



# SMART MANUFACTURING 1.0 - 176020L02

March 12<sup>th</sup> to 16<sup>th</sup> 2018 at Anna University, Chennai.

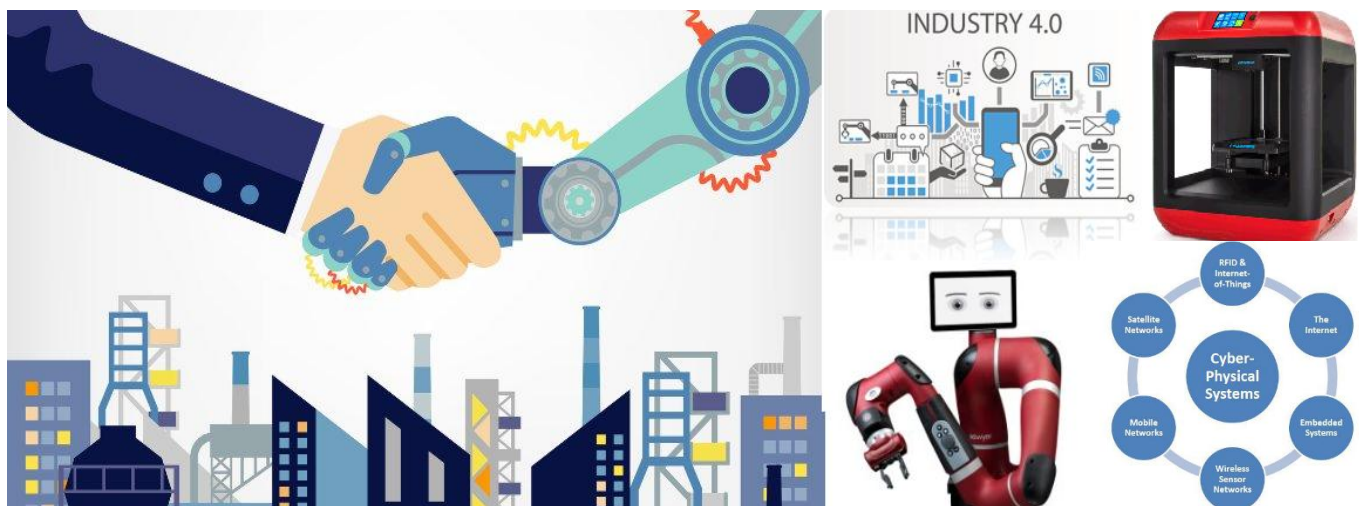
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## Overview

The future trend of manufacturing will predominantly include cyber-physical systems, the industrial internet of things and cloud technologies. Such a trend, generally termed as Industry 4.0 in Germany and Smart Manufacturing in North America, is expected to introduce new business models in manufacturing (such as eco-system integration, mass customization and servitization), new processes (such as co-creation and collaboration), new technology (such as 3-D printing, machine to machine communication and Big Data Analytics) and finally new skills in the factory worker to cope with all of these changes.

Needless to say, this global trend has already taken root in India. Over the next decade, rapid advancements in Smart Manufacturing are expected in India, centered around empowering factory workers with new technology, adequate automation and assisted devices to perform work more effectively, efficiently and without errors. This would necessitate the development of the requisite skills and retraining of the current work force and simultaneous development of new curriculum within the academia to prepare students for this emerging manufacturing landscape.

Beyond providing an overview of the emerging concepts in manufacturing, this course will cover the engineering processes, practices, technology and applications of Smart Manufacturing. The objective of the course is to provide a strong orientation to both the industry and the students on the new advancements in manufacturing in general and the relevant features of Smart Manufacturing to an Indian context, in particular.



<p><b>Duration</b> <b>Course Code &amp; Credit</b> <b>Venue</b></p>	<p><b>Date: March 12<sup>th</sup> to 16<sup>th</sup> 2018 (includes 15 hrs lectures and 04 hrs Tutorials)</b> <b>Course Code: [176020L02]</b> <b>No. of Credit : 1</b> <b>Venue: Hall of Guines'68, Department of Manufacturing Engineering, CEG Campus, Anna University.</b> <i>Number of participants for the course will be limited to 80.</i></p>
<p><b>Modules</b></p>	<ul style="list-style-type: none"> <li>• <b>Introduction to smart manufacturing:</b> What is “smart manufacturing” really and how does it differ from conventional/legacy manufacturing-Smart Manufacturing Processes- Three Dimensions: (1) Demand Driven and Integrated Supply Chains;(2) Dynamically Optimized Manufacturing Enterprises (plant + enterprise operations);(3) Real Time, Sustainable Resource Management (intelligent energy demand management, production energy optimization and reduction of GHG)</li> <li>• <b>Smart design/fabrication:</b> Smart Design/Fabrication - Digital Tools, Product Representation and Exchange Technologies and Standards, Agile (Additive) Manufacturing Systems and Standards. Mass Customization, Smart Machine Tools, Robotics and Automation (perception, manipulation, mobility, autonomy), Smart Perception – Sensor networks and Devices.</li> <li>• <b>Smart Communication systems</b> Information, Mobility, Communication Technologies, Protocols, Cyber Physical Systems – the next generation of Embedded Systems and Networks, IT and OT convergence, co-creation and collaboration enablement. Smart Cloud- Hyper scale Computing; Application Delivery Platforms and Platform as a Service; Intelligent Analytics Services.</li> <li>• <b>Smart Applications:</b> Online Predictive Modeling, Monitoring and Intelligent Control of Machining/Manufacturing and Logistics/Supply Chain Processes; Smart Energy Management of manufacturing processes and facilities</li> <li>• <b>Smart and Empowered Workers:</b> Eliminating Errors and Omissions, Deskilling Operations, Improving Speed/Agility, Improving Information Capture/Traceability, Improving Intelligent Decision Making under uncertainty Assisted/Augmented Production, Assisted/Augmented Assembly, Assisted/Augmented Quality, Assisted/Augmented Maintenance, Assisted/Augmented Warehouse Operations and Assisted Training.</li> </ul>
<p><b>You Should Attend If...</b></p>	<ul style="list-style-type: none"> <li>▪ You are a student (B.E/M.E/M.Tech), PhD Scholars / Post-Doctoral Fellow</li> <li>▪ You are a faculty from reputed academic institutions and technical institutions.</li> <li>▪ You are the executives, engineers, and researchers from manufacturing, service and government organizations including R&amp;D laboratories is also strongly encouraged.</li> </ul>
<p><b>Fees</b></p>	<p>The participation fees for taking the course is as follows:</p> <ul style="list-style-type: none"> <li>✚ Participants from abroad: US \$500</li> <li>✚ Industry/ Research Organizations : Rs. 10000/-</li> <li>✚ Faculty from academic institutions : Rs. 5000/-</li> <li>✚ Research Scholars (Ph.D) : Rs. 3000/-</li> <li>✚ Student participants (UG/PG) : Rs. 2000/-</li> </ul> <p>The above fee includes all instructional materials, computer use for tutorials, lunch and refreshments for all the five days. <i>Course participants should make their own arrangement for travel and accommodation..</i></p>

## The Faculty



**Dr. Ananth Seshan** is the Group Managing Director, 5G, Board Member at Large, International Board of Directors at MESA International.

5G, a research and innovation group that performs research in the area of digital manufacturing automation, builds products and commercializes them. The group offers IOT solutions, energy intelligence, and manufacturing software to a user base in 13 countries and has licensed its products to several Fortune 500 manufacturing companies.

The group comprises four companies - 5G Automatika Ltd., Canada, 5G Automatika de Mexico, Mexico, Fifth Generation Technologies India (P) Ltd., India and 5G Technologies Europe Ltd., UK. Each of these companies contribute towards building and successfully commercializing Intellectual Property in "Real Time Intelligence" as applied to Smart Manufacturing, Internet of Things and Digital Manufacturing.

Dr. Seshan is the co-founder of all of the above-mentioned companies. The companies have received numerous awards and accolades from industry associations, forums and governments for the thought leadership demonstrated through its innovation and practice. Under the stewardship of Dr. Seshan the companies have inculcated a culture of enrichment of the self as the core purpose for achieving excellence in performance. As such the motivation for an individual to continuously learn, improve and excel is triggered internally (by the individual) rather than being triggered externally by a superior authority within the organisation. The company's employees come from multiple cultures, geographies, social and economic backgrounds.

More recently, Dr. Seshan has developed a paradigm for continuous improvement of maintenance organisations of large utilities and manufacturing companies called "Reliability Excellence". The philosophy of Reliability Excellence is to remove uncertainty in the outcome of an initiative that is mandated to improve effectiveness or to drive availability of a production unit. The paradigm systematically breaks down the task of removing uncertainty via an implementation of a suite of "Transformational Processes", with each Transformational Process satisfying a specific goal of removing some uncertainty. A systematic process of achieving Reliability Excellence in an organisation has been synthesized as a journey that is punctuated by several incremental stages of maturity. This has been applied in one of the largest water utilities in the UK, apart from manufacturing organisations in North America.

[Contact Ananth on LinkedIn](#)

### COURSE CO-ORDINATOR



**Dr. P. Hariharan** is a Professor and Head in the Department of Manufacturing Engineering, College of Engineering Guindy Campus, Anna University, Chennai. His main areas of specialization are Micromachining, Computer Aided Manufacturing, Robotics, MEMS, Electronics Packaging, Composites and Nano-materials. He has over 150 papers in national and international journals and conferences.

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