

# CSE400/600: Blockchain Programming and Financial Applications

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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](https://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.
- Knowledge in cryptography is *not* required.

## Audience

Graduate/undergraduate students interested in learning the BitCoin and Blockchain technique.

## 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

Programming labs (100%)

## Course Schedule (Tentative)

- Lecture: Bitcoin/Blockchain API: Transactions and smart contract
- Lab 1: Smart contract programming in Ethereum/Solidity
- Lecture: Domain applications on Blockchain
- Lab 2: Cryptocurrency exchange services and payment applications (CoinBase alike)
- Lab 3: Access Control on Smart Contract for Permissioned Blockchain
- Lecture: Application and smart-contract security
- Project 1 (Choose one):
  - Archiving legal documents on Blockchain
  - Medical supply-chain on Blockchain
  - Infrastructure management with Blockchain
  - Cloud storage on Blockchain

- Lecture: Blockchain internals: Storage and mining.