PATHAHEAD · FREE ROADMAP

Become a Blockchain / Web3 Developer from Scratch

Build the systems where code enforces the rules. Go from zero to deploying smart contracts and full dApps in about five months — everything on free testnets.

22	5	4	₹0
weeks · ~10–12 hrs/wk	on-chain projects	phases · to deployed dApp	free testnets only

A free PathAhead learning resource · adjust the pace to your life — the order matters more than the dates.

THE ONE RULE

Build on testnets → verify on-chain → document

Web3 is learned by shipping contracts, not watching charts. Everything below is deployed to free test networks, verified publicly, and written up on GitHub — real proof anyone can check on-chain.

> **Legal & ethical use only.** This roadmap teaches blockchain development, not crypto trading. Buying, trading, or speculating on tokens is risky and regulated differently across countries — build the technology; don't gamble on it. Everything here uses free test networks.

THE ROADMAP

Four phases, step by step

0 Foundations

Weeks 1–5

How blockchains actually work, before any code.

WEEK 1
Blockchain mechanics
Blocks, hashing, consensus, why it can't be quietly edited.

WEEK 2
Ethereum & wallets
Accounts, gas, transactions; set up MetaMask on a testnet.

WEEK 3
Cryptography basics
Public/private keys, signatures, hashes in practice.

WEEK 4
JavaScript refresher
The language of Web3 tooling and frontends.

WEEK 5
Smart-contract concepts
What contracts can (and can't) do; reading real ones.

1 Solidity

Weeks 6–11

Write, test, and deploy real smart contracts.

WEEK 6
Solidity syntax
Types, functions, modifiers, events — in Remix.

WEEK 7
Contract patterns
Ownership, access control, upgradability basics.

WEEK 8
Testing
Hardhat/Foundry tests — the habit that prevents disasters.

WEEK 9
Tokens (ERC-20)
Build and deploy your own token, properly.

WEEK 10
NFTs (ERC-721)
Mint an NFT collection with on-chain metadata.

WEEK 11 · PROJECT ▶
Token on testnet
Deploy a verified token contract with a test suite.

2 dApps

Weeks 12–17

Connect contracts to real user interfaces.

WEEK 12

ethers.js / viem

Talk to contracts from JavaScript.

WEEK 13

Wallet connection

Sign-in with wallet, transactions from the browser.

WEEK 14

Decentralized storage

IPFS for images and metadata.

WEEK 15

Reading the chain

Events, indexing, The Graph basics.

WEEK 16

Oracles

Chainlink — bringing real-world data on-chain.

WEEK 17 · PROJECT ▶

Full dApp

A complete mint site or voting dApp, live on a testnet.

3 Security & Portfolio

Weeks 18–22

Think like an auditor — the highest-paid skill in Web3.

WEEK 18

Common exploits

Reentrancy, overflow, front-running — and their fixes.

WEEK 19

Ethernaut challenges

Hack intentionally-vulnerable contracts, legally.

WEEK 20

Best practices

Audits, OpenZeppelin libraries, checklists.

WEEK 21

DeFi concepts

How swaps, lending, and staking actually work.

WEEK 22 · CAPSTONE ▶

Audited dApp

A polished dApp with tests and a self-audit writeup.

BUILD A PORTFOLIO

Five projects that get you hired

Projects beat certificates. Do them in order — each builds on the last. Put every one on GitHub with a clear README: problem → approach → result.

Start here

1 · CryptoZombies Course

Learn Solidity by building a game — free and interactive.

Tokens

2 · Your Own ERC-20 Token

Deployed, verified, and tested on a public testnet.

NFTs

3 · NFT Collection + Mint Page

ERC-721 contract with IPFS metadata and a mint frontend.

In demand

4 · Full dApp

Voting or crowdfunding dApp — contract + wallet-connected UI.

Capstone

5 · Audited Capstone dApp

Full test suite, security self-audit, and documentation.

ROLES YOU CAN APPLY FOR

Blockchain Developer · Smart Contract Engineer · Web3 Frontend Developer · Junior Security Auditor

TYPICAL STARTING SALARY · INDIA

₹5–15 LPA

LEARN IT

Learning resources

Every item links to the real source (clickable in this PDF).

BOOKS

- Mastering Bitcoin by Andreas Antonopoulos
- Mastering Ethereum by Andreas Antonopoulos and Gavin Wood
- The Infinite Machine by Camila Russo

COURSES

- Cyfrin Updraft Solidity course
- Alchemy University Ethereum Developer Bootcamp
- Blockchain Specialization (Coursera)
- CryptoZombies interactive Solidity

YOUTUBE

- Patrick Collins
- Dapp University
- Whiteboard Crypto
- freeCodeCamp Solidity course

PRACTICE

- CryptoZombies
- Ethernaut by OpenZeppelin
- Remix IDE
- SpeedRunEthereum
- GitHub

DO THIS TODAY

Your first step (takes 30 minutes)

1

Install MetaMask

Free wallet extension — switch it to a test network (no real money).

2

Do CryptoZombies lesson 1

cryptozombies.io — you'll write your first Solidity in 30 minutes.

3

Deploy in Remix

remix.ethereum.org — deploy a Hello-World contract to a testnet today.

> **Job-ready checklist:** 3–5 solid projects on GitHub (≥1 deployed or documented) · can explain your work in an interview · comfortable with the core tools of the field · a portfolio or profile recruiters can find.

PathAhead — India's premium career guidance platform. This roadmap is a free educational resource; timelines are a guide and everyone learns at a different pace. Referenced third-party resources (Cyfrin Updraft, Alchemy University, CryptoZombies, Ethernaut, Solidity docs) are for learning only and are not affiliated with PathAhead.