



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Introduction to Quantum Computing and Quantum Algorithms

2425-1-113R-06

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#### Obiettivi

##### Aims

Understanding Quantum Computing Fundamentals: Provide students with a foundational understanding of the principles and concepts that underpin quantum computing, including qubits, superposition, entanglement, and quantum gates.

Exploring Quantum Algorithms: Introduce students to various quantum algorithms such as Grover's algorithm, Shor's algorithm, and quantum simulation algorithms. Students learn how these algorithms differ from classical algorithms and their potential applications.

##### Tentative contents

- Introduction to quantum technology
- Introduction to superconducting platform
- Basics of quantum information
- Fundamentals of quantum algorithms
- Quantum Machine Learning: implicit and explicit model
- Quantum Information and High energy physics: connecting the dots (theory and use case)
- Introduction to software for quantum computing
- From quantum algorithms to software package

##### Lecturers

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## **Contenuti sintetici**

## **Programma esteso**

## **Prerequisiti**

## **Modalità didattica**

## **Materiale didattico**

## **Periodo di erogazione dell'insegnamento**

## **Modalità di verifica del profitto e valutazione**

## **Orario di ricevimento**

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## **Sustainable Development Goals**

