

# Blockchain technologies and cryptocurrencies

A course for PhD students, Alma Mater Studiorum Università di Bologna  
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## Instructor

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## Course Outline

The course discusses some relevant research themes related to blockchain technologies, cryptocurrencies and novel applications that can be built over the blockchain.

## Objectives

Bitcoin and novel cryptocurrencies gathered momentum in the last months. More and more investors look with interest at these technologies, while others label them as a dangerous speculative bubble. The truth is that the blockchain, and the alternative implementations of a distributed ledger, represent very interesting technologies, that can be exploited to build novel distributed applications. The underlying building blocks are related to many concepts and research areas of computer science in general. This course will illustrate the main principles and conceptual foundations of the blockchain and the Bitcoin network.

## Program

- Introduction to Crypto and Cryptocurrencies
- The blockchain: how Bitcoin achieves decentralization
- Transactions and transaction scripting languages
- Mining
- Attacks to the blockchain
- Anonymity
- Alternative cryptocurrencies and smart contracts

## Learning and assessment modalities

The course will be organised in four slots of 2.5 hours each. It will be taught in either Italian or English at the preference of the convenors. The final assessment consists of a technical report on one of the course topics. Hopefully, the student will identify some aspects that can be analyzed and/or combined with his/her research interests.

## Teaching materials

Lecture notes and slides will be provided by the instructor, along with papers and a list of bibliographical references and additional material. All the course material is in English.

## Schedule

- 21/02/2018: 10:00 - 12:30, Aula Seminari 2, DISI, Mura A. Zamboni 7, Bologna
- 28/02/2018: 10:00 - 12:30, Aula Seminari 2, DISI, Mura A. Zamboni 7, Bologna
- 07/03/2018: 10:00 - 12:30, Aula Seminari 2, DISI, Mura A. Zamboni 7, Bologna
- 21/03/2018: 10:00 - 12:30, Aula Seminari 2, DISI, Mura A. Zamboni 7, Bologna