Publication date : 06/28/2024

Course : Blockchain, developing on Ethereum

Practical course - 3d - 21h00 - Ref. BKE
Price : 2470 CHF E.T.

Ethereum is a decentralized exchange protocol enabling users to create smart contracts using a Turing-complete language. They are based on a computer protocol that enables the verification or enforcement of a mutual contract that can be publicly consulted on a blockchain.

Teaching objectives

At the end of the training, the participant will be able to:

- Coding and deploying a smart contract on the Ethereum test network
- Code and deploy your first DApp (Decentralized Application)
- Learn how to deploy Etherum nodes (public or private)
- Using a blockchain explorer (bitcoin)
- Executing a transaction on a blockchain

Intended audience

All audiences. Developers, architects and design engineers.

Prerequisites

No special knowledge required.

Practical details

Hands-on work

Theoretical input, discussion, demonstration.

Teaching methods

Deductive pedagogy based on exchanges, examples and demonstrations.

Course schedule

PARTICIPANTS

All audiences. Developers, architects and design engineers.

PREREQUISITES

No special knowledge required.

TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more.
Participants also complete a placement test before and after the course to measure the skills they've developed.

TEACHING AIDS AND TECHNICAL RESOURCES

• The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
• At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
• A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

1 Origins and fundamentals of blockchain and cryptocurrencies

- Historical background to NAKAMOTO's publication.
- Differences with a centralized database.
- Bloackchain transaction life cycle.
- Focus on the first application: bitcoin.
- What are the limits for so-called "1.0" Blockchain.

Hands-on work

Use a blockchain (bitcoin) explorer.

2 Blockchain and 2nd-generation cryptocurrencies: evolving use cases

- Blockchain 2.0 and Ethereum
- What is a smart-contract?
- The different types of Ethereum account.

Hands-on work

Execute a first transaction. Exchange cryptocurrency between participants.

3 Deploying a smart contract

- An introduction to the theory, so that you can get to grips with the terms and definitions.
- Putting it into practice: using Metamask.
- Mining and exchanging tokens: understanding gas management.
- Private/public key theory: seed management.
- OpenZeppelin: understanding and using ERC20/21.
- Using Remix.

Hands-on work

Learn how to code and deploy a Smart Contract on one of Ethereum's public test networks: the Rinkeby network.

4 Code and deploy your first DApp (Decentralized Application)

- Using Truffle.
- Using Ganache for local deployment.
- Unit tests on smart contracts.
- Using the Web3 API for Contract ABI.
- Using Infura (connecting to a node).
- DApp deployment.

Hands-on work

Create a DApp and deploy it.

TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.

5 Initializing an Ethereum network and circulating value

- Reminder of the different types of node: light node and full node.
- Different types of consensus: proof of work, proof of authority.
- Virtual machine initialization.
- Introducing Parity.
- Using Geth.
- Real-life use cases: non-validated blocks, scan.
- Ethereum 2.0: challenges and opportunities.
- Use cases by segment (finance, energy, logistics, agri-food) and possible interfaces (big data, IoT, AI).

Hands-on work

Initialize a node, create a network, circulate value.