SHARDA UNIVERSITY
Beyond Boundaries

NAAC
A+
ACCREDITED

SHARDA SCHOOL OF BASIC SCIENCES & RESEARCH

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One Weak Training Program on

QUANTUM COMPUTING
AND
QUANTUM CRYPTOGRAPHY

October 6th to 10th 2025

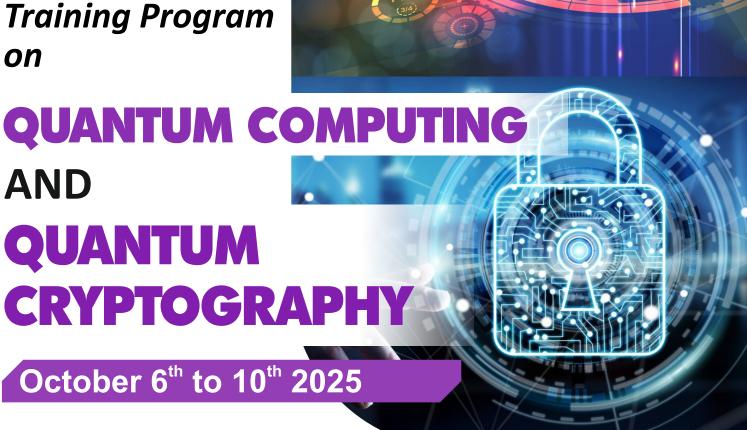*Sponsored by: PLM Pundits*

About the University

Sharda University is a leading Educational Institution, NAAC A+ graded, and has an NIRF ranking of 86, located at Greater Noida, Delhi NCR. It is a venture of the renowned Sharda Group of Institutions (SGI). The University has established itself as a high-quality education provider with a prime focus on holistic learning and imbibing competitive abilities in students. The University is approved by UGC and prides itself in being a multi-disciplinary campus in the NCR, spread over 63 acres and equipped with world-class facilities. There are 14 different schools offering 130 programs with more than 13000 students from 95 different countries. Sharda University promises to become one of India's leading universities with an acknowledged reputation for excellence in research and teaching.

About the Center for Cyber Security and Cryptology

The Center aims at the promotion of interdisciplinary research as well as training and development in cybersecurity and cryptology. The center aspires to develop cutting-edge research activities in the field of cybersecurity and related technologies, to enhance knowledge for present and future requirements to fulfill the growing demand in the national and international arena. The goal of this Center is primarily to foster fundamental as well as demand-driven "research and applications in cryptology and cybersecurity". The objectives are to create a skilled manpower base and to provide training and direction to various

wings of the Armed Forces, Central and State Police Organizations, and also financial institutions.

Another major objective of the Centre is capacity building at the national level to make the country self-sufficient in this niche area.

About the Training Program

Objective:

The primary objective of this 5-day short-term training program is to provide participants with a comprehensive introduction to the fundamental principles, emerging technologies, and practical applications of Quantum Computing and Quantum Cryptography. As quantum technologies rapidly evolve, they are poised to revolutionize fields ranging from secure communication to high-performance computing. This program aims to bridge the knowledge gap for students, researchers, researchers, and professionals interested focus on Quantum Key Distribution (QKD), quantum-safe encryption.

Scope of the Training Program

This short-term training program is designed to introduce participants to the foundational and emerging aspects of Quantum Computing and Quantum Cryptography, combining theoretical knowledge with practical skills. The scope of the program encompasses a broad spectrum of topics to ensure participants gain a holistic understanding of quantum technologies and their growing relevance across scientific and technological domains.

Key areas to be covered include:

• **Quantum Computing Fundamentals:** Introduction to quantum mechanics principles relevant to computing, including qubits, superposition, entanglement, and quantum gates.

• **Quantum Algorithms:** Overview of key algorithms such as Shor's algorithm for integer factorization and Grover's algorithm for database search, including their computational advantages over classical algorithms.

• **Quantum Cryptography Concepts:** Understanding the principles and protocols of secure communication using quantum mechanics, with a focus on Quantum Key Distribution (QKD) and BB84 protocol.

• **Post-Quantum Security:** Discussion on the impact of quantum computing on current cryptographic systems and the emerging field of post-quantum cryptography.

• **Quantum Programming and Simulation:** Hands-on sessions using tools like IBM Qiskit, Google Cirq, or Microsoft Q#, enabling participants to design and simulate basic quantum circuits.

• **Research and Industry Trends:** Insights into ongoing research, real-world applications, and the future landscape of quantum technologies in academia, industry, and defense.

The program is suitable for undergraduate and postgraduate students, research scholars, faculty members, and industry professionals from computer science, physics, electronics, mathematics, and related fields. It aims to foster interdisciplinary learning and encourage participants to pursue advanced studies or research in the quantum domain.

By the end of the program, attendees will have built a solid conceptual and applied foundation in quantum technologies, preparing them to engage with further academic or professional opportunities in this rapidly advancing field.

Eligibility

Faculty Members, Research Scholars, and UG and PG Students of Academic Institutions, Government and PSU Officials, and Industry Personnel.

Topics to be Covered (but not limited to): Five modules with eight hours each

Module 1: Introduction
Module 2: Quantum Cryptography and Quantum Communication
Module 3: Post-Quantum Cryptography (PQC)
Module 4: Quantum Algorithms
Module 5: Hands on Experience in Python

Important Dates

• Last Date for Registration: 1-10-2025
• Start of the Programme: 06-10-2025
• End of the Programme: 10-10-2025

Registration Process

Kindly do the following for registration:

1. Registration Charges –
Rs. 500 for students (Inclusive 18% GST)
Rs. 1000 for Ph.D/Post-Doc/Faculty (Inclusive 18% GST)
Note: Kindly fill Programme name (TPPC) while making the payment.
No Cheque/Cash payment is accepted. Amount is non-refundable

Account details

Bank Name   :   **ICICI Bank Ltd.**
Branch Address :   **Krishna Apra Royal Plaza, D-2, E(acb)**
Account Holder Name :   **Sharda University-Seminar**
Account No.   :   **025405005815 (CURRENT AC)**
IFSC Code   :   **ICIC0000254**
SWIFT Code :   **ICICINBBCTS**
MICR Code: **110229037**

QR Code for Payment

Certification
*An evaluation will be done at the end of the program and the certificate will be issued to those participants who have attended the program with **80% attendance** and filled the feedback form.*

Organizing Committee

Chief - Patrons

Shri. P. K. Gupta
Hon. Chancellor, Sharda University

Shri. Y. K. Gupta
Hon. Pro-Chancellor, Sharda University

Patron

Prof. (Dr.) Sibaram Khara
Vice Chancellor, Sharda University

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Prof. Parma Nand
Pro Vice -Chancellor, and
Dean SSCSE, Sharda University

Prof. Bhuvnesh Kumar
Dean Research, Sharda University

Convener

Prof. Shri Kant
Head, Centre for Cyber Security and Cryptology,
Sharda University

Co-Conveners

Dr. Kapil K. Sharma, Associate Professor, Sharda University
Prof. Amrita, Professor, Sharda University
Dr. Ravi Prakash Chaturvedi, Assistant Professor, Sharda University
Mr. Prashant Upadhyay, Assistant Professor, Sharda University
Dr. Keshav Kaushik, Associate Professor, Sharda University
Dr. Shaheen Naz, Assistant Professor, Sharda University

Speakers

Dr. Kapil K. Sharma
Associate Prof. (Physics),
Sharda University

Dr. Rishikant Rajdeepak
DY Patil International Univ. Pune

Dr. Indrajit S.
(Scientist Qdit Labs Pvt Ltd)

Dr. Amit Kumar Chauhan
(PQC Research Lead; QNu Labs Pvt. Ltd.)

Mr. Arka Mukherjeet
Scientist E, C-DoT, Delhi

Alvary Kefas Kwala

Dr. Giovanni Scala
University of Gdansk, Poland

Dr. AbhiShek Shukla
Senior Research Associate, QuNu Lab, Bangalore

"Hands-on Training by C-DAC Bangalore"

1. Raghavendra Patil (Scientist F)/Mr. Jeevan
2. Dr. Divyansh / Mr. Raja (CDAC)

Advisory Committee

- **Prof. Prasanta K. Panigrahi**, *IISER, Kolkata*
- **Dr. Archan S. Majumdar**, *S. N. Bose National Centre for Basic Sciences, Kolkata*
- **Prof. Jonas Maziro**, *Federal Univ. Santa Maria, Brazil.*
- **Prof. Marcelo Serrano Zanetti**, *UFSM, Santa Maria, Brazil.*
- **Prof. Ngoc Diep Do**, *Thang Long University in Hanoi, Vietnam*
- **Prof. Shi-Hai Dong**, *Instituto Politécnico Nacional, Mexico*
- **Prof. Hans-Thomas Elze**, *University of Pisa, Italy.*
- **Fatih Ozaydin**, *Tokyo International Univ., Japan*
- **Prof. Suneet Awasthi**, *JIIT, Noida.*

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- **Mr. Alvary Kefas Kwala,** *Research Scholar, Sharda University*
- **Ms. Deepika Singh,** *Junior Research Fellow, Sharda University*
- **Mr. Aman Singh,** *Junior Research Fellow, Sharda University*

Student Committee

- **Krishna Jindal,** *Sharda University*
- **Hilansh Kharb,** *Sharda University*
- **Shivangi Jindal,** *Sharda University*
- **Sneha Mishra,** *Sharda University*
- **Ishika Dhiman,** *Sharda University*

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