CIS600/FIN600: Blockchain and Cryptocurrency

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Course Description

BitCoin/Blockchain is set to disrupt 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 acquire programming skills for application development on Bitcoin and Blockchain. Towards the goal, it features lectures and a series of hands-on labs and projects based on a real BitCoin software (ethereum.org). It will cover Bitcoin and Blockchain in terms of their programming API, applications and internal mechanisms.

This will be a 3-credit course.

Prerequisite/Co-requisite

- Basic programming skills are required.

Learning Objectives

Students will be able to design and develop Blockchain-based software for applications in BitCoin and beyond. Students will have in-depth knowledge about the Blockchain platform and will be able to analyze application security.

Texts - Recommended

Bitcoin and Cryptocurrency Technologies, Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder, [online-book version]

Grading

Tests (60%) and programming labs (40%)

Course Schedule (Tentative)

- Lectures
    - Blockchain as transaction storage
    - Blockchain as smart-contract execution platform
    - Blockchain as cryptocurrency mine
    - Issues in Blockchain
    - Case studies: Blockchain applications
- Labs
    - Lab 1: Smart contract programming in Ethereum/Solidity
    - Lab 2: Cryptocurrency exchange services and payment applications (CoinBase alike)
    - Lab 3: Access Control on Smart Contract for Permissioned Blockchain
- Project 1 (Choose one):
    - Archiving legal documents on Blockchain
    - Medical supply-chain on Blockchain
    - Infrastructure management with Blockchain
    - Cloud storage on Blockchain