Chattopadhyay)</b>
	<b>Electrodeposition and USSP hybrid surface-modification (Prof. A. Basu)</b>
	<b>USSP based laboratory session</b>

## Who should attend

Young faculty members (SERB mandate), researchers/scientists from R & D, and Industry personnel are welcome to attend the workshop. Research scholars in an advanced stage (completed 3 years) are also welcome.

**Inaugural Session's MS Team Joining Link:**

**<https://bit.ly/3tSpxzZ>**

**Sharp at 10:00 AM, 28th June 2022**