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## Blockchain Developer Certification

### Course description

Particularly focuses on Blockchain Application by using the Ethereum framework and its Turing complete scripting language Solidity which recently have become the front-runner. Blockchain Application becomes much more secure with a combination of Ethereum and Solidity Programming Language.

### Student Take away

- Study Material
- Learning stuff
- Sample project for practice

### Training Objective

- Understanding the use of Ethereum and other Cryptocurrency
- Understanding the comparison of Distributed Apps to Web Apps
- Creating Connection of Ethereum Smart Contracts with HTML/CSS/JS Web Application

## Blockchain Developer Certification Online Training curriculum

### Basic Overview of Blockchain

- Introducing the concept of Blockchain
- Basic Understanding of Ethereum Blockchain

### Understanding Three Parts of Blockchain

- Peer-to-peer networking
- Asymmetric Cryptography
- Cryptographic Hashing

### ➤ Dealing with Crypto Economics and Security

### Introduction to Smart Contracts

- Dealing with Objects and Methods for Value
- Understanding Data and its Mining

### Overview of EVM (Ethereum Virtual Machine)

- Mist Browser
- Difference between Browser and Wallet

➤ **Understanding Private and Public Chains**

**Mist Browser in detail**

- Using Wallets as a Computing Metaphor
- Understanding the concept of Address
- Overview of Ether
- Using Bank Teller Metaphor
- Complete Visualization of Ethereum Transactions
- Encryption concepts in detail
- Symmetric Encryption
- Asymmetric Encryption
- Secure Messaging
- Secure and Signed Messaging
- Digital Signature

**Understanding Tools for Developers**

- Using Meta-Mask Chrome Extension
- Geth
- Parity

➤ **Dealing with CLI Nodes**

➤ **Working of Parity with Geth**

**Understanding MIST in detail**

- Downloading and Installation of Mist
- Basic configuration of Mist
- Dealing with Address in Mist
- Sending and Receiving Ethers
- Understanding the concept of Ethereum Account Types
- Backup and Restore Keys Concepts
- Dealing with Paper Wallet
- Dealing with Mobile Wallets
- Understanding Messages and Transactions

**Overview of Blockchain**

- Concept of Payment for Transactions
- Dealing with Denominations
- Concept of Getting Ethers
- Using Anonymity in Cryptocurrency

**Ethereum Virtual Machine (EVM)**

- Understanding the Virtual Machines
- Basic role of Ethereum Protocol in Banking System

### **Working of EVM**

- EVM Applications with Smart Contracts
- Using EVM with Bytecode

### **Basic Overview of State Machines**

- Difference between Digital and Analog
- Overview of “State-ments”
- Understanding the Role of Data in State

### **Concept of Cryptographic Hashings**

- Working of Hashing Algorithms

### **Introduction to Blocks in State**

- Understanding Block Time
- Major Drawbacks of Short Blocks
- Using “Solo Node” Blockchain
- Concept of Mining in State Transition Function

#### ➤ **Overview of Gas Terminology**

### **Understanding Gas as Regulations**

- Working of Gas
- Specifics for Gas
- Gas Relation with Scaling of Systems

### **Understanding Accounts, Transactions and Messages**

- Externally Owned Accounts
- Contracts Accounts
- Transactions Characteristics
- Messages Characteristics

### **Estimation for Gas Fees for Operations**

- Understanding OpCodes in EVM

### **Overview of Solidity Programming**

- Concept of Primer in Solidity
- Basic Features of Solidity

#### ➤ **Understanding Statements and Expression in Solidity**

#### ➤ **Overview of Data Types in Solidity Programming**

## **Introduction to Smart Contracts and Tokens**

- Concept of Using EVM as Backend
- Overview of Cryptocurrency
- Understanding Asset Ownership and Civilization

## **Practical Implementation on Token**

- Token Creation on Test-net
- Concept of getting Test Ether from Faucet
- Token Registration Concept

### ➤ **First Contract Deployment**

### ➤ **Practical demos on Contracts**

## **Concept of Mining Ether**

- Understanding the source of Ether
- Overview of Mining in General
- Factors required for Block Validation
- Overview of DAG and Nonce

## **Ethereum with Stale Blocks**

- Overview of Uncle Rules and Rewards
- Concept of Difficulty Bomb
- Miner's Winning Payout Structure
- Concept of Block Processing

## **Using Ethereum and Bitcoin as Tree Structure**

- Understanding Merkle-Patricia Trees

## **Basic Contents of Ethereum Block Header**

- Transaction Trees
- Receipts Tree
- State Tree

### ➤ **Concept of Forking**

- **Hands on Mining**
- Installation of Geth on Mac, Windows, Linux
- Using Command Line
- Command Execution in EVM using geth console
- Geth Launch using Flags
- Mining on Test-net
- Mining on Pool with Multiple GPUs

### **Concept of DApp Deployment**

- Understanding 7 Ways to think about Smart Contracts
- Understanding DApp Contract Data Models

### **Overview of EVM Backend Communicates to JS Front End**

- Using JSON-RPC
- Using Web3
- Using JavaScript's API

#### ➤ **Using Geth for DApp Deployment**

#### ➤ **Using Meteor with EVM**

#### ➤ **Installation of Web3.JS for Ethereum Based Application**

#### ➤ **Contract Execution in Console**

#### ➤ **Overview of Third-Party Deployment Libraries**

### **Concept of Private Chain**

- Understanding Private and Permissioned Chains
- Setting up Local Private Chain
- Using Optional Flags for New Chains
- Using Private Blockchain in Production Usage