

CE/CZ4153
Blockchain Technology

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Instructor



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Instructor and Course Coordinator



Alex Luoyuan XIONG

Cryptography Engineer

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Invited Instructor



***"Insomnia eh? Have you tried listening
to a guy try to explain Bitcoin?"***

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Learning Outcomes

- recognize and identify various consensus protocols in distributed systems,
- discuss and explain Bitcoin blockchain, its technical mechanisms, and protocols,
- discuss and explain Ethereum blockchain, its smart contracts, DApps, and tokens,
- design and develop decentralized apps using tokens and smart contracts,
- analyse and argue anonymity, security, and privacy issues in modern blockchain,
- analyse and argue scalability and interoperability of blockchain platforms,
- examine and create enterprise solutions and applications of blockchain.



Cx4153 Course Delivery

Flipped Classroom

13 LAMS Sequences

Online Lectures and Informal Quizzes

Interactive Learning

12 Seminar + Tutorial

Invited Talks and Deep-Dive Sessions

Group Discussions and Interactions

Primary Topics (in the LAMS)

Topics for Seminars

Module 01	1 Week	Motivation and Introduction Distributed Systems, Consensus and Blockchain	<i>Introduction & Admin Matters</i>
Module 02	3 Weeks	The Bitcoin Blockchain Construction and Mechanics of Bitcoin Blockchain Mining, Proof-of-Work, Consensus and Optimizations	<i>Textbook Streamlined Blockchain and other variations in AltCoins.</i>
Module 03	3 Weeks	The Ethereum Blockchain Ethereum Virtual Machine and Smart Contracts DApps, Tokens and Cryptocurrency Eco-System	<i>Design and Development of DApps using the Ethereum Blockchain.</i>
Module 04	2 Weeks	Decentralized Finance Blockchain Primitives and Protocols in DeFi Stablecoins, DEX, Lending and Borrowing	<i>Case Studies on DeFi Primitives, Protocols and Applications.</i>
Module 04	3 Weeks	Practical aspects of Blockchain Security and Privacy in Blockchain Frameworks Scalability and Interoperability of Blockchain	<i>Case Studies on Security, Privacy, Anonymity and Scalability.</i>
Module 05	1 Week	Other Pertinent Topics Enterprise Blockchain Solutions and Applications Blockchain Laws, Regulations and Governance	<i>Case-Studies on Enterprise Ideas and Solutions using Blockchain.</i>

Deep-Dive

Consensus Protocols

Bitcoin Mechanics

Smart Contracts

Security and Privacy

Decentralized Finance

Invited Talks

Security of Blockchain

Security issues in DeFi

Blockchain Scalability

Decentralized Finance

Enterprise Applications

Hands-on Sessions

Ethereum Development





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Performance Evaluation
No Final Examination

Assessments

Quizzes based on Lectures	40%
Development Project (Group)	40%
Term Paper (Group)	20%

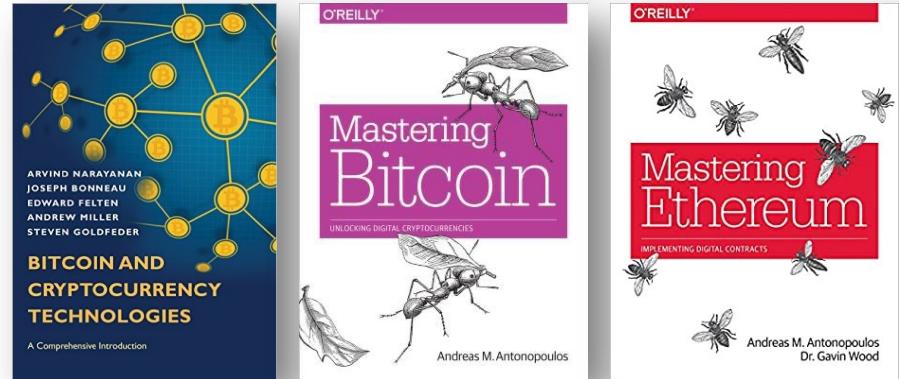
You may choose your own groups in both cases!



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References and Resources

No Single Textbook



You may refer to these three books (not mandatory).
More resources will be shared during the sessions.



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Support System

2 Teaching Assistants

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Gwyneth Ang Xin Yi

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- Your primary points of contact on MS Teams.
- Consult regarding the Development Project.
- Discuss ideas and plan for the Term Paper.

Discuss the LAMS material with the Instructors.

*SAVE
THE
DATE*

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Course Calendar

Check on NTU Learn

Week 01 : Introduction + LAMS start

Week 02 – 05 : Tutorials + Seminars

Week 06 : Invited Talk + Demo Session

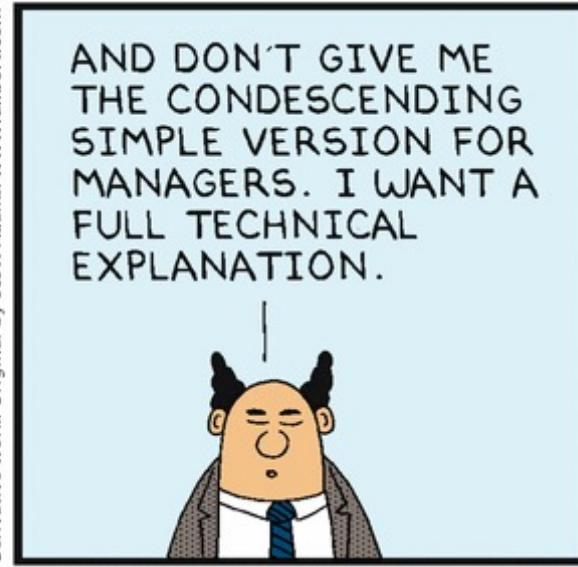
Week 07 : Quiz 1 + DApp Workshop

Week 06 – 11 : Dev Project (Group)

Week 08 – 12 : Tutorials + Invited Talks

Week 11 – 15 : Term Paper (Group)

Week 13 : Quiz 2 + Invited Talk



Questions or Comments?

Sourav SEN GUPTA

Course Coordinator, SCSE, NTU

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