



University  
of Basel

Center for  
Innovative Finance



# Bitcoin, Blockchain and Cryptoassets

## Intro: Welcome to the Course

Prof. Dr. Fabian Schär  
University of Basel

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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
- FAQ: Attack Vectors

# Course Structure 2

## 4. Transaction Legitimacy:

- Transactions
- Bitcoin Script and Standard Transactions
- Example Transaction
- Sig Hash Types

## 5. Transaction Consensus:

- Block Assembly
- Chain Structure
- Introduction to Consensus
- Consensus Protocols Overview
- Proof-of-Authority
- Proof-of-Work
- Fork Theory
- Incentives and Potential Attacks

# Course Structure 3

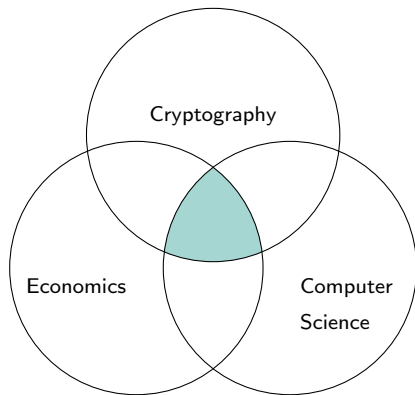
## 6. Bitcoin as Money:

- History of Digital Money
- Valuation Models
- Volatility
- CBDC and Stablecoins
- Risks and Illicit Activity

## 7. Advanced Topics:

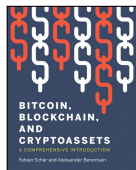
- Bitcoin Applications
- Economic Scripting
- Scalability
- Payment Channels and LN
- Transaction Malleability and SegWit
- Teaser: Next Steps

# 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

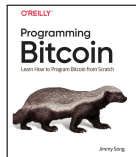
ISBN: 978-0262539166



## **Mastering Bitcoin - Second Edition**

Andreas Antonopoulos

ISBN: 978-1491954386



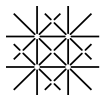
## **Programming Bitcoin**

Jimmy Song

ISBN: 978-1492031499

# Part of Multi-Course Series

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



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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 will be more open lecture courses.

# 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	Assignments	ECTS
YouTube	✓			
Cryptolectures.io	✓	✓	✓	
University of Basel	✓	✓	✓	✓

🔗 [YouTube Channel](#)

🔗 [Cryptolectures.io](#)

🔗 [University of Basel - General Information](#)



# Information for University of Basel Students

## **Exam:**

- 90 Minutes
- Closed book
- T/F, MC, Numbers and Text/Figure Boxes
- You may use a non-programmable calculator (↗ Rules)

## **Mid-Semester Problem Set:**

- Problem set will be published mid-semester
- Extra credit if you hand-in correct solutions before deadline.

# Meet the Open Crypto Lectures Team

## Professor

Fabian Schär



## PhD Candidates

Mitchell Goldberg



Matthias Nadler



Katrin Schuler



## Student Assistants

Lorenz Geering



Jakob Roth



Dario Thürkau

