

Cryptocurrency, Blockchain, and Their Business Applications

ACCT 4801

Instructor: Allen Huang (Accounting; allen.huang@ust.hk)

TA: (Vincent Leung : vincentltm@ust.hk)

COURSE DESCRIPTION

This course introduces cryptocurrencies (including Bitcoin, Ethereum, and others), blockchain, also known as distributed ledger technology (DLT), and their multidimensional business applications. Student will be equipped with fundamental skills to comprehend cryptocurrencies and blockchain/DLT, and be provided with insights into the latest development in the field.

COURSE MATERIAL

This course has no required textbooks. The following are some suggested reading/watching materials.

Key Materials:

- [Bitcoin: A Peer-to-Peer Electronic Cash System](#) (Satoshi Nakamoto, 2009)
- [The idea of smart contracts](#) (Nick Szabo)

Introductory Materials and Short Videos:

- [Explain Bitcoin Like I'm Five](#) (Non-technical)
- [Blockchain explained](#) (Non-technical) [6 minutes]
- [The Essence of How Bitcoin Works](#) (Non-technical) [5 minutes]
- [Introduction to Bitcoin](#) (Non-technical) [37 minutes]
- [How Bitcoin Works Under the Hood](#) (Somewhat technical) [22 minutes]
- [How Bitcoin Works in 5 Minutes](#) (Technical) [5 minutes]
- [Ever wonder how Bitcoin \(and other cryptocurrencies\) actually work?](#) (Technical) [26 minutes]
- [Digital Currency Tutorials](#) (Coindesk Q&A)

On-Line Course:

- [Bitcoin and Cryptocurrency Technologies](#) (Coursera, by Arvind Narayanan and follows the recommended book below. Advanced)
- [Decentralized Finance \(DeFi\): The Future of Finance](#) (Coursera, by Cam Harvey)

Recommended Books:

- [Bitcoin and Cryptocurrency Technologies](#). Princeton University Press (by Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder.) [Book based on a [Coursera](#) by the same name run by Arvind Narayanan. Lectures also on [YouTube](#).] A full pre-publication draft can be downloaded at no cost at the following link:
https://d28rh4a8wq0iu5.cloudfront.net/bitcointech/readings/princeton_bitcoin_book.pdf
- [Mastering Bitcoin](#). (by Andreas M. Antonopoulos)
The author offers a free English version here: <https://github.com/bitcoinbook/bitcoinbook>

EVALUATION

20% Class participation (10% based on class attendance and 10% based on discussion)

10% Online individual assignments (on canvas)

25% Two in-class quizzes (12.5% each)*

20% Presentation

25% Final exam*

* Quizzes and exams are open-book, open-notes but electronic devices (phone, computer, etc) are not allowed.

COURSE OUTLINE

Topic 1: Blockchain and Cryptocurrency Overview

- What is cryptocurrency and Blockchain?
- History of cryptocurrency
- How is it different from fiat currency?
- Current state of the field

Suggested Reading:

Narayanan et al., Preface

Additional Reading:

[Untraceable Electronic Cash \(Chaum, Fiat and Naor 1990\)](#)

Topic 2: Blockchain Fundamentals – Cryptography

- Blockchain overview
- Basics of cryptography in the blockchain
- Decentralized digital identity

Suggested Reading:

Narayanan et al., Ch. 1-3, 5

Topic 3: Blockchain Fundamentals – Transactions and Consensus Mechanism

- Transactions
- Block building
- Consensus mechanism

Suggested Reading:

Narayanan et al., Ch. 1-3, 5

Case: *CryptoBLK: Balancing Enterprise and Tokenization Businesses* (Case in Canvas)

Topic 4: Smart Contracts

- What is a smart contract?
- Advantage of smart contracts
- Applications of smart contracts
- A smart contract example: Lightning network

Suggested Reading:

Narayanan et al., Ch. 9

[Lightning network](#) (Summary, [white paper](#))

Additional Materials:

Lightning network status: <https://1ml.com/>

Topic 5: Practical Use of Cryptocurrency

- The cryptocurrency ecosystem
- Cryptocurrency and anonymity
- Decentralized Finance

Suggested Reading:

Narayanan et al., Ch. 4, 6

Individual assignment: Bitcoin Case

Both the case materials and questions will be posted on Canvas

Other Topic (if time allows): Valuation of Cryptocurrency

- Basic valuation approach
- Crypto valuations

Links to data sources:

Bitcoin marketcap: <https://www.blockchain.com/charts/market-cap>

Bitcoin transactional value: <https://www.blockchain.com/charts/estimated-transaction-volume-usd>

More cryptocurrency data: <https://coinmetrics.io/data-downloads/>

Additional tools: <https://coinmetrics.io/>

PRESENTATION (20%)

Each student will give an individual presentation on a topic of their choice related to cryptocurrency and blockchain. The goal is to explore a subject in depth, synthesize what you learn, and share it with the class.

Choosing a topic

You may present on any cryptocurrency- or blockchain-related topic that interests you. To help you find a direction, here are six broad categories, pick one and propose your own specific topic within it:

1. *Technology & protocols* — how something works under the hood (e.g., a consensus mechanism, a scaling solution, a privacy technique, a particular chain's design).
2. *Applications & use cases* — blockchain solving a real problem in any industry (e.g., supply chain, gaming, identity, healthcare, art, payments).
3. *Markets, finance & economics* — e.g., DeFi, valuation, trading, stablecoins, ETFs, tokenomics, market structure.
4. *Regulation, law & policy* — how any jurisdiction governs crypto, tax treatment, AML, CBDCs, legal disputes.
5. *Society, ethics & the future* — e.g., environmental impact, financial inclusion, scams and consumer protection, crypto in developing economies, where the field is heading.
6. *Case studies & post-mortems* — a deep dive on one company, project, hack, collapse, or success story (e.g., FTX, Terra/Luna, a specific protocol exploit, an adoption success).

You must submit your proposed topic for instructor approval before presenting. Topics are approved on a first-come basis to avoid duplication, so submit early. I'll discuss with each student about the topic in one of the lectures.

Format

- **Length:** 10–15 minutes of presentation, followed by 5 minutes of Q&A.
- **Slides:** Prepare a slide deck of 10–15 slides. Your final slide must list your sources. You are expected to draw on primary sources where possible (white papers, regulator filings, company disclosures) rather than relying only on news headlines or blog posts.
- **Depth:** You are expected to go beyond “what is X.” Include analysis, a tension, a trade-off, an open question, or your own assessment, and close with a “so what / what's next” takeaway.

Audience participation

Every student is required to ask at least one question during the course of the presentations (i.e., when others are presenting). This keeps the room engaged and counts toward **your class participation**.

Use of generative AI

You may use generative AI (e.g., ChatGPT) to help research and prepare your presentation and slides. However, you must fully understand your material and be able to explain and defend everything you present during Q&A.

Grading rubric for the presentation

Criterion	Weight
Content & accuracy — correctness, relevance, and use of credible sources	20%
Depth of analysis — goes beyond description; offers insight, trade-offs, or assessment	20%
Clarity of delivery — organization, pacing, and ability to explain clearly	20%
Slide quality — clear, well-designed, appropriately detailed	20%
Q&A — handles questions thoughtfully and demonstrates command of the topic	20%