

Table Of Contents

Module 1: Introduction to Blockchain Technology

- 1.1 Understanding the Basics of Blockchain
- 1.2 History and Evolution of Blockchain
- 1.3 Components of Blockchain: Blocks, Chains, and Nodes
- 1.4 Types of Blockchains: Public, Private, and Consortium

Module 2: Cryptography Essentials

- 2.1 Cryptographic Principles in Blockchain
- 2.2 Hash Functions and Digital Signatures
- 2.3 Public Key Infrastructure (PKI) and Encryption
- 2.4 Cryptographic Algorithms Used in Blockchain

Module 3: Blockchain Architecture and Consensus Mechanisms

- 3.1 Overview of Blockchain Architecture
- 3.2 Peer-to-Peer Network Structure
- 3.3 Consensus Mechanisms: Proof of Work (PoW), Proof of Stake (PoS)
- 3.4 Understanding Forks and Chain Reorganizations

Module 4: Smart Contracts and Solidity Programming

- 4.1 Introduction to Smart Contracts
- 4.2 Ethereum Virtual Machine (EVM) and Solidity Language
- 4.3 Writing, Deploying, and Interacting with Smart Contracts
- 4.4 Security Considerations and Best Practices for Smart Contracts

Module 5: Ethereum and Decentralized Applications (DApps)

- 5.1 Overview of Major Social Media Platforms (e.g., Facebook, Instagram, Twitter)
- 5.2 Creating and Optimizing Social Media Profiles
- 5.3 Content Creation and Curation
- 5.4 Social Media Advertising and Targeting
- 5.5 Social Media Analytics and Monitoring

Module 6: Hyperledger Fabric and Enterprise Blockchain Solutions

- 6.1 Introduction to Hyperledger Fabric
- 6.2 Features and Architecture of Hyperledger Fabric
- 6.3 Creating and Managing Blockchain Networks with Hyperledger Fabric
- 6.4 Use Cases of Hyperledger Fabric in Enterprise Solutions

Module 7: Blockchain Security and Privacy

- 7.1 Security Risks and Threats in Blockchain
- 7.2 Securing Blockchain Networks and Applications
- 7.3 Privacy Enhancements: Zero-Knowledge Proofs and Confidential Transactions
- 7.4 Auditing and Compliance in Blockchain Systems

Module 8: Blockchain Interoperability and Scalability

- 8.1 Interoperability Challenges in Blockchain
- 8.2 Cross-Chain Communication Protocols
- 8.3 Scalability Solutions: Sharding, Layer 2 Solutions, and Sidechains
- 8.4 Current Trends and Future Directions in Blockchain Scalability

Module 9: Use Cases and Industry Applications

- 9.1 Real-World Applications of Blockchain in Finance
- 9.2 Blockchain in Supply Chain Management and Logistics
- 9.3 Healthcare, Identity Management, and Voting Systems on Blockchain
- 9.4 Exploring Emerging Use Cases and Opportunities

Module 10: Hands-on Projects and Case Studies

- 10.1 Hands-on Project: Building a Decentralized Voting Application
- 10.2 Case Study: Implementing Blockchain in a Supply Chain Solution
- 10.3 Group Projects and Presentations
- 10.4 Final Assessment and Certification Examination