Ministry of Electronics and Information Technology
Government of India

E & ICT Academy IIITDM Jabalpur
https://www.iiitdmj.ac.in/ict.iiitdmj.ac.in/Autumn-2021/quantum-computing.html

Two Weeks Certification Program
Quantum Computing
Sept 27 – Oct 8, 2021
(Monday to Friday)

Resource Persons from IBM India

An intensive two-week online certification programme is being organized jointly by MNIT Jaipur, PDPM IIITDM Jabalpur, NIT Patna, and IIT Guwahati for the **Faculty Members** of **Engineering** and **TechnologicalInstitutions**. It is also open to **Industry Personnel** and **DoctoralStudents** of Indian organizations.

National Mission on Quantum Technologies & Applications (NM-QTA) with budget of Rs 8000 Crore for 5 years will be implemented by the DST. Quantum Science will be a major technology disruption that will change entire paradigm of computation, communication, and encryption. Applications will receive boost in aero-space engineering, numerical weather prediction, simulations, securing communications, financial transactions, cyber security, advanced manufacturing, health, agriculture, education, etc. The focus is on creation of high skilled jobs, human resource development, start-ups & entrepreneurship.

This workshop will cover fundamentals of **Quantum Computing**and introduces Quantum **Cryptography** and Quantum **Machine Learning**. Domain experts from **IBM Labs India / IBM Partners** will handle **all the sessions** will be handled, whowould be conducting online lab and training sessions.

Experts/Speakers-

Nivedita Dey
Director and Research Coordinator
QRDLab, University of Calcutta

Rajesh K Jeyapaul,
IBM Quantum Ambassador
Engineering Lead, AIOps@ IBM Labs India

Course Content:

Qubits, Bloch Sphere, VectorAlgebra, bra-ket notations
Superposition, Entanglement, Teleportation, No Cloning theorem,
IBM Qiskit, UI Tools and OpenQASM(Open Quantum Assembly Language)
Quantum Gates – Pauli & Hadamard, Multi Qubit gates, Deutch's Algorithm
Quantum Programming Languages, Platforms and Frameworks
Quantum Search, Quantum subroutines, Grover's Algorithm
Quantum Fourier Transforms, Discrete logarithms, Shor's Algorithm, BB 84
Quantum Cryptography& Key Distribution
Quantum Machine Learning, Opportunities, Applications

Registration:
Registration is open to faculty, industry persons, doctoral,postgraduate and graduate students.Participants will beadmitted on first-come first-served basis. Register online at-https://www.iiitdmj.ac.in/ict.iiitdmj.ac.in/Autumn-2021/quantum-computing.html

Course and CertificationFee:

Academic (Student/ Faculty): ₹500/- Industry/Others:₹ 1,000/-

(A)Fee once paid will not be refunded back; it may be adjusted in future courses upon prior request.
(B)The fee covers online participation in the programme, comprehensive tutorials, practice notes & certification charges.
(C) The organizers should receive the registration amount through online payment gateway provided at the registration portal.
(D) Register here: https://forms.gle/RH7xcQMhiMK58tsy8

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Preamble (Electronics & ICT Academy)
Government of India had announced a National Policy on Skill Development, which has set a target of skilling 500 million people by 2022 in the domain of Electronics & IT. Under the plan scheme of "Digital India Manpower Development". MeitY has set up seven (07) Electronics and ICT Academies as a unit in 03 IITs, 03 NITs and 01 IIIT with an objective of faculty/mentor development/up gradation in the areas related to Electronics & ICT leading ultimately to improved employability of graduates/diploma holders. MNIT Jaipur has set up such an academy for providing specialized training to faculty and industry persons in the states/UTs of Rajasthan, Gujarat, Daman & Diu, Dadra Nagar Haveli.

(A) Issues-
1. IT Hardware and Electronics Manufacturing industry- availability of properly trained, skilled and qualified manpower
2. Number of quality PhDs generated in IT / Computer Science is very low
3. In E & ICT domain- there is a very high degree of obsolescence of existing technologies and faster emergence of newer technologies

(B) Approach-
1. A focused faculty training/updation programme for IT, Electronics and related sectors
2. Spreading up and continuous updation regarding Emerging Technology
3. Training and consultancy services for Industry
4. Design, Develop and Deliver specialized modules for specific research areas and Industry
5. Providing advice and support for technical incubation and entrepreneurial activities