

## Blockchain Solution Architecture Training

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### Course Summary

#### Objective

Upon completion of this course, Students will learn:

- What is Blockchain
- How does Blockchain work
- Types of Blockchains
- How is Blockchain different from what we have today
- What are use cases for Blockchain
- What does a Blockchain app look like
- How do I design a Blockchain app
- How do I develop a Blockchain app
- How do I test a Blockchain app

#### Audience

This Blockchain Architecture training is for technical leaders who need to make decisions about architecture, environment, and development platforms.

#### Topics

- What is Blockchain
- How Does Blockchain Work
- Types of Blockchains
- How is Blockchain Different Than What We Have Today
- What Does a Blockchain Application Look Like?
- How Do I Design a Blockchain Application?
- How Do I Develop a Blockchain Application?
- How Do I test a Blockchain Application?
- Use Cases for Blockchain

#### Prerequisite

There are no prerequisites for this class.

#### Duration

Three Days

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### Course Outline

- I. ***What is Blockchain***
  - A. Blockchain Basic Principles
  - B. Centralized and Decentralized Ledgers
  - C. Mechanics of Blockchain
  - D. What is a Block?
  - E. How are Blocks Chained Together?
- II. ***How Does Blockchain Work***
  - A. Benefits and Drawbacks of Blockchain
  - B. Cryptography
  - C. Public Key Cryptography
  - D. Cryptographic Hashing
  - E. Blockchain Consensus
  - F. Proof of Work Consensus
  - G. Proof of Stake Consensus
  - H. Other Consensus Mechanisms Explained
  - I. Lifecycle of a Public Blockchain Transaction
- III. ***Types of Blockchains***
  - A. Public vs Private Blockchains
  - B. Open vs Closed Blockchains
  - C. Open Source Blockchain Projects
  - D. Blockchain Smart Contracts
  - E. Tokens and Coins
  - F. Using Gas in Ethereum
  - G. "Blockless" Solution Platforms
- IV. ***How is Blockchain Different Than What We Have Today***
  - A. Types of Networks
  - B. Centralized Networks
  - C. Distributed Networks
  - D. Decentralized Networks
  - E. Software vs Firmware
  - F. Blockchain vs Database
- V. ***What Does a Blockchain Application Look Like?***
  - A. Blockchain Application Architecture
  - B. Integrated Development Environment (IDE)
  - C. User Interaction Layer
  - D. Middle/Interface Layer
  - E. Smart Contracts/Chaincode
- VI. ***How Do I Design a Blockchain Application?***
  - A. Guiding Design Principles
  - B. Personas (User Types)
  - C. User Stories (Application Interaction)
  - D. Application Functional Requirements
  - E. Application Technical Requirements
  - F. Design Tasks
  - G. Fundamental Design Questions
- VII. ***How Do I Develop a Blockchain Application?***
  - A. Fundamental Design Concepts
  - B. Calling External Contracts
  - C. Error Handling
  - D. Pull vs Push Payments
  - E. On-Chain Data
  - F. Local Testing Recommendations
  - G. Not Using Agile Development Process
  - H. Technology Design Decisions
  - I. Monolithic vs Modular
  - J. Complexity Models
- VIII. ***How Do I test a Blockchain Application?***
  - A. Blockchain Testing Approaches
  - B. Unit Testing
  - C. Developer Level Testing
  - D. Configuration & Environment Testing
  - E. Load/Performance Testing
  - F. Volume/Stress Testing
  - G. Regression Testing
  - H. Application Bug Classifications
  - I. User Load Testing
  - J. Key Blockchain Architecture Testing Questions
- IX. ***Use Cases for Blockchain***
  - A. Real world implementations of Blockchain