

DEPARTMENT VISION

To produce globally competitive and socially responsible engineering graduates and to bring out quality research and education, generating knowledge in the frontier areas of Electronics and Communication Engineering

DEPARTMENT MISSION

1. To achieve self-sufficiency on all fronts to ensure qualitative Teaching-Learning practices.
2. To provide quality education, student-centred Teaching-Learning processes and state of art infrastructure for professional aspirants hailing from both rural and urban areas.
3. To impart technical education that encourages independent thinking, developing strong domain knowledge, contemporary skills and attitude towards holistic growth of young minds.
4. Responsiveness to both local and global industry needs and creating opportunities through incubation and implementation of innovative programs
5. To serve the community as disciplined responsible citizens in a rapidly changing and expanding global community.
6. Evolving this organization into a centre of academic and research excellence.

QUANTUM COMPUTING-THE FUTURE IS HERE

The world of computing is on the brink of a revolutionary shift as quantum computing moves from theory to reality. This incredible technology harnesses the mind-bending principles of quantum mechanics to perform calculations exponentially faster than classical computers. In this edition, we explore the latest developments and potential impacts of quantum computing.

What is Quantum Computing? Classical computers encode information in binary bits (0s and 1s) which can exist as only one value at a time. Quantum computers, however, use quantum bits or "qubits" which can represent multiple states simultaneously through a principle called quantum superposition. This ability to process a vast number of potential outcomes in parallel unlocks quantum computers' tremendous processing power.

Key Developments: Google achieved "quantum supremacy" in 2019 with its 54-qubit Sycamore processor performing a specific calculation in 200 seconds that would take the world's fastest supercomputer 10,000 years. In 2022, IBM unveiled its 433-qubit Osprey processor, further advancing the number of qubits. Quantum computers are being developed by companies like IonQ, Rigetti, Honeywell, and startups using different qubit technologies.

Potential Applications:

Cryptography: Quantum computers could crack today's encryption methods, driving the need for quantum-safe cryptography. **Drug Discovery:** Simulating molecular interactions to discover new materials and drugs. **Logistics Optimization:** Calculating ideal routes and supply chain configurations. **Financial Modeling:** Rapidly analyzing investment scenarios and risk factors. **Artificial Intelligence:** Training advanced AI models and neural networks more efficiently.

Challenges Ahead: Quantum computers require ultra-cold temperatures near absolute zero to operate reliably. Error correction techniques are needed since qubits are extremely fragile. Developing the software environment, programming models, and algorithms for quantum hardware. The quantum revolution is coming. While still in relatively early stages, quantum computing's unparalleled abilities could transform fields from cybersecurity and scientific research to finance and logistics. The race is on to develop this powerful new computing paradigm.

Quote: "We are the product of quantum fluctuations in the very early universe."

