

Short Term Course
on

MICRO FABRICATION AND HYBRID MACHINING

Under TEQIP-III (MHRD)

MARCH 12 – MARCH 16, 2018

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.
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Coordinator: Dr. Alakesh Manna, Professor,

Co-coordinator: Dr. Sushant Samir, Asso. Prof.
Department of Mech. Engineering
PUNJAB ENGINEERING COLLEGE
(Deemed to be University)
CHANDIGARH-160012, UT. INDIA

1. Important Dates

- Receipt of application: **Feb 20, 2018**
- Information to the selected candidate:
Feb 21, 2018 by email.
- Receipt of Draft: **Feb 28, 2018**
- Short term course duration:
March 12 to March 16, 2018.

2. Course Registration Fee:

- (a) Rs.2500/- for institute faculty and industry delegates
- (b) Rs.1500/- for research scholar and student delegates
- (c) No registration fee for delegates from JNGEC, Sundernagar, Himachal Pradesh

3. Address for Correspondence

- **Dr. Alakesh Manna**
Professor & Former Head
Department of Mechanical Engineering
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Sector-12, Chandigarh-160012, U.T.
E-mail: pecmanna@gmail.com
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- **Dr. Sushant Samir,**
Associate Professor
Department of Mech. Engineering
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4. Objective

Nowadays advanced, meso (1-10mm) and micro (1-999 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 with the principle, basic machine tools, development and advancement in manufacturing as well as μ -fabrication and hybrid machining processes, and research trends in the area of advanced, micro and nano-manufacturing processes.

5. Course Contents

(1) Introduction to μ -fabrication

- (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

(2) Introduction to μ -manufacturing

(a) *Traditional μ - manufacturing*

- (i) Micro casting
- (ii) Micro forming(e.g.micro sheet forming, micro laser forming etc)
- (iii) Micro joining
- (iv) Micro machining (e.g. micro turning micro milling, micro grinding etc.)

(b) *Nontraditional μ - manufacturing*

- (i) Mechanical micromachining (e.g. AJM, USM etc)
- (ii) Thermal micromachining (e.g. EDM,WEDM,LBM,EBM etc)
- (iii) Chemical and electrochemical micromachining(e.g. CM, ECM, etc)
- (iv) Ion beam machining
- (v) Photochemical Etching
- (vi) Micro & Nano finishing (e.g. AFF, MAF,MRAFF, MFP etc)
- (vii) Micro & Hybrid machining (e.g. ECSM, TWECM, ECG etc.)
- (viii)Laser beam micro welding
- (ix) Electron beam micro welding etc.

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. Manoj Kumar
Arora

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

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

Co-coordinator: Dr.Sushant Samir, Asso. Prof.
Department of Mech. Engineering
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**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,
Punjab Engineering College (Deemed to be
University)**” payable at “**Chandigarh**”