

Bitcoin and blockchain fundamentals

Technical analysis, application perspective and business implications of blockchain-based digital assets

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Language

English

Course description and objectives

Blockchain, Bitcoin and cryptocurrencies: three terms used often without having precisely in mind where the boundaries among them are located. Some believe that blockchain is the most promising and revolutionary technology currently being researched in the IT field, others think that is only an overhyped phenomenon destined to explode in a market bubble. Regarding Bitcoin, some think it is 21st century's digital gold, non-country specific and censorship-resistant; others, that it represents an asset used only for illicit trafficking.

The course aims to provide a 360° knowledge of the basics of this new technological paradigm, analyzing the following topics:

- What is Bitcoin?
- How is Bitcoin related to blockchain?
- How does this technology work? What is the difference with Distributed Ledger Technologies?
- What is the application landscape of the blockchain?
- How it is possible to build a blockchain application that actually makes sense?
- Is blockchain really anonymous?

At the end of the course, the participants will be able to:

- Understand the concept of blockchain architecture;
- Use some of the most common software tools (i.e. wallet and blockchain explorers) needed to manage and exchange a cryptocurrency protocol;
- Comprehend the logic behind the development of an enterprise project based on blockchain.

Audience

The course is open to all Bocconi students. In particular, it is targeted to students:

- Who want to understand the fundamental aspects of blockchain technology, not only from a technical-functional point of view but also from an application one;
- Who wish to deepen their knowledge of cryptocurrencies' exchange, deposit and transfer tools;
- Who want to learn how to design the business model of a new blockchain application.

Prerequisites

Basic knowledge of Microsoft Windows and Microsoft Office applications (PowerPoint)

Duration

16 hours

Calendar

Lecture	Date	Time	Room
1	Wed 12/02/2020	18.00 - 19.30	Perego
2	Mon 17/02/2020	18.00 - 19.30	Perego
3	Wed 19/02/2020	18.00 - 19.30	Perego
4	Mon 24/02/2020	18.00 - 19.30	Perego
5	Wed 26/02/2020	18.00 - 19.30	Perego
6	Mon 02/03/2020	18.00 - 19.30	Perego
7	Mon 09/03/2020	18.00 - 19.30	Perego
8	Tue 10/03/2020	18.00 - 19.30	Zappa

Note: lessons will be held in the traditional room and **all the students have to bring their own device.**

Syllabus of the course

Lecture	Topics	Book reference
1	Introduction to digital money <ul style="list-style-type: none">- Brief history of money: from shells to digital currencies- The three functions of money- Centralized vs. decentralized monetary paradigms- The case of Rai Stones- Failed attempts	Slide Money: The Unauthorised Biography
2	Bitcoin in 5W: Why, Where and Who (1/2) <ul style="list-style-type: none">- The birth of Bitcoin- Why: why was Bitcoin created?- Where: where are data stored in Bitcoin?- P2P Networks: Bitcoin vs. BitTorrent- Who: who owns Bitcoin?- Hands-on: how to manage a Bitcoin wallet- Hands-on: how to exchange Bitcoin- Hands-on: the Bitcoin testnet	Slide The Bitcoin Standard
3	Bitcoin in 5W: What and When (2/2) <ul style="list-style-type: none">- What: what is the underlying asset of Bitcoin?- The energy consumption of Bitcoin- Mining: definition, reality and myths- When: when are transactions confirmed?- Hands-on: checking Bitcoin's history	Slide The Bitcoin Standard
4	Anonymity and Privacy in Bitcoin <ul style="list-style-type: none">- Financial anonymity and privacy- The myths about Bitcoin anonymity- Privacy gaps and past leaks- Possible solutions to enhance anonymity and privacy	Slide
5	Blockchain: technical analysis <ul style="list-style-type: none">- Definition: what is blockchain?- Blockchain technical pillars (cryptography, distributed computation, consensus mechanism, data architecture)- The fundamental characteristics of a blockchain solution (transparency, immutability, security)	Slide The Blockchain Journey

<p>6 The blockchain application landscape (1/2)</p> <ul style="list-style-type: none"> - Application areas - Certification - Smart Contract Platform - Digital Identity - Financial Services - Gaming 	<p>Slide The Blockchain Journey</p>
<p>7 The blockchain application landscape (2/2)</p> <ul style="list-style-type: none"> - P2P Energy Trading - P2P Content Distribution - Tracking and Supply Chain Management - Prediction markets - ICO: what are they, and what for? - Final work: team composition and rules explanation 	<p>Slide The Blockchain Journey</p>
<p>8 Final Contest</p> <ul style="list-style-type: none"> - Designing a blockchain solution - The competitive advantages of a blockchain solution - When blockchain is needed, and when it is not - Final pitch by each team 	<p>Slide The Blockchain Journey</p>

Software used

Microsoft PowerPoint
Microsoft Excel
Electrum wallet

Suggested bibliography

Salviotti G., De Rossi L. M., Abbatemarco N., *The Blockchain Journey. A guide to practical business applications*, EGEA, 2018

Martin F., *Money: The Unauthorized Biography - From Coinage to Cryptocurrencies*, Vintage, 2015

Ammous S., *The bitcoin standard: the decentralized alternative to central banking*. John Wiley & Sons, 2018

Available seats

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