



## Course and Examination Fact Sheet: Spring Semester 2024

### 8,288: Blockchain Markets

ECTS credits: 4

#### Overview examination/s

(binding regulations see below)

decentral - Presentation, Analog, Group work group grade (40%)

Examination time: Term time

decentral - Digital written examination, Digital, Individual work individual grade (60%, 90 mins.)

Examination time: Term time

#### Attached courses

Timetable -- Language -- Lecturer

[8,288,1.00 Blockchain Markets](#) -- English -- [Häfner Samuel](#)

#### Course information

#### Course prerequisites

There are no formal requirements. However, students should have a sound knowledge of basic microeconomics and be acquainted with game-theoretic reasoning. Furthermore, students should be willing to engage in abstract mathematical modelling and read research articles. No previous knowledge of blockchain technology is required.

#### Learning objectives

This course introduces blockchain technology and the current microeconomic research on the topic. Specifically, students will learn about (1) the technical aspects of blockchains and blockchain markets, (2) the stakeholders in blockchain ecosystems and their incentives, and (3) key questions in current microeconomic blockchain research.

#### Course content

We first examine the history of blockchain technology and how the industry has evolved over the last few years. Then, the course comes in two major parts.

##### **Part I: Cryptographic Payment Systems**

In this part, we focus on the most famous cryptographic payment system today, Bitcoin. We will discuss some underlying cryptographic primitives, analyze the incentives in Nakamoto consensus (in particular, Proof-of-Work, Longest-Chain Rule, and Double-Spending Attacks), and explore the economic value of decentralization for payment systems.

##### **Part II: Smart Contract Chains**

In this part, we consider a significant evolution of blockchain technology: smart contracts. We focus on the first and most popular smart contract chain, Ethereum. We discuss diverse topics evolving around decentralized finance, like decentralized exchanges and automated market makers, automatization and counterparty risk, stablecoins and bank runs.

Notably, while the course does provide a technical overview of blockchains at a relevant level of detail, its central perspective on



the technology is economic. Specifically, the focus lies on a fast-growing microeconomic literature that covers various aspects of blockchain markets. In addition, we will also look at a relatively novel game-theoretic literature that takes a strategic perspective on consensus mechanisms.

## Course structure and indications of the learning and teaching design

The course consists of in-class lectures and self-studies.

**In-class lectures:** lecture material is provided on Canvas.

**Self-studies:** students must give a presentation summarizing an empirical or theoretical paper selected from the reading list (see course outline to be published on Canvas).

## Course literature

A self-contained manuscript will be provided.

There is no single textbook that covers all topics of the course. I will draw from various sources, including the following textbooks:

- Narayanan, A., J. Bonneau, E. Felten, A. Miller, and S. Goldfeder (2016): Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press.
- Schär, F. and A. Berentsen (2020): Bitcoin, Blockchain, and Cryptoassets: A Comprehensive Introduction, MIT Press.
- Halaburda, H., M. Sarvary, and G. Haeringer (2022): Beyond Bitcoin: Economics of Digital Currencies and Blockchain Technologies, Palgrave McMillan.

The relevant literature, including the research papers for self-study, will be available on Canvas.

## Additional course information

--

## Examination information

### Examination sub part/s

#### 1. Examination sub part (1/2)

##### Examination modalities

Examination type	Presentation
Responsible for organisation	decentral
Examination form	Oral examination
Examination mode	Analog
Time of examination	Term time
Examination execution	Asynchronous
Examination location	On Campus
Grading type	Group work group grade
Weighting	40%
Duration	--

##### Examination languages

Question language: English

Answer language: English

##### Remark

Classroom presentation of a research paper.



## Examination-aid rule

### Free aids provision

Basically, students are free to choose aids. Any restrictions are defined by the faculty members in charge of the examination under supplementary aids.

### Supplementary aids

none.

---

## 2. Examination sub part (2/2)

### Examination modalities

Examination type	Digital written examination
Responsible for organisation	decentral
Examination form	Written exam
Examination mode	Digital
Time of examination	Term time
Examination execution	Synchronous
Examination location	On Campus
Grading type	Individual work individual grade
Weighting	60%
Duration	90 mins.

### Examination languages

Question language: English

Answer language: English

### Remark

Based on in-class lectures.

### Examination-aid rule

Closed Book

The use of aids is prohibited as a matter of principle, with the exception of pocket calculator models of the Texas Instruments TI-30 series and, in case of non-language exams, bilingual dictionaries without any handwritten notes. Any other aids that are admissible must be explicitly listed by faculty members in the paragraph entitled "Supplementary aids" of the course and examination fact sheet; this list is exhaustive.

Procuring any aids, as well as ensuring their working order, is the exclusive responsibility of students.

### Supplementary aids

The examination will be conducted as a digital examination with the following admissible media:

- **Private notebook** (compulsory) – no tablets!
- **Mains adapter** (compulsory)
- External computer mouse (optional)
- External computer keyboard (optional)

We would like to point out explicitly that the examination cannot be taken with tablets/iPads.

You will need the following for the examination:

- Appliance and system requirements: [cf. StudentWeb](#)



- Special software: [LockDown Browser](#)
- HSG log-in including access modalities
- WLAN – operational access to Eduroam

Please make sure that

- all the updates have been carried out before the examination.
- In the run-up to digitally conducted examinations, technical tests (mock examinations without grades) are carried out. Participation is urgently required!
- You yourself are responsible for the perfect working order of your appliance, [cf. also StudentWeb](#).
- Keyboard stickers in the language in which the examination is conducted (such as English, German, as well as Arabic, Chinese, Russian, Japanese, etc. in language examinations) are permitted. The stickers must be identical with the original characters of the language concerned.

Any use of additional appliances that are not listed above will be strictly prohibited throughout the examination.

Any necessary actions with another software or additional appliances require the express prior approval of the persons in charge of the examination and are only permitted under supervision.

Any infringement of these rules of conduct may be sanctioned as an infringement of the rules of the University.

---

## Examination content

The written exam is based on the in-class lectures and counts 60% of the grade. The topics are those described in the section "Course Content".

The presentation (40%) requires students to give a presentation summarizing a research paper selected from the reading list (see course outline on Canvas).

## Examination relevant literature

Lecture notes, slides, manuscripts, and original literature; as listed on Canvas by the last session before the exam.



## Please note

Please note that only this fact sheet and the examination schedule published at the time of bidding are binding and takes precedence over other information, such as information on StudyNet (Canvas), on lecturers' websites and information in lectures etc.

Any references and links to third-party content within the fact sheet are only of a supplementary, informative nature and lie outside the area of responsibility of the University of St.Gallen.

Documents and materials are only relevant for central examinations if they are available by the end of the lecture period (CW21) at the latest. In the case of centrally organised mid-term examinations, the documents and materials up to CW 13 are relevant for testing.

Binding nature of the fact sheets:

- Course information as well as examination date (organised centrally/decentrally) and form of examination: from bidding start in CW 04 (Thursday, 25 January 2024);
- Examination information (supplementary aids, examination contents, examination literature) for decentralised examinations: in CW 12 (Monday, 18 March 2024);
- Examination information (supplementary aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 13 (Monday, 25 March 2024);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised examinations: Starting with de-registration period in CW 15 (Monday, 08 April 2024).