

# COURSE DETAIL

## INTRODUCTION TO QUANTUM COMPUTING

**Country**

Denmark

**Host Institution**

University of Copenhagen

**Program(s)**

University of Copenhagen

**UCEAP Course Level**

Upper Division

**UCEAP Subject Area(s)**

Computer Science

**UCEAP Course Number**

149

**UCEAP Course Suffix****UCEAP Official Title**

INTRODUCTION TO QUANTUM COMPUTING

**UCEAP Transcript Title**

QUANTUM COMPUTING

**UCEAP Quarter Units**

6.00

**UCEAP Semester Units**

4.00

## Course Description

This course provides an introduction to the field of quantum computing and information, covering a variety of topics ranging from computation and cryptography to foundations of quantum physics. It explores current research topics and discusses how quantum phenomena give rise to new algorithms for machine learning, quantum computational supremacy, cryptographic schemes with unprecedented security guarantees, and device-independent protocols. Topics include fundamentals of quantum computing; the circuit model; basic quantum algorithms and the concept of quantum computational supremacy; Bell inequalities, non-local games, and the concept of device-independence; and basic quantum protocols for cryptography. As part of the exercises, students run simple quantum programs on an actual quantum computer available through the cloud.

## Language(s) of Instruction

English

## Host Institution Course Number

NMAB19003U

## Host Institution Course Title

INTRODUCTION TO QUANTUM COMPUTING

## Host Institution Course Details

<https://kurser.ku.dk/course/nmab19003u/>

## Host Institution Campus

## Host Institution Faculty

Faculty of Science

## Host Institution Degree

Bachelor

## Host Institution Department

Department of Mathematical Sciences

**Course Last Reviewed**

2022-2023

[Print](#)