

## Electronics & ICT Academy IIT Roorkee



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

# A Joint Faculty Developmet Programme

## on

## Basic Quantum Programming Lab

#### In association with



May 16 – June 06, 2025 Register Before: May 14, 2025



### 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/ Development Scholar Programme. Research 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

Basic knowledge of semiconductor physics, electronic circuits, and familiarity with simulation or programming tools.

#### Objectives of the course

- To introduce the fundamentals of quantum computing and quantum mechanics principles
- To provide hands-on experience with quantum programming languages like Qiskit or Cirq
- To familiarize participants with quantum gates, circuits, and algorithms
- To enable simulation of quantum programs using open-source platforms
- To explore real quantum hardware access and execution
- To develop an understanding of applications in cryptography and optimization
- To empower faculty to guide student projects and research in quantum computing

#### Focus Areas

- Basics of qubits, superposition, and entanglement.
- Quantum logic gates and circuit design.
- Quantum algorithms: Deutsch-Jozsa, Grover's, and Shor's.
- Programming with Qiskit, Cirq, or similar platforms.
- Simulation of quantum circuits on classical systems.
- Accessing cloud-based quantum computers (e.g., IBM Quantum).
- Applications in cryptography, chemistry,

#### Mode of Delivery is Online

#### Course Outcomes

- Understand core concepts of quantum computing
- Build and simulate basic quantum circuits
- Write quantum programs using opensource frameworks
- Analyze performance and limitations of quantum algorithms
- Connect quantum computing with realworld applications
- Access and run programs on actual quantum machines
- Mentor students and initiate research in quantum programming



## 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/ Students ₹ 1000/- Industry/Others Note: Refund will be done in case of course cancellation only, with in 20 working days

#### 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-JFDP-NKN-10** 

#### **Registration Link**

## https://forms.gle/XjLLPasx8PUSX5rc8



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Scan QR for registration Register before: May 14, 2025

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#### and machine learning.

#### **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

## **Principal Coordinator**

• Dr. E. S. Pilli, MNIT Jaipur

### Joint Principal Coordinator

- Prof. Sanjeev Manhas, IIT Roorkee
- Dr. Siba K Patro, IIT Roorkee
- Prof. M P Singh, NIT Patna
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