Blockchain+ Developer™

The Blockchain+ Developer certification offers a comprehensive journey into blockchain technology and smart contracts. Beginning with the origin and structure of blockchain, participants explore consensus mechanisms and the concept of smart contracts, delving into Ethereum Virtual Machine (EVM) and Solidity basics. Advanced topics cover Solidity structures, tokenization, and non-fungible tokens (NFTs). Development tools like Truffle and Ganache are introduced, along with testing techniques and DApp integration. Participants then explore private blockchain with Hyperledger Fabric, learning its architecture, Docker setup, and Golang programming. The course culminates in chaincode development, REST API integration, and chaincode auditing.

Course Duration:

5 Days

Prerequisites:

- Familiarity with general programming concepts like data structures, algorithms and networks
- Understanding of at least one legacy programming stack (e.g. Python, JavaScript, Java or similar) Fundamental knowledge to use command line consoles on any operating system
- Ability to understand developer concepts like SDKs, APIs, application development tools etc.
- Experience with building end to end tiered applications

Course Objectives:

- Understand the fundamentals of blockchain technology and smart contracts.
- Learn about Ethereum Virtual Machine (EVM) and Solidity programming language.
- Explore advanced features and techniques in Solidity programming.
- Gain knowledge about Non-Fungible Tokens (NFTs) and their implementation.
- Familiarize with developer tools and techniques for blockchain development.
- Develop skills in testing and integrating Decentralized Applications (DApps).
- Learn about setting up and managing private blockchains using Hyperledger Fabric (HLF).
- Dive deeper into Hyperledger Fabric architecture and features.
- Gain proficiency in Go programming language.
- Understand the concepts and implementation of chaincode in Hyperledger Fabric.
- Explore customization of chaincode for specific use cases.
- Learn about Docker, Firefly, and Fabconnect for blockchain development and deployment.

Course Outlines:

Module 1: Introduction to Blockchain and Smart Contracts

- 1.1 Origin of Blockchain
- 1.2 What is Blockchain?
- 1.3 Consensus Mechanisms

- 1.4 What are Smart Contracts?
- 1.5 Bitcoin Blockchains

Module 2: Ethereum Virtual (EVM) and Solidity Basics

- 2.1 What is an EVM and Ethereum?
- 2.2 Wallets Introduction and Creation
- 2.3 Introduction to Remix Editor with Metamask
- 2.4 Smart Contract Basic Structure
- 2.5 Variables, If/Else, Strings, Loops, Arrays, Test Tokens

Module 3: Advanced Solidity and Structures

- 3.1 Libraries, Interfaces, Modifiers
- 3.2 Structures, Enums, ABI, Calldata, Events, and Transfers
- 3.3 Contract-to-Contract Calls
- 3.4 Address and Address Payable
- 3.5 Receive and Fallback Functions
- 3.6 Upgradeable Contracts
- 3.7 Openzepplin Libraries

Module 4: Tokenization and NFTs

- 4.1 ERC20 Token Creation
- 4.2 NFT, NFT Minting, IPFS, Security, and Pinata Cloud

Module 5: Development Tools and Techniques

- 5.1 Truffle, Ganache, and Hardhat
- 5.2 Metamask Wallet
- 5.3 Remix Development Environment
- 5.3 Localnet, and Testnet Deployment

Module 6: DApp Integration and Testing

- 6.1 Web3.0 Integration with JS
- 6.2 Wallet Creation and Sending Transactions

Module 7: Introduction to Private Blockchains - Hyperledger Fabric

- 7.1 Public Vs Private vs. Consortium Blockchain Frameworks
- 7.2 Introduction to the Hyperledger Fabric
- 7.3 Hyperledger Projects

Module 8: Deep Dive into the Hyperledger Fabric

- 8.1 Basic Concepts of HLF
- 8.2 Docker Introduction
- 8.3 Commands and Setup

Module 9: Golang Programming for Hyperledger Fabric

- 9.1 Installation and Path Setup
- 9.2 VS Code Plugin Setup, Variables, Strings, Conditional Statements, and Loops

- 9.3 Basics of the Language

Module 10: Chaincode Structure and Error Handling

- 10.1 Chaincode Explanation using Fabric Samples, Test-network Explanation using Linux Scripting
- 10.2 Error Handling
- 10.3 Error Codes and Messages
- 10.4 Logging Errors
- 10.5 Handling Panics

Module 11: Custom Chaincode

- 11.1 Extending the Default Chaincode
- 11.2 Chaincode Deployment
- 11.3 REST API Integration with Front End

Module 12: Smart Contract Auditing and Tools Hyperledger Fabconnect, and Firefly

- 12.1 Why Smart Contract Audits are Necessary
- 12.2 Introduction to Firefly, Fabconnect, and Blockchain Explorer

Who should attend

- Blockchain Developers: Gain the technical expertise needed to build and implement blockchain-based applications and solutions for diverse industries.
- Software Engineers: Learn how to integrate blockchain technology into software development to enhance security, scalability, and efficiency.
- Tech Innovators: Dive deep into blockchain development to stay at the forefront of technological advancements.
- Fintech Developers: Explore blockchain's role in transforming financial services, from digital wallets to decentralized finance (DeFi) applications.
- Enterprise IT Professionals: Understand how to leverage blockchain to improve operational efficiencies, data integrity, and transparency within large organizations.