

# Process Analysis and Metrology for Discrete Products Manufacturing

## Overview

Discrete products manufacturing, encompassing automotive, aerospace, biomedical and energy systems, constitutes the largest fraction of the manufacturing sector in terms of GDP (manufacturing comprised 15% of Indian GDP in 2014). This segment is dominated by metals processing and production. The nature of the processing determines durability and quality of the manufactured components, and product life cycles. In this context, there is a critical need for understanding the science and technology underlying manufacturing processes for the discrete products sector. This will enable significant improvements in product quality and process efficiency, process innovations and enhanced process modeling.

The course will be an introduction to principles of manufacturing science and metrology for discrete products, emphasizing quantitative analysis, experimental characterization of processes and materials, first-order process modeling, process visualization and industrial applications. Typical manufacturing processes that will be covered are bulk deformation processing, sheet metal forming, and surface generation and conditioning processes. The course will be taught from a mechanics and materials perspective; highlight analyses, sensing and measurement tools of broad applicability for both R & D and industry; and feature demonstration experiments and videos. Although developed in the context of metallic materials, the contents of this course would also be of value for study of manufacturing of non-metallic materials. It is envisaged that the course will eventually evolve into an online course.

The development of this course is particularly timely, given the renewed worldwide focus and renaissance in manufacturing, and the emerging “Make in India” initiative.

<b>Dates for the Course</b>	<b>13<sup>th</sup> March to 27<sup>th</sup> March, 2017</b>
<b>Host Institute</b>	<b>IIT Madras</b>
<b>No. of Credits</b>	<b>2</b>
<b>Maximum No. of Participants</b>	<b>50</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"><li>▪ You area engineer or research scientist involved in manufacturing interested in honing your knowledge about these processes.</li><li>▪ you are a student or faculty from academic institution interested in learning the basic modeling and physics of popular manufacturing processes.</li></ul>
<b>Course Registration Fees</b>	<p>The participation fees for taking the course is as follows: <b>Student Participants (IIT Madras or GIAN institutes):</b>Rs. 500 per credit <b>Non students:</b> Rs.1500 per credit</p> <p>The above fee is towards participation in the course, the course material and computer use for the course work.</p> <p><b>Mode of payment: Demand draft in favour of “Registrar, IIT Madras” payable at Chennai</b></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



**Srinivasan Chandrasekar** is a Professor in the Schools of Industrial Engineering and Materials Engineering (courtesy), and Director of the Center for Materials Processing and Tribology at Purdue University, Indiana, USA. His research and teaching interests are in manufacturing, materials processing, tribology and structural materials.



**Balkrishna C Rao** is a faculty in the Department of Engineering Design at the Indian Institute of Technology Madras, Chennai, India. Professor Rao's research interests include sustainable-manufacturing, modeling manufacturing processes and additive manufacturing.

## Course Coordinator

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