



Blockchain Certification Training

About Magna Infotech Career Services (MICS)

MICS is a leading e-learning platform providing live instructor-led, interactive online training. We cater to IT professionals and students across the globe in skill development in all the trending technologies, including *IoT, Blockchain, AI & Machine Learning, Robotics, Big Data, Data Sciences, Business Analytics, Business Intelligence, Database Technologies, Java & Mobile Technologies, System Engineering, Project Management, Programming and many more.*

About the course

The course is designed to introduce you to the concept of Blockchain and explain the fundamentals of blockchain and bitcoin. The course will provide an overview of the structure and mechanism of blockchain. As a beginner, you will be learning the importance of consensus in transactions, how transactions are stored on blockchain, history of bitcoin and how to use bitcoin. Furthermore, you will be taught about the Ethereum platform and its programming language. You will setup your own private blockchain environment using Ethereum. Also, you will develop a smart contract on private Ethereum blockchain and will be deploying the contract from web and console. The course is fed with various use-cases and examples, which makes the learning more interesting.



Module 1: Cryptocurrency & Blockchain

Learning Objectives – In this module, you will learn the concept of cryptocurrencies and networking structure.

At the end of this module, you should be able to:

- ✓ Understand the drawbacks in current financial system
- ✓ Infer how spectrum of finance can be secured using distributed system
- ✓ Induce the key concepts which constitutes the Distributed System
- ✓ Infer various types of cryptocurrencies Deduce various uses of cryptocurrencies

Topics

- ✓ Transformation in trading units Cryptography and Crypto-currency
- ✓ Anonymity and Pseudonymity in cryptocurrencies Digital Signatures
- ✓ Cryptocurrency Hash codes Distributed networks

Module 2: Delving into Blockchain

Learning Objectives - In this module, you will learn blockchain technology and its architecture.

At the end of this module, you should be able to:

- ✓ Explain blockchain and its uses
- ✓ Grasp the components of a blockchain ecosystem Induce the structure and mechanisms of a blockchain
- ✓ Deduce various cryptography and consensus algorithm
- ✓ Fathom different types of blockchain
- ✓ Infer various types of blockchain platforms

Topics

- ✓ Introduction to Blockchain Why Blockchain is crucial?
- ✓ Key vocabulary while discussing Blockchain Distinction between databases and blockchain Explaining Distributed Ledger
- ✓ Blockchain ecosystem Blockchain structure
- ✓ Working of blockchain technology Permissioned and permission-less Blockchain

Hands On

- ✓ Show how a blockchain works

Module 3: Bitcoin and Blockchain

Learning Objectives - In this module, you will learn about bitcoins. You will understand why transactions with bitcoins is secure and efficient. Also, you will learn how bitcoin network works.

Topics

- ✓ Bitcoin and its History
- ✓ Why use bitcoins?
- ✓ Where and how to buy bitcoins
- ✓ How to store bitcoins?
- ✓ How and where to spend bitcoins?
- ✓ Selling bitcoins
- ✓ Bitcoin transactions
 - How bitcoin transactions work
 - What happens in case of invalid transactions
 - Parameters that invalidate the transactions
- ✓ Scripting language in bitcoin
- ✓ Applications of bitcoin script
- ✓ Nodes and network of bitcoin
- ✓ Various roles you can play in bitcoin ecosystem

Hands On

- ✓ Setting up bitcoin wallet
- ✓ Creating a paper wallet
- ✓ Transaction tracking of bitcoin

Module 4: Bitcoin mining

Learning Objectives – In this module, you will learn more about bitcoins and its mechanisms. You will understand why transactions with bitcoins is secure and efficient. Also, you will learn how bitcoin mining works. You will also be taught, how to mine bitcoin from your own personal computer.

Topics

- ✓ Purpose of Mining
- ✓ Algorithm used in mining
- ✓ Mining hardware
- ✓ How bitcoin mining works?
- ✓ Bitcoin mining pools
- ✓ How cloud mining of bitcoin works?
- ✓ Mining Incentives
- ✓ Security and Centralizations

Hands On

- ✓ Installing bitcoin mining software
- ✓ Mining bitcoin on your PC



Module 5: Ethereum

Learning Objectives - In this module, you will learn Ethereum (Another Blockchain platform). You will also learn Solidity: An Ethereum 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
 - Libraries
 - Types & Optimization
 - Global Variables
 - Debugging
- ✓ Future of Ethereum

Module 6: Setting up Private Blockchain Environment using Ethereum Platform

Learning Objectives – In this module, you will learn about public and private blockchain. You will be able to setup your private blockchain environment. Also, you will be developing a smart contract on Ethereum and will be deploying it 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?

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

Module 7: Hyperledger

Learning Objectives - In this module, you will learn about Hyperledger project to develop an enterprise-grade and open-source distributed ledger framework. You will be taught the Hyperledger architecture and the consensus mechanism applied in the Hyperledger. Also, you will learn 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

Hands On

- ✓ Creating and Deploying a Business Network on Hyperledger Composer Playground
- ✓ Testing the business network definition
- ✓ Transferring the commodity between the participants

Module 8: Setting up development environment using Hyperledger Composer

Learning Objectives - In this module you will learn about Hyperledger Fabric. You will be taught to develop business networks using Hyperledger Composer. Also, you will be deploying & testing your business network.

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

Hands On

- ✓ Setting up Hyperledger Fabric blockchain using Hyperledger Composer locally
- ✓ Developing business network
- ✓ Deploying & testing business networks



Module 9: Create & deploy your private Blockchain on MultiChain

Learning Objectives - In this module, you will learn about MultiChain platform. You will be able to setup your private blockchain environment. Also, you will be able to customize your blockchain parameters as per your requirements.

Topics

- ✓ Introducing MultiChain
- ✓ Privacy & Permissions in MultiChain
- ✓ Mining in MultiChain
- ✓ Multiple configurable blockchains using MultiChain
- ✓ Setting up a private blockchain
 - Creating a blockchain
 - Connecting to a blockchain
 - Some commands in interactive mode
 - Using native assets
 - Transaction metadata
 - Streams
 - Round robin mining

Hands On

- ✓ Creating private blockchain
- ✓ Connecting to your blockchain
- ✓ Create a new asset and sending it between nodes
- ✓ Mining between nodes

Module 10: Prospects of Blockchain

Learning Objectives - In this module, you will understand how blockchain is essentially shaping the future economics. Discussions on various use-cases of blockchain will clear the missing segment of the picture.

Topics

- ✓ Blockchain prospering our world
- ✓ Blockchain transforming business and professionalism
- ✓ Discussing practical use-cases of blockchain
 - How can we take Aadhaar Card on blockchain?
 - How blockchain can be used to remove corruption
- ✓ Real case scenarios of Blockchain
 - Blockchain in Banking System
 - Blockchain in Land Registry
 - Blockchain in Capital Market
- ✓ Use cases for government
- ✓ Summary of the course



Project Work

Project 1: Property Transfer via Smart Contracts

Industry: Real Estate

Problem Statement: You need to build a smart contract which is capable of handling property transfer with below cases.

Actions to be performed:

Insert some dummy properties to replicate the real world. These properties shall have basic characteristics such as address, location, floors, etc. Any owner can send the property from his account to other owners. Check the ownership of property before transferring it to the other owner. After the successful transfer of the property, you need to be sure that the former owner is not able to send the property again. The new owner must be able to send the freshly received property to any owner.

Project 2: Crowdfunding Smart Contract

Industry: Non-Profit Organization

Problem Statement: Rewards in Crowdfunding's are usually handled by a central unchangeable database that keeps track of all donors. However, we can do this the decentralized way and just create a token to keep track of rewards.

Actions to be performed:

You are required to develop a smart contract which keeps track of all the donors. Just create a token for the track of rewards. Deploy it on Ethereum network using remix IDE.

Project 3: Decentralized Car Auction

Industry: Automobile

Problem Statement: In a car auction, the price for your car is set by the company itself, therefore there is always a mediating or commission fee involved. Instead, we can create an interactive decentralized auction network where the highest bidder gets the car.

Actions to be performed:

Create a Local Business Network Containing the following:

- ✓ Participant Types- Member, Auctioneer, Owner
- ✓ Asset Types- Vehicle, VehicleListing,
- ✓ Transaction Types- Offer, CloseBidding
- ✓ After defining the business network, Create and Submit the "caracutionnetwork.bna" file for evaluation

What are the system requirements for this course?

The requirement for doing practicals on the Blockchain course is a system with Intel i3 processor or above, minimum 8GB RAM and 30 GB HDD Storage, Chrome (latest version) / Mozilla with firebug (latest version).

How will I execute the practicals?

For Practical, we will help you to install and setup virtual machine with CentOS as the client. The detailed installation guides are provided in the LMS for setting up the environment and will be addressed during the session. In case you come across any doubt, the 24*7 support team will promptly assist you.

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