A Short term School on

MICROMANUFACTURING
AND ITS APPLICATIONS
March 31 – April 05, 2014

(Registration form should contain the following information. It should be printed (not hand written) on A4 size paper)

Name: Position: Department: Institution/Organization: Address: E-mail Address: Mobile No.: Telephone No.: Fax No.:

Educational Background (starting from B.E./B.Tech):

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<th>Degree</th>
<th>Field of Specialization</th>
<th>Institution</th>
<th>% marks/ CGPA/CPI</th>
<th>Year</th>
<th>Rank in the class</th>
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Areas of Research Interest:

Have you attended any course on "Micromanufacturing" at IITK or elsewhere: Yes / No
(If yes, please give details.................................................................)

Note: Candidates from the teaching institutions should send the demand draft only when they get the selection letter.

Payment details
Demand draft no.________ dated________
Amount in Rs.________ drawn at________

Recommendation

Signature of Head of the Department
/ Head of the organization (with seal).

*IMPORTANT DATES*

For College Teachers
- Receipt of applications: March 01, 2014
- Information to the selected candidates: March 07, 2014
- Receipt of the draft: March 20, 2014
- Short term school duration: March 31 to April 05, 2014

For Participants from Industries and R&D Labs
- Receipt of applications: March 10, 2014
- Information to the selected candidates: March 17, 2014
- Receipt of the draft: March 26, 2014
- Short term school duration: March 31 to April 05, 2014

ADDRESS FOR CORRESPONDENCE

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Fax: 0512-259 7408
*Home page: http://home.iitk.ac.in/~vkjain/

Note: Correspondence will be done through e-mail. Application’s hard copy should definitely be sent by post.

Nano-finishing of Free form Surface (Knee - Joint)

1- CNC milling M/c head, 2- MR finishing tool, 3- MR polishing fluid, 4- fixture for knee joint implant (Ti6Al4V), 5- knee joint implant
OBJECTIVE

Nowadays, meso (1-10 mm) and micro (1-100 μm) manufacturing are emerging as an important technology specially in the areas where miniaturization yields economic and technical benefits, namely, aerospace, automotive, optical, biomedical and similar other areas.

With the advent of numerical control (NC) in machine tools, accuracy, uniformity and repeatability of the machined parts have improved and manufacturing has gained the flexibility. With time, the miniaturization of the machines and devices is leading to the demand of parts with dimensions of the order of a few micrometers to a few hundred micrometers. Scientists and researchers are engaged in developing even the nano featured products such as NEMS (Nano Electro Mechanical System). It is quite safe to say that there is a need to have the manufacturing processes, which are capable of dealing with atomic and molecular dimensions. Hence, such processes come under the category of μ-manufacturing.

The demand of industries for μ-manufacturing of various types of materials (metallic, ceramics and plastics) is increasing day by day. Miniature parts have applications in various industries like electronics, medicine, communication, avionics and others. Some of the examples of the products that require μ-manufacturing are micro holes in fiber optics, micro nozzles for high temperature jets, micro molds etc. Conventional methods (turning, drilling, etc.) with modified versions have been reported as low as the size of an atom or even a fraction of the size of an atom. Now, the natural question arises, how to measure such surface roughness or which equipment should be used to measure such low values of surface roughness? Atomic force microscope is one of the latest equipment used to measure such a low value of surface roughness.

The basic objective of the present course is to acquaint the participants with the principles, basic machine tools, developments in the μ-manufacturing process, micro and nano metrology and research trends in the area of μ-manufacturing processes. Thus, this short term school will deal with various areas of micromanufacturing including measurement techniques.

COURSE CONTENTS

- Introduction to Micromanufacturing
- Traditional Micromachining
  Micromilling, Microturning, Microgrinding.
- Advance of Micro- / Nano– Manufacturing
  Mechanical Micromachining (AJM, USM, etc.), Thermal
  Micromachining (EDM, LBM, EBM, etc.), Electrochemical and
  Chemical Micromachining, Ion Beam Machining,
  Photochemical Etching, Biomachining, X-ray Lithography.
- Micro/Nano-finishing
  Abrasive Flow Finishing, Magnetic Abrasive Finishing,
  Magneto rheological finishing, etc.
- Microforming
  Micro-Sheet Forming, Micro-Laser Forming, etc.
- Microjoining Technology
  Laser Beam Microwelding/Microjoining, Electron Beam
  Microwelding/Microjoining, etc.
- Microcasting.
- Microsensors/Microactuators.
- Measuring techniques in μ-Manufacturing & Finishing.

FACULTY

Speakers shall be drawn from various disciplines of different IITs and other institutions of higher learning, and related industries and R&D organizations of different parts of the country.

MODE OF PAYMENT

The registration fee or refundable caution money deposit should be sent by bank draft payable at the “Union Bank of India, IIT Kanpur” Branch and drawn in favour of “Micromanufacturing”.

There is no course fee for the sponsored teachers from engineering colleges (only those approved by AICTE, New Delhi). They will be paid to and from III AC class train fare via shortest route (strictly on production of ticket), and free boarding and lodging in the guest house / hostel of IIT Kanpur. The applications of the teachers from the accredited colleges should reach the course coordinator latest by Mar.01, 2014 giving the information as shown in the Proforma. The engineering College teachers are required to send applications duly recommended by the Head of the Institution/Department. The candidate should have minimum qualification as B.E. / B.Tech. in mechanical / Production / Production and industrial Engineering. However, the candidate with M.E. / M.Tech. in Production / Production and industrial engineering will be given preference. The candidates with Ph.D. degree in the manufacturing specialization are most welcome.

For selected candidates: The selected candidates will be requested to send a refundable caution deposit of Rs.1000/- to ensure their commitment for participation in this course. This amount will be refundable only to those teachers who attend the course. Please do not send the money until you get selection letter / e-mail / fax.

FOR COLLEGE TEACHERS ONLY

Private and public sector industries, R & D Labs, teaching Institutions and other organizations are welcome to deputize their executives, managers, teachers and engineers to participate in the course. The sponsoring organizations are required to pay a registration fee of Rs.10, 000/- per participant. The participants will have to make their own arrangements to meet their travel and other expenses. Boarding and lodging can be arranged in IITK guest house or IITK hostels based upon prior request and on the payment basis. Applications on a separate sheet giving the information shown in the Proforma should reach the Course Coordinator latest by March 01. 2014.

* * * For Ph.D. Scholars, the registration fee is Rs. 2500/-