Blockchain Development Track

Comprehensive Program Overview

Agnes

Source: 3d Programming Code Abstract Technology Background

Program Goal & Key Learning Areas

Our Core Objective

Achieve a **comprehensive understanding** of blockchain development, guiding you from **foundational principles** to **advanced Decentralized Application (DApp) deployment.**

Key Modules

Blockchain Fundamentals & Cryptography

Explore the **foundational concepts** of blockchain technology, including distributed ledgers, and essential **cryptographic principles**.

Ethereum & Smart Contracts (Solidity)

Master **Solidity programming** to design, write, and securely deploy **smart contracts** on the Ethereum network.

Decentralized Applications (DApps)

Develop interactive **DApps**, learning to integrate front-end interfaces with your deployed smart contracts.

Token Standards (ERC-20, ERC-721)

Gain expertise in **ERC-20** for fungible tokens and **ERC-721** for non-fungible tokens (NFTs).

Blockchain Security & Use Cases

Understand critical **blockchain security** and explore diverse **real-world use**

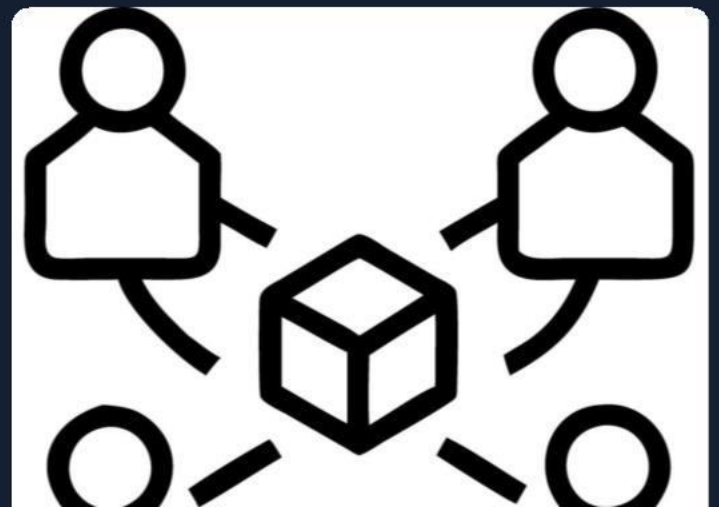
Growing Developer Community

Phase 1: Foundational & Core Concepts (Online)

Phase Overview

This initial phase consists of **interactive online sessions**, expertly guided by experienced instructors, ensuring a dynamic learning environment.

A strong emphasis is placed on **hands-on exercises** and **practical application**, translating theoretical knowledge into tangible skills.



Monthly Learning Milestones

Month 1: Foundational Mastery

- Master **blockchain principles** and DLT.
- Understand core **cryptography concepts**.
- Grasp **Ethereum basics** and its architecture.

Month 2: DApp Development

- Build **Decentralized Applications (DApps)**.
- Comprehend various **token standards** (ERC-20, ERC-721).
- Explore **advanced concepts** in Web3 integration.

Month 1: Blockchain & Ethereum Fundamentals

Week 1: Basics & Cryptography

DLT: Grasp concepts of Distributed Ledger Technology.

Components: Explore blocks, transaction structures, and nodes.

Hash Functions: Dive into SHA-256 for data integrity.

Digital Signatures: Ensure authenticity and non-repudiation.

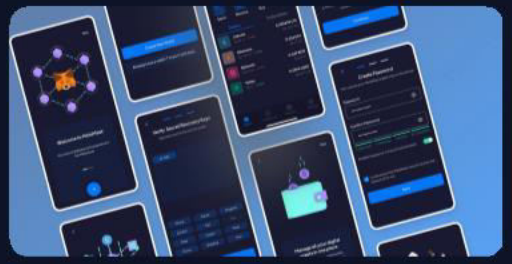
Week 2: Ethereum & Wallets

EVM: Understand the Ethereum Virtual Machine.

Accounts: Differentiate EOAs and Contract Accounts.

MetaMask: Set up and manage your wallet practically.

Etherscan: Navigate testnets and block explorers.



Week 3: Solidity Fundamentals

Language Features: Learn Solidity syntax, data types, and operators.

Contract Structure: Define state variables and functions.

Remix IDE: Write, compile, and deploy contracts hands-on.

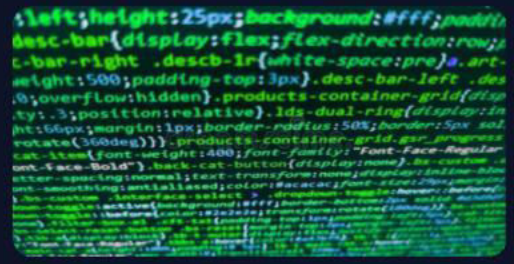
Week 4: Advanced Solidity & Setup

Control Structures: Master complex logic and function modifiers.

Inheritance: Use inheritance and libraries for code reusability.

Error Handling: Implement robust error management.

Local Tools: Set up Hardhat/Foundry for professional development.



Month 2: DApp Development & Advanced Topics

Week 5: DApp Frontend Integration

DApp Architecture: Understand the core components, integrating frontends with deployed smart contracts.

Web3.js/Ethers.js: Master JavaScript libraries for seamless interaction with the Ethereum blockchain.

UI Best Practices: Design user-friendly interfaces for wallet connections, transaction management, and data display.

Week 6: Token Standards

ERC-20 for Fungible Tokens: Dive deep into the standard for cryptocurrencies, utility tokens, and stablecoins.

Week 7: Consensus & Security

Consensus Algorithms: Compare Proof of Work (PoW) and Proof of Stake (PoS) mechanisms.

Common Vulnerabilities: Analyze vulnerabilities like re-entrancy and integer overflows.

Secure Coding Practices: Implement best practices for writing secure and resilient smart contracts.

Week 8: Use Cases & Scalability

Key Use Cases: Explore applications in DeFi, NFTs, and DAOs.

Phase 2: Project Application & Industry Readiness (Offline)

Offline Immersion & Collaborative Learning

Immersive Environment: This phase transitions to an intensive offline, immersive environment, fostering a focused and dedicated learning atmosphere.

Team-Based Projects: Actively engage in team-based project work, promoting collaborative problem-solving, code reviews, and shared learning.

Dedicated Mentor Support: Benefit from direct, in-person mentor support, receiving personalized guidance and industry insights.

Month 3: Core Project Development

Goal: The primary objective is to design, develop, test, and successfully deploy a functional smart contract and Decentralized Application (DApp).

This hands-on experience culminates your theoretical understanding into a practical, deployable blockchain solution, serving as a critical portfolio piece.

Key Focus Areas:

- Smart Contract Implementation: Translating logic into secure Solidity contracts.
- DApp Frontend Development: Building intuitive UIs with Web3.js/Ethers.js.
- Rigorous Testing & Debugging: Ensuring functionality and security.
- Deployment Strategy: Deploying to a chosen blockchain network.

Career Readiness & Market Entry

Dedicated Sessions: Participate in sessions focused on job market entry, equipping you with skills for the blockchain industry.

Comprehensive Preparation: Receive expert guidance on resume building, interview practice, and networking in the Web3 ecosystem.

Industry Insights: Gain valuable insights from guest speakers and professionals on trends, skills, and opportunities.

Month 3: Capstone Project - Design & Development

Week 9: Project Kick-off & Design

Team Formation & Collaboration: Participants form project teams, leveraging diverse skill sets to tackle real-world blockchain challenges.

Mentor Allocation & Guidance: Each team is allocated a dedicated mentor for expert guidance, technical oversight, and strategic advice.

Design & Architecture Sessions: Initial sessions focus on defining project scope, architecture, and core functionalities.

Week 10: Smart Contract Dev & Security

Solidity Implementation: Teams begin hands-on development of their smart contracts, translating design specs into functional on-chain logic.

Rigorous Testing & Debugging: A strong focus on comprehensive unit testing ensures the reliability and correctness of deployed contracts.

Security Review & Audits: Critical peer and mentor-led code audits are conducted to identify vulnerabilities and enhance security.

Capstone Mini Project Examples

Architecture & Tooling Setup

Month 3: DApp Integration, Deployment & Showcase

Week 11

Integration & Deployment Focus

DApp Frontend Integration: Seamlessly connect **React/Vue.js** frontends using **web3.js/ethers.js**, with a core focus on exceptional **UX**.

Deployment Strategies: Deploy **smart contracts to a testnet** and the frontend to **decentralized hosting** (e.g., IPFS).

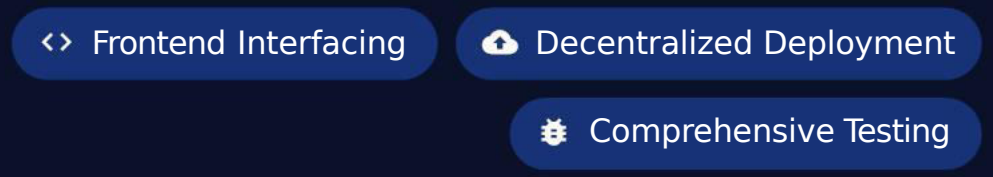
End-to-End Functionality Testing: Conduct rigorous testing across the entire DApp stack to ensure robustness and reliability before the final showcase.

Week 12

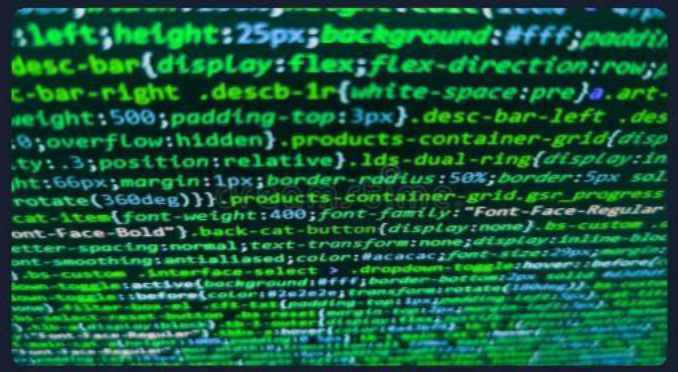
Showcase & Career Readiness

Final Project Presentation: Demonstrate your DApp to **mentors and industry guests**, showcasing technical skills and project outcomes as a key portfolio piece.

Career Development Workshops: Hone your **Resume & LinkedIn** profile, practice with **mock interviews**, and learn Web3 **networking strategies**.



Career Launchpad & Program Completion



Resume & Portfolio Building

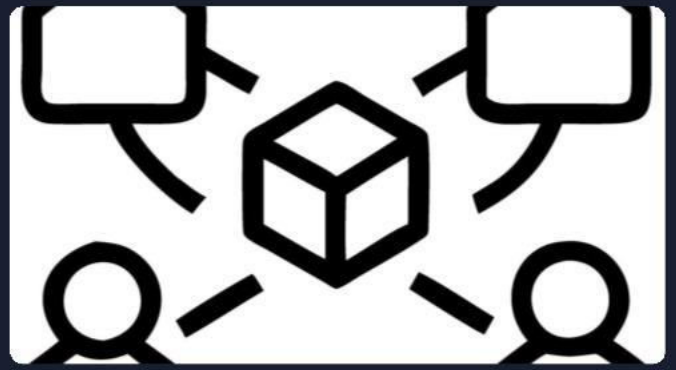
Tailored for Blockchain: Craft compelling resumes and portfolios specifically designed to highlight your unique skills as a Blockchain Developer. Focus on showcasing your mastery of Solidity, DApp development, and Web3 integration.

Showcasing Projects: Learn to effectively present your capstone projects, GitHub repositories, and

LinkedIn & Web3 Networking

LinkedIn Optimization: Optimize your LinkedIn profile with Web3-specific keywords (e.g., Solidity, Ethereum) and strategically showcase your projects to attract relevant opportunities.

Web3 Networking Strategies: Develop effective strategies for networking within the Web3 ecosystem, including engaging with online communities, attending



Mock Interviews

Technical Preparedness: Engage in mock technical interviews covering smart contract logic, DApp architecture, cryptographic principles, and common Web3 data structures.

Behavioral Acumen: Refine your behavioral interview skills with scenarios tailored to decentralized environments. Receive constructive feedback to boost your confidence.