Byte Academy

Blockchain

Blockchain

Program created with industry experts

Featured in Bloomberg

We also offer workshops and customized corporate training

Curriculum is developed in collaboration with leading industry experts and company founders who may guest lecture or mentor serving as resources for students who may want to delve deeper into topics. We also introduce topics then go deeper throughout the program.

Technical project work and use cases will be emphasized throughout the program. Additionally, instruction in fullstack software development particularly Python, JavaScript and front-end languages will be given. This will ensure that students develop strong technical projects. For more on fullstack Python development material please see our technology syllabus.

Introduction

- Blockchain and cryptocurrency overview including history, milestones and “hot” topics such as token and initial coin offerings (ICOs).
- Intro to technical concepts: including hash functions, blockchain hashes, mining, noncing and difficulty
- Decentralization: purpose, weighing pros and cons
- Consensus, mining and propagation.
- Use cases/applications: finance, supply chain, insurance, manufacturing, more.

Blockchain and Platforms

- Blockchain varieties: public vs private, hybrid
- Main chain, side chains, speed and transaction time
- Overview of popular blockchains including ethereum and Bitcoin blockchain (more depth provided later)
- Permissioned vs. Permissionless: data privacy
- Enterprise blockchains overview: Hyperledger-Fabric, r3-Corda, Quorumfrom from JP Morgan
- Consensus mechanisms including POW (proof of work), Proof of Stake, Byzantine fault tolerance
- Introduction to algorithms and blockchain APIs
- Storage and transactions
- Launch your own blockchain
- Forks, altcoins and metacoins

Keys and Addresses

- Security: Public vs. private key vs. wallets
- Cryptography: terms and definitions
- Cryptocurrency address to private key
- Transactions and Segwit according to Python/JS protocol tools
- Hashes and signing transactions
- Create an address

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Cryptocurrency: Overview

- Popular cryptocurrencies and valuation
- Mining vs consensus
- Keys and wallets
- Wallet backup and storage
- Impact of blockchain fork on cryptocurrency value (eg. Bitcoin V Bitcoin cash)
- Open-source tools for app development
- Mining and Wallets
- Send, storage, pricing of popular digital currencies

Assets and Tokenization and the Value of the Blockchain

- Utility vs. security tokens
- Credits versus tokens
- Power of community on currency

Bitcoin

- History: milestones and the legend of Satoshi
- Send, storing, pricing, trading Bitcoins
- Futures and exchanges
- Hashes including intro, functions and JS/Python
- Protocols
    - Rules and documentation
    - Basic hashing functions
    - Python and JS buffers
    - Messages: including creating messages with JS/Python, tools and breakdown
    - Create your own transaction
- Algorithms, proof of work and nodes

Ethereum, Smart Contracts and Development

- Overview/history: why is ethereum so popular?
- Comparison with similar platforms such as Stellar
- Smart contracts: distributed ledgers and scalability
- Truffle framework to create smart contracts
- *Solidity*
    - Write a smart contract in solidity
    - Compilers including smart contract concepts and architecture, functions, variables, arrays
    - Creation and deployment: your first smart contract
- Smart contracts: testing
- Open Source tools
- Applications and use cases

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Development and dAPPs (Decentralized Applications)

- Set-up working environment using truffle
- Python and JavaScript libraries for working with Bitcoin and ethereum
- Web 3.js -basic concepts and commands
- ERC 20 and other structures
- File distribution using IPFS
- To create a final working dAPP Integrate smart contracts, IPFS and web3

Create Your Own Cryptocurrency

- Students create their own currency in class

Regulatory Environment

- International versus offerings aka ICOs
- Is it a scam? Token or (Initial Coin Offerings)
- Trading: regulated vs. unregulated exchanges
- Other current events and regulatory initiatives. Discussion may include SAFT agreements, SEC and CFTC regulations

Security: Attacks and Trustless Networks

- Historical (DAO) and recent hacks
- Prevention of hacks
- Security issues and pseudo-anonymity

- *Program will also include fullstack development topics so that students can build strong applications. For these, see technology syllabus -*