



Universität
Zürich^{UZH}

UZH
Blockchain
Center

Prof. Dr Claudio J. Tessone

Syllabus

Blockchain Platforms

03SM22MIS016 / 03SM22BIS016

Autumn Semester 2023

Blockchain & Distributed Ledger Technologies
Department of Informatics (IfI)
University of Zurich, Switzerland

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PREAMBLE

Welcome

This seminar takes place every Fall Semester. You will find all necessary information concerning the course within this Syllabus. From time to time, updates will be communicated on MS Teams and on the Blockchain & Distributed Ledger Technologies Group's webpage at Ifl (<http://www.ifi.uzh.ch/bdlt>).

We are very happy to welcome you to our lecture.

Prof. Dr Claudio J. Tessone

Blockchain and 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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Meetings are online (MS Teams, or equivalent) after previous appointment

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Webpage: <https://www.ifi.uzh.ch/en/bdlt/Team/Tessone.html>

Instructors

- Sheng-Nan Li

E-mail: shengnanli@ifi.uzh.ch

Details

Type: Lecture

Target Audience: This course is acknowledged for MSc and MA students and is assigned to the Core elective areas „Wahlpflichtbereich“:

- MSc in Informatics:
 - Elective Area INF/WWF
 - Core Elective Area for Information Systems INF/WWF
- BSc in Informatics (RVO22) - Information Systems: Core Elective Area

Frequency: Each Autumn Semester

AP: 3 ECTS

Language: English

Prerequisites

General familiarity with computer networks and distributed systems basic principles, and high-level familiarity with Internet as of Web 2.0 would be a plus, but none are strictly required.

Content:

At the end of this seminar, students will gain knowledge in most popular blockchain platforms including, but not limited to, Bitcoin, Ethereum, Cardano and Polkadot. Students will research on the technical and economic aspects of blockchains via multiple resources such as official documentation of the blockchain protocols.

Grading:

Attendance + Final Project

Further information:

<https://www.ifi.uzh.ch/en/bdlt/Teaching/Blockchain-Platforms.html>

Registration:

Through the registration tools at the University of Zurich.

1. INTRODUCTION AND OBJECTIVES

The goal of this Seminar is to give students first-hand overview of the most popular blockchain protocols, including - but not limited to - Bitcoin, Ethereum, Cardano, Algorand, Casper, Tezos, Cosmos, and Polkadot. This seminar sheds light on selected advances of Blockchain platforms in terms of their structure, performance, security, and use cases, while the challenges and deficits will be critically and objectively analysed, too.

Students will be offered a set of topics from which they can pick one in groups of 1 – 2 members and will present the topic. This seminar requires a short report, which is a documentation of the studied (and presented) topic be produced by the students of each group.

2. COURSE CONTENTS

LECTURE 1. Introduction to the course, Bitcoin and Derivatives (CT, S-NL) [21.09.23]

- . Introduction to the module
- . Blockchain taxonomy

LECTURE 2. Blockchain Taxonomy (S-NL) [28.09.23]

- . Reward Mechanisms in both PoW and PoS protocols
- . Project suggestion / selection

LECTURE 3. Student Project Presentations [by 21.12.23]

- . Final project submission on OLAT

3. COURSE MATERIAL

Material Offered

Students have access to a Team specifically created on MS Teams to download the slides presented in class, find relevant material, datasets and literature.

The following procedure is strongly recommended as preparation for the classes.

Overview of classes

On the webpage an overview of all classes given by our team can be found. Develop an idea of the classes and how they best fit into your personal agenda. Keep in mind that network science classes are only offered once a year.

Syllabus

For each course, a detailed syllabus exists with all details concerning that specific course. This is your guideline for the class and a **MUST** read. You'll find everything in here concerning the grading of the course, the agenda, the planned topics and much more... The main materials used in this course are Bibliography and the Slides.

The Slides

The slides presented and discussed in class are available in a digital format. You can download the slides to each class. The slides do not completely cover the entire Syllabus; therefore, it is necessary to participate in the class. All slides will be distributed after each module. All our slides follow our detailed standardised slide format. All presentations in the classroom also have to follow this format.

All course slides, recordings of the lectures, the assignments (and sample solutions after their due date) will be given on a dedicated Team on MS Teams communicated to all students.

4. READING

Bibliography

Basic bibliography:

- ⊕ "Mastering Ethereum" by Antonopoulos A.M., Wood G. (O'Reilly Media)
- ⊕ "Mastering Bitcoin" by Antonopoulos A.M. (O'Reilly Media)

Recommended readings:

- ⊕ "Blockchain By Example" by Bellaj Badr, Richard Horrocks, Xun Wu (Packt Publishing)

Useful links

- ⊕ "Ethereum book" <https://github.com/ethereumbook/ethereumbook>
- ⊕ "Solidity documentation" <https://solidity.readthedocs.io/>
- ⊕ "Solidity by example" <https://solidity-by-example.org/>
- ⊕ "Bitcoin whitepaper" <https://bitcoin.org/en/bitcoin-paper>
- ⊕ "Ethereum whitepaper" <https://ethereum.org/en/whitepaper/>
- ⊕ "Polkadot whitepaper" <https://polkadot.network/PolkaDotPaper.pdf>
- ⊕ "Cardano whitepaper" <https://whitepaper.io/document/581/cardano-whitepaper>
- ⊕ "Tezos whitepaper" <https://tezos.com/whitepaper.pdf>

Related scientific journals

- Ledger
- Frontiers in Blockchain
- Ledger

5. APPLICATION PROCEDURE

Please enrol to the course using the usual UZH planning tools. In case of doubts, contact the instructor of the booking service of the Faculty.

E-Mail: modulbuchung@oec.uzh.ch

6. EVALUATION

There is no final written exam on the subjects taught during the course. However there is an written project report through which students will demonstrate first-hand knowledge of the course topic.

6.1 Final project

Students will form groups and select topics of their interest. Then they will develop a project in the area of the course. Written report and presentation is expected as an output of the project.

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 hand-out penalties for fraud behaviour.

8. ADMINISTRATIVE COMMENTS

8.1 Course format

Lectures. As of 01.09.2022, all lectures will be held onsite.

8.2 Getting in contact with us

- The first option for you is to contact us on the General Channel on MS Teams (and eventually other channels when appropriate) if the question is relevant to all students. This channel is there for you to post questions, and we will strive to have a rapid answering time. If it is a bilateral question, we suggest you to write on MS Teams on a bilateral chat.
- We will strive to provide you with speedy answers to the questions posted on MS Teams.
- You can reach us either bilaterally (if it is a matter that concerns only you), or through the appropriate, common channels (in case your question may be of help to others).
- *We do not guarantee answering e-mail communication*

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 discussion 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 in for the sole purpose of supporting the individual learning process.