

CIS600/FIN600: Blockchain and Cryptocurrencies

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Course Description

BitCoin/Blockchain is a disruptive technology across many industries, including banking, supply-chain, insurance, cloud, information-technology and beyond. This course teaches about the BitCoin/Blockchain technology from a practice perspective. The learning objective is for students to identify, design and develop business applications on BitCoin and Blockchain. Towards the goal, it will include lectures, case studies, labs and projects on BitCoin/Blockchain. The hands-on part of the course will be application design and development on real software (ethereum.org). It will cover Bitcoin and Blockchain in terms of their interfaces, applications and internal mechanisms.

This is a 3-credit course co-taught by Dr. Tang and Dr. Velu. The lectures will cover the Blockchain technology and applications interspersed.

Learning Objectives

Students will be able to 1) analyze existing applications on Blockchain, 2) design and development applications on Blockchain/cryptocurrency, and 3) identify new Blockchain applications in various functional areas of business. The learning goals will lead to potential startup opportunities on Blockchain.

Texts - Recommended

Bitcoin and Cryptocurrency Technologies, Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder, [[online book](#)]

Mastering Ethereum: Smart contract and decentralized applications Andreas M. Antonopoulos, Gavin Wood [[online book](#)]

Mastering Bitcoin: Programming the Open Blockchain Andreas Antonopoulos [[online book](#)]

Ethereum White Paper: A Next-Generation Smart Contract and Decentralized Application Platform, [[online book](#)]

Grading

Class participation (15%), labs (50%), project/technical reviews (35% choose one)

Course Schedule (Tentative)

- Blockchain protocol and system
 - Transaction storage
 - Smart-contract execution platform
 - Cryptocurrency mining
- Blockchain security
 - Blockchain attack surface
 - Blockchain security analysis
- Decentralized domain applications and case studies
 - Cryptocurrency in financial applications: pricing and trading
 - Case studies: SilkRoad, CryptoKitties, Ransomware, etc.
- Labs: <https://blockchainlabsu.github.io/>

- Projects: selected advanced topics in Blockchain security, systems and applications.