

# **Digital Currency, Blockchains, and the Future of the Financial Services Industry**

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Tisch Hall 200, 44 West 4<sup>th</sup> Street  
Tuesdays & Thursdays, 1:30 – 2:50  
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## Course overview

Recently Bloomberg summarized a new research report issued by McKinsey & Co:

*Firing people won't be enough to save the world's biggest banks from technological and regulatory changes that have reshaped the industry - whole businesses must go, according to McKinsey & Co. Almost every bank will have to quash aspirations to be all things to all customers . . . Only three to five global full-service banks will survive, McKinsey said.*

This course covers digital currencies, blockchains, and related topics in the FinTech area, perhaps the most significant innovation in the financial world since the advent of double-entry bookkeeping centuries ago. The technology appears to represent an existential challenge for major parts of the finance industry. It is now commonly suggested by experts such as McKinsey that commercial banks and stock exchanges may no longer exist, or may become much smaller, within the next 10 to 20 years, with increasing volumes of payments and exchange taking place on a peer to peer basis.

We will begin with a study of the nature of money and legacy payment and banking systems. We will then study the emergence of stateless, cloud-based digital currency systems since 2009. Further lectures will explore threats that blockchain technology poses to incumbent firms and their resulting attempts to co-opt the technology into existing business models. We survey related issues including hacking, “smart contracts,” governance, and emerging regulation.

Learning Outcomes: The goal of this course is to equip the students to better understand the law and business of blockchain technology, both in its initial application in the digital currency Bitcoin, as well as in the applications currently being explored for a wide variety of uses and functions. The course is also intended to create a bridge between law students and business students that will enhance the quality of their communications after they enter into their careers.

## Course organization

The course meets twice a week for lectures, Tuesdays and Thursdays from 1:30–2:50. The course will feature a number of guest speakers from industry and government.

We will follow the academic calendar of the Stern School, with the first class meeting January 31 and the final class on May 4. We will *not* hold class on Tuesday, February 21, even though this date is a “legislative Monday” at the Law School.

### Readings

In addition to the articles listed with each lecture topic below, we will use the following sources, all of which can be obtained at no cost:

- Carnell, Macey & Miller, *The Law of Financial Institutions* (6<sup>th</sup> edition, forthcoming). Excerpts from a draft of this textbook will be distributed to students via photocopy.
- Narayanan et al., *Bitcoin and Cryptocurrency Technologies*. This book, a companion to the Princeton open on-line course in digital currency, is available in hardcover, and a draft of the manuscript can be downloaded at:

[https://d28rh4a8wq0iu5.cloudfront.net/bitcointech/readings/princeton\\_bitcoin\\_book.pdf](https://d28rh4a8wq0iu5.cloudfront.net/bitcointech/readings/princeton_bitcoin_book.pdf)

- Goldman Sachs Equity Research, 2016, “Profiles in Innovation: Blockchain.”

<http://www.the-blockchain.com/docs/Goldman-Sachs-report-Blockchain-Putting-Theory-into-Practice.pdf>

Students are encouraged to stay current on the topic by following recent developments:

- One of the leading FinTech organizations, R3CEV, each Friday devotes a section of its website to “The Weekend Read,” which typically includes the most interesting feature journalism and research reports published in the FinTech area. The website includes an archive and can be accessed at, for instance:

<https://www.r3cev.com/blog/2016/12/11/the-weekend-read-dec-11>

- For daily breaking FinTech news, the authoritative source is

<http://www.coindesk.com/>

### Evaluation

Evaluation will be based on student papers or projects that will be due during the May exam period.

### Lecture topics

An approximate list of the course’s lecture topics appears below. We may deviate from this schedule based upon factors including the pace of individual lectures and the availability of guest speakers.

- Jan 31 Course introduction – Miller & Yermack
- *The Economist*, 2015, “The Great Chain of Being Sure About Things.”
- Feb 2 Payment systems 1 – Miller
- Narayanan et al, Preface pp 3-22.
  - Carnell, Macey & Miller (52-58; 65-78)
- Feb 7 Payment systems: the problem of bank runs and panics 2 – Miller
- Carnell, Macey & Miller (21-23; 33-38; 199-204)
- Feb 9 [Class cancelled – snow day]
- Feb 14 Managing bank runs and panics: liquidity regulation (I) – Miller
- Narayanan et al, Chapter 4.
  - Carnell, Macey & Miller (204-238)
- Feb 16 Managing bank runs and panics: liquidity regulation (II) – Miller
- Feb 23 Emergence of blockchains and digital currencies – Yermack
- Guest speaker:* W. Scott Stornetta, <http://nakamotoinstitute.org/authors/w-scott-stornetta/>
- Haber and Stornetta, 1991, “How to Time-Stamp a Digital Document.”
  - Nakamoto, 2008, “Bitcoin: A Peer-to-Peer Electronic Cash System.”
  - Narayanan et al, Chapter 7
- Feb 28 Managing bank runs and panics: capital regulation – Miller
- Carnell, Macey & Miller (238-249; 260-266)
- Mar 2 How do blockchains work? (I) – Yermack
- Narayanan et al, Chapter 5
- Mar 7 How do blockchains work? (II) – Yermack
- Yermack, “Corporate Governance and Blockchains” (2017)
- Mar 9 The New York bitcoin license – Miller
- Guest speakers:* Ryne V. Miller, <https://www.sullcrom.com/lawyers/RyneV-Miller>, and Daniel Alter, former NYDFS general counsel and former general counsel of chief compliance officer of itBit.
- NYDFS, Bitcoin License Regulation
- Mar 21 Cryptocurrencies: a better form of payment? – Miller

- Mar 23 Cryptocurrency custody, security, and dispute resolution – Yermack  
*Guest speaker:* Tim Swanson, <http://www.ofnumbers.com/about-the-author/>
- Narayanan et al, Chapter 4
- Mar 28 Money laundering, KYC, and suspicious activities – Miller  
*Guest speaker:* Brian Stoeckert, <http://www.stratisadvisory.com/firm-leadership/> (invited)
- Goldman, Sachs pp 71-77
- Mar 30 Blockchains in the capital markets – Yermack  
*Guest speaker:* Abhishek Biswas, <https://www.linkedin.com/in/abhishek-biswas-8192041>
- Apr 4 Taxation of digital assets – Miller  
*Guest speaker:* Joshua Blank, NYU School of Law
- Apr 6 Smart contracts - Yermack
- Szabo, “Formalizing and Securing Relationships on Public Networks”:  
<http://ojphi.org/ojs/index.php/fm/article/view/548/469>
  - Chamber of Digital Commerce, “Smart Contracts – 12 Use Cases for Business”
- Apr 11 Criminal activity and digital currency – Miller  
*Guest speaker:* Brian Klein, [http://www.bakermarquart.com/attorneys/brian\\_klein](http://www.bakermarquart.com/attorneys/brian_klein)
- Apr 13 Bitcoin and digital currencies as investments – Yermack  
*Guest speaker:* Barry Silbert, <http://dcg.co/who-we-are/>
- Apr 18 Ethereum and The DAO – Yermack  
*Guest speaker:* Drew Hinkes, [bergersingerman.com/people/andrew-m-hinkes](http://bergersingerman.com/people/andrew-m-hinkes)
- Hinkes, “A Legal Analysis of the DAO Exploit and Possible Investor Rights,” *Bitcoin Magazine*, July 21, 2016:  
<https://bitcoinmagazine.com/articles/a-legal-analysis-of-the-dao-exploit-and-possible-investor-rights-1466524659>
- Apr 20 Altcoins: Z-cash, Auroracoin, Ripple, etc. – Yermack
- Narayanan et al, Chapters 8, 10
- Apr 25 Blockchain uses for auditing, insurance, logistics, and other applications – Yermack

- Apr 27 Digital currency, central banking, and macroeconomics – Yermack  
*Guest speaker:* Hanna Halaburda, [bankofcanada.ca/profile/hanna-halaburda/](http://bankofcanada.ca/profile/hanna-halaburda/)
- Dyson and Hodgson, 2016, “Digital Cash: Why Central Banks Should Start Issuing Electronic Money,” *Positive Money*
  - Fung and Halaburda, 2017, “Central Bank Digital Currencies: A Framework for Assessing Why and How,” *Staff Discussion Paper, Bank of Canada*
  - Ho, 2017, “Bank of Canada’s Blockchain Tests Spotlight Challenges,” *Reuters*, February 10, <http://www.reuters.com/article/boc-blockchain-idUSL1N1FV10E>
  - Raskin and Yermack, 2017, “Digital Currencies, Decentralized Ledgers, and the Future of Central Banking.”
- May 2 Blockchains in the public sector – Yermack
- UK Government Office for Science, “Distributed Ledger Technology: Beyond Blockchain”  
  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/492972/gs-16-1-distributed-ledger-technology.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf)
- May 4 Capstone class - Miller  
*Guest speaker:* Patrick Murck, [cooley.com/people/patrick-murck](http://cooley.com/people/patrick-murck)