

**Specialized Training Programme on  
Quantum Computing and Information Science**  
**Duration: 2 weeks (17 February, 2025 to 28 February, 2025)**

**Week 1:**

- Introduction to Quantum Computing History of Quantum Computation & Quantum Information Science, Applications & Use cases.
- Introduction to Quantum Computing Tools & Kits Circuit Composer, Quantum Information Science Kit, CIRQ Quantum Framework.
- Introduction to Python Programming Overview, Features, Installation, Data types, Strings, Operators & Expressions etc., Control Flow Instructions, Data Structures: Lists, Dictionaries, Tuples, Functions & Modules etc.

**Week 2:**

- Quantum Mechanics & Linear Algebra Principles of Superposition, Entanglement, Young's Double Slit experiment, State space, Quantum measurement, Linear operators and Matrices, Pauli Matrices, Inner Products, Eigenvectors and eigenvalues etc.
- Quantum Gates & Circuits Single/ Multiple Qubit Gates, Quantum Circuits, Bell States Quantum Algorithms
- Quantum Teleportation, Super Dense Coding, Grover's Search Algorithm