

Short Term Course  
on

## MANUFACTURING 4.0

Under TEQIP-III (MHRD)

October 28 – November 1, 2019

At  
**PUNJAB ENGINEERING COLLEGE**  
(Deemed to be University)  
Chandigarh-160012, U.T.

Organized by



**Mechanical Engineering Department**

**PUNJAB ENGINEERING COLLEGE**  
(Deemed to be University)  
Sector-12, Chandigarh-160012  
Union Territory, INDIA.  
Fax: 0172-2745175  
Website: [www.pec.ac.in](http://www.pec.ac.in)

**Coordinator:** Dr. Alakesh Manna, Professor,

**Co-coordinator:** Dr. Sushant Samir, Professor

Department of Mech. Engineering  
**PUNJAB ENGINEERING COLLEGE**  
(Deemed to be University)  
CHANDIGARH-160012, UT. INDIA

### 1. Important Dates

- Receipt of application: **Sep 30, 2019**
- Information to the selected candidate:  
**Oct 8, 2019 by email.**

- Receipt of Draft: **Oct 18, 2019**

- Short term course duration:

**October 28 – November 1, 2019**

### 2. Course Registration Fee:

- (a) Rs.500/- for institute faculty, research scholar, students and industry delegates
- (b) No registration fee for delegates from JNGEC, Sundernagar, Himachal Pradesh

### 3. Address for Correspondence

#### • Dr. Alakesh Manna

Professor & Former Head  
Department of Mechanical Engineering  
Punjab Engineering College  
(Deemed to be University)  
Sector-12, Chandigarh-160012, U.T.  
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M: + 91-9417565398 / 9781986570

#### • Dr. Sushant Samir,

Professor & Registrar  
Department of Mech. Engineering  
Punjab Engineering College  
(Deemed to be University)  
Sector-12, Chandigarh-160012, U.T.  
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### 4. Objective

Manufacturing 4.0 encompasses a promise of a new manufacturing revolution through applications of advanced manufacturing techniques with the artificial intelligent and internet of things. In the revolution create new manufacturing systems that are not only interconnected but also communicate, analyse and use appropriate information to drive further intelligent action for implementation of new processes and solutions provide to the modern manufacturing units. Manufacturing 4.0 referred to as smart manufacturing technologies applied to physical production and operations with smart digital technology, machine learning, and tools to improve manufacturing efficiency. Manufacturing 4.0 offers a more comprehensive, interlinked, and holistic approach to increase the productivity. However, nowadays advanced, meso (500µm-10mm) and micro (1-500 µm) manufacturing are emerging as an important technology specially in the area where miniaturization yields economic and technical benefits, namely aerospace, automotive, optical, biomedical, defence etc. areas. The

advanced meso and micro manufacturing process can be applied to metal, non metals, ceramics and composites materials. In case of advanced machining processes, material is removed at micro level either by mechanical means (such as USM, AJM, MAF etc processes), thermal erosion (such as LBM, EBM, PBM etc. processes), anodic dissolution (such as CM, CM etc processes), chemical reaction or combination of two or more than two processes called hybrid machining (such as ECDM, TW-ECSM, ECSG etc processes). The basic objective of this course is to acquaint the participants about the advanced and smart manufacturing including applications of manufacturing techniques with the artificial intelligent and internet of things to create new manufacturing systems for higher quality products, improve energy efficiency and productivity.

## 5. Course Contents

### (1) Introduction to Manufacturing 4.0

- (a) Basic IIoT Concepts
- (b) Artificial intelligent in manufacturing
- (c) Smart digital technology
- (d) Machine learning
- (e) M2M technique
- (f) Cloud computing & Ecosystem

### (2) $\mu$ -fabrications and manufacturing

- (a) MEMS Fabrication Techniques
- (b) Lithography, Photolithography
- (c) Deposition and Doping Electroplating
- (d) Etching and substrate removal
- (e) Silicon wafer fabrication
- (f) Bonding and Packaging
- (g) Various printing techniques
- (h) Thin Film Deposition and Doping
- (i) Chemical Vapor Deposition and Epitaxy
- (j) Micro casting, forming & joining
- (k) Mechanical, Thermal, Chemical and Electrochemical micromachining
- (l) Ion beam machining
- (m) Photochemical Etching
- (n) Micro & Nano finishing
- (o) Hybrid machining (e.g. ECSM, TWECSM, ECG etc.)

### (3) Introduction to Smart Manufacturing

- (a) Utility of Internet-Connected Machinery
- (b) Cyber physical systems - CPS
- (c) Computer-integrated manufacturing
- (d) Digital information technology
- (e) Automatic operations and data analytics
- (f) Sensors in manufacturing
- (g) Standards and Interoperability

## 6. Speakers

Speakers shall be drawn from various disciples of different IITs, University of repute and other institutions of higher learning, industries and R&D organizations of different parts of the country.

## 7. Mode of Payment

The registration fee should be sent by Demand Draft in favour of “**The Director, Punjab Engineering College (Deemed to be University)**” payable at “**Chandigarh**”

## 8. Accommodation

Accommodation is available in the institute Hostels, Guest House and Hotel /Lodge on reasonable charges.

## 9. About PEC

The Punjab Engineering College (PEC), Chandigarh was originally established as Mugalpura Engineering College at Lahore (Pakistan) on November 9, 1921. The college name was changed to Maclagan Engineering College and started functioning from and on March 19, 1924 at Lahore. In the year of 1931 the college was affiliated to Punjab University, Lahore. After partition the college was shifted to Roorkee, India and stated with the name of East Punjab College of Engineering. In the year of 1953 the college was again shifted to Chandigarh and stated functioning with rename Punjab Engineering College. In 1994 the National Foundation of Engineers adjudged this college the best technical college in India. The institute has been conferred the status of Deemed University in 2004. Currently this institute is offering 8 undergraduate courses, 14 post-graduate courses and Ph.D. programmes.

**Director of the Institute:** Prof. Dheeraj Sanghi

**HOD (Mech):** Prof. P.S.Satsangi

**Course Coordinator:** Dr. Alakesh Manna,  
Professor, Mech.Engg.Department

**Co-coordinator:** Dr. Sushant Samir, Professor  
**Department of Mech. Engineering**  
**Punjab Engineering College**  
(Deemed to be University)  
CHANDIGARH-160012, UT. INDIA

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**October 28 – November 1, 2019**

**DEPARTMENT OF MECHANICAL  
ENGINEERING  
PUNJAB ENGINEERING COLLEGE**  
(Deemed to be University)  
**Chandigarh-160012, U.T., India**

**Registration Form**

1. Name : \_\_\_\_\_
2. Designation :  
\_\_\_\_\_
3. Organization:  
\_\_\_\_\_
4. Address: \_\_\_\_\_  
\_\_\_\_\_
5. Qualification:  
\_\_\_\_\_
6. Phone: \_\_\_\_\_ Mob: \_\_\_\_\_
7. Fax : \_\_\_\_\_
8. Email : \_\_\_\_\_
9. Accommodation Required: Yes/No  
(i) If Yes from date: \_\_\_\_\_ to: \_\_\_\_\_  
(ii) Room type: AC/Non-AC/single/double :  
\_\_\_\_\_
10. Details of the registration fee:-  
Name and branch of bank:  
\_\_\_\_\_  
DD No. : \_\_\_\_\_ Date: \_\_\_\_\_  
Amount: \_\_\_\_\_  
Date: \_\_\_\_\_ Signature : \_\_\_\_\_

\*DD should be drawn in favour of “**The Director,  
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