Quantum gates are the fundamental operations in quantum computing, similar to classical logic gates (AND, OR, NOT) in traditional computing. They manipulate qubits (quantum bits) by changing their state using linear algebra and unitary transformations.

Why Are Quantum Gates Important?

✅ **Enable Superposition** – Quantum states can exist in multiple states at once.

✅ **Create Entanglement** – Qubits can be correlated over distance, enabling faster computing.

✅ **Perform Reversible Computation** – No information loss, unlike classical computing.

✅ **Essential for Quantum Algorithms** – Used in **Shor's Algorithm (factoring)** and **Grover's Algorithm (searching)**.