

## Scope

With the rapid growth of a wide array of customer preferences in terms of form, factor, cost, quality and service, the buyers' market shift now towards Individual customization for products according to the customer needs (automobile, aerospace, electronics, medical, energy, etc.). Therefore, the products have to be designed and manufactured as economically without compromising the quality. Meanwhile, the products have to be performed functionally satisfactory. In this, functionally-gradient materials are used to make the products. Especially, in aerospace, automobile and medical applications; according to the functionality, the materials have to be embedded in align with the conceptual design of the product. With the growing market demand, freeform technology is facing many challenges in terms of Design, Materials, Manufacturing and Testing of the present day Product portfolio.

## Topics

Key challenges in AM:

Challenge 1: Size Limitations & Shape Optimization

Challenge 2: Design for 3D Printing

Challenge 3: Slicing & Part Orientation

Challenge 4: Printing Methodologies

Challenge 5: Multi-material Printing

Challenge 6: Error control

Challenge 7: Pre & Post processing

Challenge 8: Quality Consistency

Challenge 9: Certification & Regulation

Challenge 10: The Skills Gap

## IIT Madras

Indian Institute of Technology Madras is one among the foremost institutes of national importance in higher technological education, basic and applied research. In 1956, the German Government offered technical assistance for establishing an institute of higher education for engineering in India. The first Indo-German agreement was signed in Bonn, West Germany for the establishment of the Indian Institute of Technology at Madras in 1959 (<https://www.iitm.ac.in/about>).

### Department of Mechanical Engineering at IIT Madras

The Department of Mechanical Engineering at IIT Madras is as old as the Institute itself. Its impact on the institute and on society is easily demonstrated by noting the alignment of the department's evolution with key events and technological advances in India and elsewhere. Today, the department of Mechanical engineering of IIT Madras attracts and features an extraordinary rich diversity and quantity of talented individuals, with nearly 700 undergraduates, 500 graduate students and over 60 faculty members. The impressive array of students makes the department as the largest in the country and one of the largest in Asia.

The Manufacturing Engineering Section (MES) at Department of Mechanical Engineering is spread over three laboratories, one housed in Ranganathan Building, one in the Machine Tool Laboratory, Central Workshop and third in Mechanical Sciences Block.

Faculty members with MES as their research focus work on the development of next generation advanced manufacturing processes and cutting tools, machining of difficult-to-machine materials, machining and forming at micro and Nano scales, friction and laser based surface engineering, microstructural alterations to improve material properties, infusing smartness into processes and machines, automation of processes at different levels, high precision measurement and characterization at all length-scales.

The department has a computational facility with several computing workstations, and software like Deform, Abaqus, MATLAB, ANSYS, COMSOL for simulation purposes. Several labs including the Metrology lab, Sheet metal laser cutting lab use such state of art tools for design and analysis. These labs place a strong emphasis on research and support research oriented M.S. and Ph.D. programs.

## AICTE QIP

### Short Term Training Program

on

### KEY CHALLENGES

### AND ROAD AHEAD TO

### ADDITIVE MANUFACTURING

27<sup>th</sup> Jan - 01<sup>st</sup> Feb, 2020

Organized by



Department of Mechanical Engineering

Indian Institute of Technology Madras

Chennai - 600036

Coordinator:

Dr. S. Soundarapandian

Department of Mechanical Engineering,

IIT Madras, Chennai - 36

Contact : 044 2257 4718; Email: [sspandian@iitm.ac.in](mailto:sspandian@iitm.ac.in)

Personal homepage: <https://home.iitm.ac.in/sspandian>

**SHORT TERM COURSE**  
*on*  
**KEY CHALLENGES AND ROAD AHEAD**  
**TO ADDITIVE MANUFACTURING**

**Application Form**

**Name (block letters):**

**Dept. & Designation:**

**Organization:**

**Address for communication:**

**Ph. No. :**

**E-mail :**

**Fax :**

**Academic Qualification:**

**Specialization:**

**Experience (in years):**

**(a) Teaching:**

**(b) Industrial:**

**Accommodation:**

Required / Not Required

(No accommodation for local participants)

All data provided are true to the best of my knowledge and belief. Kindly register me for the short term course on “Key challenges and road ahead to additive manufacturing” to be held at IIT Madras.

**SPONSORSHIP**

Prof./Dr./Mr./Ms./Mrs./

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is an employee of our institute and his/her application is hereby sponsored. The applicant will be permitted to attend the short-term course “Key challenges and road ahead to additive manufacturing” at IIT Madras during 27<sup>th</sup> Jan - 01<sup>st</sup> Feb, 2020, if selected.

Date: Signature of Sponsoring Authority

Designation:

Official Seal:

Provisionally selected candidates have to pay Rs.1000/- as caution-deposit.

Transaction reference number:

Date:

Bank:

Amount:

Signature of the Applicant

**The duly sponsored application form should be posted to:**

**Dr. S.Soundarapandian**

MES 102, Ranganathan Building

Manufacturing Engineering Section

Department of Mechanical Engineering

Indian Institute of Technology Madras

Chennai – 600 036, Tamilnadu

Ph. No.: 044 2257 4718

**email : [sspandian@iitm.ac.in](mailto:sspandian@iitm.ac.in)**

**ELIGIBILITY**

The course is open to faculty with background in Mechanical, Manufacturing, Production Engineering from engineering colleges approved by AICTE. **No course fee** is charged for participants sponsored by AICTE approved institutions. However, Rs.1000/- caution-deposit has to be paid by the provisionally selected participants, which will be returned only when participant completes the course.

All payments are to be made by online payment mode to the following account :

**Account Name: CCE IIT Madras**

**Account Number: 36401111110**

**Bank Name: Sate Bank of India (SBI), IIT Madras branch, Chennai, India**

**Bank IFSC code: SBIN0001055**

**SWIFT code: SBININBB453**

**FINANCIAL ASSISTANCE**

Limited number of participants from AICTE recognized engineering institutions will be eligible for to and fro railway fare via shortest route in \*\*\*\*\* and free lodging and boarding in the institute guest house during course period. Candidates attending the course in full only will be eligible for TA and DA.

**BOARDING AND LODGING**

Boarding and lodging facilities will be provided for the selected candidates from AICTE approved institutions in the Taramani guest house at IIT Madras. Accommodation will be on twin sharing basis.

**IMPORTANT DATES**

Last date for applications : **13-01-2020**

Intimation of selection (through email) : **16-01-2020**

Confirmation of participation : **20-01-2020**