



Universität  
Zürich<sup>UZH</sup>

**UZH**  
Blockchain  
Center

*UZH International Summer Schools*

# **Deep Dive into Blockchain**

Linking Economics, Technology and Law

## **Syllabus**

Spring Semester 2026

Prof. Dr Claudio J. Tessone

# Content

<b>Preamble</b>	<b>3</b>
Welcome	3
<b>Quick Overview</b>	<b>4</b>
Module coordinator	4
Instructors	4
Details	4
<b>1. Introduction and Objectives</b>	<b>5</b>
<b>2. Course Contents</b>	<b>5</b>
<b>3. Course Material</b>	<b>6</b>
Material Offered	6
Overview of classes	6
Syllabus	6
The Slides	6
<b>4. Reading</b>	<b>6</b>
Bibliography	6
Related scientific journals	6
<b>5. Application Procedure</b>	<b>7</b>
<b>6. Evaluation</b>	<b>7</b>
6.1 Assignments	7
6.2 Final Project	7
<b>7. Academic Fraud</b>	<b>7</b>
<b>8. Administrative Comments</b>	<b>8</b>
8.1 Course format	8
8.2 Getting in contact with us	8
8.3 Students with disabilities	8
8.4 Laptops	8

# Preamble

## Welcome

This course takes place every Spring Semester, in the month of July. You will find all necessary information concerning the course within this Syllabus. Updates to this document will be communicated on the UZH Blockchain Center webpage at (<https://www.blockchain.uzh.ch/teaching>), when necessary, amendments may be presented to the students during the course.

We are very happy to welcome you to our lecture.

### **Prof. Dr Claudio J. Tessone**

Blockchain & Distributed Ledger Technologies Group  
Department of Informatics  
Faculty of Business, Economics, and Informatics  
University of Zurich

## Quick Overview

### Module coordinator

Prof. Dr Claudio J. Tessone

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### Instructors

- Dr Sheng-Nan Li. *E-mail:* [shengnan.li@uzh.ch](mailto:shengnan.li@uzh.ch)
- Parminder Kaur Makode. *E-mail:* [parminderkaur.makode@uzh.ch](mailto:parminderkaur.makode@uzh.ch)

### Details

**Type:** Lecture

**Target Audience:**

- UZH students: Advanced Bachelor Students.
- Students from other Universities: Advanced Bachelor students, Master students, and early PhD candidates. This course is of particular interest to students from the fields of Economics, Finance, Business, Computer Science, Mathematics, Physics, or Law. Students from other disciplines with a strong interest in blockchain technology and a solid analytical background are also encouraged to apply.

**Frequency:** Each Spring Semester

**AP (ECTS):** 6

**Language:** English

**Prerequisites:** Basic knowledge of programming is not required but desirable.

**Content:** An interdisciplinary exploration of blockchain technology, economics, and law, providing a comprehensive understanding of blockchain systems and their real-world applications.

**Learning outcome:** Participants will gain a detailed understanding of blockchain systems, comprehend the economic incentives foundational to these systems, develop the ability to critically assess design decisions in blockchain technologies, and acquire hands-on experience with both established and emerging blockchain platforms.

**Grading:** Assignments given in class and a final project.

**Further information:** <https://www.summerschools.uzh.ch/en/courses-on-offer/deep-dive-into-blockchain.html>

**Registration:**

- UZH students. Through the registration tool (Modulbuchungtool) at the University of Zurich.
- Students from other Universities: Through the website of UZH International Summer Schools.

## 1. Introduction and Objectives

Blockchain-based systems, with cryptocurrencies as the most prominent example, have disrupted and reshaped the way we now think about digital finance and other similar applications, such as supply chains. Blockchain and related technologies allow storing sequential, trustful information without enforced consensus by central authorities or trustees.

For a full understanding of blockchain, with all its implications and potential for application in practice, it is crucial to approach it from a multidisciplinary perspective. This is exactly what the UZH Blockchain Center offers during this three-week course: participants will understand the three key pillars of blockchain systems, namely the technology, the economics, and the legal aspects behind them. Building on this, the course will explore other fields of application, such as forensics and data analytics.

The programme is highly interactive, with hands-on practice sessions incorporating the most advanced and promising blockchain-based platforms. Participants will learn from top industry leaders shaping the future of this transformative technology and equip themselves with the expertise to excel in this dynamic, rapidly evolving field.

## 2. Course Contents

The programme is divided into two tracks. One Academic Track consisting of three main pillars, each focusing on a critical aspect of blockchain systems, and an Industry Track

### Academic Track

#### Pillar I – Technology

- **T1. Introduction to Blockchains**
- **T2. Bitcoin and Derivatives**
- **T3. Ethereum and Smart Contracts**
- **T4. Consensus Mechanisms**
- **T5. Fungible and Non-Fungible Tokens**
- **T6. Smart Contracts**
- Assignments and Hands-on Sessions:
  - o **A1. Raspberry Pi: Block creation & Network Consensus**
  - o **A2a. Ethereum PoW consensus node and Mining, transactions**
  - o **A2b. Creation of Tokens**
  - o **A3. Ethereum PoS consensus node and Staking**

#### Pillar II – Economics

- **E1. Cryptocurrencies and Tokenisation**
- **E2. Decentralised Finance (DeFi) and Stablecoins**
- **E3. Automated Market Making (AMM)**
- **E4. Introduction to Cryptoeconomics and decentralisation**
- **E5. Central Bank Digital Currencies (CBDCs)**
- **E6. Reward distribution and Incentives at Protocol level**
- Assignments and Hands-on Sessions:
  - o **A4. Automated Market Making**
  - o **A5. Delegated Proof of Stake**
  - o **A6. Optimism (Layer2 solution)**

Pillar III – Regulation and Governance

- **L1. Crypto Assets Regulation**
- **L2. Regulation of DeFi and Financial Markets**
- **L3. Governance of Blockchain-based systems**
- **L4. Decentralised Autonomous Organisations (DAOs)**
- Assignments and Hands-on Sessions:
  - o **A7. DAO (common goods)**

### **Industry Track**

In addition to academic sessions, the programme features presentations and hands-on workshops from leading blockchain platforms and organisations, including (the list varies from year to year and it is only intended as a guide): Ethereum, Cardano, Hedera, Polkadot, Solana, DFINITY, BNB Chain, Avalanche, Arbitrum, Curve, Sui.

## **3. Course Material**

### **Material Offered**

Participants will have access to a dedicated online platform where all lecture slides, recordings, relevant materials, and literature can be found.

### **Overview of classes**

A comprehensive overview of all classes, including detailed schedules and topics, will be provided on the course webpage. Participants are encouraged to familiarise themselves with the schedule to plan their personal agendas effectively.

### **Syllabus**

A detailed syllabus outlining all aspects of the course, including grading criteria, agenda, planned topics, and more, will be made available. This document serves as the primary guide for the course and is essential reading for all participants.

### **The Slides**

Lecture slides presented and discussed in class will be available in digital format for download after each module. While these slides are a valuable resource, they do not comprehensively cover the entire syllabus; therefore, active participation in class is necessary to fully grasp the course content.

## **4. Reading**

### **Bibliography**

- Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.
- Buterin, V. (2014). Ethereum White Paper: A Next-Generation Smart Contract and Decentralized Application Platform.

### **Related scientific journals**

- *Ledger*
- *Blockchain Research and Applications*
- *Frontiers in Blockchain*
- *The Journal of The British Blockchain Association*

## 5. Application Procedure

The application process for the “Deep Dive into Blockchain” summer school programme varies depending on your student status:

For University of Zurich (UZH) Students:

- Module Booking: Enrol via the UZH online module booking tool within the specified booking period. Detailed instructions and deadlines are available on the UZH Module Booking page.
- Interview Process: Admission is subject to a personal interview. After booking the module, you will be contacted to schedule this interview.

For International Students:

- Application Portal: Apply through the official UZH International Summer Schools application page.
- Application Period: The application is until 23 April 2026. Early application is recommended, as programmes may fill up before the deadline.
- Application Steps: Complete the online registration form and submit the required documents as outlined on the application page.

For any questions regarding the application process, please contact the Faculty’s booking service at [summer@int.uzh.ch](mailto:summer@int.uzh.ch)

## 6. Evaluation

The evaluation for this course comprises two components: assignments and a final project. The final grade will be determined as PASS/NO PASS. Participants must pass both components to successfully complete the course.

### 6.1 Assignments

Throughout the course, participants will complete various graded assignments designed to provide practical experience in blockchain concepts and applications. Assignments must be submitted by the specified deadlines, which will be communicated during the course. Sample solutions will be provided after submission. While participation in practical sessions is not mandatory, it is strongly recommended to enhance understanding and performance.

### 6.2 Final Project

The final project is a group endeavor that allows participants to demonstrate their understanding and application of concepts learned throughout the course in a real-world context. Working in groups fosters essential teamwork and collaboration skills, including communication, problem-solving, and time management. Each group will produce a comprehensive report on their project and present their findings to the instructors.

## 7. Academic Fraud

The Code of Honour of the University of Zurich applies to all work in this course and will be strictly enforced. The intent of the Honour Code in this course is to ensure that each student claims and receives credits for his/her own efforts. Violations to this are considered academic fraud.

### Definition

Academic fraud is an act by a student, which may result in a false academic evaluation of that student or of another student. Plagiarism is understood as the use or imitation of another people’s work, either wholly or

partially, without acknowledging the source and the author. In principle, plagiarism is an infringement of copyright law. Short passages from another author may be quoted.

All documents you will hand-in are going to be checked by software and manually for plagiarism. Documents with a score above 10% are going to be intensively validated and in suspicious cases, we will hand-out penalties for fraud behaviour.

## 8. Administrative Comments

### 8.1 Course format

**Lectures.** Attendance to lectures and practical sessions are *mandatory*. Each lecture typically lasts two hours. Hands-on sessions 2-4 hours

**Academic Trips.** The consists of *mandatory* academic trips to important stakeholders of the Blockchain ecosystem. These are mandatory.

**Q&A Sessions.** Every day there are Q&A sessions which take place onsite or on MS Teams in a Meeting in the General Channel.

Students are expected to keep up with the programme.

### 8.2 Getting in contact with us

- **On-Site Availability:** Throughout the summer school, the course director, lecturers, and teaching assistants (TAs) are readily available for in-person consultations. Participants are encouraged to approach faculty members before or after sessions for immediate support.
- **MS Teams Platform:** In addition to on-site interactions, participants can communicate with faculty and peers via the MS Teams platform.

*We strive to provide timely replies, however, in some periods it may be slightly delayed because of the intensity of the programme.*

### 8.3 Students with disabilities

Any student with a documented disability needing academic adjustment or accommodation is requested to speak with the instructors during the first two weeks of class. All discussions will remain confidential. Students with disabilities will need to also contact the directors of the Faculty.

### 8.4 Laptops

Laptops or equivalent computing devices are needed for the sole purpose of supporting the individual learning process.