



Online Faculty Programme on QT-08 Quantum Materials



Facilitated by AICTE, NQM, APSCHE,
IITM, IBM, TCS & Others

March 09 – April 02, 2026
Twenty Days (Mon to Sat)
Time: 3– 5 PM (Daily 2 Hours)



इलेक्ट्रॉनिक्स एवं सूचना प्रौद्योगिकी मंत्रालय
MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

Jointly Organized by Meity, MNITJ, IITG, IITK, NITP, IIITDM & Others

Chairman, EICT Academy & Director MNIT Jaipur

Prof. Narayana Prasad Padhy

Chief Investigator, EICT Academy

Prof. Vineet Sahula, ECE

Coordinator, EICT Academy

Dr. Satyasai Jagannath Nanda, ECE

Co- Chief Investigators, EICT Academy

Prof. Lava Bhargava, ECE

Prof. Pilli Emmanuel Shubhakar, CSE

Dr. Ravi Kumar Maddila, ECE

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, polytechnics, ITIs, and PGT educators.

An intensive **20 Day - 40 Hours** Training Programme in Online Mode is being organized for faculty and doctoral students of engineering, science, and technological institutions. It is also open to working professionals from the industry/organizations. The programme will be run for **only two hours** in the afternoon from **15:00 to 17:00 hours Daily (Mon to Sat)**.

QT-08: Quantum Materials is the **seventh** in a series of Faculty Development programmes aligning to the courses in the recently approved **Minor Course Curriculum on Quantum Materials** by AICTE, DST and IBM.

<https://facilities.aicte-india.org/Minor Quantum Technologies.pdf>

Experts/Speakers-

- | | |
|---|------------------------------------|
| 1) Prof. S. Ramakrishnan, IISER Pune | 2) Prof. Sunil Nair, IISER Pune |
| 3) Prof. R. C. Nath, IISER Trivandrum | 4) Prof. Surjeet Singh, IISER Pune |
| 5) Dr. C. Shekhar, MPI-CPfS, Germany | 6) Dr. Ashish Arora, IISER Pune |
| 7) Prof. S. Roychowdhury, IISER Bhopal | 8) Prof. Sameer Sapra, IIT Delhi |
| 9) Dr. Bahadur Singh, TIFR, Mumbai | 10) Prof. Pintu Das, IIT Delhi |
| 11) Prof. Satinder K. Sharma, IIT Mandi | 12) Prof. Samaresh Dash, IIT Delhi |
| 13) Dr. Vaibhav Gupta, IIT Mandi | 14) Dr. Aswath Babu, IIIT Dharwad |
| 15) Dr. D. K. Shukla, UGC DAE CSR, Indore | 16) Prof. Ajit Patra, UoH |
| 17) Dr. Ajay Kumar Shukla, NPL Delhi | 18) Prof. V. Gorige, UoH |
| 19) Dr. Sunil Singh Kushvaha, NPL Delhi | 20) Dr. Abhiram Soori, UoH |
| 21) Dr. Mostafizur Rahaman, IBM Quantum | |

Programme Modules:

Introduction to crystal symmetries and x-ray diffraction. Band theory basics, Metals, Semiconductors and Insulators, Band structure of solids, Survey of devices for quantum technologies (electronic, quantum optical devices and principle of operation), Correlated systems and their characteristics.

Classical and quantum theory of Magnetism, Para, ferro magnetism basics, Magnetic measurements, Hall effect (Classical & Quantum). Magnetoresistance and quantum oscillations, Faraday and Kerr effects. Superconductivity: BCS theory, Ginzburg Landau, Josephson Effect – AC and DC Josephson effects

Introduction to topological phases of matter, Basics of Topology, Berry phase and Berry curvature, Aharonov Bohm effect. 2D materials: Graphene and its properties – single and few layers, Transition Metal Dichalcogenides – Electronic and Optical Properties

Introduction to material synthesis, Single crystal growth techniques. Thin Film growth techniques: Molecular beam epitaxy, Chemical vapor deposition, MOVPE, Pulsed laser deposition, etc. Epitaxial Graphene- Growth and Optimization, Materials to Device Fabrication: Lithography for Device Fabrication.

Principal Coordinator

Dr. Manoj Kumar
9549659761(M)

Joint-Principal Coordinator

Dr. Bhagwati Sharma
9893082476 (M)

Registration:

Registration is open to faculty, working professionals, industry persons, doctoral, postgraduate and graduate students. Participants will be admitted on first-come first-served basis.

Register online at – (<http://online.mnit.ac.in/eict/>)



Certification Fee:

- Academic (Faculty/PhD Scholars) [(India/SAARC/African countries)]: ₹500/-
- Professionals / Industry / Others [India / SAARC / African countries]: ₹1000/-
- Participants from the **Rest of the World USD: US\$ 60**

(A) The fee covers online participation, material and certification charges.

(B) Webinar Classes will be on Cisco **WebEx**, Notes / Slides will be shared and Quizzes / Assignments will be conducted on **Canvas e - Learning Platform**,

→ For any other query, email us at fdp.eict@mnit.ac.in

Malaviya National Institute of Technology (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.

Andhra Pradesh State Council of Higher Education (APSICHE), the first of its kind in the country, set up as per the recommendations of the NEP, is primarily a coordinating body between the **University Grants Commission (UGC)** and the **State Government Universities**