

CMR ENGINEERING COLLEGE

UGC AUTONOMOUS CAMPUS

Approved by AICTE-New Delhi | Affiliated to JNTUH | Accredited by NAAC & NBA
Kandlakoya, Medchal Road, Hyderabad-501401



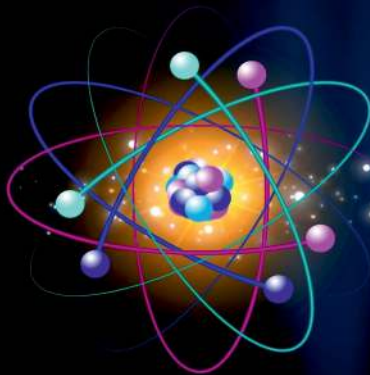
All India Council for Technical Education Government of India

AICTE TRAINING AND LEARNING (ATAL) ACADEMY Sponsored

6 Day Faculty Development Programme on

Next-Generation Computing: Quantum Technologies and Applications

21st - 26th, September 2026



Organized by

Department of Electronics and Communication Engineering

CMR ENGINEERING COLLEGE

UGC AUTONOMOUS

www.cmrec.ac.in

CMR Engineering College

CMR Engineering College, widely recognized as CMREC, stands as a pioneering institution in UGC autonomous engineering education. Founded in 2010 by the visionary CH. Narasimha Reddy, who transitioned from agriculture to education, CMREC occupies a sprawling 10-acre campus. Its primary mission is to offer an exemplary platform for students in Engineering and Technology, fostering academic excellence, holistic development, and ethical growth.

CMREC provides undergraduate programs in various specialized fields, including Computer Science and Engineering with specializations in Artificial Intelligence & Machine Learning, Cyber Security, and Data Science, along with standalone programs in Artificial Intelligence & Data Science, Information Technology and Electronics and Communication Engineering. Additionally, it offers postgraduate courses such as M.Tech in VLSI System Design and Computer Science Engineering.

All India Council For Technical Education

The establishment of the All India Council for Technical Education (AICTE) aimed to facilitate the systematic planning and coordinated growth of the technical education system across India. Its objectives include enhancing the quality of technical education alongside ensuring its quantitative expansion, as well as regulating and upholding standards within the technical education domain. AICTE's jurisdiction encompasses various programs in engineering, technology, architecture, town planning, management, pharmacy, applied arts and crafts, hotel management, and catering technology, among others, spanning across different educational levels.



AICTE ATAL Academy

The objective of AICTE's Training and Learning (ATAL) is to impart quality training through Faculty Development Programmes (FDPs) for Faculty Members, Postgraduate students, Research scholars and Industry Professionals.

Overview of the FDP

This Faculty Development Programme (FDP) is designed to enhance the knowledge and skills of faculty members in engineering institutions, which is essential in today's rapidly evolving technology-driven world. As we move beyond the limitations of classical computing, next-generation computing paradigms are emerging to address complex computational challenges.

Among these, Quantum computing stands out as a transformative technology that leverages the principles of Quantum mechanics such as superposition and entanglement to process information in fundamentally new ways. This paradigm has the potential to revolutionize fields such as cryptography, optimization, material science, artificial intelligence, and secure communication.

This FDP aims to provide comprehensive exposure to the foundations, technologies, and applications of quantum computing. It bridges the gap between theoretical concepts and practical implementation through hands-on sessions.

Participants will explore quantum algorithms, circuit design, error correction techniques, and current research challenges, enabling them to contribute effectively to teaching and research in this emerging domain.

Objectives of the FDP

- To introduce the fundamentals of Quantum computing and Quantum mechanics
- To provide hands-on experience with Quantum programming tools
- To explore Quantum algorithms and their real-world applications
- To understand research challenges and future directions in Quantum technologies
- To enable faculty to integrate Quantum computing concepts into curriculum and research

Target Audience

- Faculty members of ECE, CSE, IT, and related disciplines
- Research scholars (M.Tech / Ph.D.)
- Industry professionals interested in quantum technologies

Topics Covered

- Basics of Quantum Computing
- Mathematical Foundations
- Quantum States & Measurement
- Quantum Gates
- Quantum Circuit Design
- Fundamental Algorithms
- Advanced Algorithms
- Applications
- Research Challenges
- Hands-on Programming

Articles to be Discussed

1. **Quantum Computing for Predictive Transport Modeling:** A Systematic Literature Review and Future Research Needs
2. **Quantum Computational Unpredictability Entropy and Quantum Leakage Resilience**
3. **Quantum Learning and Estimation for Coordinated Operation between Distribution Networks and Energy Communities**
4. **QATNet: A Lightweight Quantum-Classical Tabular Network for Low-Latency Intrusion Detection**
5. **Enhanced Network Security Protocols for the Quantum Era:** Combining Classical and Post-Quantum Cryptography, and Quantum Key Distribution



Resource Persons:



Dr. Y Sreenivasa Rao
Associate Professor,
NIT Warangal



Dr. Bibhudendra Acharya
Associate Professor,
NIT Raipur



Mr. V. Sai Pavan
Technical Lead, Brain O Vision Solutions,
Hyderabad

Dr. Bijayananda Patnaik
Associate Professor, ECE
NIT Raipur



Dr. S. Sreejith
Senior Scientist, CSIR–National Institute
for Interdisciplinary Science & Technology
Thiruvananthapuram, Kerala



Mr. Anjil Reddy Chinnapatlolla
Senior Software Engineer,
IBM India



Dr. G Prasad
Scientist, NRSC,
Hyderabad



Mr. Karthiganesh Durai
Co-Founder Quantum Computing India,
Bengaluru



Dr. Biroju Papachary
Associate Professor,
CMR Engineering College, Hyderabad

Target Group

- The faculty members, Research scholars of the AICTE approved institutions and Industry Personnel
- Not more than 30% from Host Institution.



Chief Patrons

Shri. Ch. Narasimha Reddy
Chairman

Shri. Ch. Bhoopal Reddy
Vice-Chairman

Shri. Ch. Srisailam Reddy
Secretary and Correspondent

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Dr. M. Ashok
Principal

Convenor :

Dr. Suman Mishra

Professor and HOD
Experience : 25 Yrs.

Dept. of ECE, CMR Engineering College,
Telangana State, INDIA
Mail: ecehod@cmrec.ac.in

CONTACT DETAILS

Programme Coordinator

Dr. Somala Rama Kishore

Professor & Dean Academics

Experience : 18 Yrs.

Dept. of ECE, CMR Engineering College
Telangana State, INDIA

Mail: ramakishore.s@cmrec.ac.in

Contact : 9701200981

Programme Co-Coordinator

Dr. Biroju Papachary

Assoc Professor

Experience : 17 Yrs.

Dept. of ECE, CMR Engineering College,
Telangana State, INDIA

Mail: b.papachary@cmrec.ac.in

Contact : 9949854697

ORGANIZING COMMITTEE

1. Dr.M.Amru, Professor
2. Dr. Telugu Satya Narayana, Professor
3. Dr. Pramod Kumar, Associate Professor
4. Mrs K Vani, Associate Professor
5. Mrs G Kalpana, Associate Professor
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Application Number: 1775960362

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Programme Schedule



Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
9.00-9.30 Inauguration					
9.30-12.00 Session 1 Qubits, Superposition, Entanglement, Applications By: Dr Y Sreenivasa Rao , Associate Professor, NIT Warangal.	9.30-12.00 Session 3 Research Methodology Types of Research, statistics, Probability distribution, Effective literature studies approach, Effective technical writing Dr. B. Papachary , Associate Professor, CMR Engineering College, Hyd.	9.30-12.00 Session 5 Applications: Quantum cryptography, Optimization, Machine learning, Industry use cases. Research Challenges& Opportunities By: Dr. G. Prasad , Scientist, NRSC, Hyderabad	9.30-12.00 Session 7 Advanced Algorithms: Shor's Algorithm, Quantum Fourier Transform, Cryptography By: Dr Bibhudendra Acharya Associate Professor, NIT Raipur	9.00-1.00 Industrial Visit: C-DAC, Hyderabad	9.30-12.00 Session 10 Engineering Molecular Quantum Materials: Supramolecular Approaches for Next –generation Quantum Technologies By: Dr. S. Sreejith , Senior Scientist, CSIR-National Institute for Interdisciplinary Scienceand Technology, Thiruvananthapuram, Kerala
12.00-1.00 Article discussion	12.00-1.00 Article discussion	12.00-1.00 Article discussion	12.00-1.00 Article discussion		12.00-1.00 Article discussion
1.00 -2.00 Lunch	1.00-2.00 Lunch	1.00-2.00 Lunch	1.00-2.00 Lunch	1.00-2.00 Lunch	1.00-2.00 Lunch
2.00-4.30 Session 2 Introduction to fundamentals of Quantum Computing, Design, Simulate, Execute Quantum circuits using Qiskit SDK By: Mr. Anil Reddy Chinnapatlolla , Senior Software Engineer, IBM, India	2.00-4.30 Session 4 Quantum Gates: Single qubitgates (X, Y, Z,H), Multi-qubitgates (CNOT,SWAP), Circuit diagrams By Mr. V Sai Pavan , Technical Lead, Brain O Vision Solutions, Hyderabad	2.00-4.30 Session 6 Fundamental algorithms : Deutsch-jozsa algorithms, grovers algorithm By Mr. V Sai Pavan , Technical Lead, Brain O Vision Solutions, Hyderabad	2.00-4.30 Session 8 Quantum Hardware and Simulators Building Quantum Machine Learning based Solutions By: Mr. Karthiganesh Durai Co-Founder ,Quantum Computing India, Bengaluru	2.00-4.30 Session 9 Quantum Circuit Design: Circuit model, Quantum teleportation. Fundamental Algorithms: Deutsch–Jozsa Algorithm,Grover's Algorithm By: Dr Bijayananda Patnaik Associate Professor, NIT Raipur.	2.00-4.30 MCQ & Reflection Journal
4.30-5.30 Hands on Training/Labs By Mr. Anil Reddy Chinnapatlolla , Senior Software Engineer, IBM, India	4.30-5.30 Hands on Training/LabsBy Mr. Sai Pavan , Technical Lead, Brain O Vision Solutions, Hyderabad	4.30-5.30 Hands on Training/LabsBy Mr. Sai Pavan , Technical Lead, Brain O Vision Solutions, Hyderabad	4.30-5.30 Hands on Training/Labs By Mr. Karthiganesh Durai Co-Founder ,Quantum Computing India, Bengaluru	4.30-5.30 Hands on Training/LabsBy Dr Bijayananda Patnaik Associate Professor, NIT Raipur.	4.30-5.30 Valedictory Session

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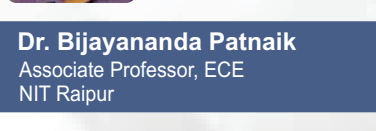
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