ISSS Teaching Programme

PMRF students' teaching requirement facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS134/II/2024.

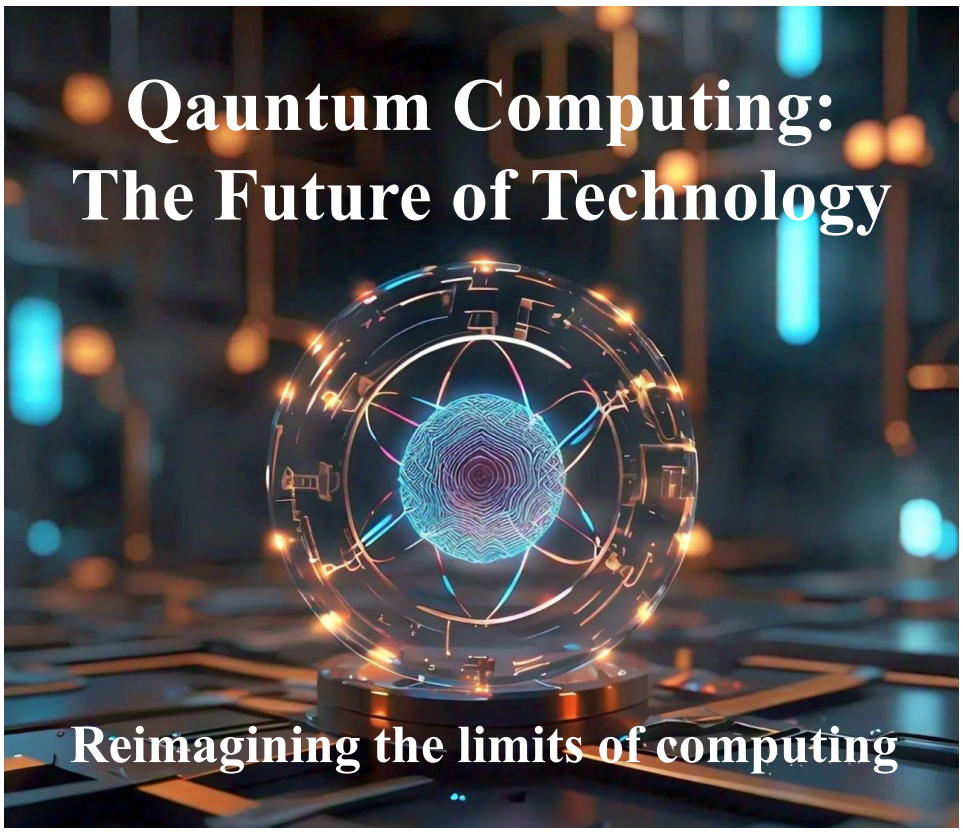
Quantum Computing: Theory to Physical Implementation

Name

Asif Altaf Shah

Required background of the students

- UG/ PG/ Ph.D.



You might be thinking there is an error in the spelling of **"Quantum".** Keen observation! Well, we need some **Qauntum Error Correction** here!

Details of the content of the module

This course will focus on foundations of Quantum Computing. The broader context of topics will include:

1. **Overview of Quantum Computing**
2. **Stern- Gerlach Experiment**
3. **Quantum Gates to Quantum Circuits**
4. **Bell States and Quantum Teleportation**
5. **Quantum Parallelism and Quantum Algorithms**
6. **Introductory Mathematical Background**
7. **Introduction to Qiskit**
8. **Looking into a Black Box- Bernstein Vazirani Algorithm**
9. **Physical Implementations of a Qubit**
10. **Industrial scalable approaches to building Quantum Computers**
11. **Overview of Quantum Error Correction**

Schedule of the module

Start Date: 14 September, 2024

Occurrence: Every Saturday (Self-Pace Course)

Lecture Duration: 1 hour

Total lectures: 20-30

Meeting link : Will be shared later

Contact email ID: asifshah@iisc.ac.in

Registration link:
https://forms.gle/pcj8fepJfC1DqcRJA