

# **Cryptocurrency, Blockchain, and Their Business Applications**

**ACCT 5801**

**Spring 2019**

Instructor: Allen Huang (Accounting) and Yanzhen Chen (ISOM)

## **COURSE DESCRIPTION**

This course discusses cryptocurrencies (including Bitcoin, Ethereum, and others), blockchain, also referred to as distributed ledger technology (DLT), and their application 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 draws real-world applications of blockchain technology. We will discuss enterprise blockchain, smart contracts, and token offerings, e.g., initial coin offerings (ICOs), securities token offering (STOs). Finally, the course will cover the valuation models for cryptoassets, the practical details of how to use cryptocurrency, and various investment 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 can businesses 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](https://d28rh4a8wq0iu5.cloudfront.net/bitcointech/readings/princeton_bitcoin_book.pdf)

- [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)

## **EVALUATION**

20% In-class quizzes

20% Class participation

20% Individual assignment

40% Group project (including presentation)

## **COURSE OUTLINE** (Topic 2 by Yanzhen Chen; all others by Allen Huang)

### **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:*

Bruniske and Tatar, Ch. 1-3

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

### **Topic 2: Blockchain Fundamentals**

- 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: Enterprise Applications of Blockchain**

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

#### **Topic 4: Smart Contracts**

- What is a smart contract?
- Advantage of smart contracts
- Applications of smart contracts
- A smart contract example: Lightning network
- Other use cases and characteristics

*Suggested Reading:*

Narayanan et al., Ch. 9

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

*Additional Materials:*

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

Latest prediction market on Augur: <https://predictions.global/?s=Money%20at%20Stake>

#### **Topic 5: Token Offering**

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

*Suggested Reading:*

Narayanan et al., Ch. 7

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

*Additional Reading:*

Bruniske and Tatar, Ch. 16

#### **Topic 6: Valuation of Cryptocurrency**

- Basic valuation approach
- Crypto valuations

##### **Individual assignment: Bitcoin Case**

Due before class (Both the case materials and questions posted on Canvas under Files)

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

#### **Topic 7: Practical Use of Cryptocurrency**

- 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

**Session 8: Student project presentation and discussion**

*15 minutes maximum per presentation (maximum ten slides).  
Each group should have 3-4 members. Group participation is self evaluated.*