Web3 From Zero — A Deep, Cohort-Style Roadmap

This document is written for students who want to truly understand Web3, not just participate in it. Every week focuses on thinking correctly before building anything.

How This Roadmap Works

This roadmap is structured like a slow, rigorous cohort. Each week introduces concepts that must be understood deeply before moving forward. Do not rush. Confusion means you are learning.

Week 1–2: Why Web3 Exists (Foundational Thinking)

Most beginners jump directly into tools without understanding the underlying problem Web3 is trying to solve. These two weeks are dedicated entirely to understanding why the current internet architecture fails when it comes to trust and value.

In Web2, platforms act as trusted intermediaries. They store user data, manage transactions, enforce rules, and can change those rules at will. This works well for convenience but fails when neutrality, censorship resistance, or global coordination is required.

Web3 introduces the idea that trust should be minimized, not assumed. Instead of trusting a company or authority, users rely on cryptography and open verification. This shift is the philosophical foundation of everything that follows.

Week 3–4: Blockchain Fundamentals

A blockchain is best understood as a shared state machine rather than a database. It maintains a global state that is replicated across many independent nodes.

Transactions are requests to modify this state. Blocks bundle these transactions together, and cryptographic hashes link blocks to create an irreversible history.

Consensus mechanisms exist to ensure that all honest participants agree on the same version of history even in the presence of faulty or malicious actors.

Week 5: Cryptography and Digital Ownership

Cryptography is what enables ownership in Web3. A private key represents control, while a public key or address represents identity on the network.

There is no password recovery, no customer support, and no central authority. This makes Web3 empowering but also unforgiving.

Understanding this trade-off early prevents careless behavior later.

Week 6–7: Ethereum as a Reference System

Ethereum is not chosen because it is perfect, but because it provides the clearest conceptual model for understanding programmable blockchains.

Accounts on Ethereum can either be controlled by private keys or by code. Every computation costs gas, which prevents abuse and forces developers to think efficiently.

The Ethereum Virtual Machine executes code deterministically across all nodes, ensuring that everyone reaches the same result.

Week 8: Solidity and Smart Contract Basics

Smart contracts are programs that live on the blockchain. Once deployed, they are extremely difficult to change.

This week focuses on reading and understanding Solidity code rather than rushing to write complex contracts.

Students should become comfortable with contract structure, state variables, functions, and events.

Week 9–10: Smart Contract Design and Constraints

Designing smart contracts is fundamentally different from traditional software development.

Because contracts are immutable and public, developers must design for failure, misuse, and attack.

Upgrade patterns, access control, and gas optimization are introduced as design considerations, not optimizations.

Week 11: Security as a Mindset

Most failures in Web3 are security failures, not feature failures.

This week introduces common vulnerabilities conceptually, focusing on why they happen rather than memorizing exploits.

Security is treated as a continuous process, not a checklist.

Week 12: Decentralized Finance (DeFi)

DeFi protocols recreate financial primitives using smart contracts.

Understanding DeFi requires understanding incentives, liquidity, and risk, not just interfaces.

Students learn how protocols compose with one another to form larger systems.

Week 13: NFTs as Infrastructure

NFTs are often misunderstood as art or speculation.

In reality, they are standardized ownership records that can represent identity, access, or rights.

This week reframes NFTs as infrastructure rather than media.

Week 14: Oracles, Bridges, and Systemic Risk

Blockchains cannot access external data on their own.

Oracles provide this connection but introduce trust assumptions.

Bridges expand interoperability but are frequent points of failure and attack.

Week 15: Real-World Assets and Compliance

Tokenizing real-world assets introduces legal and regulatory complexity.

On-chain representation does not automatically imply legal ownership.

This week focuses on understanding why RWAs are challenging but necessary for institutional adoption.

Week 16: Choosing a Long-Term Direction

At this stage, students should stop exploring broadly and start specializing.

Possible paths include smart contract engineering, protocol research, infrastructure, or compliance-focused roles.

Depth, not speed, determines long-term success in Web3.

Final Note

Web3 rewards those who understand systems deeply. Tools will change. Fundamentals will not.