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| Date | Title and contents to be discussed | Duration |
| Week 1 | Session1: Introduction to Quantum Computing and IBM QE  Motivation to QC, Qubits, Quantum states, gates, circuits, HW Tech and challenges, Q in Industry  Handson: walk through IBM Q composer/lab dashboard | 2 hrs |
| Week 2 | Session2: Quantum Computing Basics-   * Deeper dive into the quantum state model * Vector notation of qubits and Bloch sphere representation and how it extends to multi-qubits * Unitary operations such as NOT, CNOT, Hadamard etc * Reversible computation as a concept/Unitary operations connect them to postulates of Q mechanics * Universality of quantum gates * Essentially cover basic notations, definitions that will be assumed when we cover Q algorithms * Entanglement, Interference, superposition in more detail with examples   Handson:  Creating Basic quantum circuits such as bell states etc using IBM QE  Visualization of results on bloch sphere, statevector etc | 2 hrs |
| Week 3 | Quantum Algorithms Part I  How does one formulate a Q algorithm and how it is different from a classical algorithm – how concepts such as superposition/entanglement/interference are employed   * General Oracles * Deustch Jozsa algorithm * Walk through end to end how the Deustch Jozsa algorithm works   Handson:  Implement the algorithm in IBM Q C composer/lab and walk through the results | 2 hrs |
| Week 4 | Quantum Oracles part II  Grovers Algorithm  why is it important  end to end how the algorithm works  Handson  Implement the algorithm in IBM Q C composer/lab and walk through the results | 2 hrs |
| Week 5 | Quantum Algorithms Part II  Theory and Details on Shors algorithm how it works, significance of the Quantum algorithm    Handson: Implement the algorithm in IBM Q C composer/lab and walk through the results | 2 hrs |
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| Week 6 | NISQ era Quantum algorithms  Perspective/overview of the problem and motivation and Significance,  Using VQE/QAOA algorithms and applications in industry | 2 hrs |