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| **Block Chain Development Course Curriculum** |

**ELECTIVE 1**

**Module # 1: Bitcoin:**

* **Objective:**
* Apprehend another blockchain platform: Bitcoin
* Understand how mining works in Bitcoin
* **Topics:**
* What is Bitcoin?
* What is Bits?
* How to use Bitcoin?
* How Bitcoin mining works?
* Bitcoin consensus mechanism.
* Parameters that invalidate the transactions
* Nodes and network of bitcoin
* Various roles you can play in bitcoin ecosystem

**Module # 2: Setting up Bitcoin network for:**

* **Objective:**
* Explain the steps required to build a blockchain solution
* Setup your blockchain environment
* Analyze the blockchain environment.
* **Topics:**
* Private and public blockchain
* Various blockchain setup platforms
* Setup Bitcoin blockchain and connect to testnet
* Steps to build a blockchain solution
* **Skills:**
* Implementing Blockchain using bitcoin
* **Hands On:**
* Installing bitcoin software
* Setting up servers

**ELECTIVE 2**

**Module # 1: Ethereum:**

* **Objective:**
* Apprehend another blockchain platform: Ethereum
* Perceive the Ethereum Ecosystem
* Understand how mining works in Ethereum
* Learn Solidity programming language
* **Topics:**
* What is Ethereum?
* What is Ether?
* How to use Ethereum?
* The Ethereum ecosystem, DApps and DAOs
* How Ethereum mining works
* Learning Solidity \* Contract classes, Functions and conditionals \* Inheritance & abstract contracts o Libraries \* Types & Optimization \* Global Variables o Debugging \* Future of Ethereum
* **Skills:**
* Cryptocurrencies (Ethereum) • Developing Smart Contracts

**Module # 2: Setting up Private Blockchain Environment using Ethereum Platform:**

* **Objective:**
* Explain the steps required to build a blockchain solution
* Setup your private blockchain environment
* Analyze the blockchain environment.
* Develop smart contract on Ethereum
* Deploy the contract on Web and console
* **Topics:**
* Private and public blockchain
* Various blockchain setup platforms
* Using Ethereum to setup private blockchain
* Steps to build a blockchain solution
* Smart contract on Ethereum
* Compile, deploy and instantiate contracts
* Configuring, running and working with the go-Ethereum client
* Account management and mining
* Understand the different stages of a contract deployment
* How to interact with a contract once deployed?
* **Skills:**
* Implementing Blockchain using Ethereum
* Developing Smart Contracts
* **Hands On:**
* Installing Ethereum software
* Setting up servers
* Creating blockchain environment
* Mining of Ether & Sending of Ether
* Tracking information using hash
* Viewing Information about blocks in blockchain
* Developing smart contract on private blockchain
* Deploying contract from web and console

**ELECTIVE 3**

**Module # 1: Hyperledger:**

* **Objective:**
* Apprehend Hyperledger project
* Infer the Hyperledger architecture
* Explore the consensus mechanism in Hyperledger
* Landscape- Four major Hyperledger frameworks
* **Topics:**
* Introduction to Hyperledger
* Hyperledger architecture
* Membership, Blockchain, Chaincode & Consensus
* Consensus & its interaction with architectural layers
* Application programming interface
* Application model & Network topology
* Exploring Hyperledger frameworks
* Hyperledger Fabric & Hyperledger Indy
* Hyperledger Iroha & Hyperledger Sawtooth
* **Skills:**
* Blockchain Platforms (HyperLedger)
* **Hands on:**
* Creating and Deploying a Business Network on Hyperledger Composer Playground
* Testing the business network definition
* Transferring the commodity between the participants

**Module # 2: Setting up development environment using Hyperledger Composer:**

* **Objective:**
* Develop & deploy business networks
* Interact with Hyperledger Fabric Blockchain using Hyperledger Composer
* Infer Hyperledger Fabric
* **Topics:**
* Setting up development environment using Composer
* Developing business networks
* Testing business networks
* Introduction to Hyperledger Fabric
* Hyperledger Fabric Model
* Various ways to create Hyperledger Fabric Blockchain network
* **Skills:**
* Implementing Blockchain using HyperLedger Fabric
* **Hands On:**
* Setting up Hyperledger Fabric blockchain using Hyperledger Composer locally
* Developing business network
* Deploying & testing business networks