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ETHEREUM 2 DEVELOPMENT
MASTERY SPECIALIZATION

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JavaScript Crash Course

- Variables.
- Data Types.
- Conditional Statements.
- Arrays.
- Loops.
- Functions.
- Objects.

01

Blockchain and Smart Contracts

- Blockchain and Smart Contract Basics
- Smart Contract Programming Basics
- Understanding Decentralized Information and Web3
- Ropsten Test-Ether and MetaMask
- Basics of Ethereum and the EVM
- Proof of Work vs. Proof of Authority
- PoS + PoW to PoS
- Ethereum 1.0 vs Ethereum 2.0

02

The ETH 2.0 Explainer

- Sharding: A Big Picture
- Ethereum 2.0 Phases
- Slots & Epochs
- Introduction to Validators, Attestations,
- and the Beacon Chain
- Crosslinks: Rooting Shards to the Beacon Chain
- Committees: Introduction
- Committees: Crux
- Beacon Chain Checkpoints
- Finality
- Attestations: a closer look
- Staking Rewards and Penalties

03

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Ethereum 2.0 Phases

- Introduction
- Design Goals
- Phase 0 - Beacon Chain
- Phase 1 - Shard Chains
- Phase 2 - State Execution

04

Proof of Stake

- Proof of Stake
- Benefits of proof of stake
- How does proof of stake fit current scenario
- Weak subjectivity
- Automate the social authentication to reduce the load
- Validators
- Security equivalent of a 51% attack against Casper look like
- MC => MR mean that all consensus algorithms with a given security level are equally efficient
- Exchanges in proof of stake pose a similar centralization risk to pools in proof of work
- Private/consortium chains

05

Serenity Phase 0 (EIP #2982)

- Simple Summary
- Abstract
- Motivation
- Decentralization and economic finality through proof-of-stake
- Specification
- Parameters
- Validator deposit contract
- Beacon chain and validator mechanics
- Issuance
- Initial punitive parameters
- Rationale
- Backwards Compatibility

06

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Ethdo tool

- Account Management
- Transaction Generation and Signing
- Blockchain Interaction
- Smart Contract Deployment
- Contract Function Execution
- Event Listening
- Gas Price Estimation
- Network Configuration

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