CENTRAL BANK OF EGYPT
Egyptian Banking Institute

Blockchain Advanced for Bankers

Digital Payment

8535

In-Class

24 hours

Course Description:

This advanced three-day course, Blockchain Advances for Bankers, is designed for professionals in the banking sector who already possess a foundational understanding of blockchain technology. The program delves deeper into advanced blockchain concepts, including smart contracts, decentralized finance (DeFi), and non-fungible tokens (NFTs), with a focus on their relevance to banking. Participants will explore real-world applications, advanced use cases, and the latest developments in blockchain that are reshaping the financial industry. By the end of the course, bankers will gain actionable insights to drive innovation and strategic implementation of blockchain solutions in their organizations

Target Audience:

- **Experienced Banking Professionals:** Mid-level to senior banking staff who want to deepen their understanding of blockchain advances.
- **Strategy and Innovation Teams:** Bank leaders exploring cutting-edge blockchain use cases and implementation strategies.
- **Technology Teams:** IT professionals integrating blockchain with existing banking systems or developing blockchain-based solutions.
- **Fintech Specialists:** Consultants and innovators working at the intersection of finance and technology.
- **Compliance Officers and Risk Managers:** Professionals navigating advanced regulatory and risk challenges associated with blockchain.

Course Objectives:

Master Blockchain Architecture and Protocols:

- Dive deeper into advanced blockchain architectures, including Layer-1 and Layer-2 solutions, cross-chain interoperability, and governance mechanisms.

Develop Advanced Smart Contracts:

- Design and implement complex smart contracts with enhanced functionality, incorporating best practices for security, gas optimization, and scalability.

Explore Consensus Mechanisms in Depth:

- Analyze and compare advanced consensus algorithms, including Delegated Proof of Stake (DPoS), Practical Byzantine Fault Tolerance (PBFT), and Proof of History (PoH).

Implement DeFi Solutions:

- Build and deploy decentralized finance (DeFi) applications, including decentralized exchanges (DEXs), lending protocols, and token standards (ERC-20, ERC-721, ERC-1155).

Enhance Security and Auditing Skills:

- Identify vulnerabilities in blockchain systems and smart contracts, and apply advanced techniques for auditing, penetration testing, and risk mitigation.

Integrate Blockchain with Emerging Technologies:

- Explore blockchain integration with AI, IoT, and cloud computing for innovative real-world applications.

Optimize Blockchain Scalability:

- Implement advanced solutions such as sharding, state channels, and rollups to address scalability challenges.

Understand Tokenomics and Cryptoeconomics:

- Design effective token models, analyze economic incentives, and evaluate the sustainability of blockchain ecosystems.

Develop Private and Enterprise Blockchains:

- Build and customize private blockchain networks using platforms like Hyperledger Fabric or Corda for enterprise use cases.

Explore Advanced Use Cases:

- Evaluate advanced applications of blockchain in fields such as governance, supply chain optimization, digital identity, and NFTs.

Work on Capstone Projects:

- Lead and execute an advanced blockchain project, applying technical and strategic skills to solve a real-world problem

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Course Outline:

Day 1: Advanced Blockchain Concepts

Session 1: Advanced Blockchain Basics
- Review of Blockchain Fundamentals
- Public, Private, and Consortium Blockchains
- Layer 1 vs. Layer 2 Solutions
- The Role of Oracles in Blockchain

Session 2: Deep Dive into Smart Contracts
- What Are Smart Contracts?
- How They Work: Key Components and Features
- Security Concerns in Smart Contracts
- Smart Contracts in Banking:
  - Automation of lending processes
  - Trade finance agreements
  - Collateral management

Session 3: Practical Workshop – Smart Contracts
- Hands-On: Writing and Deploying Simple Smart Contracts
- Case Study: Smart Contract Use in Cross-Border Payments

Session 4: Risk and Regulatory Challenges in Advanced Blockchain
- Legal Challenges with Smart Contracts
- Operational Risks in Blockchain Implementation
- Regulatory Frameworks: Global Perspectives

Day 2: Non-Fungible Tokens (NFTs) and Digital Assets

Session 5: Introduction to NFTs
- What Are NFTs?
- How NFTs Work: Token Standards (ERC-721, ERC-1155)
- NFTs Beyond Art: Financial Instruments and Applications

Session 6: Tokenization in Banking
- Tokenized Assets in Banking
- Real-World Applications:
- Tokenization of Real Estate and Loans
- Digital Securities and Bonds
- Fractional Ownership

Session 7: Practical Workshop – Exploring NFTs
- Demo: Creating and Selling NFTs
- Group Activity: Brainstorming NFT Use Cases for Banking

Session 8: Risks and Challenges with NFTs
- Security Risks (Counterfeiting and Theft)
- Market Volatility
- Legal and Compliance Issues

Day 3: Decentralized Finance (DeFi)

Session 9: Understanding DeFi
- What is Decentralized Finance?
- Key Building Blocks: DEXs, Lending Protocols, and Stablecoins
- DeFi vs. Traditional Finance

Session 10: DeFi Applications in Banking
- DeFi Lending and Borrowing Mechanisms
- Decentralized Insurance Models
- Cross-Border Payments via DeFi Platforms

Session 11: Practical Workshop – Exploring DeFi Platforms
- Hands-On: Using DeFi Platforms (e.g., Uniswap, Aave)
- Demo: Participating in a Liquidity Pool
- Group Activity: Designing a DeFi Use Case for Banking

Session 12: The Future of Blockchain in Banking
- Central Bank Digital Currencies (CBDCs) and Their Impact
- Blockchain Interoperability for Financial Institutions
- Predictions for the Next Decade

Assessment and Attendance Strategy:
- Participants will be evaluated based on their participation in class discussions and individual exercises.
- Each Participant must achieve 80% attendance of the total in-class sessions

Course Language:
- Material: English
- Instruction and Explanation: Bilingual (EN <>AR)

Prerequisites:
No prerequisite for this Course