

Class Summary

1. Class Overview

1. What is Blockchain / Bitcoin - why it is important.

In 2009, a person or group of people named Satoshi Nakamoto published "Bitcoin: A Peer-to-Peer Electronic Cash System". ... The Bitcoin design was revolutionary—it elegantly tied cryptography, game theory, and economics into a trustless solution to the double-spend problem, and introduced the world to the first "chain of blocks", a censorship-resistant public ledger protected by proof-of-work.

This is a big deal. Unlike traditional payments, Bitcoin transactions don't rely on a trusted third-party. Anyone can connect to the network and transact, without fear of censorship. Satoshi's work solved these problems, and founded the field of cryptoeconomics.

In 2013, Vitalik Buterin proposed a new cryptocurrency—Ethereum. Ethereum was Vitalik's answer to Bitcoin's poor scripting capabilities. Instead of focusing on financial transactions and their outputs, Ethereum transactions are about state: agreeing on a computed state, and transitioning from one state to the next.

Each transaction in Ethereum includes a sender, recipient, funds, and data, similar enough to Bitcoin. Unlike Bitcoin, however, a recipient can be a user or a smart contract.

2. Gartner group projects that 3% of the world economy will blockchain based in 10 years. This is a compounded annual growth rate of 62.2%.
3. Plan - do lectures in advance of when assignments are due on the material - give students time to do homework. Mark what is going to be tested on.
4. This class is not a "heavy" programming class. Yes you will program - but not a huge amount. Unlike a lot of computer science classes this class has a paper and will have test questions involving definitions. We are going to cover some finance, accounting, economics and other topics - not just "how to build a better program". If you have a limited programming background I will work with you.

2. What this class will cover

1. What is Blockchain - what is Bitcoin / Ethereum / Other token systems.
2. The worlds worst, most expensive database.
3. What is the "hype" - what is real about blockchain.
4. Economics - Coin, ICO, Stocks, Bonds, Tokens, Utility Tokens, A Security.

5. Legal Ramifications. ICOs 506(d), Subpart (s).
6. Programming - $\frac{1}{2}$ in go, $\frac{1}{2}$ in Solidity (Ethereum) and Web front end (JavaScript/HTML/CSS).
7. Some Homework.
8. Write a Paper - How will Blockchain affect the economy.
9. 2 tests (Midterm and Final).
10. Why Go.
11. What is Proof of work.
12. What is Proof of stake.
13. Enough Go to make it through this class (and be able to convincingly tell an employer that you have programmed in Go).
14. Why Ethereum? Solidity?
15. dApp - what is that? What is web3?
16. A detailed understanding of the security model behind Blockchain.
17. Some advanced stuff on security - distributed computation and public/private keys, distributed key generation.
18. What is a "tangle" - why is a blockchain called a "chain".
19. Why is blockchain so slow?
20. How to explain "blockchain" to people - the 30 second elevator pitch.
21. How to develop for a blockchain.