

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

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NYU Law School LAW-LW.12371.001  
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Paulson Auditorium, Tisch Hall upper concourse, 40 West 4<sup>th</sup> Street  
Mondays & Wednesdays, 10:30 – 11:50  
Spring 2018

## 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, cryptographic tokens, 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. New financing channels such as initial coin offerings have the potential to upend segments of entrepreneurial finance

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, decentralized, cloud-based digital currency systems since 2009, and follow-on investment products, derivatives, and innovations such as initial coin offerings. Many lectures will explore threats that blockchain technology poses to incumbent firms and even to central banks and their resulting attempts to co-opt the technology into existing business models. We survey related issues including hacking, “smart contracts,” governance, investment risk and return, and emerging regulatory approaches to these assets.

## Learning outcomes

The goal of this course is to equip the students to 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 in the financial services industry and beyond. 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, Mondays and Wednesdays from 10:30–11:50. The course will feature a number of guest speakers from industry, academia, and government.

We will follow the academic calendar of the Stern School, with the first class meeting January 29 and the final class on May 7. We will *not* hold class on February 19, which is a holiday, or during the spring break week of March 12-14.

### Readings

Many readings for the course will be posted in .pdf format on NYU Classes or will be available through Internet links included in the syllabus below.

We will also use two textbooks:

- Burniske and Tatar, *Cryptoassets: The Innovative Investor's Guide to Bitcoin and Beyond* (2018). This is a newly published book available for purchase at the NYU campus bookstore and from other retail sources.
- Narayanan et al., *Bitcoin and Cryptocurrency Technologies* (2016). This book, a companion to Princeton University's Coursera open on-line course in digital currency, is available for purchase, but a full pre-publication draft and 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)

Note that due to the fast-changing nature of the subject matter, material in both books may already appear to be out of date.

Students are encouraged to stay current on the topic by following recent developments. 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. Requirements for the final assignment will be discussed in class early in the semester.

### 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, the availability of guest speakers, and developing issues in the FinTech ecosystem.

- Jan 29 Course introduction –Yermack & Hinkes
- *The Economist*, 2015, “The Great Chain of Being Sure About Things.”
- Jan 31 Emergence of blockchains and distributed ledgers – Yermack
- Guest speaker:* W. Scott Stornetta, pioneer of the distributed ledger  
<https://www.edmodo.com/profile/4795235>  
<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.”
- Feb 5 Payment systems and the road to Bitcoin – Hinkes
- Narayanan et al, Preface, pp 3-22.
  - Burniske & Tatar, Ch. 1-3.
- Feb 7 How do blockchains Work? (I) – Yermack
- Narayanan, et al. Ch. 1.
  - Burniske & Tatar, Ch. 13.
- Feb 12 Blockchains as open source projects – Hinkes
- Guest speaker:* Prof. Angela Walch, legal authority on public blockchains  
<https://law.stmarytx.edu/academics/faculty/angela-walch/>  
[https://twitter.com/angela\\_walch](https://twitter.com/angela_walch)
- Feb 14 How do blockchains work? (II) - Yermack
- Narayanan, et al. Ch. 5.
  - Burniske & Tatar, Ch. 14.
- Feb 21 Cryptocurrency custody, security, and dispute resolution – Yermack
- Narayanan et al, Ch. 4.
- Feb 26 Cryptocurrencies - a better form of payment? – Hinkes

- Feb 28 Regulatory approaches to bitcoin/blockchain – Hinkes  
 Alternatives to proof of work – Yermack
- Mar 5 AML/KYC, blockchain tracing, and suspicious activities – Hinkes  
*Guest speaker:* Jonathan Levin, co-founder of Chainalysis  
[https://twitter.com/jony\\_levin](https://twitter.com/jony_levin)
- Goldman, Sachs pp 71-77.
  - Transcript, *In re: Ulbrecht* (re: tracing analysis).
- Mar 7 Blockchains in the capital markets – Yermack  
*Guest speaker:* Caitlin Long, former Chairman and President of Symbiont  
<https://caitlin-long.com/>  
[https://twitter.com/caitlinlong\\_](https://twitter.com/caitlinlong_)
- Yermack, 2017, “Corporate Governance and Blockchains,” Review of Financial Studies
- Mar 19 Digital currency, central banking, and macroeconomics – Yermack  
*Guest speaker:* Hanna Halaburda, Senior Analyst, Bank of Canada  
[www.bankofcanada.ca/profile/hanna-halaburda/](http://www.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-idUSL1N1FV>
  - Raskin and Yermack, 2017, “Digital Currencies, Decentralized Ledgers, and the Future of Central Banking.”
- Mar 21 Snow day – class cancelled
- Mar 26 Introduction to smart contracts and ICOs – Yermack
- Burniske & Tatar, Ch. 4 & 16
  - Narayanan et al, Ch. 9.
  - Szabo, 1996, “Formalizing and Securing Relationships on Public Networks,

<http://ojphi.org/ojs/index.php/fm/article/view/548/469>

- Chamber of Digital Commerce, 2016, “Smart Contracts – 12 Use Cases for Business & Beyond,” <http://www.the-blockchain.com/docs/Smart%20Contracts%20-%202012%20Use%20Cases%20for%20Business%20and%20Beyond%20-%20Chamber%20of%20Digital%20Commerce.pdf>

Mar 28 Ethereum and The DAO – Hinkes

*Guest speaker:* Vlad Zamfir, Ethereum Foundation

<http://hackingdistributed.com/vzamfir/>

<https://twitter.com/vladzamfir>

- Hinkes, The DAO (unpublished)
- Hinkes, “A Legal Analysis of the DAO Exploit and Possible Investor Right,” *Bitcoin Magazine*, July 21, 2016:  
<https://bitcoinmagazine.com/articles/a-legal-analysis-of-the-dao-exploit-and-possible-investor-rights-1466524659/>
- *In re:* The DAO

Apr 2 Token sales/ICOs: Regulation – Hinkes

*Guest speaker:* Dario de Martino,

Co-Chair of Blockchain and Smart Contracts practice, Morrison & Foerster

<https://www.mofo.com/people/f-dario-de-martino.html>

- SEC Report of Investigation: TheDAO,  
<https://www.sec.gov/litigation/investreport/34-81207.pdf>
- *In re* Munchee

Apr 4 Digital currencies as investments I – Yermack

*Guest speaker:* Barry Silbert, Founder, Digital Currency Group

<http://dgc.co/who-we-are/>

<https://twitter.com/barrysilbert>

- Burniske & Tatar, Ch. 14-15.

Apr 9 Digital currencies as investments II – Hinkes

*Guest speaker:* Chris Burniske, author and co-founder of Placeholder Ventures

<https://medium.com/@cburniske>

<https://twitter.com/cburniske>

- Burniske & Tatar, Ch. 7-13 (suggested)

Apr 11 Second level protocols – Hinkes

*Guest speaker:* Muneeb Ali, Co-Founder of Blockstack

<https://muneebalicom>

<https://blockstack.org>

Apr 16 Digital currency litigation – Hinkes

*Guest speakers:*

Stephen Palley, trial attorney, Of Counsel at Anderson, Kill

<https://www.andersonkill.com/People-Details/PeopleID/134>

<https://twitter.com/palleylaw>

Brian Klein, criminal defense attorney, Baker Marquart

[http://www.bakermarquart.com/attorneys/brian\\_klein](http://www.bakermarquart.com/attorneys/brian_klein)

<https://twitter.com/brianeklein>

Apr 18 Blockchains and provenance in the art world – Yermack

*Guest speaker:* Prof. Amy Whitaker,

authority on economics of fine arts and advisor to Bitmark

[https://steinhardt.nyu.edu/faculty/Amy\\_Whitaker](https://steinhardt.nyu.edu/faculty/Amy_Whitaker)

<https://twitter.com/theamywhit>

- Jason Bailey, "The Blockchain Art Market Is Here," Artnome, December 27, 2017:  
<https://www.artnome.com/news/2017/12/22/the-blockchain-art-market-is-here>
- Scott Reyburn, "Will Cryptocurrencies be the art market's next big thing?" New York Times, January 13, 2018:  
<https://www.nytimes.com/2018/01/13/arts/cryptocurrency-art-market.html>
- Additional optional reading posted on NYU Classes

Apr 23 Taxation of digital assets – Hinkes

- Burniske & Tatar, Ch. 17, pp 274-277.

Apr 25 Blockchain applications: voting, lotteries, certificate issuance and security auditing - Yermack

*Guest speaker:* Prof. Joseph Bonneau, Courant Institute  
<http://jbonneau.com/>  
<https://twitter.com/josephbonneau/>

Apr 30 Enterprise blockchains – Hinkes

*Guest speaker:* Amber Baldet, blockchain program lead, JPMorgan  
<http://amberbaldet.com/>  
<https://twitter.com/amberbaldet>  
<http://fortune.com/40-under-40/amber-baldet-31/>  
<https://www.coindesk.com/coindesk-most-influential-2017-9-amber-baldet/>

May 2 Cryptocurrency trading and hedging strategies – Yermack

*Guest speaker:* Prof. Ian D'Souza, advisor to BlockTower Capital  
<http://people.stern.nyu.edu/sternfin/idsouza/index.htm>

May 7 Altcoins – Yermack

- Burniske & Tatar, Ch. 4.
- Narayanan et al, Ch. 10.