

# Micro and Nano Manufacturing Processes

## Overview

The need for better quality of work and life has led to increased demand for micro products in almost all the human activities. Typical microproducts include micro reactors, MEMS devices, Micro medical components, home appliances, telecommunication devices, automotive and aerospace components etc. Micro-manufacturing technologies are well established in electronics manufacturing, however using them to manufacture complex 3D shapes with high accuracy in materials like non-silicon metals, Polymeric devices and composites is a challenge. To address the above challenges the Researchers and Industries focused on miniaturization of existing technologies and development of advanced and hybrid manufacturing process like Mechanical micromachining, Non-traditional manufacturing methods etc.

This course will provide the technological advancements for the manufacturing of microproducts especially with both mechanical micromachining and non-traditional methods like Electro Discharge Machining (EDM), Electro Chemical Machining (ECM), and Ultrasonic Machining (USM). The essentials like process variants, design considerations for manufacturing technology provided for the participants will ease their manufacturing practices of microproducts. While Advances in Micro/Nano Metrology, Inspection systems, Bio-fabrication etc. included in this course will enable the participants to get familiar with the current trends and advances manufacturing engineering.

<b>Dates for the Course</b>	<b>5<sup>th</sup> December, 2016 to 10<sup>th</sup> December, 2016</b>
<b>Host Institute</b>	<b>IIT Madras</b>
<b>No. of Credits</b>	<b>1</b>
<b>Maximum No. of Participants</b>	<b>50</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ You are a Mechanical engineer or Research scientist from Manufacturing service Departments, Government &amp; Private Organizations, R&amp;D laboratories interested in manufacturing Micro/Nano Featured Components.</li> <li>▪ You are a student(B.Tech, M.Tech, MS, PhD) or faculty from academic institution interested in learning new technologies and do research on improving Hybrid technologies for fabricating Micro/Nano components</li> </ul>
<b>Course Registration Fees</b>	<p>The participation fees for taking the course is as follows:  <b>Student Participants:</b> Rs.1000.00  <b>Faculty Participants:</b> Rs.5000.00  <b>Government Research Organization Participants:</b> Rs.10000.00  <b>Industry Participants:</b> Rs.10000.00</p> <p>The above fee is towards participation in the course, the course material, computer use for tutorials and assignments, and laboratory equipment usage charges.  <b>Mode of payment: Demand draft in favor of “Registrar, IIT Madras” payable at Chennai</b>  The demand draft is to be sent to the Course Coordinator at the address given below.</p>
<b>Accommodation</b>	<p>The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Request for hostel accommodation may be submitted through the link:  <a href="http://hosteldine.iitm.ac.in/iitmhostel">http://hosteldine.iitm.ac.in/iitmhostel</a></p>

## Course Faculty



**Dr.K.P.Rajurkar** is distinguished Professor of Mechanical and Materials Engineering and director of Center for Non-traditional Manufacturing Research at University of Nebraska-Lincoln, United States. His research areas includes Modeling and Analysis of Manufacturing Processes, Systems Sensing and Control of Traditional and Nontraditional macro, Micro and Nano Manufacturing Processes, such as electric discharge, electrochemical machining and ultrasonic machining and their hybrid processes. Dr. Rajurkar has more than 120 refereed publications and nearly 120 technically edited papers which were published in conference proceedings. Dr. Rajurkar serves as a reviewer for several professional journals and is an Associate Editor of the ASME Journal of Engineering for Industry and Chairman of the Scientific Committee of the NAMRI/SME. He was awarded with Gold Medal from Society of Manufacturing Engineers (SME) for his contributions to technical communications through published literature, technical writings or lectures in 2009 and Hideo Hanafusa Outstanding Investigator Award, 2010.



**Dr.G.L.Samuel** is Associate professor at manufacturing engineering Section at Indian Institute of Technology (IIT), Madras. His research area include Micro Machining, Conventional and Non-conventional manufacturing, Metrology and Computer Aided Inspection. His publications include 42 International Journal Papers and 45 National/International Conference Papers. He was awarded with Post-Doctoral Fellowship by Korean Science and Engineering Foundation (KOSEF) in 2003. Recently in 2013 he was awarded with Erasmus Mundas European HERITAGE Scholarship, funded by the European Commission.

## Course Coordinator

**Name: Dr.G.L .Samuel**  
**Manufacturing Engineering Section**  
**Department of Mechanical Engineering**  
**IIT Madras, Chennai - 600036**  
Phone: +91-9444468251  
E-mail: samuelgl@iitm.ac.in

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URL:  
<http://mech.iitm.ac.in/Faculty/gls/home.php>