

Module Outline

Module Title : Blockchain Applications in Finance
Class Date : From 10/6/2024 To 14/6/2024
Semester : Special Term 1 Academic Year 2022/2023
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Overview

This course introduces students to non-technical fundamentals and economics of digital assets and blockchain. After learning the basics, we will discuss blockchain applications in finance. Industry experts will give guest lectures on the real-world applications and answer questions from students.

Module Objectives

This course empowers students with the understanding of digital assets, blockchain, and their applications in the finance industry. Through lectures, discussions, and case studies, students will gain insights into various real-world applications of digital assets and blockchain. The course is focused on non-technical understanding of how blockchain and digital assets can help improve business as well as the most recent ideas, techniques, and trends in blockchain and digital assets.

Assessment

The final course grade will be computed based on the following weights:

Assessment Components	Weightage
Pre-segment readings and assignments	10%
In-class participation	30%
Team presentation	30%
Test	30%
Post-semester reflection	optional
Total	100%

In-class participation:

Online students are required to keep a video on with their real name on the screen.

In-class participation grades will be allocated on the basis of quality of participation. In evaluating class participation, I will look for comments that are thoughtful and lead the discussion forward. Excellent participation involves enhancing the class experience for your classmates by answering questions that I ask of you or the class, making relevant comments, posing valuable questions, and participating when your classmates make presentations. Peer-learning is the bedrock of executive education; please take advantage of your classmates' knowledge and experience.

Test

Test will consist of multiple-choice questions and will cover all assigned readings and problems as well as material covered and discussed in class. All questions will be designed to test your analytical and problem-solving skills, and your knowledge of conceptual and qualitative material. It is an open-book test. If you have a medical emergency, please let me know.

Team project

The objective of the team project is to identify, analyze, and present the existing real-world application of blockchain in finance industry. Please note that I am not asking you to propose your own blockchain application, but rather the one that is already existing or being developed in the real world by a specific company. You can choose to critique a failed blockchain application (we can learn from failures of others as well), but I would much prefer a valuable solution.

The ideal team presentation would provide clear description of the problem, the blockchain application, and the proposed solution. Presentation should explain how blockchain solves the existing real-world problem (or an anticipated problem). More specifically, how blockchain provides better, faster, cheaper, safer, etc, solution to a problem. Presentations do not have guidelines (except time limit – 10–12 minutes for the presentation and 8–10 minutes for questions). The team decides format of the presentation. Keep these in mind:

- You should explain why it is an interesting problem and a valuable solution.
- While you should try to present a valuable solution, do not be overly defensive about it.
- Focus on economics of it, not technical details. Leave tech issues to programmers.
- Be aware of the issues/limitations of the solution and consider laying them out explicitly.
- Be aware of the strict time limitations; practicing helps.
- Focus more on the substance of your presentation and less on fancy slides.
- Be prepared for questions.

The benefits of identifying your own topic are numerous; I would encourage you to take this seriously. However, if the team cannot find a topic, I will assign the topic to your team, but will subtract 15% from the grade. If I do not receive the tentative outline of the presentation by the deadline, I will automatically assign the topic to your team (and subtract above-mentioned percentage).

After the team presentation in class, please submit your presentation (one document per team) to LumiNUS (NUS learning portal) within 24 hours after the presentation. The document title should be “GNAM_teamX_projecttitle”. Presentations will be graded as a team (not individually). I will assign students to teams 3-4 weeks before the course begins).

DEADLINES

I encourage each team to start thinking about the project at least 2 weeks before the course (i.e., **you should start thinking about it by Monday, May 27**). Each team must submit a very brief tentative outline of the project before the class begins (**Deadline: Friday, June 7 at 12 noon**). The proposal has to be maximum 1-page long and include the group number and group members at the top. There is no need for a cover page. There is no need for any analysis in this outline; I just want to make sure that you identified an appropriate topic and started thinking about it.

Each student should submit answers to questions of required case studies (1-2 pages per case study) (**Deadline: Friday, June 7 at 12 noon**). All summaries should be in one document (each summary should start on a new page). There is no need for a cover page.

Each student is encouraged to do other pre-readings, but no written assignments or submissions are necessary.

Post-Segment Reflection

Post-segment reflection is one-page summary of key learning points from the course. I encourage you to write this summary 1-2 weeks after the semester ends. You may use any format and any material (including the material that was not presented or recommended in class). The main idea is to reflect on the learning journey after the material settled. This summary is optional and carries no extra credit.

Schedule and Outline

Lecture	Topics	Recommended Readings
June 10	Syllabus / Outline Brief History of Money and Digital Money Intro to Cryptocurrencies	Cryptoassets, Ch. 1-3 <i>DeFi and the Future of Finance, Ch. II</i> <i>An Introduction to Blockchain, UVA-F-1810</i> <i>The DAO Hack: A Blockchain Dilemma, Ivey 9B20E017</i>
June 11	DeFi Infrastructure <u>Guest Lecture (TBC)</u> Team consultations (if time permits)	<i>DeFi and the Future of Finance, Ch. III, Ch. IV, and Ch. VI</i> <i>Blockchain and the Decentralization Revolution, JPMorgan</i> <i>Banking on Blockchain, Accenture</i>
June 12	Raising Capital and Tokenization <u>Guest Lecture (TBC)</u> Team consultations (if time permits)	Cryptoassets, Ch. 16 <i>Yuser: Funding Start-up Growth with Token Issuance?, Ivey 9B20N038</i> <i>ADDX's Tokenization Dilemma</i>
June 13	Stablecoins, CBDCs, and Monetary Policy <u>Guest Lecture (TBC)</u> Test	<i>G7 Working Group on Stablecoins: Investigating the impact of global stablecoins</i> <i>Behind the Scenes of Central Bank Digital Currencies, IMF</i> <i>FinTech Notes</i>
June 14	Team Presentations	

READINGS

Required Book

- Cam Harvey et al., [DeFi and the Future of Finance](#) (2021)

Introductory Materials and Non-Technical Short Videos:

- [Explain Bitcoin Like I'm Five](#)
- [Blockchain explained](#) [6 minutes]
- [The Essence of How Bitcoin Works](#) [5 minutes]
- [Introduction to Bitcoin](#) [37 minutes]
- [Warren Buffett: Bitcoin Is An Asset That Creates Nothing | CNBC](#) [6 minutes]
- [Chamath Palihapitiya: I Am A Buffett 'Disciple' But He's Wrong About Bitcoin | CNBC](#) [5 minutes]

Required case studies

- Yuser: Funding Start-up Growth with Token Issuance?, Ivey 9B20N038
- ADDX's Tokenization Dilemma, NUS

Technical videos

- [How Bitcoin Works Under the Hood](#) [22 minutes]
- [How Bitcoin Works in 5 Minutes](#) [5 minutes]
- [Ever wonder how Bitcoin \(and other cryptocurrencies\) actually work?](#) [26 minutes]

Additional Books

- Chris Bruniske and Jack Tatar, **Cryptoassets: The Innovative Investor's Guide to Bitcoin and Beyond** (2017)
- Arvind Narayanan et al., **Bitcoin and Cryptocurrency Technologies**, (2016).
 - a) A full pre-publication draft can be downloaded for free: https://d28rh4a8wq0iu5.cloudfront.net/bitcointech/readings/princeton_bitcoin_book.pdf
- Alex Tapscott, **Web3: Charting the Internet's Next Economic and Cultural Frontier**, (2023)

Additional case studies

- An Introduction to Blockchain, UVA-F-1810
- The Economics of Cryptocurrency, UVA-GEM-0190
- Bitcoin: Investment or Illusion, UVA-F-1819
- Getting Rich on Crypto, Ivey UVAQA0897
- The DAO Hack: A Blockchain Dilemma, Ivey 9B20E017
- Visa Inc.: Threat from Cryptocurrency?, Ivey 9B20M038
- Filecoin's ICO, ABCC-2018-014
- Digital Dollars, UVAGEM0197
- Tezos: Governance in the Cryptocurrency World, F&A0549
- China Merchants Bank: Light Banking, Payments and Blockchain, Ivey 9B20N024
- R3 Corda: A Distributed Ledger Technology for Financial Services, Ivey
- TokenFunder: Democratizing Funding and Investing with Blockchain, Ivey 9B18M186
- Terra and Luna(cy): The Tale of a Stablecoin
- A Note on China's Approach to Cryptocurrency and Blockchain Application in the Games Industry: Coco Game Currency, Ivey 9B20M071
- Dianrong: Marketplace Lending, Blockchain, and "The New Finance" in China, HBP 218043-PDF-ENG
- fidentiaX: The Tradable Insurance Marketplace on Blockchain, HBP 219116-PDF-ENG
- Fluidity: The Tokenization of Real Estate Assets, HPB 219057-PDF-ENG
- Sygnum Bank AG: Investing in Crypto Space, NUS (in progress)

Additional readings

- Behind the Cryptomania, the Secret Sauce is Blockchain Technology
- Deciphering the cryptic world of Initial Coin Offerings
- How Can Initial Coin Offerings Reinvent Themselves?
- Can Security Token Offerings Save Crypto Fundraising?
- Distributed ledger technology in payment, clearing and settlement: An analytical framework, BIS
- G7 Working Group on Stablecoins: Investigating the impact of global stablecoins
- Behind the Scenes of Central Bank Digital Currencies, IMF FinTech Notes
- Centralized Money in a Decentralized World
- How China's Digital Currency and Facebook's Libra impact monetary policies
- The Transformative Nature of Blockchain-Based Smart Contracts
- Tokenization: Merging of traditional and digital finance
- Navigating the Next Wave of Blockchain Innovation: Smart Contracts
- Decentralized Finance in a Centralized World
- Blockchain and the Decentralization Revolution, JPMorgan, 2018

Additional papers for advanced students

- Nick Szabo, The idea of smart contracts, 1997
- Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System, 2009
- E Lyandres, B Palazzo, D Rabetti, ICO success and post-ICO performance, Management Science, 2021
- Y Liu, A Tsyvinski, X Wu, Common risk factors in cryptocurrency, The Journal of Finance 77 (2), 1133-1177, 2022
- Y Liu, A Tsyvinski, Risks and returns of cryptocurrency, The Review of Financial Studies 34 (6), 2689-2727, 2021
- I Makarov, A Schoar, Cryptocurrencies and Decentralized Finance (DeFi), NBER, 2022
- J Lee, CA Parlour, Consumers as financiers: Consumer surplus, crowdfunding, and Initial Coin Offerings, The Review of Financial Studies 35 (3), 1105-1140, 2022
- J Lee, CA Parlour, U Rajan, An Introduction to Cryptocurrencies, The Palgrave Handbook of Technological Finance, 79-93, 2021
- AS Hu, CA Parlour, U Rajan, Cryptocurrencies: Stylized facts on a new investible instrument, Financial Management 48 (4), 1049-1068, 165, 2019
- Liu, Tsyvinsky, and Wu, Accounting for Cryptocurrency Value, (wp, 2022)
- Cong, Karolyi, Tang, and Zhao, Value Premium, Network Adoption, and Factor Pricing of Crypto Assets, (wp, 2022)
- Shams, The Structure of Cryptocurrency Returns, (wp, 2022)
- Catalini and Wu, Do Crypto Prices Actually Mean Anything? HBR, January, 2023
- Harvey et al, Investors' Guide to Crypto
- Cong, Lin; Li, Ye; Wang, Neng, Tokenomics: Dynamic Adoption and Valuation, Review of Financial Studies. 34.3 (2021): 1105-1155
- Cong, Lin; Li, Ye; Wang, Neng, Token-based Platform Finance, Journal of Financial Economics, 2022, 144(3), pp. 972-991.
- Cong, Lin; Yizhou Xiao, Information Cascades and Threshold Implementation: Theory and an Application to Crowdfunding, Journal of Finance, 2022
- Liu et al, Technology and Cryptocurrency Valuation: Evidence from Machine Learning, 2022

Academic Honesty & Plagiarism

Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is 'the practice of taking someone else's work or ideas and passing them off as one's own' (The New Oxford Dictionary of English). The University and School will not condone plagiarism.

Artificial Intelligence (AI) tools such as ChatGPT do not require specialist knowledge to use. Many of these AI tools are commonly used in social media, for example, to create content and disguise and refine content created from programmes like ChatGPT. We understand that students will be drawn to using these AI Tools, as they would for any other electronic aid.

However, to be clear, normal academic rules still apply. As noted in the Code of Student Conduct:

"The University takes a strict view of cheating in any form, deceptive fabrication, plagiarism and violation of intellectual property and copyright laws. Any student who is found to have engaged in such misconduct is subject to disciplinary action by the University.

With respect to AI tools (e.g., ChatGPT and image generation tools), your instructor will clarify whether the use of these tools as inputs into your assignment development process is acceptable. AI is a technology that requires skill to use, and knowledge about when and how to use it. If you use ChatGPT or any other such AI tool in your work, you must provide a proper representation of how you used the tool and what prompts you used to generate output. Failure to cite its use constitutes academic misconduct.

Further, as with any information source, be aware that minimal efforts yield low quality results. You will need to refine your work and fact check the output, as you would double-check information from any source. Further, you should be selective in how and when you use such tools instead of using it for each and every assignment you create.

To summarise:

1. Always check with your instructors on what are the permitted uses of AI tools.
2. Have a discussion at the start of a course about the use of AI.
3. Where permitted, acknowledge your use of AI.
4. You remain responsible for the quality of your work and its appropriate representation.
5. Failure to follow the above steps can lead to a concern about plagiarism (academic dishonesty).

As always, you have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is entirely your own work. This is a minimum standard.

Additional guidance can be found at:

Admission Condition: <http://www.nus.edu.sg/registrar/administrative-policies-procedures/acceptance-record#NUSCodeofStudentConduct>

NUS Code of Student Conduct: <http://nus.edu.sg/osa/resources/code-of-student-conduct>

Academic Integrity Essentials: <https://libguides.nus.edu.sg/new2nus/acadintegrity#s-lib-ctab-22144949-4>

Guidelines on the Use of AI Tools For Academic

Work: <https://libguides.nus.edu.sg/new2nus/acadintegrity#s-lib-ctab-22144949-3>