



Faculty Development Programme (FDP)

On

Nanotechnology for Electronic and Photonic Devices (NanoDev-2021)

Organized by Electronics and Communication Engineering Dept., Punjab Engineering College (Deemed to be University), Chandigarh



12-16 July, 2021

OBJECTIVE OF THE FDP

Nanotechnology is one of the increasingly important multidisciplinary area from designing medical devices to manufacturing super computing devices to better batteries, and from manipulating the atomic molecules to manufacturing. The conventional metal oxide semiconductor devices behave differently at small dimensions increasing the problem of gate leakage, power dissipation, interconnection, cost of fabrication etc. Therefore, novel concepts of devices including ballistic rectifiers, self-switching devices (SSDs), photonic devices, resonant tunneling diodes (RTDs) have been demonstrated to work at very high frequencies up to THz. In addition, conventional devices have also been modified to increase their operating speeds by implementing different devices configurations and geometries such as multi-gate MOSFETs, Vertical MOSFETs, FinFETs, HEMT, Photodetectors, and Solar cells, etc. The advanced materials including III-V heterostructures, graphene, MoS₂, etc. are being employed for the fabrication of such devices.

This course is aimed to provide an insight to understand and utilize the unique properties and interaction of matter, and thus their physics and chemistry for the design, analysis, and operation of state-of-the art next generation electronic and photonic devices. The course will provide an insight to both theoretical and practical knowledge for the design, analysis, and operation of electronic and photonic devices in order to meet the needs of relevant industry, space, defense and research organization. This technical course embraces an open

TOPICS TO BE COVERED

The major topics to be covered in short term course are:

- Materials for Nanoelectronic and photonic devices
- Growth, fabrication and characterization techniques
- Electronic transport in Nanostructures
- Novel Nanoelectronic Devices
- High electron mobility transistors (HEMT)
- Micro-electromechanical systems (MEMS)
- Use of Nanotechnology for MMIC applications
- Next generation Solar Cells
- Nano-photonics and Nano-interconnects
- Computer based simulation tools for nanoelectronic and photonic devices (e.g. Silvaco TCAD/ Comsol Multi-physics/ Ansys Software's).

* **Few Sessions be allotted for Industry resource person/Laboratory sessions/Hands-on session and visit to Clean Room Facility in PEC, Chandigarh.**

* **One Session will be dedicated to mental & emotional development, stress management, meditation, human values and ethics, health and happiness etc.**

LIST OF RESOURCE PERSONS.

- Scientists/Engineers from DRDO/ ISRO /CSIR, labs etc.
- Faculty from IISc, IITs and Institute of national repute.

SUPPORTED BY



**AICTE Training and Learning (ATAL)
Academy**

AICTE TRAINING AND LEARNING (ATAL) ACADEMY

ATAL Programme is an initiative by AICTE which aims at empowering faculty to achieve goals of Higher Education such as access, equity and quality. These programs have been designed to fulfill the need to train the young generation in skill sector and having faculty & technicians to be trained in their respective disciplines.

The objectives of ATAL FDP are

- To support technical institutions in fostering research innovation and entrepreneurship through training.
- To stress upon empowering technical teachers & technicians using ICT
- To provide a variety of opportunities for training and exchange of experiences such as workshops, orientations, learning communities, peer mentoring and other FDPs.

ABOUT THE DEPARTMENT

The Department of Electronics and Communication Engineering formerly known as Department of Electronics & Electrical Communication Engineering was established in the year 1963 with an intake of 30 students, which was subsequently increased to 60 in view of the competence of the infrastructure and the faculty of the department. The intake has further been increased to 75 from 2014-15 and 120 from 2016-17 onwards.

The department offers B.Tech. degree course in Electronics and Communication Engineering. Two full time master's courses namely M.Tech. Electronics and M.Tech. Electronics (VLSI Design) are being run in this department. The department also offers full time and part time PhD degree course. The department has excellent research facilities in the core and emerging areas of Electronics and Communication like Embedded systems, VLSI Design, Photonics and Optical Communication, Wireless Communication, Microprocessors, Digital Signal Processing etc. The pre-eminence of the department can be understood by the ever increasing demand of its fresh graduates.

ABOUT THE INSTITUTION

Punjab Engineering College (Deemed to be University) (PEC) having its roots in Lahore as Mugalpura Engineering College since 1921, moved to its present campus in 1953 as PEC affiliated to Panjab University. The institute became Deemed University in 2003 through a MHRD notification and rechristened as PEC University of Technology in 2009.

It is a Grant-in-Aid institution under administration of Union Territory of Chandigarh, Government of India. The institute has a 146 acres sprawling and pious campus and is house of Chandigarh College of Architecture also. The academic and administrative processes are similar to IITs in the country. The institute governance is through a vibrant Board of Governors, chaired by a renowned industrialist, Sh. Rajinder Gupta. The institute is headed by a Director on 5 years tenure; a position, which is equivalent to Vice Chancellor of Universities.

The institute offers 8 Undergraduate B. Tech. Programmes and 14 Post graduate M. Tech. Programmes in various disciplines of engineering and technology. After becoming University, the institute has also started PhD programme in various disciplines of engineering, science, management, humanities and social sciences. The admission to UG and PG programmes are made through national level examinations namely JEE (Mains) and GATE respectively. There are 9 academic departments and 3 centers of excellence.

The faculty of academic departments and centers is involved in cutting edge research and development works. The institute collaborates very closely with research organisations, industries, alumni and other academic institutions both India and abroad, and has signed MoUs to pursue joint research in niche areas. The students graduating from this institute are placed in highly reputed companies with handsome salary packages.

With a history of about 99 years now, the institute has produced a number of alumni who have earned name and fame both for themselves and the Institute.

REGISTRATION

The registration details will be provided on www.pec.ac.in.

Link for Registration: <https://atalacademy.aicte-india.org/signup>

Mode of the course **Online**
(Details will be shared with registered participants only)

Time **10:00 AM Onwards (Daily)**
This event is FREE to attend. Seats are limited.

Registration Details **Advance registration is recommended**
(Last Date: July 05, 2021)

Certificates Certificates will be issued to the participants after successful completion of the course

WHO CAN ATTEND

- Scientists/Engineers from Industry and Research Organizations
- Faculty from Universities/ Engineering Institutes/ Colleges
- Ph.D., M.Tech Students/ JRFs/ SRFs

ADDRESS FOR CORRESPONDANCE

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For more details visit:

<https://bit.ly/NRL-PEC> or www.pec.ac.in