



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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Approved by AICTE, New Delhi, and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.

<http://lbrce.ac.in/it/index.php>, hodit@lbrce.ac.in, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF INFORMATION TECHNOLOGY

Report on “A FIVE-DAY ONLINE FDP ON ANATOMY OF QUANTUM COMPUTING”

Event Type: FDP (Online)

Date/ Duration: 23rd –27th June 2025, Five Days.

Resource Persons:

1. DR. EMMANUEL SHUBHAKAR, Associate Professor & Department of Computer Science & Engineering, MNIT, Jaipur.
2. DR. AJOY KUMAR KHAN, Professor & Dept of CSE, Mizoram Central University
3. MANISHA SHAH, Senior Java Developer, Production Support Specialist, Corporate Trainer.

Name of Faculty Coordinator(s):

- Dr K. Phaneendra, Associate Professor, Dept. of IT, LBRCE- Mylavaram
- Dr Ch. Malathi, Sr. Assistant Professor, Dept of IT, LBRCE- Mylavaram

Target Audience: Faculty & industry persons from various institutions & organizations within India

Total no of Participants: 75

Objectives of the event:

- Understand the fundamental principles of quantum computing.
- Learn the essential building blocks of quantum systems.
- Explore applications of quantum computing in various fields.
- Explain key concepts and techniques in quantum computing.
- Identify and investigate potential research areas in quantum computing.

Outcome of event:

At the end of the event, participants will be able to:

- Understand fundamental principles of quantum computing.
- Explain key quantum concepts and techniques.
- Identify essential components and applications.
- Explore potential research areas in quantum computing

Brochure:

Chief Patrons:
Sri Lakireddy Jaya Prakash Reddy, USA, Honorary Chairman
Sri Lakireddy Prasad Reddy, USA, Chairman

Patrons:
Mr. G. Srinivasa Reddy, President
Dr. K. Appa Rao, Principal
Dr. B. Ramesh Reddy, Vice-Principal
Dr. M. Srinivasa Rao, Dean of Academics & Professor of CSE

Convener:
Dr. D. Ratna Kishore, Professor & HOD

Co-Convener:
Dr. B. Srinivasa Rao, Professor
Dr. Satluri Naganjaneyulu, Professor
Dr. K. Venu Gopal, Professor

Coordinators:
Dr. Phaneendra K, Associate Professor
Dr. Ch. Malathi, Sr. Assistant Professor

Organizing Committee:
Mrs. M. HemaLatha, Sr. Assistant Professor
Mr. Rajasekhar K, Sr. Assistant Professor
Mr. V.V. Krishna Reddy, Sr. Assistant Professor
Mr. G. Rajendra, Sr. Assistant Professor
Mr. B. Sarath Chandra, Sr. Assistant Professor
Mr. Rajesh Reddy Muley, Sr. Assistant Professor
Mr. M. Vijay Kumar, Sr. Assistant Professor
Mr. Ch.Poorna Venkata Srinivasa Rao, Sr. Assistant Professor
Mrs. D. Vijaya Sri, Sr. Assistant Professor

FDP Objective:
"To equip participants with a comprehensive understanding of the fundamental principles, essential building blocks, and applications of quantum computing, enabling them to explain, identify, and explore the concepts, techniques, and potential research areas in quantum computing."

Topics to be covered:
·Foundation of quantum computing
·Quantum bits, Gates & Circuits
·Quantum speed up Algorithms & Applications
·Performance security & Scalability
·Quantum models, error correction & noise
·Quantum, classical & probabilistic computing
·Quantum cryptography & Quantum key Distribution

Schedule:
Dates: 23rd June - 27th June
Timings: 2:00 to 4:00 PM (Every Day)

Resource Persons


Prof. Ajoy Kumar Khan
Professor
Department of Computer Engineering, Mizoram University
(A Central University)
Aizawl-796004


Dr. Pilli Emmanuel Shubhakar
Associate Professor
Department of Computer science and Engineering,
MNIT, Jaipur-302017


Dr. Sudarshan Chakravarthy
Assistant Professor
Department of Computer science and Engineering,
NIT Calicut, Kozhikode - 673601


Dr. A. Yamahli
Assistant Professor
Department of Information Technology,
National Institute of Technology Karnataka, Mangalore
-575025


Prof. Pisipati Radha Krishna
Professor
Department of Computer Science and Engineering,
National Institute of Technology Warangal-506004


Dr. Venington K
Assistant Professor
Department of Information Technology,
NIT Srinagar, Hazratbal-190006

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
[AUTONOMOUS]
Approved by AICTE, New Delhi and Permanently affiliated to JNTUK, Kakinada
L.B. Reddy Nagar, Mylavaram, N.T.R. District, Andhra Pradesh-521030

A Five-Day National Level Faculty Development Program on
"Anatomy of Quantum Computing"
23rd June - 27th June



Organized by
Department of Information Technology

About the institute	Department of IT vision	Registration Form
 Lakireddy Bali Reddy College of Engineering (LBRCE) was founded through Lakireddy Bali Reddy Charitable Trust in 1998 by eminent philanthropist and NRI Entrepreneur Sri Lakireddy Bali Reddy, a Chemical Engineer by qualification. Since the inception, LBRCE aims at co-creating value-based technical excellence, which ultimately leads to the development of the rural area where the college is situated. Lakireddy Bali Reddy College of Engineering (LBRCE), approved by AICTE and affiliated to JNTUK, Kakinada is an Autonomous Institution since 2010 and has been accredited by NAAC with 'A' Grade (3.20 / 4 in Cycle-2), NBA (ASE, CE, CSE, IT, ECE, EEE, & ME) under Tier-I and ISO 21001:2018, 14001:2015, 50001:2018 Certified. It has also been awarded 2(A) and 2(B) status and Recognized as a 'Colleges with Potential for Excellence' (CPE) by UGC. It ranks in 101-150 Rank Band in NIRF India Innovation Rankings - 2023 and ranked 251-300 band (Under Engineering) in NIRF India Rankings - 2023, 201-250 band (Under Engineering) in NIRF India Rankings - 2020.	• To emerge as one of the most preferred department for the budding engineers, aspiring to be successful IT professionals.	One Week National Level Faculty Development Program on "GENERATIVE AI FOR DATA VISUALIZATION" 24-29 June 2024
About the department  The Department of Information Technology at the LBRCE was established in 1999. offers Undergraduate program (B.Tech) in IT and Post-graduate program (M.Tech) in Software Engineering. The B.Tech (Information Technology) program was started in the year 1999 with an intake of 40 students. The intake was subsequently increased to 60 students in the year 2001, 120 students in the year 2019. Currently, our institute enabled high speed Internet bandwidth of 1800Mbps. Since then, it has grown to be a center for excellence, innovation and research with dedicated faculty & staff, highly motivated students, state-of-the-art facilities and an innovative teaching-learning environment.	Department of IT MISSION • To impart quality education with a well designed curriculum, consistent with industry requirements, that equips the student to face the career challenges. • To extend the student's learning beyond the curriculum, through workshops on cutting edge technologies. • To strengthen creativity and team spirit of the students by providing a conducive environment, preparing them to face the challenges posed by the IT industry. • To develop life-long learning, ethics, moral values and spirit of service so as to contribute to society through technology	Salutation: Dr./Mr./Ms. Name: _____ Participant Category: Faculty/Scholar/Industry Designation: _____ Department: _____ Institution/University/Company Name: _____ Address for Communication: _____ E-mail: _____ Phone Number: _____ Is the Institution Approved by AICTE: Yes / No _____ Online Form Filled: Yes / No _____ Signature of the Participant _____
	Participants Faculty of Engineering from all AICTE Approved Institutions Research Scholars / PG Students / Industry	SPONSORSHIP CERTIFICATE This is to certify that Dr./Mr./Ms. _____ is an employee of our institution/organization/industry. He/she is permitted to attend the programme, if SELECTED. He/she will abide by the rules and regulations of the host institute Date _____ Signature _____ of the Sponsoring Authority with Date and Seal
	Registration QR Code & Link https://forms.gle/vbQfZ9mw9U12UsQy5 Payment Details Complete the payment to this UPI Code through any of the UPI payment facility Fee: Rs. 100/- per participant Meeting Link and Other details of day to day activity will be shared in the WhatsApp group  https://chat.whatsapp.com/CpGjE9VgJz6k60XMeSPXX Join WhatsApp group through the link	Address For Communication Dr.B.Srinivasa Rao, Convener- FDP Department of Information Technology LB Reddy Nagar, Lakireddy Bali Reddy College of Engineering, Mylavaram, NTR(DU), AP, INDIA. 521230. email: hodit@lbrce.ac.in, Phone: 9032833744, 9848303289.

Description /Report on Event:

The Department of Information Technology (IT), Lakireddy Bali Reddy College of Engineering (LBRCE), Mylavaram, organized the National Level Online Faculty Development Program on **Anatomy of Quantum Computing** from 23rd to 27th June 2025. The five-day FDP is conducted through CISCO WebEx every day from 2:00 PM to 4:00 PM.

Day 1 (23/06/2025):

FDP was inaugurated on 23rd June, 2025, by the Principal Dr. K. Appa Rao, LBRCE, and HOD Dr. D. Ratna Kishore, Department of IT. All the IT department faculty members, resource persons, and participants attended. The day started with the welcome speech given by Principal Sir & HOD Sir, followed by the FDP.

Day-1 (23/06/2025): The following topics were covered:

Day-I session taken by **Dr. EMMANUEL SHUBHAKAR, Associate Professor & Dept of CSE**

- Core concept in Quantum Computing
- Qubit models
- Types of Qubit Models
- Applications of Qubits

Day 2 (24/06/2025): The following topics were covered:

Day-II session taken by **MANISHA SHAH, Senior Java Developer, Production Support Specialist, Corporate Trainer**

- Performance, Security & Scalability in Quantum Systems
- Introduction to Quantum Computing
- Qubits vs Classical bits
- Quantum parallelism
- Security & Scalability

Day 3 (25/06/2025): The following topics were covered:

Day-III session taken by **MANISHA SHAH, Senior Java Developer, Production Support Specialist, Corporate Trainer**

- Basic Types of Quantum Errors
- Bit- Flip Errors
- Coding Implementation
- Performance Aspects

Day 4 (26/06/2025): The following topics were covered:

Day-IV session taken by **MANISHA SHAH, Senior Java Developer, Production Support Specialist, Corporate Trainer**

- BB84 Protocol System
- Types of Protocol System
- Coding Implementation
- Performance Aspects

Day 5(27/06/2025): Last day, regular sessions, feedback, and valedictory completed

Day-V session taken by **DR. AJOY KUMAR KHAN, Professor & Dept of CSE, Mizoram Central University**

- Overview of Cryptography Evolution
- Impact of Quantum Computing on Cryptography
- Forces the development of new cryptographic standards
- Threatens current public-key systems

In the last Session, take the feedback from participants, followed by the Valedictory. Vote of thanks given by Dr. CH. MALATHI, Sr. Assistant Professor, Department of IT, LBRCE.

Feedback/Suggestions:

The feedback survey (completed through Google Sheets) was completed by 75 attendees, which is a sponsor rate of about 95%. The survey's findings on outcomes, satisfaction, overall FDP feedback, and recommendations for improvement

- Suggested to organize is kind of Sessions regularly.
- Recommendation for future FDPs in offline mode

S. No	Content	Excellent/ 5	Good/4	Satisfactory/3	Poor/2	Very Poor/1
1	Overall Rating for the FDP	74%	22%	2%	1%	1%
2	Rating of Day 1 Dr. EMMANUEL SHUBHAKAR	74%	20%	4%	1%	1%
3	Rating of Day 2 MANISHA SHAH	70%	24%	2%	2%	2%
4	Rating of Day 3 MANISHA SHAH	70%	23%	3%	2%	2%
5	Rating of Day 4 MANISHA SHAH	71%	22%	3%	2%	2%
6	Rating of Day 5 Prof AJOY KUMAR KHAN	74%	20%	4%	1%	1%

Photographs:

Day 1 - Dr. EMMANUEL SHUBHAKAR, Associate Professor & Dept of CSE

Five-Day National Level Faculty Development Program on "Anatomy of Quantum Computing"

Participants: sufia Enayat (Unverified), PHANEENDRA KA..., MSK (Unverified), Dr. Shaik Salma B... (Unverified)

Viewing Emmanuel Pilli's shared content

100%

AWS Ocelot

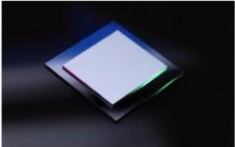


Figure: Amazon AWS Ocelot – Cat Qubits for Quantum Error Reduction

Dr. Pili Emmanuel Shubhakar (MNIT Japda) Quantum Computer Roadmap 5/7/23

Participants (64)

- Dr. Venu Gopal (Unverified)
- Dr. Ch. Malathi (Unverified)
- Dr. RATNA KISHOR DA... (External)
- Emmanuel Pilli (Unverified)
- PHANEENDRA KANAK... (Host)
- B Ravi Shankar (Unverified)
- B SARATH CHANDRA (Unverified)
- B YAMINI SUPRIYA (Unverified)
- Dr. A. Suneetha (Unverified)
- Dr. ANTI AKSHIT VAN

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Five-Day National Level Faculty Development Program on "Anatomy of Quantum Computing"

Participants: sufia Enayat (Unverified), PHANEENDRA KA..., V.Chandra Kumar (Unverified), Dr. Shaik Salma B... (Unverified)

Viewing Emmanuel Pilli's shared content

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Zuchongzhi 3.0

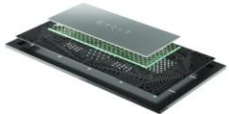


Figure: China's Zuchongzhi 3.0 – A Quantum Powerhouse

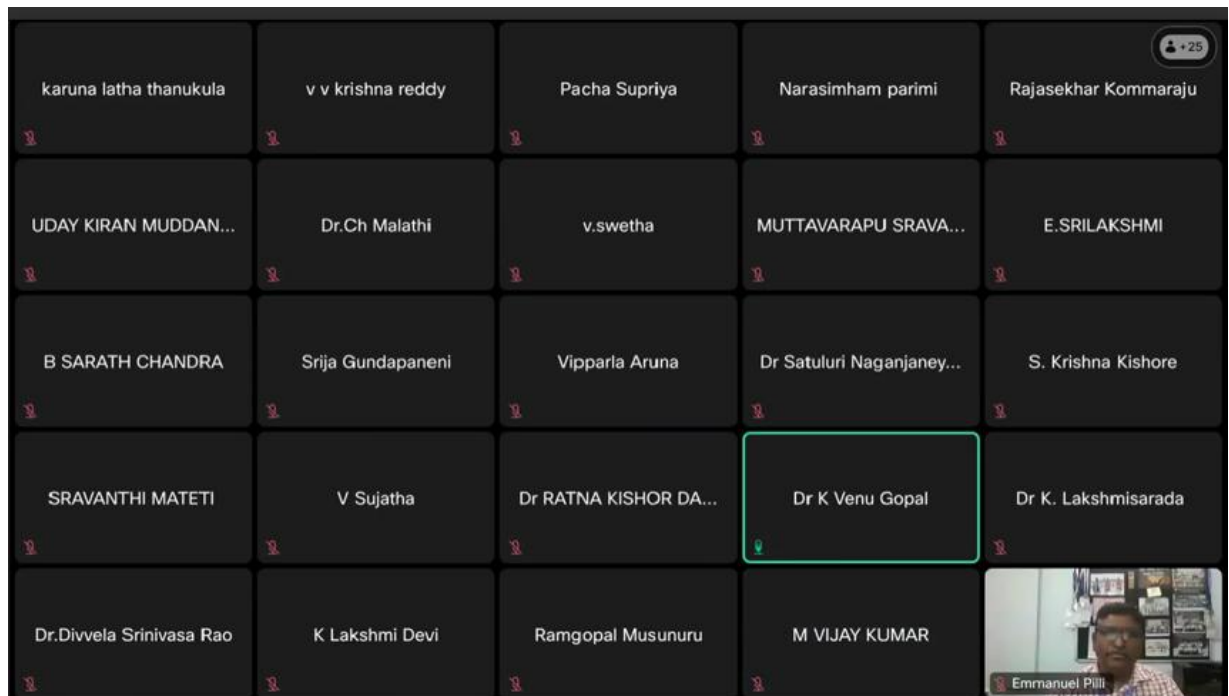
Dr. Pili Emmanuel Shubhakar (MNIT Japda) Quantum Computer Roadmap 7/7/23

Participants (65)

- Dr. Venu Gopal (Unverified)
- Dr. Ch. Malathi (Unverified)
- Dr. RATNA KISHOR DA... (External)
- Emmanuel Pilli (Unverified)
- PHANEENDRA KANAK... (Host)
- B Ravi Shankar (Unverified)
- B SARATH CHANDRA (Unverified)
- B YAMINI SUPRIYA (Unverified)
- Dr. A. Suneetha (Unverified)
- Dr. ANTI AKSHIT VAN

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DAY 2-. MANISHA SHAH, Senior Java Developer, Production Support Specialist, Corporate Trainer

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Five-Day National Level Faculty Development Program on "Anatomy of Quantum Computing"

Participants (59)

Viewing Manisha's shared content

100%

Key Quantum Concepts

- Qubit (Quantum Bit): The basic unit of quantum information (like a bit in classical computers).
- Superposition: A quantum particle can exist in multiple states at once.
- Entanglement: Two quantum particles can be linked so that the state of one affects the other, no matter the distance.
- Quantum Tunneling: Particles can pass through barriers they shouldn't be able to, classically.
- Measurement Effect: Observing a quantum system changes its state.

Participants (59)

- Dr. Ch. Malathi
- Dr. RATNA KISHOR DA...
- Manisha
- PHANEENDRA KANAK...
- aruna
- B SARATH CHANDRA
- Ch Sreenu Babu
- Divvela Srinivasa Rao
- Dr. B. Srinivasa Rao, P...
- Dr.G.Krishna Mohan

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Five-Day National Level Faculty Development Program on "Anatomy of Quantum Computing"

Participants (60)

Key Quantum Concepts

- **Qubit (Quantum Bit):** The basic unit of quantum information (like a bit in classical computers).
- **Superposition:** A quantum particle can exist in multiple states at once.
- **Entanglement:** Two quantum particles can be linked so that the state of one affects the other, no matter the distance.
- **Quantum Tunneling:** Particles can pass through barriers they shouldn't be able to, classically.
- **Measurement Effect:** Observing a quantum system changes its state.

Participants (60)

- Dr Ch. Malathi
- Dr RATNA KISHOR DA...
- Manisha
- PHANEENDRA KANAK...
- aruna
- B SARATH CHANDRA
- Ch Sreenu Babu
- Divvela Srinivasa Rao
- Dr. B. Srinivasa Rao, P...
- Dr.G.Krishna Mohan

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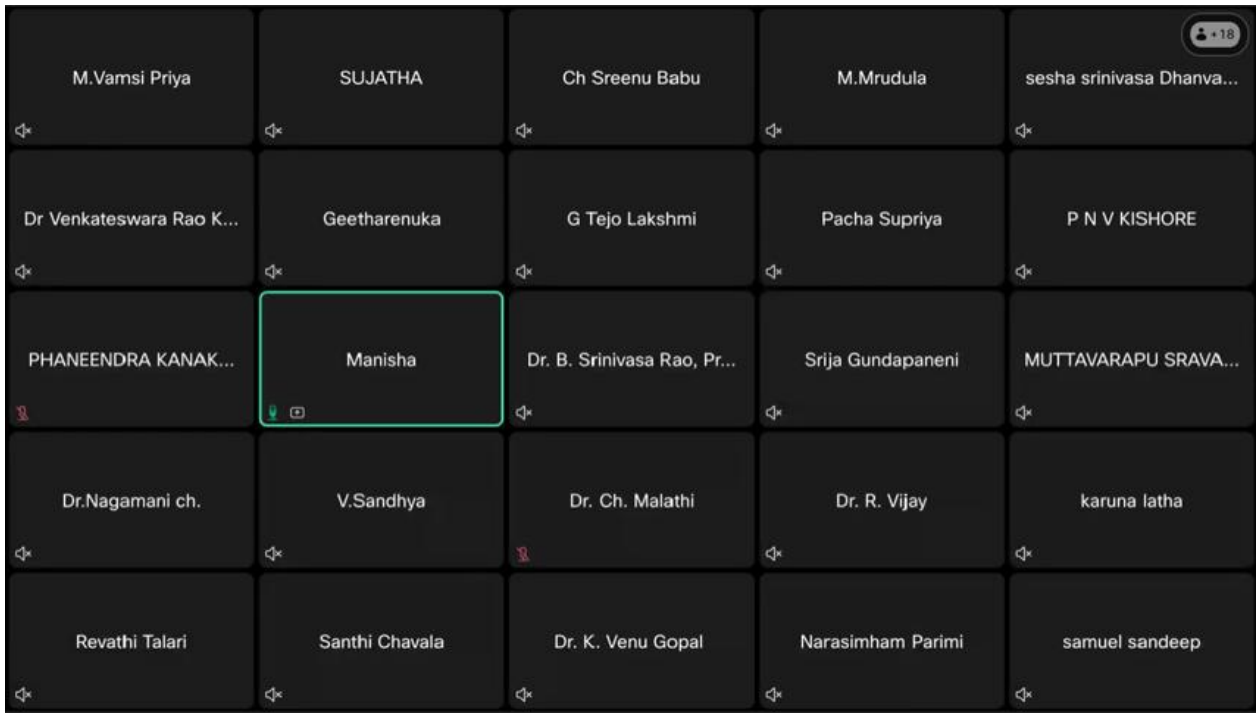
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Manoj	Dr RATNA KISHOR DA...	gorripati kalyani	PHANEENDRA KANAK...	sesha srinivasa Dhanva...
Manisha	TechLogics	karuna latha thanukula	Dr Ch. Malathi	DrG.Krishna Mohan
Dr. R. Vijay	Srija Gundapaneni	G Tejo Lakshmi	Pacha Supriya	Dr Satuluri Naganjaney...
MUTTAVARAPU SRAVA...	V.V.R.MANOJ	M.Mrudula	SRAVANTHI MATETI	Dr.k.Lakshmi Sarada
Rajasekhar Kommaraju	Dr K. VenuGopal	V.Sandhya	P.Neela Sundari	G. RAJENDRA

DAY 3- MANISHA SHAH, Senior Java Developer, Production Support Specialist, Corporate Trainer.

The screenshot shows a Zoom meeting window titled "Five-Day National Level Faculty Development Program on 'Anatomy of Quantum Computing'". The meeting ID is m7b7bed7ac1b7083b90eaa21ac928dd55. The interface displays a list of participants at the top, including rehana begum, Manisha, Dr. R. Vijay, Dr M S S Sai, and Narasimham Parimi. The main content area shows a code editor with Python code for a quantum circuit simulation using Qiskit. The code includes imports for QuantumCircuit, execute, BasicAer, and visualization libraries. It defines a quantum circuit with 3 qubits and 3 classical bits, encodes logical operations, and visualizes the results. A terminal window at the bottom shows the execution of pip commands to install and uninstall packages. The right sidebar lists 67 participants, including PHANEENDRA KANAK, Dr. Ch. Malathi, Manisha, A. Krishna Veni, A. Manoj Kumar, aruna, B Ravi Shankar, Ch Sreenu Babu, and Dr. Adilakshmi Yannam. The bottom status bar shows the temperature as 86°F and the time as 3:10 PM on 6/25/2025.

The screenshot shows a Zoom meeting window titled "Five-Day National Level Faculty Development Program on 'Anatomy of Quantum Computing'". The meeting ID is m7b7bed7ac1b7083b90eaa21ac928dd55. The interface displays a list of participants at the top, including Manisha, PHANEENDRA KA..., Rajesh Reddy Mu..., Dr. R. Vijay, and Malleswari. The main content area shows a Google Colab notebook with Python code for a quantum circuit simulation using Qiskit. The code includes imports for QuantumCircuit, execute, BasicAer, and visualization libraries. It defines a quantum circuit with 3 qubits and 3 classical bits, encodes logical operations, and visualizes the results. The right sidebar lists 59 participants, including Dr. Ch. Malathi, Manisha, A. Manoj Kumar, Annapareddy V N Red..., aruna, B Ravi Shankar, Dr. A. Suneetha, Dr. Adilakshmi Yannam, Dr. B. Srinivasa Rao, P..., and Dr. Divvela Srinivasa Rao. The bottom status bar shows the temperature as 86°F and the time as 3:37 PM on 6/25/2025.



DAY 4- MANISHA SHAH, Senior Java Developer, Production Support Specialist, Corporate Trainer.

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Five-Day National Level Faculty Development Program on "Anatomy of Quantum Computing"

Participants (49)

Manisha Shah (Unverified), Dr K. VenuGopal (Unverified), Dr Sravanthi (Unverified), muralikrishna (Unverified), RAMAMOHANA R... (Unverified), V.V.R.MANOJ (Unverified)

Viewing Manisha Shah's shared content

BB84 Protocol (Most Popular QKD Protocol)

Proposed by Charles Bennett and Gilles Brassard in 1984.

Steps:

- Bit Encoding:**
Alice sends qubits to Bob using two bases:
• Rectilinear: $|0\rangle = |0\rangle, |1\rangle = |1\rangle$
• Diagonal: $|+\rangle = \frac{1}{\sqrt{2}}(|0\rangle + |1\rangle), |-\rangle = \frac{1}{\sqrt{2}}(|0\rangle - |1\rangle)$
- Transmission:**
Alice sends a string of qubits using randomly chosen bases.
- Measurement:**
Bob measures each qubit in a randomly chosen basis.

Video stopped

Participants: Dr. Ch. Malathi (Cohost), PHANEENDRA KANAK... (Host), Dr. K. VenuGopal (Cohost), Manisha Shah (Presenter), B YAMINI SUPRIYA, Dr. B. Srinivasa Rao, P..., Dr.G.Krishna Mohan, Dr.k.Lakshmi Sarada, Dr K. VenuGopal

Unmute, Start video, Share, Record, Participants, Chat

85°F Mostly cloudy, 2:57 PM 6/26/2025

Five-Day National Level Faculty Development Program on "Anatomy of Quantum Computing"

Participants (45)

Manisha Shah Unverified, Dr. K. VenuGopal Unverified, Dr. Sravanthi Unverified, muralikrishna Unverified, PHANEENDRA KA... Unverified, B Ravi Shankar Unverified

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```
Begin HybridAlgorithm
Initialize problem parameters
// Phase 1: Apply a fast deterministic algorithm (e.g. Greedy)
solution1 = GreedyAlgorithm(problemInstance)
// Phase 2: Use a probabilistic/metaheuristic method for refinement (e.g., Genetic Algorithm)
InitialPopulation = GeneratePopulation(solution1)
For generation in 1 to MaxGenerations do
  EvaluateFitness(InitialPopulation)
  selectedParents = Selection(InitialPopulation)
  offspring = Crossover(selectedParents)
  Mutate(offspring)
  InitialPopulation = ReplaceWorst(InitialPopulation, offspring)
End For
Return BestSolution(InitialPopulation)
```

Video stopped

Unmute, Start video, Share, Record, Participants, Chat

35°F Mostly cloudy 3:10 PM 6/26/2025

Five-Day National Level Faculty Development Program on "Anatomy of Quantum Computing"

Participants (45)

Manisha Shah Unverified, Dr. K. VenuGopal Unverified, Dr. Sravanthi Unverified, muralikrishna Unverified, Dr. ADILAKSHMI ... Unverified, Narasimham parimi Unverified

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A. Binary search
B. Sorting
C. Integer factoring
D. Linear regression

8. What is the main source of speedup in quantum algorithms like Grover's?
A. Larger memory
B. Higher clock speeds
C. Superposition and interference
D. Random number generation

Part 3: Quantum-Classical Hybrid Computing
9. What is the role of the classical optimizer in variational quantum algorithms (VQAs)?
A. Measure qubits
B. Prepare quantum states
C. Tune parameters based on quantum outputs
D. Simulate quantum circuits classically

Video stopped

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Dr. Nagamani ch.: B View message
Sarada Devi Yaddanpudi: B View message
Sarada Devi Yaddanpudi: C View message
Sarada Devi Yaddanpudi: D View message
Dr. Nagamani ch.: Yes mam View message
Dr. Nagamani ch.: C View message
Dr. Nagamani ch.: B mam View message

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DAY 5- DR. AJOY KUMAR KHAN, Professor & Dept of CSE, Mizoram Central University

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Five-Day National Level Faculty Development Program on "Anatomy of Quantum Computing"

PHANEENDRA KA... Dr.k.Lakshmi Sara... E.SRILAKSHMI Dr K. VenuGopal

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Overview of Cryptography Evolution

Classical Cryptography

- Examples: Caesar Cipher, Vigenere Cipher
- Based on substitution and transposition techniques
- Vulnerable to frequency analysis

Modern Cryptography

- Based on computational hardness assumptions (e.g., RSA, AES, ECC)
- Used in digital communication, banking, e-commerce
- Public-key cryptography introduced in the 1970s (Diffie-Hellman, RSA)

Quantum Era

- Shor's algorithm threatens RSA, ECC
- Need for cryptographic systems resilient to quantum attacks
- Emergence of Quantum Cryptography (e.g., QKD) and PQC

Timeline of Cryptography Evolution:

- 400 B.C.: System cryptology
- 1469: Caesar cipher
- 1818: Vigenere cipher
- 1877: Diffie-Hellman
- 1917: Vernam cipher
- 1918: German cryptosystem
- 1919: DES
- 1977: RSA cryptosystem
- 1977: Hash cash
- 1977: SHA-1 algorithm
- 1977: ECC
- 2008: Bitcoin
- 2019: Quantum cryptography

Participants (32)

- Dr. Ch. Malathi
- Dr.K.Venu Gopal
- PHANEENDRA KANAK...
- Prof. Dr. Ajoy Kumar K...
- B Ravi Shankar
- Dr.k.Lakshmi Sarada
- Dr K. VenuGopal
- Dr M S S Sai
- Dr. R. Vijay

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Five-Day National Level Faculty Development Program on "Anatomy of Quantum Computing"

Ch Sreenu Babu Dr Venkateswara ... Dr.Nagamani ch. k aruna

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Impact of Quantum Computing on Cryptography

Shor's Algorithm:

- Can factor large integers in polynomial time
- Threatens RSA, DSA, and ECC-based cryptosystems

Grover's Algorithm:

- Quadratic speedup for brute-force search
- Weakens symmetric algorithms (e.g., AES-128 becomes AES-64)

Public-Key Cryptography at Risk:

- Internet security protocols (SSL/TLS, VPN, PGP) rely on RSA/ECC
- These could be broken by scalable quantum computers

Symmetric Key Cryptography Impact:

- Less impacted but key lengths may need to be doubled

Participants (46)

- Dr. Ch. Malathi
- Dr.K.Venu Gopal
- PHANEENDRA KANAK...
- Prof. Dr. Ajoy Kumar K...
- B Ravi Shankar
- Ch Sreenu Babu
- Dr.A.Suneetha
- Dr. B. Srinivasa Rao, P...
- Dr.k.Lakshmi Sarada
- Dr K. VenuGopal

91°F Mostly cloudy

List of Participants:

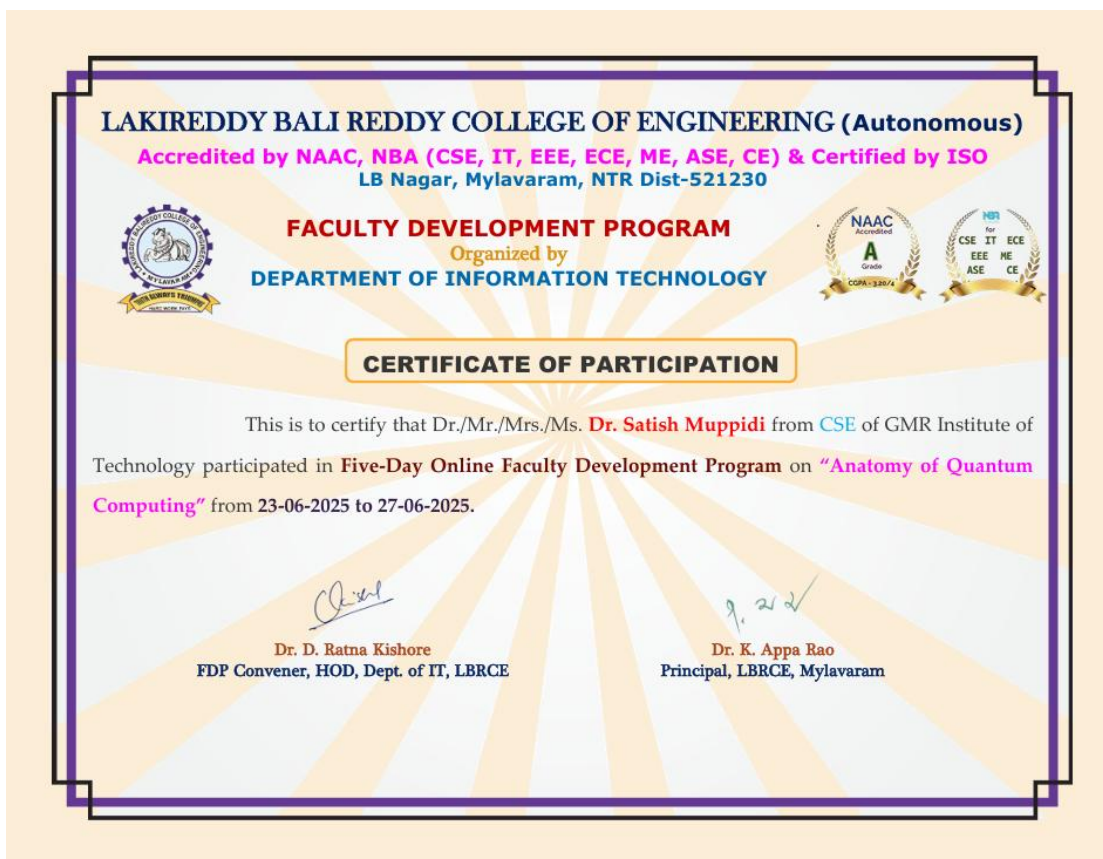
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CERTIFICATE OF PARTICIPATION

This is to certify that Dr./Mr./Mrs./Ms. **SRIJA GUNDAPANENI** from **CSE -IOT** of RVR &JC COLLEGE OF ENGINEERING participated in **Five-Day Online Faculty Development Program** on **"Anatomy of Quantum Computing"** from 23-06-2025 to 27-06-2025.

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