COURSE 04

Ethereum and Smart Contracts

Course description

Course 04 - Ethereum, Smart Contracts, Layer 2, DeFi , Dapp

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Description

An advanced course on the evolution of Ethereum and Smart Contracts, as well as applications and concrete use cases that result in multiple protocols and Decentralized Applications, each with unique governance mechanisms and costs that often depend on the speed and security of the blockchain on which they are based. The course provides an in-depth look at some protocols and the main financial applications of DeFi.

Target participants

- Financial Advisors
- Asset managers
- Financial professionals

Speaker

Prof. Claudio Grassi

Materials

- Course presentation
- Summary sheets
- Access to selected Route Crypto Training resources

Contents

In-depth analysis of Ethereum mechanisms

- Ethereum Virtual Machine (EVM): what it is and why it matters
- Gas prices, transaction fees, and recent updates (e.g., EIP-1559)
- Ethereum 2.0 and scalability: rollups, L2, sharding, and what they mean for businesses
- Implications for institutional use and cost models
- Activity: interactive simulation of a congested Ethereum network and fee analysis

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Smart contracts in action: design, risks, and strategy

- How smart contracts are created and structured (from a visual, non-technical perspective).
- Security vulnerabilities: reentrancy, oracle manipulation, rug pulls.
- Legal applicability vs. technical applicability of smart contracts.
- Auditing, testing, and due diligence processes.
- Case study: analysis of a smart contract failure (e.g., The DAO or Wormhole exploit)
- Group discussion: What internal controls are necessary before interacting with smart contracts?

Advanced DeFi concepts and products

- Protocol categories
- Yield aggregators (Yearn)
- Derivatives (Synthetix, GMX)
- Liquid staking (Lido)
- On-chain real-world assets (RWA)
- Governance and DAOs: how decentralized protocols make decisions
- Interoperability and composability: the Lego bricks of DeFi
- DeFi 2.0 and beyond: why this topic still has many open and unresolved issues.
- Interactive demo (no code required): using DeFi dashboards (Zapper, DeFiLlama, Token Terminal) to evaluate the actual metrics of protocols

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Institutional DeFi: onboarding, custody, and compliance

- Institutional DeFi gateways (e.g., Fireblocks, MetaMask Institutional)
- KYC/AML for on-chain finance
- Custody models (self-custody, third parties, MPC wallets)
- Treasury and portfolio risk management in DeFi
- Exercise: mapping an internal compliance checklist for interacting with a DeFi lending platform

Workshop: Design a DeFi use case or strategy

- Choose a theme (e.g., tokenized fund, FX hedging, treasury yield strategy)

  Work in teams to
- Define the objective
- Identify the smart contracts/protocols to use
- Assess risks, costs, and compliance issues
- Propose a high-level governance model
- Result: Each team presents a "DeFi strategy presentation" to the class to receive feedback from peers