Blockchain+ Developer™

Duration: 40 Hours

Course Overview

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 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 Agenda

Module 1: Introduction to Blockchain and Smart Contracts

- Origin of Blockchain
- What is Blockchain?
- Consensus Mechanisms
- What are Smart Contracts?
- Bitcoin Blockchains

Module 2: Ethereum Virtual Machine (EVM) and Solidity Basics

- What is an EVM and Ethereum?
- Wallets Introduction and Creation
- Introduction to Remix Editor with Metamask

- Smart Contract Basic Structure
- Variables, If/Else, Strings, Loops, Arrays, Test Tokens

Module 3: Advanced Solidity and Structures

- Libraries, Interfaces, Modifiers
- Structures, Enums, ABI, Calldata, Events, and Transfers
- Contract-to-Contract Calls
- Address and Address Payable
- Receive and Fallback Functions
- Upgradeable Contracts
- Openzepplin Libraries

Module 4: Tokenization and NFTs

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

Module 5: Development Tools and Techniques

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

Module 6: DApp Integration and Testing

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

Module 7: Introduction to Private Blockchains - Hyperledger Fabric

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

Module 8: Deep Dive into the Hyperledger Fabric

- Basic Concepts of HLF
- Docker Introduction
- Commands and Setup

Module 9: Golang Programming for Hyperledger Fabric

- Installation and Path Setup
- VS Code Plugin Setup, Variables, Strings, Conditional Statements, and Loops
- Basics of the Language

Module 10: Chaincode Structure and Error Handling

- Chaincode Explanation using Fabric Samples, Test-network Explanation using Linux Scripting
- Error Handling
- Error Codes and Messages
- Logging Errors
- Handling Panics

Module 11: Custom Chaincode

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

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

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