Hands-On Training Workshop

on

Techniques of Incremental Sheet Forming & Related assisted method

March 12 , 2025

Organized by

Production Engineering,

Funded by-SERB/ANRF

Indian Institute Technology (BHU), Varanasi

Organizing Committee

Coordinators

Prof. Santosh Kumar, Dr. G. M. Karthik

Production Engineering, IIT (BHU), Varanasi

About IIT BHU

The Indian Institute of Technology (Banaras Hindu University) owes its existence to Mahamana Pandit Madan Mohan Malviya, Bharat Ratna- the founder of the first residential university of modern India, the Banaras Hindu University. The three erstwhile engineering colleges of BHU, named BENCO, MINMET, and TECHNO, were merged to form the Institute of Technology (IT-BHU) in 1968 to provide an integrated educational base. The ITBHU has been admitting students through the JEE conducted by the IITs since 1972 and has been consistently ranked among the top few engineering institutions in the country. IT-BHU became IIT (BHU) on June 29, 2012, by an Act of Parliament. The Institute has maintained high academic standards since its inception. It has turned out luminary engineers and administrators who served the nation with great distinction.

About Production Engineering

Production Engineering also called as Manufacturing Engineering is a Research based discipline having combination of manufacturing technology, Design engineering sciences & production management sciences. The group woks on the problems of the Manufacturing, Design & management challenges related to Manufacturing such as: Additive manufacturing, Unconventional manufacturing, Metal forming, Material characterizations, Welding Technology, Robotics, Computer Aided Manufacturing, Computer Integrated manufacturing, Machine tools & Machining sciences, product design & development etc. The group is engaged in Teaching, Research & Consultancy & Ind. Training work.

SERB/ANRF

The Science and Engineering Research Board (SERB) supported basic research in science and engineering in India until it was dissolved in 2023. Its role was taken over by the Anusandhan National Research Foundation (ANRF), a broader statutory body that supports interdisciplinary research across multiple fields and promotes innovation aligned with national and societal needs.

In line with the **Scientific Social Responsibility (SSR) policy**, such research carries a responsibility beyond academic outcomes. The developed process and infrastructure can be shared with nearby institutions and industries, researchers can train students and young faculty in advanced forming technologies, and experimental results can be disseminated through workshops and public lectures. Thus, the project not only advances scientific knowledge but also supports capacity building, skill development, and societal benefit, aligning technical innovation with national and social priorities.

The Project (CRG/2023/008715)

Vacuum-cum Ultrasonic Assisted Warm Incremental Sheet Forming (ISF) of Titanium Alloys is an advanced manufacturing process developed to overcome the poor formability of titanium at room temperature. By combining **vacuum assistance** (to improve sheet stability and reduce oxidation), **warm forming** (to enhance ductility), and **ultrasonic vibration** (to reduce forming forces and friction), the process enables defect-free forming of complex titanium components. This process development and experimental study contributes to aerospace, biomedical, and defence applications by enabling cost-effective, flexible, and high-precision manufacturing of difficult-to-form materials.

Objective of the Workshop

The objective of this work is to develop skillful manpower by executing a robot control program using the teach pendant of a Yaskawa MH180 industrial robot and related techniques for performing Single Point Incremental Sheet Forming (SPIF). This includes creating and validating robot motion INFORM II code directly on the teach pendant, ensuring accurate tool path generation, safe robot operation, and repeatable forming conditions. The study further aims to successfully run the developed program to carry out incremental sheet forming on different alloy sheets, evaluate the robot’s capability in terms of positioning accuracy, process stability, and formability of various materials, and establish a reliable robot-based SPIF methodology for flexible and low-cost sheet metal forming applications.

Eligibility Criteria

- Students which are in final year of ITI (Mechanical) course
- 2nd and 3rd year Students of BTech

Google Form Link

https://forms.gle/d8hHPTKAwZGbn6sD9

Note: Fees Exempted

Important dates

Registration – Up to 6th March 5:00 PM IST

Selection of Candidates – 10th March

Address for Communication

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Professor (HAG) in Mechanical Engineering Department
HOD (Ex) Department of Mechanical Engineering
Professor In-charge (Ex) IIT (BHU) Main Library
Professor In-charge (Ex) IIT (BHU) Main Workshop

Coordinator (Ex) Teaching Learning Centre & Teaching Learning Cell
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