Electronics & ICT Academy
IIT Roorkee

An Initiative of
Ministry of Electronics & Information Technology (MeitY)
Government of India

सत्यमेव जयते

Joint Faculty Development Program

on

Quantum Computing

Two - Week Joint Faculty Development Programme

In association with

Feb 28 – March 22, 2025
05:00 – 07:00 PM
Everyday

Register Before: Feb 16 , 2025

Mode of Delivery is Online

About E&ICT Academy

Electronics and ICT Academy is an initiative of Ministry of Electronics & Information Technology (MeitY), Govt. of India for conducting various Faculty/ Research Scholar Development Programme. Academy has planned short-term training programs on fundamental and advanced topics in IT, Electronics & Communication, Product Design, and Manufacturing with hands-on training and project work using the latest software tools and systems. In addition, the Academy will conduct specialized/customized training programs and research promotion workshops for corporate sector & educational institutions.

Prerequisites

No experience is required, but fundamental knowledge of any programming language would be helpful.

Objectives of the course

- Introduce quantum measurements, density matrices, and decoherence.
- Explore quantum superposition, entanglement, and quantum gates.
- Learn quantum algorithms: Deutsch, Grover's, and Shor's.
- Understand quantum error correction, fault tolerance, and cryptography.
- Discuss scalability and fidelity in quantum computing.
- Explore NMR Quantum Computing, Spintronics, and QED.
- Investigate optical approaches and the future of quantum technologies.

Focus Areas

- Quantum Measurements, Density Matrices, and Decoherence
- Quantum Superposition, Entanglement, and Quantum Gates
- Bell's Inequality and Quantum Teleportation
- Quantum Algorithms: Deutsch, Grover's, Shor's
- Quantum Error Correction and Fault Tolerance
- Quantum Cryptography and Fidelity Issues

Course Features

- 40 Hours of Lectures, hands-on, and Pedagogy/Industry sessions.
- Lectures from Expert Speakers, Hands-on from industry/Academia experts.
- Access to learning material and video lectures
- Certificate by E&ICT Academy IIT Roorkee

Course Outcomes

Participants are likely to:

- Apply quantum measurements, density matrices, and handle decoherence.
- Implement quantum superposition, entanglement, and teleportation.
- Design quantum algorithms (Deutsch, Grover's, Shor's).
- Apply error correction techniques for fault tolerance.
- Assess fidelity and scalability challenges in quantum computing.
- Understand NMR Quantum Computing, Spintronics, and QED methods.
- Evaluate optical methods and future developments in quantum computing.

Experts from Academia/Industry

Who Should Register?

Any Interested Faculty/PhD-Scholars
UG/PG/ & Industry Persons can register

Registration Fee

Fees: ₹ 500/- Faculty/Research Scholar
Note: Registration Fee is Refundable if the cancellation request is submitted before the last date of registration.

How to make Payment

Please make the payment first using the below link upload the payment receipt when filling out the Google registration form

https://eict.iitr.ac.in/instruction-for-payment/

Conference Code: EICTIITR-FDP-25-30

Registration Link

https://forms.gle/f2As7XFQt84c4jqP6

Scan QR for registration

Register before:
Feb 16 , 2025

Click to follow us on:

Resourse Person

Dr. Mani Madhukar, IBM India & his team

Principal Coordinator

Dr. Emmanuel Shubhakar Pilli, MNIT Jaipur

Joint Principal Coordinators

- Prof. Sanjeev Manhas, IIT Roorkee
- Prof. Vishvendra Singh Poonia , IIT Roorkee
- Dr. M P Singh, NIT Patna
- Dr. Rajeev Arya , NIT Patna
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