alchemy [university]

All courses > Ethereum Developer Bootcamp

Ethereum Developer

The Ethereum Developer Bootcamp is a comprehensive course that teaches you the fundamentals of EVM development from 0 to 100.

91 lessons

Intermediate skill level

JS pre-requisite

Start course

Join 14K+ enrolled students

About the

The course includes everything from cryptography to smart contracts to fully functional dApp development. This is the #1 resource to jumpstart your web3 career and a MUST if you want to learn Ethereum.

The curriculum includes interactive coding challenges, videos, written guides, and weekly projects - as well as a capstone final project which can be submitted for official Alchemy certification.

This bootcamp, along with the rest of the AU content, is supported by the AU community of learners, builders and entreprenuers - join the AU Discord for the max bootcamp experience!

Skills you'll obtain

Become interview ready

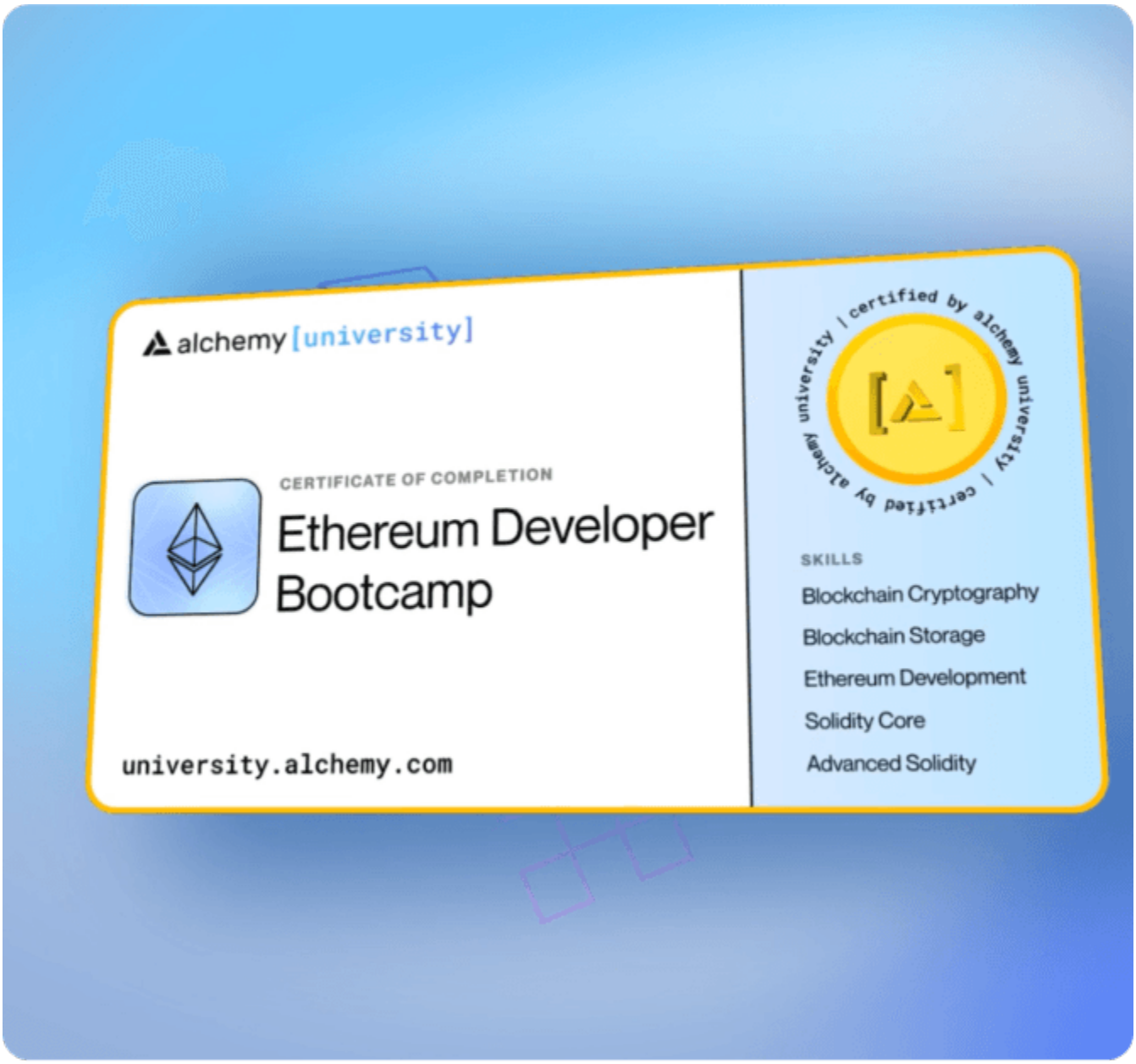
Master Solidity

Build Smart Contracts

Earn your

Complete the Ethereum Developer Bootcamp to earn an NFT certificate

Start course



Student

> I learned the skillset I needed to transition from web2 to web3 and it led directly to landing my dream job and helping secure the open economy.
>
> **Dan McKeon, @OpenZeppelin**
>
> Full Stack Ethereum Developer

Syllabus

90 lessons | 13 videos | 7 projects

Blockchain Cryptography

Learning Core Blockchain Cryptography

11 lessons **4 videos**

Bootcamp Introduction:

Itemized advice on maximizing your AU learning experience!

- **Ethereum Dev. Bootcamp Tips & Tricks**

The First Primitive:

Blockchain and Cryptographic Hashes

- **Blockchain and Crypto**
- **Cryptographic Hashes**

Digital Signatures:
Verify a Signature Without Revealing a Private Key

- **Public Key Cryptography**
- **Public Key Exercise**
- **Further Study**

Proof of Work:
Intro to Blockchain Consensus Mechanisms

- **Mining & Proof-of-Work**
- **Proof of Work Miner**
- **Proof of Work**
- **Further Study**

Blockchain Network:
How Blockchain Functions as a Network

- **Blockchain Structure**
- **Blockchain Data Structure**
- **Further Study**

Week 1 Project:
Build a Project with Cryptography

- **ECDSA Node Project**
- **Week 1 Recap**

Blockchain Storage

Blockchain Balances and Data Structures

10 lessons **3 videos**

Keeping Track of Blockchain User State:

How Do Blockchains Keep Track of User State?

- **UTXO vs Account Model**
- **Coding the UTXO Model**
- **UTXO Locking & Unlocking Scripts**

Tree Data Structures:

Learning to Build and Work with Trees

- **Basic Tree Data Structures**
- **Build a Binary Search Tree**
- **Merkle Tree Intro**
- **Merkle Trees**

Blockchain Data Storage:

Understanding data storage on blockchains

- **Merkle Trees in Blockchains**
- **Ethereum Tries**
- **Learn Tries**
- **Supplemental Reading**

Week 2 Assignments:
A coding project and recap of the week article

- **Merkle Gift List**
- **Week 2 Recap**

Ethereum

Diving into the State Machine

17 lessons

Ethereum Features:
High Level Overview of Ethereum

- **Introduction to Ethereum**
- **Proof of Stake**
- **Gas on Ethereum**
- **Transactions Game**
- **Ethereum Accounts**
- **Supplemental Reading**

Reading Data from Ethereum:
Ethereum Clients and the JSON RPC API

- **Read Requests**
- **Activity: Query Ethereum**
- **Ethereum Nodes**

JSON-RPC Requests

Ethereum Transactions:
Transactions = Signed JSON-RPC Requests

Intro to Transactions

Code a Transaction

Front-End Libraries:
Ethereum Front-End Libraries

Intro to Front-end Libraries

Intro to Ethers.js

Where is the Ether?

Week 3 Assignments:
A Project and Reflections on Week 3

Build your own Block Explorer

Week 3 Recap

Smart Contract Basics
Diving into Solidity Syntax and Data Types

20 lessons **2 projects**

Solidity Syntax:
Learning the Basics of Solidity

Solidity Syntax

- **Data Types**
- **Solidity and the EVM**
- **Solidity at a Glance**

Functions:
Solidity Functions & Visibility

- **Solidity Functions**
- **Functions**

Smart Contract Communication:
How Do We Talk to Smart Contracts?

- **Contract Communication**
- **Contracts with ethers.js**

Intro to Hardhat:
Hardhat is Here to Help!

- **What is Hardhat?**
- **Guide: How to Deploy a Contract with Ethers + Hardhat**
- **Guide: How to Modify State using Hardhat**

Address Interactions:
Contracts Communicating with Addresses

- **Calling EOAs**
- **Sending Ether**

Reverting Transactions

Learning Revert

Calling Contracts

Sending Data

Practice Solidity:
Put your Solidity skills to the test!

Sum and Average

Countdown

Week 4 Assignments:
Challenges and Reflections on Week 4

Smart Contract Winner

Hardhat Guide: How To Unit Test Contracts

Week 4 Recap + Feedback

Solidity

Mastering the Solidity Language

10 lessons **1 projects**

Mappings:
Revert & Mappings

Mappings

Mappings

Contract Puzzles

Events:
Events, Logs and Receipts

Events

Local Hardhat Games

Events

Escrow Contract:
Build an Escrow Smart Contract

Escrow Introduction

Build an Escrow

Reference Types:
Arrays & Structs

Arrays & Structs

Arrays

Structs

Week 5 Project:
Lets work on a dapp

Decentralized Escrow Application

Week 5 Recap

Solidity Core

The Core Solidity Concepts

16 lessons **2 projects**

Solidity Challenges:
Honing Solidity Skills

- **Solidity Practice**
- **Party Split**
- **Dead Man's Switch**
- **Hackathon Ratings**

Multi-Sigs:
Learn All About the Features of Multi-Sigs

- **What is a Multi-Sig Contract?**
- **Multiple Signature Wallet**

Inheritance:
Contracts That Build on Each Other

- **What is Inheritance?**
- **Inheritance**

ERC-20:
The Fungible Token Standard: ERC20

- **What Is The ERC-20 Token Standard?**
- **ERC-20 Token**

Deploy Your Own Token

ERC-20 Treasure Chest

Fetching Token Transfers

Send ERC20s to Contracts

ERC-20 Token Indexer App

NFTs:
Learning Non-Fungible Tokens

What are NFTs?

How to Mint NFTs

NFT Indexer App

Week 6 Recap:
Reflections on Week 6

Week 6 Recap + Feedback

Solidity Governance

How Smart Contracts are Governed

6 lessons **2 projects**

Proxy Contracts:
Delegate to Other Contracts

Storage Slots

Delegatecall

Evolution of Proxies

Libraries:
Learn about Solidity Libraries

Introduction to Libraries

Smart Contract Libraries

Upgrading Contracts:
Learn Frameworks for Upgrading Contracts

What is Smart Contract Upgradeability?

Deploy Upgradeable Smart Contracts

Governance:
How Smart Contract Protocols are Governed

The State of Governance

Basic Governance

The Governor Standard

Week 7 Recap:
Reflections on Week 7

Week 7 Recap

The web3 development platform


Products

Supernode
NFT API
SDK
Webhooks
Custom Webhooks
Websockets
Transfers API
Token API
Transact
Transaction Simulation
Account Abstraction
Spearmint

Developers

Docs
Status
Sepolia Faucet
Mumbai Faucet
GWEI Calculator
Create Web3 Dapp
Smart Contracts
Chain Connect
Request a Chain

Community

Alchemy University
Web3 Jobs
Dapp Store
Overviews
Case Studies
WAGBI Grant
Newsletter
Blog

Company

About us
Careers
Customers
Newsrooms
Press Kit
Security
Terms of Service
Dapp Store Terms
Privacy Policy

Contact

Sales

Press

Support

Discord