Topics covered in Introduction to Quantum Computing:

Quantum Operations: not, swap, c-not, H-gate, Z-gate, C-Z gate

Superposition and Measurement, Bra-Ket Notation, Vector Notation, Single Qubit Matrix Multiplication

Entanglement, multi qubit operations, tensor production, multi qubit superposition, same entanglement circuit, Phase Kickback, Oracles, Bernstein-Vazirani Algorithm, Inference, Alchimedes Oracle

Using IBM Experience, Using Qiskit

Tensor multiplication, combining gates in parallel and series, same and opposite entanglement circuits, same entanglement circuit with phase, Bell states

Reversibility of QIS, Decoherence, Ancilla bit, Toffoli Gate, Circuit identities, Circuit commutivity, circuit simplification

Maximal entanglement, GHZ circuit, The no-cloning theorem, quantum teleportation, quantum information protocols, superdense codes

Grover's algorithm, Shor's algorithm

Error sources in quantum circuits, Bloch Sphere, S and T gates, change of basis, Hadamard basis,