

**University of Minnesota
Carlson School of Management**

Spring 2021 FINA 6125 – Cryptocurrency, Blockchain, and Their Business Applications

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Course website and calendar:
<http://www.vivianfang.org/teaching.html>

COURSE DESCRIPTION

This course discusses cryptocurrencies (including Bitcoin, Ethereum, and others), blockchain, also referred to as distributed ledger technology (DLT), and their applications in various business sectors. The course first explains the history of cryptocurrency, and the fundamentals of blockchain including cryptography and consensus mechanism. Although technical, this part is essential to establish a foundation to understand cryptocurrencies and blockchain. The rest of the course is on the applications of blockchain. We will discuss enterprise blockchain, smart contracts, and token offerings, e.g., initial coin offerings (ICOs) and securities token offering (STOs). We will have industry experts to give guest lectures on the real-world blockchain applications and interact with students. Finally, we will cover the valuation models for crypto assets, the practical details of how to use cryptocurrency, and various investments related to blockchain. The goal of the course is to provide students with a basic set of skills to understand cryptocurrencies and blockchain and how businesses can use them.

COURSE MATERIAL

No required textbook. 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, done by Arvind Narayanan and follows the recommended book below. Advanced)

Recommended Books:

- [The Age of Cryptocurrency: How Bitcoin and Digital Money Are Challenging the Global Economic Order](#) (Published in 2015; Wall Street journalists Paul Vigna and Michael J. Casey, explains cryptocurrency)
- [Bitcoin and Cryptocurrency Technologies](#). Princeton University Press (Released in 2016. 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

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- [Cryptoassets. The Innovative Investor's Guide to Bitcoin and Beyond.](#) (Published in 2017. Chris Bruniske and Jack Tatar.)
- [The Truth Machine: The Blockchain and the Future of Everything.](#) (Published in 2018, Wall Street journalists Paul Vigna and Michael J. Casey, focus on blockchain use cases)

COURSE OUTLINE (subject to change and adjustment)

Topic 1: Blockchain and Cryptocurrency Overview (March 10th, March 15th)

- 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:

Bruniske and Tatar, Ch. 1-3

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

Topic 2: Blockchain Technology and Cryptography (March 17th, March 22nd)

- Blockchain overview
- Basics of cryptography in the blockchain
- Decentralized digital identity
- Transactions
- Block building and consensus mechanism

Suggested Reading:

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

Topic 3: Practical Use of Cryptocurrency (March 24th, March 29th)

- The cryptocurrency ecosystem
- Cryptocurrency and anonymity
- Cryptocurrency wallets
- Investment in altcoins and mining
- Tax and inheritance

Suggested Reading:

Narayanan et al., Ch. 4, 6

Additional Reading:

Bruniske and Tatar, Ch. 4, 14-15

Topic 4: Enterprise Applications of Blockchain (March 31st, April 12th)

- Pros and Cons of using blockchain
- Blockchain applications in various sectors
- Notable blockchain consortiums
- Business decisions about blockchain

Topic 5: Smart Contracts (April 14th, April 19th)

- What is a smart contract?
- Advantage of smart contracts
- Applications of smart contracts
- Other use cases and characteristics

Suggested Reading:

Narayanan et al., Ch. 9

Topic 6: Token Offering and Valuation of Cryptocurrency (only if we have time left) (April 21st, April 26th)

- What is an Initial Coin Offering?
- Advantage and Disadvantage of ICO
- ICO Regulation
- Securities Token Offering – Regulated ICOs
- Trends in Token Offering
- Tokenomics
- Basic valuation approach
- Crypto valuations

Suggested Reading:

Narayanan et al., Ch. 7

[SEC Release No. 81207 \(The DAO\)](#)

Additional Reading:

Bruniske and Tatar, Ch. 16

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/>

Additional Reading:

Bruniske and Tatar, Ch. 6-13