University of Basel

Center for Innovative Finance

# Bitcoin, Blockchain and Cryptoassets

## Intro: Welcome to the Course

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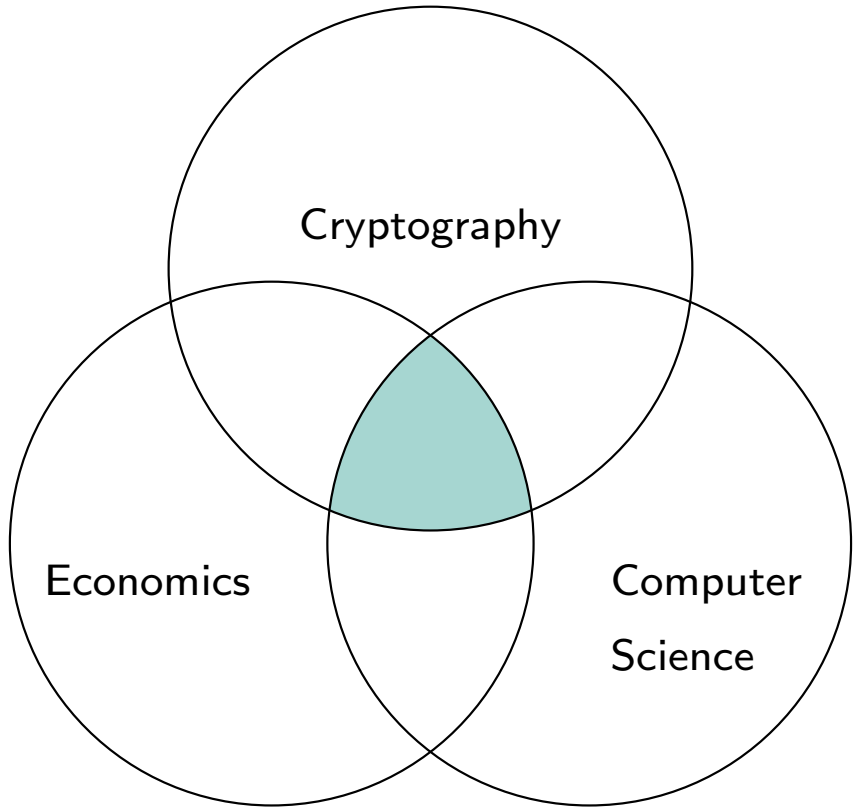
# Course Structure 1

1. **Introductory Part:**
   - Introduction to the Class
   - Foundations of Monetary Theory
   - Payment Systems
   - Monetary Control Structures
   - Bitcoin Primer
2. **Transaction Capacity:**
   - Peer-to-Peer Networks
   - The Bitcoin Network
3. **Introduction to Cryptography:**
   - Hash Functions
   - Symmetric Cryptography
   - Asymmetric Cryptography
   - Elliptic Curve Cryptography

# Course Structure 2

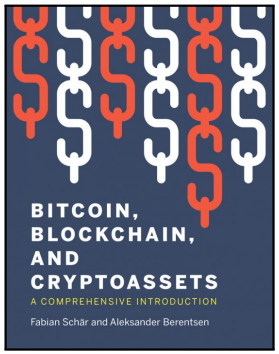
4. **Transaction Legitimacy:**
   - Transactions
   - Bitcoin Script and Standard Transactions
   - Sig Hash Types
5. **Transaction Consensus:**
   - Block Assembly and Chain Structure
   - Proof-of-Work
   - Fork Theory
   - Incentives and Potential Attacks
   - Alternative Consensus Protocols
6. **Bitcoin as Money:**
   - History of Digital Money
   - Bitcoin Volatility and Pricing Models
   - CBDC and Stablecoins

# Interdisciplinary Approach

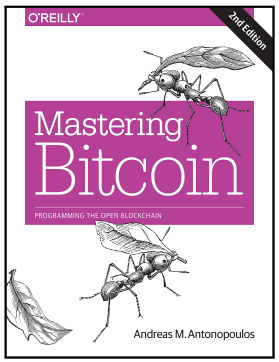



Bitcoin and public Blockchains can only be fully understood, when they are studied from various perspectives. This is the reason why this class uses an **interdisciplinary** approach.

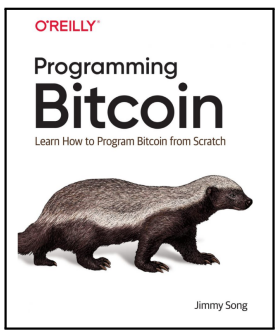
# Recommended Literature




**Bitcoin, Blockchain and Cryptoassets**
Fabian Schär and Aleksander Berentsen
ISBN: 978-0262539166



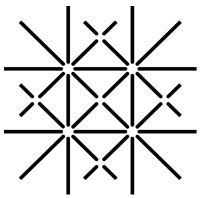

**Mastering Bitcoin - Second Edition**
Andreas Antonopoulos
ISBN: 978-1491954386




**Programming Bitcoin**
Jimmy Song
ISBN: 978-1492031499

# Part of Multi-Course Series

Blockchain courses have been part of the University of Basel's curriculum since 2017.



University of Basel

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- This is a University undergrad-/bachelor-level course
- It is part of a series of courses
- First course to switch to open lecture format

→ There is another open lecture course "Smart Contracts and Decentralized Finance" at the graduate-/master-level (↗ link to course)

# Three Options to Take This Course

The goal of our open lectures is to make teaching resources freely available. There are **three options** for taking this course:

| | Videos | Platform | Quizzes & Exercise Sets | ECTS |
|---|---|---|---|---|
| YouTube | ✓ | | | |
| Cryptolectures.io | ✓ | ✓ | ✓ | |
| University of Basel | ✓ | ✓ | ✓ | ✓ |

- YouTube Channel
- Cryptolectures.io
- University of Basel - General Information

# Quizzes and Exercise Sets

End-of-lecture quizzes and two exercise sets are available on the cryptolectures platform. Please note that these assessments are **not** graded and **entirely voluntary** for self-evaluation.

**Quizzes:**

- Simple MC questions to test yourself
- At the end of each lecture on the cryptolectures platform
- **Not** graded

**Exercise Sets:**

- PDFs on the cryptolectures platform
- Test yourself; the solutions are also available on cryptlectures.io
- **Not** graded

# Information for University of Basel Students

To earn 3 ECTS, you must pass the end-of-semester exam. Additionally, there is one voluntary mid-semester assignment that allows you to earn bonus points for the final exam.

**Mid-Semester Assignment:**

- Similar to the exercise sets
- Will be published mid-semester on ADAM
- Bonus points for the exam if you hand-in correct solutions before deadline

**Exam:**

- 90 Minutes
- Closed book
- T/F, MC, Numbers and Text/Figure Boxes
- You may use a non-programmable calculator in accordance with the ↗ faculty rules.
- Any calculator that is not included on the faculty-approved list must not be used!

# Meet the Open Lectures Team

**Professor**

Fabian Schär

**PhD Candidate**

Dario Thürkauf

**Student Assistants**

Andreas Arnold

Jonas Ruchti