GLOBAL INITIATIVE OF ACADEMIC NETWORKS

Micro/Meso-Scale Manufacturing Technologies

August 08-12, 2016

Organized by

DEPARTMENT OF PRODUCTION ENGINEERING
VEERMATA JIJABAI TECHONOLOGICAL INSTITUTE (V.J.T.I.)

[Central Technological Institute, Maharashtra State, INDIA]

H. R. Mahajani Marg, Matunga, Mumbai 400019 Tel. no. +91 22 24198101-02 Fax: +91 22 24102874
Veermata Jijabai Technological Institute (VJTI) was established in 1887. It initially started with two departments, namely the Sir J. J. School of Mechanical Engineering and the Rippon Textile School. In 1913, the institute was recognized by the then Government of Bombay as the Central Technological Institute, Bombay Province. In addition to other Departments, a Department of Sanitary Engineering and Plumbing was added in 1923. The Department started to conduct the ‘Licentiate in Civil & Sanitary Engineering Programme’. The institute was granted administrative, academic, financial and managerial autonomy from June 21, 2004.

The Institute is reputed for excellent teaching and training in Engineering and Technology at Diploma, Degree, Post Graduate levels and for Research. Presently VJTI offers Diploma in 6 disciplines of Engineering, B. Tech programmes in 9 disciplines, 17 M. Tech. programmes, M.C.A. and Ph.D. programmes. Since the time of inception, VJTI has been playing a vital role in producing quality Engineers, introducing new programmes and electives in emerging areas. In 1998, the Institute was renamed from “Victoria Jubilee Technical Institute” to the present name “Veermata Jijabai Technological Institute”. It was one of the fourteen institutes selected by the Central Government for further development with grant-in-aid from the Centre under Technical Education Quality Improvement Programme (TEQIP - I & II). VJTI is selected for establishment of Centre of Excellence (CoE) in "Complex & Nonlinear Dynamical Systems (CNDS)" under TEQIP-II with a funding of Rs 5 Crores by World Bank through National Project Implementation Unit (NPIU), MHRD, New Delhi.

**Patron**

**Dr. O. G. Kakde**

Director, VJTI, Mumbai.

**GIAN Coordinator**

**Dr. M. M. Chandane**

Associate Professor,  
Department of Computer Engineering & IT  
VJTI, Mumbai.
Overview

Manufacturing processes based on processing scales are generally classified as nanoscale (<100 nm), microscale (100 nm-100 μm) and mesoscale (>100 μm) processes. The inspiration for miniaturization of products has been essentially the same since manufacturing was first established as an art/science. Recent developments in micromachining have not only accelerated the miniaturization of products/systems but also enhanced the application umbrella of micro products. Micromachining is related to specific techniques applied to micro and meso scale elements, in order to produce components with high precision and very restrictive dimensional and geometrical tolerances (micron or sub-micron). Micromachining finds applications in automotive, aerospace, microrobotics and biomedical fields. In the industrial world the interest in microscopic scale manufacturing is exponentially increasing in relation to the rapid growth of Micro Electro Mechanical Systems (MEMS). However, it is essential to critically control precision, accuracy, geometry and dimensional tolerances, thermal and mechanical deformations and surface quality of manufactured micro parts.

Micromachining processes may be categorized into mechanical processes, chemical processes and thermal processes. The unit volume material removal rate and precise control over position resolution of machine slides is essential to achieve accuracy of the machined features. Also, mechanics of micromachining processes alters due to change in scale of interaction between tool and workpiece. Therefore, the primary objective of this course is to study fundamental aspects, recent developments and future research perspectives in micro and meso scale manufacturing and allied technologies. The content of course will enhance the knowledge and fundamental understanding of participants in mechanical micromachining, microfactories, nanotube composites and application of micromachining in biomedical field.

Course Objectives

The primary objectives of proposed course on ‘Micro/Meso-Scale Manufacturing Technologies’ are as follows:

- To impart and share the fundamental knowledge of micromachining processes
- To provide exposure on design and integration of different stations of microfactories and automation/integration issues
- To discuss additive manufacturing technologies and modeling of processes for manufacturing of fiber-reinforced soft composites
- To impart the knowledge of nanotube/graphane composite preparation, characterization and process modeling
- To discuss the applications of micromachining and nanotube/graphane based composites in biomedical applications
- To interact and discuss with a research scholars, faculty members from VJTI and participants of programme.
The participation fees for taking the course is as follows:

- **Participants from abroad:** US $250
- **Industry/ Research Organizations:** Rs. 10000/-
- **Faculties from Academic Institutions:** Rs. 7500/-
- **Research Scholars/PG Students:** Rs. 3000/-

The above fee include all instructional materials, internet facility, Breakfast and Lunch.

**Number of participants for the course will be limited to Fifty (50).**

### How to Apply

1. Visit and register yourself on ([if not registered earlier](http://www.gian.iitkgp.ac.in/GREGN))
2. Register for the course through your login and password to obtain GIAN Reg. Number.
3. Fill the course registration form and send the scanned copy of the same via email to “samastud@vjti.org.in”
4. On receiving intimation by email prepare Demand Draft of applicable registration fee in favour of ‘Director, VJTI’ Payable at Mumbai.
5. Send the original hard copy of course registration form along with DD to course coordinator.

**Final confirmation of participation will be after receiving hard copy of Course registration form along with DD.**

### Module Details

- Fundamental aspects of popular micromachining processes
- Design aspects of Microfactories
- Additive manufacturing for meso scale manufacturing
- Micromachining of carbon nanotube composites
- Biomedical applications of micro/meso manufacturing processes.

### Who Should Attend

Academicians or Research Personnel working in Mechanical, Production, Metallurgy and Automobile Engineer or research scientist interested in Advanced Manufacturing.

### Registration Fees

- **Dr. Sachin Mastud**
  Assistant Professor, Production Engineering Department,
  Veermata Jijabai Technological Institute (VJTI),
  Mumbai, Maharashtra.
  Phone: (O) +91-22-24198235/240,
  Mobile: +91-9757136823
  E-mail: samastud@vjti.org.in

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THE FACULTY

Dr. Johnson Samuel has been serving as an assistant professor in the mechanical, aerospace and nuclear engineering department of Rensselaer Polytechnic Institute (RPI), since the Spring of 2011. Dr. Samuel obtained his M.S (Industrial Engineering, 2003) and PhD (Mechanical Engineering, 2009) degrees from the University of Illinois, Urbana-Champaign. His PhD dissertation was supervised by Prof. Shiv G. Kapoor and the late Prof. Richard E. DeVor. Dr. Johnson has published 4 book chapters, 20 conference papers and more than 30 top journal papers. As director of the Nano/Micro-scale Manufacturing and Material Design Lab (NanoM3 Design Lab) at Rensselaer, he leads research and education efforts in the areas of advanced manufacturing and material design. His research has attracted funding from multiple US agencies including the National Science Foundation, New York State Energy Research and Development Authority, and the Defense Health Program (Dept. of Defense). Dr. Samuel is the recipient of the prestigious US National Science Foundation CAREER award (2014) and the Young Scientist award (2016) from the World Economic Forum. His research efforts have been recognized by the Rensselaer School of Eng. Research Excellence Award (2016) and the Outstanding Young Alumni Award (2016) from the Mechanical Science and Engineering Dept. of the Univ. of Illinois-Urbana Champaign. He has also been awarded the Rensselaer Class of 1951 Outstanding Teaching Award (2014) and the School of Eng. Education Innovation Award (2015) in recognition of his manufacturing education efforts at Rensselaer. Reference: http://www.johnsonsamuel.com

Ramesh Singh is an Associate Professor in the Department of Mechanical Engineering at IIT Bombay. His research interests are laser-assisted micro-manufacturing, ultra-high speed micromachining, super-finishing, functional characterization of precision finished/engineered surfaces and finite element modeling of manufacturing processes. He received his PhD from Georgia Institute of Technology and MS from Tufts University. He has published about 50 international journals and 60 peer-reviewed conference publications. He has published four book chapters and has filed four patents. Recently received the Swarnajayanti Fellowship for sustainable subtractive and additive manufacturing at micro-scale. Reference: http://www.me.iitb.ac.in/~ramesh/

Dr. Sachin Mastud is working as Assistant Professor in the Production Engineering Department of Veermata Jijabai Technological Institute (VJTI), Mumbai. He has obtained his masters from VJTI Mumbai and Ph.D in Mechanical Engineering from IIT Bombay. He has more than 12 years of experience in teaching courses namely, Manufacturing Technology, Metrology and Unconventional and Micromachining Processes. He has published more than 20 quality research articles in international journals and conferences. His area of interest includes unconventional machining and Micro-manufacturing. E-mail: samastud@vjeti.org.in
Veermata Jijabai Technological Institute (VJTI), Mumbai
One Week Course on
“Micro/Meso-Scale Manufacturing Technologies”
under GIAN, August 2016
Registration Form

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Attachment Check List: (Please Tick Mark )
- Demand draft
- Resume
- ID Proof

*Forms will not be accepted without GIAN Registration Number.
**All fields are mandatory.
(Send the scan copy of registration form via email to “samastud@vjti.org.in” After approval email send the hard copy of registration form with Demand draft to Dr. S. A. Mastud.
Assistant Professor, Department of Production Engineering, Veermata Jijabai Technological Institute, H. R. Mahajani Marg, Matunga (East), Mumbai-400 019 Phone No.-022-24198235/240
Mobile No.-+91-9757136823
#The course will be conducted as per the norms of GIAN and VJTI, Mumbai.