Quantum Computing using QisKit (SDK based on python)

Tentative week-wise schedule

Week	Topics to be covered
Week 1	• Introduction to quantum computing. • Quantum computing vs classical computing and Potential applications of Quantum Computing • Discussing about the **python ecosystems for Quantum Computing** • 3 Basic principles of quantum computing ○ Superposition, Interference, Quantum entanglement

Week 2	• Introduction to qubits
	  ○ What are qubits, notation and representation of qubits
	• Introduction to quantum gates
	  ○ Single qubit gate (X,Z,H, etc) & Multi-qubit gate (CNOT, etc)
	• **Why python for QC?**

Week 3	• Introduction to quantum computing in **python using qiskit**
	  ○ Exploring qiskit sdk
	  ○ Running your first python script on an actual quantum computer
	  ○ Learning about quantum circuits
	  ○ Implementing quantum circuits in python using qiskit

Week 4	• Further exploring **python's support for quantum computing** using qiskit sdk
	  ○ Simulators
	  ○ Actual quantum computer use
	• Exploring **IBM Quantum Experience**

Week 5	• Getting started with Quantum protocols and algorithms in python ○ **Quantum teleportation**
Week 6	• Continuing Quantum protocols and algorithms in python ○ **Superdense coding**
Week 7	• Continuing Quantum protocols and algorithms in python ○ **Basic python scripts exploring cryptography (QKD)**
Week 8	• Continuing Quantum protocols and algorithms in python ○ **Deutsch-Jozsa Algorithm**
Week 9	• Applications of quantum computing using python ○ **Linear system of equations**
Week 10	• Continuing Applications of quantum computing using python ○ **Hybrid quantum-classical Neural Networks** with PyTorch and Qiskit