Course Outline

Course : The NUS BBA
Course Code : FIN4721
Course Title : AI, Blockchain and Quantum Computing
Class Date : From 19/1/2026 To 13/4/2026
Semester : Semester 1, Academic Year 2025/2026
Location : BIZ2-0111
Faculty : Prof David Lee Kuo Chuen, CFtP
Guest Lecturers: Gary Loh, CFtP, Kit Wong, CFtP, Dr James Ong (Alternative)
Department : Finance
Email : DavidLee@nus.edu.sg;
Note : Emphasis on AI, videos, hands-on experiences, group presentations and applications.
Linkedin Profiles: https://www.linkedin.com/in/david-lee-kuo-chuen-%E6%9D%8E%E5%9B%BD%E6%9D%83-07750baa/
https://www.linkedin.com/in/gary-loh-43541a37/
https://www.linkedin.com/in/jamesongkayliang/
https://www.linkedin.com/in/kit-wong-39468935/

Overview

This course provides a comprehensive framework and analysis of the latest technological advancements in the financial and insurance sectors, including emerging technologies like AI, Blockchain, Cloud & Cyber Security, Data Analytics, Environmentally Friendly Technology, Financial Inclusion, 5G, and Quantum Computing (ABCDEFG-Q). It aims to enhance students' technology literacy and equip them with the tools to critically evaluate inclusive FinTech, Generative AI, and open metaverse projects in a trustless world. The class leverages technology to provide lectures through recorded videos, discussions, AI and quizzes.

Module Objectives

Upon completion of the course, students will be able to:

- Grasp the underlying design principles behind technology.
- Evaluate inclusive fintech projects with a critical eye.
- Appreciate the social and business implications of technology.
- Possess the technical skills necessary to address the needs of underserved communities.
- Apply learned techniques to real-world scenarios.

Rules and Expectations

1. Students are required to bring their computers (laptops preferred) to every lecture and be ready to participate actively in discussions, hands-on activities, and in-class problem solving.
2. Video presentations and case studies may be shown in class, followed by guided discussions. Students are welcome to raise questions during the session for immediate clarification.
3. This course is designed around a peer-to-peer, decentralised learning model, where collaborative learning, exchange of ideas, and active participation are essential to maximise learning outcomes.
4. Consistent, meaningful participation—both online and in face-to-face sessions—is crucial. Engagement is directly linked to understanding the materials and performing well in assessments.
5. Lectures covering AI and Blockchain will run in two tracks, and may alternate depending on the professors' schedules. Students are expected to adapt accordingly.
6. Submit all work online. Deadline will be given. Group Project is due one day before the presentation.
7. Please note that missing lessons will significantly hinder your progress. If you are unable to commit to attending all sessions, we strongly advise against taking this course—past students who skipped classes have failed.

8. If you do miss a lesson, you are expected to self-study the assigned chapter(s). Most lecture slides derive directly from the textbooks, and supplementary video links (if provided) will help you catch up. The materials available are more than sufficient for independent learning. Usually the slides alone are enough.
9. Professors will not answer questions that have already been covered in class, in reference to those related to assessment requirements or expectations. Such questions must be raised during class to avoid misunderstandings due to incomplete or second-hand information.
10. This is not an easy course for students who are not genuinely interested in FinTech. Several students have failed, especially those who were absent. We reiterate: if you cannot attend all classes, this course is not recommended.
11. Who should NOT take this course:
    Students taking it only to accumulate credits to graduate.
    Those not interested in a career in FinTech.
    Students unable to attend make-up classes.
    Those not keen to hear real-life experiences from guest speakers or engage with industry practitioners.
    Students who prefer not to make independent decisions or dislike uncertainty.
12. Who should absolutely take this course:
    Students eager to try new things and explore emerging technologies for good.
    Individuals comfortable with ambiguity and capable of organising themselves in dynamic, fast-changing environments.
    Those who want to stay current with market developments and theories of the digital economy.
    Students who take the course to genuinely enrich themselves.
    Individuals who actively engage with the industry and see challenges as opportunities rather than burdens.

Assessment

Assessment Components	Weightage
Weekly Learning Log, Weekly Group PPT, End of Class Quiz, Chat Discussion and Verbal Participation	15
Group Project (Video, PPT and Answers to Questions from other groups)	30
Mid-Term Test (1.15 hours, closed book, Multiple Answers and Short Questions, covered all previous lessons)	30
Final Test (1-hour, closed book, Multiple Answers and Short Questions, covered all lessons)	25

Schedule and Outline

Dates	AI	Blockchain and Quantum	Notes
22 Jan		Bitcoin Design Thinking	**Prof David Lee**
24 Jan (Sat) SA1: 9-12am SA2: 12-3 To be confirmed		Bitcoin Design Thinking	**Prof David Lee**
29 Jan		Ethereum Design Thinking	**Prof David Lee**

5 Feb		Ethereum Design Thinking	**Prof David Lee**
12 Feb		DeFi and AMM	**Prof David Lee**
19 Feb		**Mid-Term Test** **(Covered all previous lessons)**	**Prof David Lee**
12 Mar	**GenAI and its applications**		**SA1 Kit Wong** **SA2 Kit Wong**
19 Mar	**Deep learning basics**		**SA1 Gary Loh** **SA2 Kit Wong**
26 Mar	**LLMS for finance**		**SA1 Gary Loh** **SA2 Gary Loh**
2 Apr	**Crypto AI and Applications**	**Crypto AI, Ethics and Quantum Resistance**	**Prof Lee**
9 Apr		Presentation	**Prof David Lee**
16 Apr		**Finals (Covered all lessons)** Guest Speakers	**Prof David Lee**

General Guide & Reading

Updated course outline and reading will be given when term begins.

Main Text and Reading

1. "Inclusive FinTech: Blockchain, Cryptocurrency and ICO", David Lee Kuo Chuen and Linda Low, World Scientific.
2. "AI and Quantum Computing for Finance and Insurance", Paul Schulte and David Lee Kuo Chuen, World Scientific.
3. "Artificial Intelligence, Data and Blockchain in a Digital Economy", David Lee Kuo Chuen, World Scientific.
4. "Blockchain and Smart Contracts". Lo Swee Won, Cheryl Wang and David Lee Kuo Chuen, World Scientific,
5. "Foundations for Fintech" David Lee Kuo Chuen, Joseph Lim, Phoon Kok Fai, Wang Yu, Global Fintech Institute – World Scientific Series on Fintech
6. "Applications and Trends in Fintech I", David Leek Kuo Chuen, David Lee Kuo Chuen, Joseph Lim, Phoon Kok Fai, Wang Yu, Global Fintech Institute – World Scientific Series on Fintech
7. "Fintech for Finance Professionals", David Leek Kuo Chuen, David Lee Kuo Chuen, Joseph Lim, Phoon Kok Fai, Wang Yu, Global Fintech Institute – World Scientific Series on Fintech
8. "Handbook of Blockchain, Digital Finance, and Inclusion, Volume 3: Blockchain, Artificial Intelligence, Mobile Security, and Regulation. RH Deng, David Kuo Chuen Lee.
9. "Inclusive Disruption: Digital Capitalism, Deep Technology and Trade Disputes". DKC Lee, L Low, J Lim, CCM Shih
10. "Handbook of Digital Currency: bitcoin, innovation, financial instruments and big data". DKC Lee

Reading (To Supplement and as ideas for Group Presentations)

1. "Emergence of FinTech and the LASIC Principles", David Lee Kuo Chuen and Ernie Teo, Journal of Financial Perspectives, Vol. 3, No. 3, 2015 https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2668049
2. "Handbook of Blockchain, Digital Finance, and Inclusion: Cryptocurrency, FinTech, InsurTech, and Regulation", David Lee Kuo Chuen, RH Deng – 2018
3. "Handbook of Blockchain, Digital Finance, and Inclusion: ChinaTech, Mobile Security, and Distributed Ledger", David Lee Kuo Chuen, RH Deng – 2018 (**HB**)

4. "CRypto IndeX", 2015, by Wolfgang Hardle and Team and initiated by David Lee Kuo Chuen, https://thecrix.de/
5. Decentralisation and Distributed Innovation: Fintech, Bitcoin and ICO's, David Lee, 2018, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3107659
6. The New Money: The Utility of Cryptocurrencies and the Need for a New Monetary Policy, David Lee and Ernie Teo, 2019, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3608752
7. Blockchain Use Cases for Inclusive FinTech: Scalability, Privacy, and Trust Distribution, David Lee and Caroline Lim, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3629135
8. Fintech Tsunami: Blockchain as the Driver of the Fourth Industrial Revolution, David Lee, 2017, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2998093
9. Libra: It is a fine balance, David Lee and Ernie Teo, 2018, https://jupiterchain.tech/facebook-libra/
10. Blockchain and Inclusion, David Lee, 2018, https://vinaj.com/spotlight-series/interview-with-david-lee-kuo-chuen-professor-of-fintech
11. Digital Economy and Blockchain, David Lee, 2020, http://tfageeks.com/2020/05/31/digital-economy-and-blockchain-professor-david-lee-kuo-chuen-professor-of-finance-programme-singapore-university-of-social-sciences/
12. Other articles and cases assigned

Cases

1. Ant Financial: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3052318
Robinhood and FTX
2. Trusted Third Party: https://nakamotoinstitute.org/trusted-third-parties/
3. Social Scalability:
http://unenumerated.blogspot.com/2017/02/money-blockchains-and-social-scalability.html
4. Satoshi Nakamoto White Paper (2008): https://bitcoin.org/bitcoin.pdf
5. Smart Contract: https://nakamotoinstitute.org/the-idea-of-smart-contracts/
6. DAO Governance and Voting: Digital Currency 2nd Edition
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4442470
7. Central Bank Digital Currency: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3608752
https://www.adb.org/sites/default/files/publication/906241/central-bank-digital-currency-developments-asia-implications.pdf

Weekly Learning Log and Participation

Submit the summary/study log in the given format/Group Presentation by the next lecture using the provided template. This must be done for all lectures (unless the professor decides otherwise for the week) and indicate any absences in the top right corner. There may be class quizzes.

Group Project

Each group will consist of x (class size divided by 10) students with a maximum of 10 groups, formed on **CANVAS** by students by the second lesson. The presentation will involve a 10-minute PowerPoint video presentation of not more than 15 slides (excluding the intro and references).

The students will choose a research or discussion topic on AI, Blockchain, and Quantum Computing, either from the course material or beyond, and must apply the concepts taught in the course. All references must be acknowledged on the slides, including figures, diagrams, pictures, and quotes. **The theme this semester is Crypto-AI, DeFAI, Dynamic Stablecoins, Quantum Resistance Public Blockchain, DeFi, MEV and AMM. There must be at least one slide on the ethical application to the topic covered.**

Grading will be based on content and presentation flow (20%), analysis and technical expertise (20%), original charts, diagrams, infographics, and figures (50% and most important), and conclusion (10%). Those who create viral-potential infographics can score a full 50 marks.

The video presentation must be submitted on Canvas as in all assignments. If unsure of the topic, a 100-word proposal can be submitted to the professor (DavidLee@nus.edu.sg) before preparation. Each student will present in the video. Each Group is to ask at least one question for each video. These questions should be given to the video group and the group should answer all the questions with a paragraph or maximum of 100 words for each and submit the answers online.

(Submission: STRICT 10-minute video, PPT a day before presentation at noon. Once the videos are posted or played, the group should ask the question before the end of the presentation on Canvas Chat, and the answers to the other groups should be submitted within 24 hours after the presentation.)

Midterm Test
1.15 minutes CLOSED book test.

Final Test
1 hour CLOSED book test

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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. Students should adopt this rule - 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 being presented as entirely your own work. This is a minimum standard. **In case of any doubts, you should consult your instructor.** You are encouraged to use Generative and Agenic AI for your work, but whatever you use has to be declared.

Additional guidance is available at:
http://www.nus.edu.sg/registrar/adminpolicy/acceptance.html#NUSCodeofStudentConduct

Online Module on Plagiarism:
http://emodule.nus.edu.sg/ac/

Disclaimer: Use of Generative AI in Teaching Materials

This course may incorporate content partially generated or refined using generative artificial intelligence (GenAI) tools (e.g., ChatGPT, Claude, Gemini), especially when diagrams require further detailed explanations. The course materials contain less than 10% generated by AI, and we hope to increase this to less than 20% over time. Please note the following:

1. **Transparency & Disclosure:**
    - AI-generated content is used strictly as an aid to enhance pedagogical efficiency or clarity.
    - All AI-assisted content undergoes rigorous review, fact-checking, and refinement by the instructors to ensure accuracy, relevance, and alignment with learning objectives.
2. **Instructor's Responsibility:**
    - The instructor assumes full responsibility for the quality, accuracy, and educational integrity of all materials presented, regardless of their origin (human or AI-assisted).
    - Final editorial control, pedagogical intent, and adherence to academic standards rest solely with the instructor.
3. **Purpose & Limitations:**
    - AI tools are used to support—not replace—instructor expertise. They may assist in drafting explanations, generating examples, or structuring complex ideas.
    - **AI outputs can contain errors, biases, or outdated information.** All AI-generated content is critically evaluated and contextualized by the instructor before inclusion.
4. **Ethical Use & Attribution:**
    - This disclaimer serves as acknowledgment of GenAI's potential role, in line with NUS guidelines (Section 2.1: *"Be Transparent About the Use of AI"*).
    - Students are expected to adhere strictly to NUS policies (Section 4) regarding their *own* use of AI in assignments, including proper attribution where permitted.
5. **Critical Engagement:**
    - Students are encouraged to critically evaluate all course materials (human- or AI-generated) and consult primary sources (see the reading list) or the instructor for clarification. It is therefore important to read the source when revising the materials.
    - The limitations of GenAI (e.g., potential hallucinations, bias, lack of true understanding) are discussed as part of developing digital literacy.

6. **Contact:**

   Questions or concerns regarding AI use in this course may be directed to: Davidllee@nus.edu.sg.com