Curriculum Timeline

Module No	Total Module Duration	Course	Hours (unit in hrs)	Day	Day-Time (Weekends excluded)
1	**4 Hrs**	**Introduction to Solidity and Blockchain Basics (Week 1-2)**			
1.1		- Blockchain Overview and basics - Basics of Blockchain Technology - Why Decentralization? - Decentralization vs Centralization - Benefits of Decentralization	1 hrs	Day 1	Monday (4/3/24)11:00 am - 3:00 pm
1.2		- Understanding Merkle Trees and Hash Functions - Consensus Mechanisms and Blockchain Security - Wallets (seed phrases, public addresses, types(custodial/non custodial))	1 hrs	Day 1	Monday (4/3/24)11:00 am - 3:00 pm
1.3		- DAO (Decentralised Autonomous Org)(1 hr) - Basics of popular DeFi protocols such as Uniswap, Compound, and MakerDAO.	1 hrs	Day 1	Monday (4/3/24)11:00 am - 3:00 pm
1.4		- Introduction to DeFi. (1 hr) - Understanding DeFi as a significant use case for blockchain technology. - Extension on ethereum (Layer 2's)	1 hrs	Day 1	Monday (4/3/24)11:00 am - 3:00 pm
2	**26-28 Hrs**	**Solidity Fundamentals**			
2.1		- Introduction to Ethereum and Smart Contracts - Basic Syntax and Structure of a Solidity Contract	2 hrs	Day 2	Tuesday (5/3/24)11:00 am - 3:00 pm
		Unique Data Types in Solidity Understanding Mappings and Structs Variables, Functions, and Control Structures	2 hrs	Day 2	Tuesday (5/3/24)11:00 am - 3:00 pm
		- Enums - Struct Types - Addresses and Types - Address scopes	1 hrs	Day 3	Wednesday (6/3/24)11:00 am - 3:00 pm
		- Transactions and Types - Modifiers	1 hrs	Day 3	Wednesday (6/3/24)11:00 am - 3:00 pm
2.2		-Functions and function modifiers -Storage types	2 hrs	Day 3	Wednesday (6/3/24)11:00 am - 3:00 pm
		Interfaces and Function Scopes in Solidity - Interfaces - Writing and Implementing Interfaces	2 hrs	Day 4	Thursday (7/3/24)11:00 am - 3:00 pm
		- ABI (Application Binary Interface)	2 hrs	Day 4	Thursday (7/3/24)11:00 am - 3:00 pm
		- EVM	2 hrs	Day 5	Friday (8/3/24)11:00 am - 3:00 pm
		- Function Visibility and Access Control	2 hrs	Day 5	Friday (8/3/24)11:00 am - 3:00 pm
		- Solidity sequential data types(arrays, byteArrays)	2 hrs	Day 6	Monday (11/3/24)11:00 am - 3:00 pm
2.3		- Constructors and Inheritance	2hrs	Day 6	Monday (11/3/24)11:00 am - 3:00 pm
		Token Standards - Introduction to tokenomics, token distribution, incentive mechanisms, and designing economic models for blockchain projects	2 hrs	Day 7	Tuesday (12/3/24)11:00 am - 3:00 pm
		- Recognizing the critical role of tokenomics in blockchain project success.	2 hrs	Day 7	Tuesday (12/3/24)11:00 am - 3:00 pm
		- Understanding ERC-20 (Fungible Tokens)	1 hrs	Day 8	Wednesday (13/3/24)11:00 am - 3:00 pm
		- Exploring ERC-721 (Non-Fungible Tokens), ERC-1155 (Multi-Token Standard), ERC-4626 (Yield bearing Vaults and ENS)	3 hrs	Day 8	Wednesday (13/3/24)11:00 am - 3:00 pm
		- Basics of Remix - Compilers and versions - Remix VMs' - Deployment on Remix VM's (	4 hrs	Day 9	Thursday (14/3/24)11:00 am - 3:00 pm
		- Remix's ABI - Traceback and debugging transactions	4 hrs	Day 10	Friday (15/3/24)11:00 am - 3:00 pm
		- Testnets deployment using personal wallets (eg: Metamask) - External Plugins and libraries (1 Day)	4 hrs	Day 11	Monday (18/3/24)11:00 am - 3:00 pm
2.4		OpenZeppelin Contracts			
		Token Contracts (2hrs)	2 hrs	Day 12	Tuesday (19/3/24)11:00 am - 3:00 pm
		VestingWallets.sol (2hrs)	2 hrs	Day 12	Tuesday (19/3/24)11:00 am - 3:00 pm
		ReentrancyGuard.sol (2hrs)	2 hrs	Day 13	Wednesday (20/3/24)11:00 am - 3:00 pm
		Ownable.sol (2hrs)	2 hrs	Day 13	Wednesday (20/3/24)11:00 am - 3:00 pm
3	**58-60 hrs**	**Advanced Smart Contract Development (Week 3-5)**			
3.1		- Introduction to build environments and JS libraries for Smart Contract Interactions. JS Based build environments and libraries - Ethers.js/Web3.js - Ankr/Infura - Hardhat	4 hrs	Day 14	Thursday (21/3/24)11:00 am - 3:00 pm
		- Ethers.js/Web3.js - Ankr/Infura - Hardhat	4 hrs	Day 15	Friday (22/3/24)11:00 am - 3:00 pm
3.2		Setting up and building on Foundry - Blockchain Runtime Environments (eg:Foundry, Ganache, Hardhat) - Setting up build environment (Foundry) - Foundry cli Forge, Anvil, Cast, Chisel	6 Hrs	Day 16-18	Monday (25/3/24) - Wednesday (27/3/24)11:00 am - 3:00 pm
		- Deploy on local vm using forge - Setting up a local chain with multi wallets using anvil. - Etherscan API	6 Hrs	Day 16-18	Monday (25/3/24) - Wednesday (27/3/24)11:00 am - 3:00 pm
		- Smart Contract Scripting and Events - Event Handling and Emission in Solidity	8 hrs	Day 19-20	Thursday (28/3/24) - Friday(29/3/24)11:00 am - 3:00 pm
3.3		Oracles - The Role of Oracles in Smart Contracts - Integrating Oracles in Solidity	4 hrs	Day 21	Monday (1/4/24)11:00 am - 3:00 pm
		-Using Oracles for External Data -Case Studies: Utilizing Oracles in Real-World Scenarios	8 hrs	Day 22-23	Tuesday (2/4/24) - Wednesday (3/4/24)11:00 am - 3:00 pm
3.4		Architecture of Smart Contracts - Architectural Patterns and Best Practices	6 hrs	Day 24-26	Thursday (4/4/24) - Monday(8/4/24)11:00 am - 3:00 pm
		- EIPs and usecases	6 hrs	Day 24-26	Thursday (4/4/24) - Monday(8/4/24)11:00 am - 3:00 pm
		- Gas Optimization and Efficient Coding	6 hrs	Day 27-29	Tuesday (9/4/24) - Thursday (11/4/24)11:00 am - 3:00 pm
		Proxy Contracts and Delegate Calls - Understanding Upgradable Smart Contracts - Proxy Contract Design Patterns - Security Considerations in Proxy Contracts - Drawbacks of Proxies	4 hrs	Day 27-29	Tuesday (9/4/24) - Thursday (11/4/24)11:00 am - 3:00 pm
3.5		IPFS (InterPlanetary File System) - Integration of IPFS for decentralized file storage. - Using IPFS in combination with smart contracts. - Interactive NFTs using IPFS (4hrs)	8 hrs	Day 30-31	Friday (12/4/24)-Monday(15/4/24)11:00 am - 3:00 pm
4	**36-40 hrs**	**Security and Build Environments (Week 6-7)**			
4.1		- Detailed Study of security vulnerabilities in smart contracts, secure development practices Researching Smart contract hacks Types of Security Attacks - Common Vulnerabilities: Reentrancy, Frontrunning, sandwich etc.	2 hrs	Day 32	Tuesday (16/4/24)11:00 am - 3:00 pm
		- Case Studies of Major Smart Contract Hacks	2 hrs	Day 32	Tuesday (16/4/24)11:00 am - 3:00 pm
4.2		Building resistance against MEV in smart contracts Miner Extractable Value (MEV) - Understanding MEV and its Implications	4 hrs	Day 33	Wednesday (17/4/24)11:00 am - 3:00 pm
		- Commit Reveal Designs	4 hrs	Day 34	Thursday (18/4/24)11:00 am - 3:00 pm
		- Architecture with MEV Resistance	4 hrs	Day 35	Friday (19/4/24)11:00 am - 3:00 pm
		- Exploring MEV Flashbots	4 hrs	Day 36	Monday(22/4/24)11:00 am - 3:00 pm
4.3		Security Patterns and common development practices, EIPs Security Best Practices - Security Patterns and Anti-Patterns	8 hrs	Day 37-38	Tuesday (23/4/24) - Wednesday (24/4/24)11:00 am - 3:00 pm
		- Development Practices with Audits in mind	8 hrs	Day 39-40	Thursday (25/4/24) - Friday(26/4/24)11:00 am - 3:00 pm
5	**38-40 hrs**	**Testing (Foundry) (Week 8-9)**			
5.1		- Deep dive into Testing with Foundry Setting up Forge test and building test contracts Introduction to Forge Test - Setting Up Forge	2 hrs	Day 41	Monday(29/4/24)11:00 am - 3:00 pm
		- Basic Testing with Foundry	2 hrs	Day 41	Monday(29/4/24)11:00 am - 3:00 pm
5.2		Test types and test coverage Types of Tests - Unit Testing in Solidity - Manual testing in VMs - Fuzzing and Invariant tests	4 hrs	Day 42	Tuesday (30/4/24)11:00 am - 3:00 pm
		- End-to-End Testing and code coverage(8hrs)	8 hrs	Day 43-44	Wednesday (1/5/24) - Thursday (2/5/24)11:00 am - 3:00 pm
5.3		Advanced Testing methods Writing Effective Tests - Advanced Testing Techniques	2 hrs	Day 45	Friday (3/5/24)11:00 am - 3:00 pm
		- Analyzing and Improving Test Coverage	2 hrs	Day 45	Friday (3/5/24)11:00 am - 3:00 pm
		Practicing Advanced Testing Concepts - Fuzz Testing and Invariant Testing	4 hrs	Day 46	Monday(6/5/24)11:00 am - 3:00 pm
		- Scenario-Based Testing	8 hrs	Day 47-48	Tuesday (7/5/24) - Wednesday (8/5/24)11:00 am - 3:00 pm
5.4		Development with anvil (Ganache alternative) and deploying on testnets Test Nets and Deployment - Local chain using anvil (4hrs)	4 hrs	Day 49	Thursday (9/5/24)11:00 am - 3:00 pm
		- Testing on live Testnets (eg: goerli, sepolia) (2hrs) - Testing for a L2 (optimism goerli) (2hrs)	4 hrs	Day 50	Friday (10/5/24)11:00 am - 3:00 pm
6	**20 hrs**	**Debugging, Auditing, and AI in Testing (Week 10)**			
6.1		- Debugging Tests and Transactions Debugging Tests and Transaction backtracking			
		- Tools and Techniques for Debugging(2hrs) - Analyzing Transaction Failures (2hrs)	4 hrs	Day 51	Monday (13/5/24)11:00 am - 3:00 pm
		Verbosity in Foundry - Log Management and Analysis	6 hrs	Day 52	Tuesday (14/5/24)11:00 am - 3:00 pm
		- Custom Logging and Debugging Practices	2 hrs	Day 53	Wednesday (15/5/24)11:00 am - 3:00 pm
6.2		AI based test analysis and audit preparations AI-Assisted Contract Development - Leveraging AI for Smart Contract Development(2hrs) - Automated Test Generation(2hrs)	4 hrs	Day 54	Thursday (16/5/24)11:00 am - 3:00 pm
		-Testing on Testnets and Audit Preparation - Preparing for and Conducting Audits	4 hrs	Day 55	Friday (17/5/24)11:00 am - 3:00 pm