

Blockchain Security Training

Module 1: Fundamental Blockchain Security

- Cryptography for the Blockchain
- A Brief Introduction to Blockchain
- Blockchain Security Assumptions
- Limitations of Basic Blockchain Security

Module 2: Consensus in the Blockchain

- Blockchain Consensus and Byzantine Generals
- Introduction to Blockchain Consensus Security
 - Proof of Work
 - Proof of Stake
 - Other Blockchain Consensus Algorithms

Module 3: Advanced Blockchain Security Mechanisms

- Architectural Security Measures
 - Permissioned Blockchains
 - Checkpointing
- Advanced Cryptographic Solutions
 - Multiparty Signatures
 - Zero-Knowledge Proofs
 - Stealth Addresses
 - Ring Signatures
 - Confidential Transactions

Module 4: Smart Contract Security

- Introduction to Smart Contracts
- Smart Contract Security Considerations
- Smart Contract Code Auditing

Module 5: Blockchain Risk Assessment

- Blockchain Risk Considerations
- Regulatory Requirements
- Blockchain Architectural Design

Module 6: Basic Blockchain Security

- User Security
- Node Security
- Network Security

Module 7: Blockchain for Business

- Introduction to Ethereum Security
- Introduction to Hyperledger Security
- Introduction to Corda Security

Module 8: Securely Implementing Business Blockchains

- Business Operations
- Data Management
- Infrastructure
- Legal and Regulatory Compliance

Module 9: Network-Level Vulnerabilities and Attacks

- 51% Attacks
- Denial of Service Attacks
- Eclipse Attacks
- Replay Attacks
- Routing Attacks
- Sybil Attacks

Module 10: System-Level Vulnerabilities and Attacks

- The Bitcoin Hack
- The Verge Hack
- The EOS Vulnerability
- The Lisk Vulnerability

Module 11: Smart Contract Vulnerabilities and Attacks

- Reentrancy
- Access Control
- Arithmetic
- Unchecked Return Values
- Denial of Service
- Bad Randomness
- Race Conditions
- Timestamp Dependence
- Short Addresses

Module 12: Security of Alternative DLT Architectures

- Introduction to DAG-Based DLTs
- Advantages of DAG-Based DLTs
- Limitations of DAG-Based DLTs

Key Features of Blockchain Security Training

- **Comprehensive Security Focus:** Covers vulnerabilities, best practices, and advanced techniques.
- **Hands-On Training:** Practical exercises in identifying and mitigating blockchain risks.
- **Smart Contract Security:** Learn to design and audit secure contracts.
- **Emerging Threats:** Stay ahead with knowledge of evolving blockchain security challenges.
- **Capstone Project:** Apply skills to secure a blockchain network and audit contracts.