Concept note on

Capacity Building Workshop on Quantum Technologies

Dates: 7–11 December 2026 (Five Days)
Organized and Funded by: IITM C-DOT Samgnya Technologies Foundation
Venue: DMT Hall, Sacred Heart College (Autonomous), Tirupattur, Tamil Nadu
Participants: 100 Final-Year B.Sc. Physics Students

Background:

Quantum technologies are emerging as one of the most transformative areas of contemporary science and technology, with significant potential to revolutionize computing, communication, sensing, metrology and information processing. Based on the fundamental principles of quantum mechanics, these technologies encompass diverse areas such as quantum materials, quantum computing, quantum communication, quantum cryptography and quantum sensing. Recognising the importance of preparing young graduates for these emerging technologies, a five-day Capacity Building Workshop on Quantum Technologies is proposed and subsequently approved for 100 final-year B.Sc. Physics students of north Tamilnadu from 7 to 11 December 2026.

Objectives:

The workshop aims to introduce students to the fundamental principles and emerging developments in quantum technologies, familiarise them with quantum materials and their technological applications, develop an understanding of quantum computing, communication and sensing, and provide introductory practical exposure to quantum simulation platforms and computational tools.

Major Themes and Proposed Activities:

The workshop will cover the fundamentals of quantum mechanics and quantum technologies, quantum materials and their applications in advanced devices, quantum computing concepts including qubits, superposition, entanglement and quantum circuits, quantum communication and cryptography, and quantum sensing and metrology. The programme will be delivered through expert lectures, interactive discussions, demonstrations and hands-on sessions using suitable quantum computing platforms and simulation tools.

Expected Outcomes:

The workshop is expected to enhance students' understanding of the fundamental concepts and diverse domains of quantum technologies, provide introductory practical exposure to quantum computing and simulation tools, familiarise them with emerging applications of quantum materials and quantum devices, and motivate them to pursue higher studies and research in quantum science and technology.