

**PROF. DR CLAUDIO J. TESSONE**

INTRODUCTION TO

# **ECONOMICS OF BLOCKCHAIN SYSTEMS**

**SYLLABUS**

**SPRING SEMESTER 2019**

# PREAMBLE

## Welcome

This course takes place every Spring Semester. You will find all necessary information concerning the course within this Syllabus. From time to time, updates will be communicated on the OLAT Platform and on the Network Science webpage at the URPP Social Networks (<http://www.business.uzh.ch/professorships/networkscience.html>). Please, check regularly both.

We are very happy to welcome you to our lecture.

Claudio J. Tessone

# QUICK OVERVIEW

## Instructor

- Prof. Dr Claudio J. Tessone

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## Teaching Assistants

- Florian Spychiger

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## Details

**Type:** Seminar

**Target Audience:** This course is acknowledged for Bachelor students and is assigned to the „Wahlpflichtbereich“ BWL 4.

**Frequency:** Each fall Semester

**AP (ECTS):** 3

**Language:** English

## Prerequisites

Elements of Game Theory.

## Content:

A course with very active participation of the students that presents key economic aspects – often overlooked - of blockchain-based systems.

**Grading:**

Active participation, assignments given in class, final project.

**Further information:**

<https://www.business.uzh.ch/en/professorships/networkscience/teaching>

**Registration:**

Through the registration tools at the University of Zurich.

# I. INTRODUCTION AND OBJECTIVES

Blockchain-based systems, with the cryptocurrency Bitcoin as a primary example, have disrupted the way of thinking distributed systems: This mechanism allows for securely diffusing information across a network, without necessitating trustees, or central authorities to enforce consensus.

Much is spoken about the trading markets around cryptocurrencies and other tokenised assets (the most evident applications so far in this realm). However, little is discussed about different technical, economic and social aspects that enable the functioning of the blockchain-based systems.

This course is first intended to give a non-technical overview of blockchain-based systems; then to delve into some of the incentive schemes embedded at different levels that ultimately determine their long-term functioning of these systems; and finally, to digging into real-world use-cases of this technology, critically analysing the suitability of their implementation within each context.

## 2. COURSE CONTENTS

### LECTURE 1. Kickoff + Basic concepts

- . Course organisation
- . Blockchains, cryptocurrencies, tokens
- . Trust without central authorities
- . Blockchain taxonomy
- . Token taxonomy
- . *First round of exercises: categorise cryptocurrencies and tokens*

### LECTURE 2. Decentralised systems, decentralised economies?

- . Monetary supply
- . Pseudonymity
- . User identification
- . Wealth accumulation

### LECTURE 3. Incentives schemes

- . Consensus mechanism
- . Proof of work

- . Selfish and cartel mining
- . Proof of stake, a real solution?
- . Governance: community driven?
- . *Selection of final topic list*

## 3. COURSE MATERIAL

### Material Offered

Students have access to OLAT 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 theory and analytics classes are only offered once a year. It is also necessary to have successfully completed the prior course to proceed with the following.

### 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:

### 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 standardized slide format. All presentations in the classroom also have to follow this format.

## 4. READING

The material will be distributed in OLAT and in class.

### Related scientific journals

- ⊕ *Ledger*
- ⊕ *Frontiers in Blockchain*

## 5. APPLICATION PROCEDURE

To apply for the seminar, please, send Prof. Dr Claudio J. Tessone a short application E-mail. First come first served. If you receive our positive confirmation by February 10th at the latest, **THEN** you are asked and allowed to officially book this seminar using the “Modulbuchungstool”. Booking the seminar without a positive confirmation from our Chair is not implying the right to attend the course. In this case the course may be graded as failed.

Once confirmed 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](mailto:modulbuchung@oec.uzh.ch).

## 6. EVALUATION

There is no final written exam on the subjects taught during the course. We believe this is a subject whose depth can be best learnt by investigating the subject: Therefore, there are extensive practice sessions where the students get in-depth exercises on the main topics in the area.

### 6.1 Active participation in class

Credits are awarded for thoughtful and active participation in class and in exercise discussions throughout the course. Credits will be given for knowledge of readings, cogent articulation of arguments and comments, and contribution to case discussion. Participation will be evaluated for quality as well as consistency. Attending the class and the exercises regularly and on time is an indication of professionalism and will also improve your participation grade.

### 6.2 Homework

We strongly recommend that you participate in all exercise sessions, do the readings and follow our instructions. The conduct of this course is based on student inquiry, experience, opinion and reflection related to the readings and other assignments. Exercises are a fundamental, mandatory part of the course.

### 6.3 Final project

Students will form groups and select a topic of their interest. Then they will develop a project in the area of the course. This will give them the opportunity to have practical

experience on all the research cycle: from inception to result analysis. This work will have a large impact on the grades.

## **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 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 days of class. All discussion will remain confidential. Students with disabilities will need to also contact the directors of the Faculty.

### **8.2 Getting in contact with me**

E-mails should be short and to the point. Before sending an email, make clear that email is the appropriate instrument for your task. In some situations, a telephone call is much easier and more personal. Or just ask me in class.

### **8.3 Registration cards**

Right in the beginning of the class you will receive a Word file that we ask you to fill-out. In this file we ask you to add a personal picture and personal address information. Each information is kept confidential and is only accessible to our team. The reasons for doing this are 1) we would like to learn your names by pictures, 2) we use pictures later on if you

ask reference letters to better remind ourselves, and 3) we need your contact information for the administration. Delivering these files is of course voluntary. However, we would highly appreciate your cooperation on this. Many thanks in advance.

#### **8.4 Name cards**

Please use name cards regularly in class throughout the term so I can learn your names. I usually have large numbers of students across my class, so this will make it easier for me. If you don't use name cards, I assume you do not care if I know who you are.

#### **8.5 Sound-emitting devices**

It is expected that you turn off/mute all devices that emit sounds and noises that may interrupt the class (e.g., notebook, mobile phones, watch alarms). If an occasion arises in which you may need to receive a phone call, please inform me before the class. If you leave a class to answer a call without previously notification, you will not be allowed to return to class.

#### **8.6 Laptops and calculators**

Laptops and programmable calculators are needed in for the sole purpose of supporting the individual learning process.