

York University
Faculty of Liberal Arts & Professional Studies
Department of Economics
The Economics of Cryptocurrencies AP/ECON 3880
Fall 2023

Course Instructor:

Dr. Andrea Podhorsky

Teaching Assistant: TBA

Email: andrea@yorku.ca

Course Webpage: <http://eclass.yorku.ca>

Virtual Office Hours: Fridays 12:00 pm – 1:15 pm

Please sign up on eClass to schedule a 15-minute appointment on Zoom

Lecture Time and Location:

Mondays, 11:30 am; DB 0016

TA Hours: TBA

Prerequisite/Co-requisite:

AP/ECON 1000 3.00 and AP/ECON 1010 3.00 or equivalents.

This course will automatically count towards the BUEC/FBEC special course lists for students in those programs.

Course Description:

This course introduces cryptocurrencies from an economics perspective. Topics include price determination under the Proof of Work protocol, the use of a tax to restrain network electricity costs, the 51% network attack, the welfare costs and benefits of cryptocurrencies, the surrounding governance issues, central bank digital currencies and the effects of digital currencies on the monetary policies of central banks.

Required Course Materials:

Understanding Bitcoin: Cryptography, Engineering and Economics, by Pedro Franco

Recommended Course Materials:

Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, by Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder

Mastering Bitcoin: Programming the Open Blockchain, by Andreas M. Antonopoulos

Evaluation:

Test 1 (Topics 1, 2, 3)	40%	Oct 16
Test 2 (+Topics 4, 5, 6)	40%	Nov 20
Class Presentation and Participation	20%	

This course will utilize the required course textbook in addition to numerous academic articles that are accessible to an undergraduate economics audience. We will engage in a “Flipped” Classroom Model where, during the semester, groups of students will be responsible for presenting papers and for responding to other students’ presentations. Class sessions will entail collaborative and active learning

strategies including problem-solving and structured classroom discussions. Papers will be randomly assigned to the students by the professor and the assignments will be posted on eClass. The initial group presentation must be approximately 25 minutes long and must identify and directly address the main issues posed in the assigned article. Presentation responses should be about 5 minutes long and should add significant value to the initial presentation. Presentation and response guidelines will be posted on eClass.

Topics:

Topic 1:	Bitcoin Foundations and Technology: Money and Trust; Bitcoin Basics (Cryptography); Blockchain; Consensus; 51% Attack
Sept 11, 18	Franco Chapter 1, 2, 5, 6, 7; Narayanan et al. Chapter 3
Topic 2:	Bitcoin Mining and Difficulty
Sept 25	Franco Chapter 9; Narayanan et al. Chapter 5
Topic 3:	Ethereum and Smart Contracts
Oct 2	Franco Chapter 12; Ethereum Foundation https://ethereum.org/en/developers/docs/intro-to-ethereum/
Oct 9	Reading Week
Oct 16	Review; Test 1
Topic 4:	Stable Coins and Other Cryptotokens/NFTs
Oct 23	Franco Chapter 11; Narayanan et al. Chapter 10
Topic 5:	Central Bank Digital Currencies (CBDCs)
Oct 30	https://www.bis.org/publ/qtrpdf/r_qt1709f.htm The People's Republic of China's Digital Yuan: Its Environment, Design, and Implications https://www.adb.org/publications/the-peoples-republic-of-chinas-digital-yuan-its-environment-design-and-implications Contingency Planning for a Central Bank Digital Currency – Bank of Canada https://www.bankofcanada.ca/2020/02/contingency-planning-central-bank-digital-currency/ Money and Payments: The U.S. Dollar in the Age of Digital Transformation – United States Federal Reserve Board https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf
Topic 6:	Governance and stability
Nov 6	Narayanan et al. Chapter 10 Notes on Blockchain Governance https://vitalik.ca/general/2017/12/17/voting.html The Invisible Politics of Bitcoin: Governance Crisis of a Decentralized Infrastructure https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2852691 The Crypto Ecosystem and Financial Stability Challenges – International Monetary Fund https://www.imf.org/-/media/Files/Publications/GFSR/2021/October/English/ch2.ashx Executive Order on Ensuring Responsible Development of Digital Assets – President Joseph R. Biden Jr Executive Order https://www.whitehouse.gov/briefing-room/presidential-

[actions/2022/03/09/executive-order-on-ensuring-responsible-development-of-digital-assets/
https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/09/fact-sheet-president-biden-to-sign-executive-order-on-ensuring-responsible-innovation-in-digital-assets/](https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/09/fact-sheet-president-biden-to-sign-executive-order-on-ensuring-responsible-innovation-in-digital-assets/)

Blockchain & Cryptocurrency Laws and Regulations 2022 – Canada

Global Legal Insights

<https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/canada>

Nov 13 Presentations

Nov 20 Test 2

Nov 27 Presentations

Dec 4 Presentations

Presentation Articles:

1. A Fistful of Bitcoins: Characterizing Payments Among Men with No Names (October 2013)
Sarah Meiklejohn, Marjori Pomarole, Grant Jordan Kirill, Levchenko Damon McCoy, Geoffrey M. Voelker, Stefan Savage

<https://cseweb.ucsd.edu/~smeiklejohn/files/imc13.pdf>

2. Bitcoin Omnibus Survey: Awareness and Usage (November 2019)
Christopher S. Henry, Kim P. Huynh, Gradon Nicholls and Mitchell W. Nicholson

<https://www.bankofcanada.ca/2019/11/staff-discussion-paper-2019-10/>

3. Bitcoin Adoption and Beliefs in Canada (November 2021)
Daniela Balutel, Christopher Henry, Jorge Vásquez, Marcel Voia

<https://www.bankofcanada.ca/2021/11/staff-working-paper-2021-60/>

4. The Economic Limits of Bitcoin and the Blockchain (June 2018)
Eric Budish

<https://faculty.chicagobooth.edu/eric.budish/research/Economic-Limits-Bitcoin-Blockchain-June2018.pdf>

5. Risks and Returns of Cryptocurrency (July 2018)
Yukun Liu and Aleh Tsyvinski

<https://academic.oup.com/rfs/article/34/6/2689/5912024>

6. The Blockchain Trilemma (October 2020)
Yves Longchamp, Saurabh Deshpande, Ujjwal Mehra

<https://theblockchaintest.com/uploads/resources/SEBA - The Blockchain Trilemma - 2020 - Oct.pdf>

7. Systematic Literature Review of Challenges in Blockchain Scalability (October 2021)
Dodo Khan, Low Tang Jung, Manzoor Ahmed Hashmani

<https://www.mdpi.com/2076-3417/11/20/9372/pdf?version=1634728633>

8. Is Bitcoin Really Un-Tethered? (November 2019)

John M. Griffin and Amin Shams

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3195066

Cryptocurrency firms Tether and Bitfinex agree to pay \$18.5 million fine to end New York probe (February 2021)

CNBC

<https://www.cnn.com/2021/02/23/tether-bitfinex-reach-settlement-with-new-york-attorney-general.html>

9. Initial Coin Offerings and the Value of Crypto Tokens (January 2019)

Christian Catalini and Joshua S. Gans

<https://www.nber.org/papers/w24418>

10. Bitcoin's Growing Energy Problem (May 2018)

Alex de Vries

https://www.researchgate.net/publication/325188032_Bitcoin's_Growing_Energy_Problem

11. Bitcoin Boom: What Rising Prices Mean for the Network's Energy Consumption (March 2021)

Alex de Vries

https://www.researchgate.net/publication/349952553_Bitcoin_Boom_What_Rising_Prices_Mean_for_the_Network's_Energy_Consumption

12. When Cryptomining Comes to Town: High Electricity-Use Spillovers to the Local Economy (May 2021)

Matteo Benetton, Giovanni Compiani, Adair Morse

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3779720

13. How Do Private Digital Currencies Affect Government Policy? (September 2019)

Max Raskin, Fahad Saleh & David Yermack

<https://www.nber.org/papers/w26219>

14. Flight to Bitcoin (February 2022)

Gloria Yang Yu, Jinyuan Zhang

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3278469

15. Cryptocurrencies as Asset-Backed Instruments: The Venezuelan Petro (February 2018)

Usman W. Chohan

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3119606

16. Oil as Currency: Venezuela's Petro, a New 'Oil Pattern'? (January 2018)

Ignacio Herrera Anchustegui and Tina Soliman Hunter

https://www.researchgate.net/publication/329794267_Oil_as_Currency_Venezuela's_Petro_a_New_Oil_Pattern

17. Are Cryptocurrencies Currencies? Bitcoin as Legal Tender in El Salvador (April 2022)

Fernando E. Alvarez, David Argente & Diana Van Patten

<https://www.nber.org/papers/w29968>

A Poor Country Made Bitcoin a National Currency. The Bet Isn't Paying Off. (July 2022)

The New York Times

<https://www.nytimes.com/2022/07/05/world/americas/el-salvador-bitcoin-national-currency.html>

Presentation Schedule:

Date	Article Number
Nov 13	1
	2
	3
	4
	5
	6
Nov 27	7
	8
	9
	10
	11
	12
Dec 4	13
	14
	15
	16
	17

Grading Policy:

- There is no final exam in this course. Test 2 will be cumulative.
- If a student misses a test, there will be no make-up test. The weight of a missed Test 1 will be transferred to Test 2 only for medical reasons. The student must provide the instructor with an attending physician's statement within one week of the missed exam.
- If a student misses Test 2 or both tests for medical reasons, the student must provide the instructor with an attending physician's statement within one week of the missed obligation(s) and will complete an original term paper on a topic covered by the course that is assigned by the instructor. The length and requirements of the term paper will be determined by the instructor according to how much of the course work has not been completed.

Important Course Information:

Final course grades given by the instructor will use the standard York grading scale and may be adjusted to conform to Program or Faculty grades distribution profiles. In addition, all students are expected to familiarize themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage:

<https://secretariat.info.yorku.ca/files/CourseInformationForStudentsAugust2012-.pdf>

- Senate Policy on Academic Honesty and the Academic Integrity Website
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation

Course ADD/Drop Deadlines:

Last date to add a course without permission of instructor (also see Financial Deadlines)	Sept 20
Last date to add a course with permission of instructor (also see Financial Deadlines)	Sept 28
Last date to drop a course without receiving a grade (also see Financial Deadlines)	Nov 8
Course Withdrawal Period (withdraw from a course and receive a grade of "W" on transcript – see note below)	Nov 9 – Dec 5

Policy and Guidelines on Withdrawn from Course:

<https://secretariat-policies.info.yorku.ca/policies/withdrawn-from-course-w-policy-and-guidelines/>