UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
BLOC-527DL	Open and Decentralized Financial Systems	10
Prerequisites	**Department**	**Semester**
BLOC-511DL	Digital Innovation	Fall/Spring
Type of Course	**Field**	**Language of Instruction**
Elective	Finance	English
Level of Course	**Lecturer(s)**	**Year of Study**
2nd Cycle	Dr. Ifigenia Georgiou Dr. Apostolos Kourtis Teaching Assistant Mr. Mark Wigmans	2nd
Mode of Delivery	**Work Placement**	**Corequisites**
Distance Learning	N/A	N/A

Course Objectives:

The main objective of the course is to identify how key infrastructural elements of existing international financial systems can be implemented using blockchain technology in a decentralized manner.

The elements of the existing financial system and their blockchain-based equivalents that will be covered in this course will be:

1. Gross settlement systems; settlement under blockchain models.
2. Money Transmission, payment Services and e-money; digital currencies as a method of payment and processing.
3. Securities, assets and commodities trading and settlement; digital currency exchanges; hybrid and decentralized exchange systems.
4. Insurance in conventional financial systems; decentralizing aspects of insurance, opportunities and challenges.
5. Accounting, auditing and financial controls in conventional systems; decentralizing accounting and taking advantage of the blockchain for transparency, corporate governance and regulation.

As part of the group work in this course, the students will have the opportunity to design their own blockchain-based financial system, product or service. Learning will be supported with a range of interactive activities, such as online quizzes, forum debates and student presentations.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Map a functional systems' architecture underlying the current financial system and explain if and how the system can be disrupted by using a blockchain architecture as well as assess the new risks and challenges.
- Write theory, evidence-based articles and reports on financial systems, whether traditional, blockchain based, or hybrid.
- Carry out analyses of the complete vertical process of how transactions take place in conventional and decentralized financial systems, including the spread of risk at each stage and the types of risk users are exposed to.
- Apply concepts from existing financial systems and products to open and decentralized digital currency infrastructures.

Course Content:

1. Overview: Key aspects of financial / payments architecture and emerging analogues in blockchain-based systems.
2. Gross Settlement Systems (Target2, CHIPS, Fedwire) and their equivalents in blockchain-based systems
3. Net Settlement: ACH / EFTS and their analogues in blockchain-based systems
4. FX transactions and cross-border payments using conventional and decentralized systems
5. Money Transmitters, credit and debit Card Networks and their relevance in P2P systems
6. Payment workflow in blockchain-based systems
7. Security, asset and commodity settlement, custodians, clearinghouses
8. Decentralizing asset and security issuance and trading using blockchain technology; digital currency exchanges
9. Insurance basics, differences from conventional financial markets (future and prediction markets) and structure of risk in insurance systems
10. Decentralizing Insurance, parametric insurance, viability of oracles, decentralizing

insurance risk management and differences from conventional approaches

11. Accounting, financial controls, and auditing in conventional systems

12. Decentralizing financial controls and making the most of blockchain structures for transparency, accountability, governance and regulatory oversight

13. Group project presentations

Learning Activities and Teaching Methods:

Lectures, Live Discussions, Interactive Quizzes, Forum Debates, Project Presentations

Assessment Methods:

Online interactive quizzes, Participation in forum debates, Group Project, Final Exam

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Peter Lipovyanov	Blockchain for Business 2019	Packt Publishing	2019	ISBN: 9781789956023
Tom Kokkola (Ed.)	The payment system	European Central Bank	2010	ISBN 978- 92899-0632-6 (print) ISBN 978- 92899-0633-3 (online)
Dominique Rambure, Alec Nacamuli	Payment Systems: From the Salt Mines to the Board Room		2008	ISBN-10: 0230202500 ISBN-13: 978-0230202504

Selected Readings:

*Please also see recommended readings at the end of each PowerPoint presentation for each one of the sessions, as this list will be updated as the academic literature develops.

Please note that even though oftentimes we do provide the actual reading text or the links on Moodle, it is the responsibility of the student to retrieve suggested readings from the Web and when appropriate – i.e. when they are from non-open-source journals, from the UNIC Library (online)

Topic 1

- Bech, M., Shimizu, Y. and Wong, P., 2017. The quest for speed in payments. BIS Quarterly Review.

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2931564

- Bech, M. and Garratt, R., 2017. Central bank cryptocurrencies. BIS Quarterly Review, 55.

https://www.bis.org/publ/qtrpdf/r_qt1709f.pdf

- Mills, D., Wang, K., Malone, B., Ravi, A., Marquardt, J., Chen, C., Badev, A., Brezinski, T., Fahy, L., Liao, K. and Kargenian, V., 2016. Distributed ledger technology in payments, clearing, and settlement. Washington: Board of Governors of the Federal Reserve System.

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2881204

- Peters, G.W. and Panayi, E., 2016. Understanding modern banking ledgers through blockchain technologies: Future of transaction processing and smart contracts on the internet of money. In Banking Beyond Banks and Money (pp. 239-278). Springer, Cham.

https://pdfs.semanticscholar.org/0a84/a077ada2acb6918e7764fafcd28f667dae28.pdf

Topic 2

- Holotiuk, F., Pisani, F. and Moormann, J., 2017. The impact of blockchain technology on business models in the payments industry.

https://www.wi2017.ch/images/wi2017-0263.pdf

- Jonker, N., 2018. What drives bitcoin adoption by retailers.

https://www.dnb.nl/en/binaries/Working%20Paper%20No.%20585_tcm47-373269.pdf

- Shahzad, F., GuoYi, X., Jian, W. and Shahbaz, M., 2018. An empirical investigation on the adoption of cryptocurrencies among the people of mainland China. Technology in Society.

https://www.sciencedirect.com/science/article/pii/S0160791X18300204

Topic 3

- Benos, E., Garratt, R. and Gurrola-Perez, P., 2017. The economics of distributed ledger technology for securities settlement. Bank of England, Working Paper.

https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2017/the-economics-of-distributed-ledger-technology-for-securities-settlement.pdf

- Chiu, J. and Koeppl, T.V., 2018. Blockchain-based Settlement for Asset Trading, Queen's University, Working Paper.

https://www.bankofcanada.ca/wp-content/uploads/2018/09/swp2018-45.pdf

Topic 4

- Gatteschi, V., Lamberti, F., Demartini, C., Pranteda, C., & Santamaría, V. (2018). Blockchain and Smart Contracts for Insurance: Is the Technology Mature Enough?. Future Internet, 10(2), 20.

http://www.mdpi.com/1999-5903/10/2/20/html

- Hans, R., Zuber, H., Rizk, A., & Steinmetz, R. (2017). Blockchain and Smart Contracts: Disruptive Technologies for the Insurance Market.

ftp://dmz02.kom.e-technik.tu-darmstadt.de/papers/HZR+17-1.pdf

- Klomp, L. (2018). The impact of blockchain technology on insurance business models: Stress testing the insurers' business models using the STOF Model.

https://repository.tudelft.nl/islandora/object/uuid:76fc815e-b11a-4fdc-932b-35e398c4d89d?collection=education (This is a Master Thesis and it is long, but many of the chapters and the sections are very relevant to this course and to the insurance industry in particular. Read selectively.)

- How Blockchain Could Disrupt Insurance

https://www.cbinsights.com/research/blockchain-insurance-disruption/

- Chain Reaction: How Blockchain Technology Might Transform Wholesale Insurance (by Michael Mainelli and Bernard Manson, 2016, PWC)

https://www.pwc.lu/en/fintech/docs/pwc-how-blockchain-technology-might-transform-insurance.pdf (Long document, read selectively.)

- Crawford, S., Meadows, I., and Piesse, D. (2016). Blockchain Technology as a Platform for Digitization: Implications for the Insurance Industry, EY.

http://www.ey.com/Publication/vwLUAssets/EY-blockchain-technology-as-a-platform-for-digitization/$FILE/EY-blockchain-technology-as-a-platform-for-digitization.pdf

- Blockchain in insurance: Turning a buzzword into a breakthrough for health and life insurers

Deloitte, 2015)

https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-blockchain-in-insurance-ebook.pdf (Long document, read selectively.)

Topic 5

- Kuhn, B. D. (2018). The Impact of Blockchain Technology on Business, Financial Auditors, and Accounting Professionals.

https://commons.lib.niu.edu/bitstream/handle/10843/17863/Capstone_Blockchain_Final.pdf?sequence=3 (This is a Master Thesis and it is long, read selectively.)

- Melnychenko, O., & Hartinger, R. (2017). Role of blockchain technology in accounting and auditing. European Cooperation, 9(28), 27-34.

http://we.clmconsulting.pl/index.php/we/article/view/191

- Potekhina, A., & Riumkin, I. (2017). Blockchain–a new accounting paradigm: Implications for credit risk management.

https://www.diva-portal.org/smash/get/diva2:1114333/FULLTEXT01.pdf (This is a Master Thesis and it is long, read selectively.)

- Rückeshäuser, N. (2017). Do we really want blockchain-based accounting? Decentralized consensus as enabler of management override of internal controls.

https://www.wi2017.ch/images/wi2017-0112.pdf