A 2-Week Hands-On TRAINING WORKSHOP on MECHATRONICS AND MICROFABRICATION (MechMicroFab-2022) December 05-15, 2022

Organized by
Department of Mechanical Engineering
Indian Institute of Technology Kanpur
Uttar Pradesh PIN- 208016

Sponsored by
DST-SERB Karyashala (High-End Workshop)
About MechMicroFab-2022

The workshop is organised by Indian Institute of Technology-Kanpur. Advances in mechatronics and microfabrication will be deliberated for different domains of modern manufacturing processes including additive manufacturing (AM) and subtractive manufacturing (SM). The workshop aims to impart technical knowledge with hands-on training experience to the participants. Separate laboratory modules on various manufacturing processes will be delivered with individual practices/demonstrations sessions. MechMicroFab – 2022 aims to address some of the challenges in the modern manufacturing and transfer the much needed knowledge/skills to support national manufacturing missions.

IIT Kanpur

The institute was started in December 1959 in a room in the canteen building of the Harcourt Butler Technological Institute at Agricultural Gardens in Kanpur. In 1963, the institute moved to its present location, on the Grand Trunk Road near Kalyanpur locality in Kanpur district. The campus was designed by Achyut Kavinde in a modernist style. During the first ten years of its existence, a consortium of nine US universities (namely MIT, UCB, California Institute of Technology, Princeton University, Carnegie Institute of Technology, University of Michigan, Ohio State University, Case Institute of Technology and Purdue University) helped set up IIT Kanpur’s research laboratories and academic programmes under the Kanpur Indo-American Programme (KIAP).

Mechatronics & MicroFab

The digitisation of microfabrication methods is leading towards a paradigm shift in modern factories to embrace Industry 4.0. Mechatronics of AM processes to generate micro-scale components and SM processes to precisely remove material at the micro/nanoscale demands trained professionals and engineers to cater to the need of next-generation manufacturing. Sessions on metal additive manufacturing will focus on the fabrication of miniaturised components, metamaterials, micro-AM and defect-free superalloy components. In micro/nano manufacturing, precise control of material removal at the micro and nanoscale will be deliberated with lab scale tests with synergies of basic and advanced control methods.

DST-SERB : Karyashala

Accelerate Vigyan, a division of DST-SERB empowers to develop high end research manpower. The scheme is specially designed to train the young potential researchers by giving them an opportunity to spend at least a week or two and acquire sufficient skills to undertake future research activities.

Workshop Coordinator

Dr. J Ramkumar, Dr. Sarvesh Mishra
Department of Mechanical Engineering
Indian Institute of Technology Kanpur, Kalyanpur, Uttar Pradesh, PIN- 208016
Tel: +91-874-002-1381, Email: jrkumar@iitk.ac.in, msarvesh@iitk.ac.in
**Course Fee & Registration Details**

<table>
<thead>
<tr>
<th>Course &amp; Registration Fee: NIL</th>
<th>Last Date of Registration: 29th November 2022</th>
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<td>Final shortlist to be announced: 30th November 2022</td>
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**How to Apply?**

Total No. of participants: 25. Eligibility: Only M.Tech/PhD Students. Interested candidates can submit the following Google Form.

[https://tinyurl.com/m45vyhax](https://tinyurl.com/m45vyhax)

**Note:** Final Registration, to be made after the acceptance mail from Workshop Coordinator.

**Travel, Lodging & Boarding**

Train tickets, To & Fro or Road Transport charges from the place of residence/institute will be reimbursed (limited to 3AC only on production of tickets). Suitable accommodation in student hostels including breakfast, lunch and dinner will be made available (No Charges).

**Reaching IIT Kanpur**

Kanpur belonging to the state of Uttar Pradesh. It is well connected by Rail/Road from different parts of the country. The institute is located at 13.6 Km from Kanpur Central Railway Station and 12.1 Km from State bus stand.

Registration Form, duly signed by Head of Dept./Institute to be mailed msarvesh@iitk.ac.in

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**MECHATRONIC & MICROFACBRICATION**

**MMF @ MechMicroFab-2022**

**December 05-15, 2022**

Name:
Student Status (M.Tech. / PhD.):
Department:
Institute / Organization:
Address:
Email:
Mobile:
Signature of Applicant:

Area of Research Interest:

Sign & Seal of Head of the Dept./Organization
# Tentative Schedule

<table>
<thead>
<tr>
<th>Day/Slot</th>
<th>9:00-10:30 AM</th>
<th>11:00-12:30 PM</th>
<th>02:00 - 03:30 PM</th>
<th>04:00 - 05:30 PM</th>
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<tbody>
<tr>
<td>Dec. 05, 2022</td>
<td>Inaugural session</td>
<td>Introduction to micro nano fabrication (JRK)</td>
<td>Design of experiments (AS)</td>
<td>Lab module</td>
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<tr>
<td>Dec. 06, 2022</td>
<td>Understanding transport phenomena in casting (VK)</td>
<td>Basic control (KR)</td>
<td>Lab module</td>
<td>Lab module</td>
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<tr>
<td>Dec. 07, 2022</td>
<td>Advanced control (KR)</td>
<td>Thermal and micro structural evolution in welding (VK)</td>
<td>Lab module</td>
<td>Lab module</td>
</tr>
<tr>
<td>Dec. 11, 2022</td>
<td>Design and fabrication of meta materials for strategic applications (JY)</td>
<td>Insights about microECM (VS)</td>
<td>Lab module</td>
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<td>Dec. 12, 2022</td>
<td>Wire ECM: A novel process (VS)</td>
<td>Metal additive manufacturing of aerospace grade alloys (SM)</td>
<td>Lab module</td>
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<tr>
<td>Dec. 13, 2022</td>
<td>Fundamental of micro EDM (MN)</td>
<td>Micro additive manufacturing (JB)</td>
<td>Lab module</td>
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<td>Dec. 14, 2022</td>
<td>Basic of lasers (JRK)</td>
<td>Thin wall machining using ED milling (MN)</td>
<td>Lab module</td>
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<tr>
<td>Dec. 15, 2022</td>
<td>Laser micro texturing for improvement of metal cutting tribology (SM)</td>
<td>Session on technical writing</td>
<td>Valedictory function</td>
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### COPEN 2022 (All lectures and workshops open for participants)

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### List of Resource Persons

- **JRK** : Prof. J Ramkumar
- **VK** : Dr. Virkeshwar Kumar
- **SM** : Dr. Sarvesh Mishra
- **ADS** : Dr. Amandeep Singh
- **JB** : Prof. Jitendra Bhaskar
- **MN** : Dr. Mahavir Negi
- **KR** : Dr. Keval Ramani
- **VS** : Dr. Vyom Sharma
- **JY** : Dr. Jyoti Yadav

**MechMicroFab-2022**