



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Smart Contracts, Bitcoin e Blockchain Technology

2425-1-FSG01A002

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#### Learning objectives

Understanding of the principles of blockchain operation, cryptocurrencies, and smart contracts. Ability to understand the functioning of simple smart contracts. Ability to choose the most suitable type of blockchain depending on the application.

#### Contents

Knowledge and concepts underlying the operation of blockchains, cryptocurrencies, and smart contracts. Simple practical examples of creating cryptocurrencies and smart contracts.

#### Detailed program

- Introduction to Blockchains: Motivations, Types of Blockchains, and Their Applications
- Transaction-Based Blockchains: Bitcoin and Other Cryptocurrencies
- Asymmetric Cryptography: Encryption, Digital Signatures, Hash Functions
- Exchanges and Wallets
- Bitcoin Scripts
- Account-Based Blockchains: Ethereum
- Differences Between Bitcoin and Ethereum Blockchains
- Cryptocurrencies: Practical Examples and Current Trends
- Introduction to Smart Contracts: What They Are, Possible Uses, and Limitations
- Tokenization: Fungible and Non-Fungible Tokens (NFTs).
- Consensus Algorithms

## Prerequisites

- Basic skills in mathematics (high school level).
- Ability to read simple texts in English.

## Teaching methods

- 21 lectures of 2 hours each, conducted in Italian, in person.
- Availability of lecture recordings.

## Assessment methods

- No midterm exams
- Written final exam on the course topics (open-ended questions)
- Main aspects considered for evaluation:
  - Knowledge of the course topics
  - Understanding of the course topics
  - Proficiency in language and correct use of technical terminology
  - Ability to make connections between course topics

## Textbooks and Reading Materials

- Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press.  
Can be (legally) downloaded from:  
[https://d28rh4a8wq0iu5.cloudfront.net/bitcointech/readings/princeton\\_bitcoin\\_book.pdf](https://d28rh4a8wq0iu5.cloudfront.net/bitcointech/readings/princeton_bitcoin_book.pdf)

## Sustainable Development Goals

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