**e-ITEC PROPOSAL (2021-2022)**

**Introductory Training Programme in Quantum Computing**

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| **Heading** | **Details** |
| Name of the Institute | Centre for Development of Advanced Computing, Mohali |
| Name of the Course | Introductory Training Programme in Quantum Computing  |
| Proposed Dates and Duration of the Course in week | November 22-26, 2021 (One Week) |
| Start date | November 22, 2021 |
| End date | November 26, 2021 |
| Eligibility Criteria for ParticipantsEducational QualificationWork ExperienceAge LimitTarget group (Level of participants and target ministry/department etc. may be identified) | Technical Graduate with knowledge of:Basics of electronics and computer science, programming languages (python), matrix algebra, and brief understanding of quantum mechanics.As per MEA guidelinesAs per MEA guidelinesWorking professionals/academicians with knowledge of computers and basics of mathematics with some programming language exposure. |
| Aims & Objectives of the Course | To impart basic knowledge about quantum computing and its use cases/application, quantum mechanics &linear algebra, understanding about quantum bits, quantum logic gates, quantum algorithms, introduction to quantum circuit simulator and python based software environment. |
| Details / Content of the Course  | * Introduction to Quantum Computing- History of Quantum Computation, Quantum Computing Vs. Classical Computing,, Applications & Use cases, Superposition & Entanglement principles, Quantum Information Science Kit (QISKIT)
* Introduction to Python Programming, Quantum Mechanics & Linear Algebra-State space, quantum measurement, distinguishing quantum states, phase, composite system, linear operators and matrices, the Pauli matrices, inner products, eigenvectors and eigenvalues, adjoints and hermitian operators, Tensor products, operator functions etc.
* Quantum Gates & Circuits-Single/Multiple Qubit Gates, Quantum Circuits, Bell states
* Quantum Algorithms-Implementation of Grover’s algorithm
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| Mode of Evaluation of Performance of the ITEC Participant | Presentations/ Quiz/Assignments |