AICTE Approved Minor Program on Quantum Computing

इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी मंत्रालय
MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY
सत्यमेव जयते

IBM Innovation Centre for Education

Faculty Development Programme

QT-05: Quantum Computation

July 11 – Aug 2, 2025 (Mon to Sat) 2 PM – 4 PM

Jointly organized by Electronics and ICT Academies
Established by the Ministry of Electronics and Information Technology, Govt. of India

MNIT Jaipur | IIITDM Jabalpur | IIT Guwahati | IIT Kanpur | IIT Roorkee | NIT Patna | NIT Warangal

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 specialized FDPs on emerging technologies/ niche areas / specialized 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.

Joint -Principal Coordinator

Dr. Shivansh Mishra,
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An intensive **20 Day - 40 Hour** training programme in online mode is being organized for faculty and doctoral students of various domains, including engineering, science, management and finance. It is also open to working professionals from industry/R&D organizations. The programme will run **02:00 PM to 4:00 PM (Mon-Sat).**

QT-05: Quantum Computation **is the fourth in a series of Faculty Development programmes aligning to the courses in the recently approved Minor Course Curriculum on Quantum Computing by AICTE, DST and IBM.**
https://facilities.aicte-india.org/Minor Quantum Technologies.pdf

Resource Persons

1) Dr. Aswath Babu, Assistant Professor, IIIT Dharwad
2) Dr. Jayakumar Vaithiyashankar, CEO Anuthantra & IBM Educator
3) Dr. Ritajit Majumdar, Research Scientist, IBM Quantum
4) Dr. Anindita Banerjee, Project Manager, CDAC Pune
5) Dr. Santosh Vipparthi, Assoc. Prof. & Head, School of AI & DE, IIT Ropar
6) Dr. Mostafizur Rahaman, Research Scientist, IBM Quantum, Bengaluru
7) Ms. Janani A, Support Engineer, IBM Quantum
8) Mr. A. Ananda Raman, Scientific Officer – E, NISER, Bhubaneswar
9) Mr. Jinesh VN, PES University, Bengaluru
10) Dr. Raghavendra, SRM University, Bengaluru

Programme Modules:

Qubits versus classical bits: Spin-half systems and photon polarizations, Trapped atoms and ions, Artificial atoms using circuits, Semiconducting quantum dots, Single and Two qubit gates – Solovay - Kitaev Theorem. Quantum advantage claims, Roadmap for future.
Quantum correlations: Entanglement and Bell's theorems **Review of Turing machines and classical computational complexity:** Time and space complexity (P, NP, PSPACE), Reversible computation, Universal quantum logic gates and circuits, Quantum parallelism
Quantum algorithms: Deutsch algorithm, Deutsch Josza algorithm, Bernstein - Vazirani algorithm, Simon's algorithm **Database search:** Grover's algorithm **Quantum Fourier Transform and prime factorization:** Shor's Algorithm. **Quantum complexity classes** – Q, EQP, BQP, BPP, QMA, **Additional Quantum Algorithms:** Variational Quantum Eigensolver (VQE), HHL, QAOA.
Error correction: Fault-tolerance, Simple error correcting codes, Survey of current status , NISQ era processors, Quantum Computer Vision.

Registration Link: https://forms.gle/qW82wJdCf35UE6n3A
Beneficiary Name -PDPM IIITDM Jabalpur
Bank Name - INDIAN BANK
A/C No. - 50018692852
IFSC Code - IDIB000M694

PDPM IIITDM JABALPUR
SCAN & PAY
UPI ID : iiitdmj@indianbk

Last Date of Registration- 09 July 2025
Certification Fee: Academic (Faculty / Students): ₹ 500/-
Industry Professionals / Others: ₹ 1000/-
Participants from the Rest of the World USD: US$ 60
The fee covers course material and certification charges.

Contact for queries: Mr. Durgesh Kushwaha 789 867 0354
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