Organized by
Electronics & ICT Academy

MNIT Jaipur
http://www.mnit.ac.in/eict

# Online Programme on
# Semiconductor Devices & Sensors: Applications & Research Perspective

**2nd May –10th May 2025**

**Faculty Development Programme**
Electronics & ICT Academy under aegis of

Ministry of Electronics and Information Technology
Government of India

meity.gov.in/content/schemes-projects

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**Objective (Electronics & ICT Academy-Phase II)**
1)To conduct specialized FDPs for faculty/mentor training in line with the vision of MeitY by promoting emerging areas of technology and other high-priority areas that are pillars of both the "Make in India" and the "Digital India" programs.
2) To promote synergy and collaboration with industry, academia, universities and other institutions of learning, especially in emerging technology areas.
3) To support the National Policy on Electronics 2019 (NPE 2019) which envisions positioning India as a global hub for ESDM sector, including MeitY Schemes/policies such as Programme for Semiconductors and Display Fab Ecosystem; India AI; National Programme on AI, Production Linked Incentive Scheme for IT Hardware & Large-Scale Electronics Manufacturing; EMC; SPECS; Chips to System (C2S); etc.
4) To promote standardization of FDPs through Joint Faculty Development Programmes.
5) To support the vision of the National Education Policy (NEP 2020), which mandates that Indian educators go through at least 50 hours in professional development programmes per year.
6) To design, develop & deliver specialised FDPs on emerging technologies/ niche areas/ specialised modules for specific research areas for Faculty in Higher Education Institutions (HEI), besides FDPs on multi-disciplinary areas connected with ICT tools and technologies and other digital hybrid domains, covering a wide spectrum of engineering and non-engineering colleges,

An intensive 40 HoursTrainingProgramme in Hybrid mode is being organized for faculty and doctoral students of engineering and technological institutions. It is also open to working professionals from industry/organizations. The main theme of the training program will be oriented around exploring the state-of-the-art methods for Semiconductor Devices & Sensors: Applications & Research Perspective.

**Experts/Speakers-**

1) Prof. Anand Bulusu, Deptt of ECE at IIT Roorkee
2) Dr. Gourab Dutta, Deptt of ECE, IIT Kharagpur
3) Dr. Jai Gopal Pandey, Senior Principal Scientist, CSIR-CEERI, Pilani
4) Mr. Santhosh, Scientist, CSIR-CEERI, Pilani

**Programme Modules:**

**Module 1:** Types of materials, metals, insulators and semiconductors, Band gap, Miller indices, Crystal Structure of Silicon, Intrinsic `Semiconductors, Extrinsic semiconductors, Fermi level, Thermal Equilibrium, Law of mass action, mobility, generation recombination, Transport Equations, Continuity Equations
**Module 2**: P-N junction characteristics, I-V characteristics, and small signal switching models; Avalanche breakdown, Zener diode, Schottky diode, rectifying circuits, Limiting and clamping circuits. MOSFET device structure, current voltage characteristics, DC biasing, small signal analysis, Common Source, Common Gate and Common Collector Configurations, Discrete circuit amplifiers
**Module 3**: OPAMP- Ideal Op-AMP, Inverting Configuration, Non inverting configuration, DC imperfections, difference amplifiers, circuits based on Op-amps: Integrators, differentiators, filters, logarithmic amplifiers.
**Module 4**: Signal generators, waveform shaping circuits, RC oscillatory circuits, LC and Crystal Oscillators, Bistable multivibrators, monostable multivibrators, Timers, Nonlinear waver forming circuits
**Module 5**: Applications of diodes and MOSFETs as sensors like - biosensor, Image sensor, temperature sensor, pressure sensor, pH sensor. Hands on with any one sensing application.
**Note:** This course content is aligned with the following category of minor degree course offered by AICTE in Electronics Engineering (VLSI Design and Technology) - https://aicte-qa.aicte-india.org/sites/default/files/Final%20Minor%20VLSI.pdf

**Principal Coordinator:**

Dr. Menka Yadav 9549650791(M)

**Registration:**(Email: fdp.academy@mnit.ac.in)
Registration is open to faculty, working professionals, industry persons, doctoral, postgraduate and graduate students.Participants will beadmitted on first-come first-served basis. Register online at– (http://online.mnit.ac.in/eict/)

**CertificationFee:**

| | *Online* |
|---|---|
| From Academia (faculty/PhD scholars): | 500/- |
| Working professionals, Industry, research staff/technical staff/students& Others | 1500/- |

(A)Fee once paid will not be refunded back.
(B)The fee covers participation in the programme, tutorial notes and examination, certification charges& food charges (classroom only)
(C) The organizers should receive the registration amount through online mode-NEFT/UPI,provided at the registration portal.(D) Detailed schedule will be shared after receiving registration form

**MNIT Jaipur** one of the oldest NITs, the institute has a rich heritage of sixty years producing world class engineers, managers, architects and scientists. Ranked 43rd nationally in the NIRF ranking-2024 (Engineering), the institute offers learning opportunities for undergraduate, postgraduate students, and researchers in various domains.Having a lush green campus of over 317 acres within the heart of the pink city, close to Jaipur International Airport, the campus offers a safe and lively environment. A world class teaching infrastructure, state-of-art laboratories welcome you at the campus.The institute has a vision to impart education of international standards and conduct research at the cutting edge of technology.