

## Overview

The trend in miniaturization of products is pervasive in areas such as information technology, biotechnology, environmental technology and medical industries. Advanced micromachining is the key supporting technology that has to be developed to meet the challenges posed by the requirements of product miniaturization. However, in many of the cases, a single micromachining process cannot fulfill all the requirements, due to the limitation of that process. In recent years, compound and hybrid micromachining is becoming the most promising technology for the production of miniaturized parts and components. This technology is becoming increasingly more important and popular because of a growing demand for industrial products, with an increased number not only of functions but also of reduced dimensions, higher dimensional accuracy and better surface finish. Compound and hybrid machining is the combination of processes and/or machines to produce parts in a more efficient and productive way.

The objective of this workshop is to disseminate knowledge of the recent development in Hybrid Micro and Nano Machining Processes and its application in industry. In this lecture series, some of the compound and hybrid micro-machining processes will be discussed with working principle, process capabilities, applications, advantages, limitations, current research trends, and future scopes for research of each process. Further, we will give a hands on training on hybrid machining processes.

<b>Modules</b>	Course code: 191058L01 <b>All lectures and tutorials will be held offline (Physical mode)</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>Students at all levels (B. Tech. / M. Tech. / Ph.D.) and faculty from academic institutions</li> <li>Executives, engineers and scientist and working professionals from Industries and R &amp; D Laboratories</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course are as follows:</p> <p><b>Participants from abroad : US \$100</b></p> <p><b>Industry Organizations: Rs.5000</b></p> <p><b>Faculty from Academic Institutions / Research organization: Rs.2000</b></p> <p><b>Students: Rs.1000</b></p> <p>The above fee is towards participation in the course, course materials, breakfast, lunch and dinner. One local tour may be conducted depending on the availability of fund received from the participants. The accommodation will be provided on a payment basis (depending on the availability).</p>

**MHRD Scheme on Global Initiative on Academic Network (GIAN)**  
**Hybrid Micro and Nano Machining Processes**  
**January 02 -06, 2023**  
**Department of Mechanical Engineering**  
**Indian Institute of Technology (ISM), Dhanbad, India**

## The Faculty



Prof. Muhammad Pervej Jahan is currently working as an Associate Professor, Department of Mechanical and Manufacturing Engineering, Miami University, Oxford, OH, USA. Prof. Jahan, a PhD from National University of Singapore, Singapore, is working Micro and nano-machining process. Prof. Jahan worked as postdoc researcher in the department of Mechanical Engineering,

University of Arkansas, Fayetteville, USA from August, 2010 – August, 2012. He was an Assistant Professor at Western Kentucky University, USA from August, 2012 to June, 2016. The main focus of his research is on multi-scale conventional and non-conventional manufacturing processes of engineering materials. The targeted applications of his research are in the areas of automotive, aerospace and biomedical industries. Prof. Jahan is internationally reputed researcher. He has received many prestigious award some of them are from NASA and NFS. Currently he is a graduate programme director, Mechanical Engineering Department, Miami University, Oxford, USA. Prof. Jahan has published over 115 articles in referred journals and conferences, 2 edited book and 20 book chapter. He received more than 10 US research grants. He received many best research paper award. He also received “University Assessment Award”, 2021 for significant contribution to the assessment of Mechanical Engineering Graduate Program at Miami University. He was an editorial board member of (1) International Journal of Materials Forming and Machining Processes (IJMFMP) and (2) Journal of Institute of Industrial Applications Engineers, Japan. He is an professional member of SME, ASME and ASEE.



Prof. Ashis Mallick is currently working as an Associate Professor, Department of Mechanical Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad. Dr. Mallick, a Ph.D. from National University of Singapore, Singapore, is working in the areas of mechanics of materials which includes synthesis and characterization of novel nanostructured and nanocomposite materials, thermal stresses and

microstructural evolution. He had been Visiting Scientist at University of Lille, France and worked as a postdoctoral researcher at National University of Singapore, Singapore. His name was appeared in the list of inventory for Canadian Govt. Laboratory. He has published over 90 articles in referred journals and conferences.

### Registration: Please visit following link

<https://gian.iitkgp.ac.in/GREGN/index>

- Register by paying Rs 500/- (those who have already been registered, need not pay again)
- Opt the course (Course ID: **191058L01**) registration tab and save.
- After opting the course, you must pay the course fee by NEFT on or before **15.12.2022** in the following account number:

Account No. 0986101009746;  
 IFSC Code: CNRB0000986;  
 Bank: CANARA BANK;  
 Branch : Saraidhela, Dhanbad

Kindly inform to the course coordinator by e-mail along with the receipt of the payment of course fee.

Or

kindly fillup the following Google form:

<https://forms.gle/b72t3uxwrSCak9MX7>

On desk payment may be allowed for the participants from abroad.

Maximum number of national participants is limited to seventy based on first come first served basis.

## Course Co-ordinator

Prof. Ashis Mallick

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E-mail: [mallick@iitism.ac.in](mailto:mallick@iitism.ac.in)

## Schedule (Indian standard time)

Inaugural Section 10.00-11.00 (02.01.2023)			Valedictory Programme 11.30 – 12.30 (06.01.2023)		
Day 1 02.01.23	Lecture-1 : MJ 11.30AM – 12.30 PM	Introduction of machining and micro-machining process	Day 3 04.01.23	Lecture-6 : MJ 9.00AM – 11.00 AM	Non-conventional micromachining processes
	Lecture-2 : AM 2.00 PM – 3.00 PM	Synthesis and performance of novel nanocomposites materials		Practical : AM / AD / MA 11.00AM – 1.00 PM	Visit of Machining laboratory and practical demonstration
	Practical : AM 3.00 PM – 5.00 PM	Visit and demonstration of Material synthesis laboratory			
Day 2 03.01.23	Lecture-3 : MJ 9.00AM – 10.00 AM	Hybrid mechanical micromachining processes	Day 4 05.01.23	Lecture-7: MJ 9.00AM – 11.00 AM	Assisted hybrid micromachining processes
	Lecture-4 : AM 10.00AM – 11.00 AM	Microstructural study of the novel materials		Tutorial : MJ 11.00AM – 1.00 PM	Problem solving session
	Lecture-5 : MJ 11.00AM – 1.00 PM	Introduction to Micro-EDM combined with mechanical micromachining processes			
			Day 5 06.01.23	Lecture-8: MJ 9.00AM – 11.00 AM	Current research trend and future research scope

**Instructors : Prof. Muhammad Pervej Jahan (MJ); Prof. Ashis Mallick (AM); Prof. Alok Das (AD) and Prof. Amitava Mandal (MA)**



1. Create a login ID
2. Register the course (ID: 191058L01)



### Proposal Submission

Find out information about Proposal Submissions by both Indian and Foreign Faculty.

### Proposal Tracking

Use this option for knowing status of proposals uploaded at the GIAN Server by Indian Institutions.

### Approved Courses

Till date **2163** courses have been approved. This list also contains details of Foreign Faculty associated with each course.

Courses as on ( 01-11-2022 ):

2163 Approved (Including 186 Withdrawn) | 64 Upcoming |

1694 Completed

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 Click [here](#) to know Eligibility and Procedure for Joining GIAN Scheme

For viewing the courses