

# Fund12\_Plan of the course

## A. Goal

- Understand how to design and build an automation testing framework for smart contract on Cardano.
- Become proficient in writing, executing, and reporting test cases for smart contracts.
- Use the tools: Lucid, Blockfrost, Bun and TypeScript.

## B. Audience

- QC Engineers and Automation Engineers wanting to learn about Smart Contract testing
- Developers and those interested in testing on the Cardano blockchain

## C. Expectations

- Build and implement a modular testing framework for Cardano Smart Contracts.
- Develop test scripts using Typescript and Lucid.
- Create transactions using Blockfrost, Lucid and TypeScript.
- Execute tests and validate them using Bund and TypeScript.

## D. Course Structure

### 1.Module 1: Introduction to Blockchain and Smart Contract Testing.

- Basics of Blockchain, smart contracts and testing challenges.
- Installation and introduction to tools: Lucid, Blockfrost, Bun and TypeScript.

Activities:

- Lectures: Overview of Blockchain and smart contract testing.
- Hands-on Exercise: Installing and setting up Lucid, Blockfrost and Bun on the local machine.

### 2.Module 2: Designing the Testing framework

- Overview of the framework architecture ( what the framework solves and its features)
- High-level architecture: Sub-modules and their interactions.
- Designing test cases for Smart contracts.
- Integration of Lucid and Blockfrost into the framework.
- Workflow: From test case creation to test execution.

Activities:

- Lectures: Discussing the architecture and design of the testing framework.
- Hands-on Exercise: Design a basic structure for testing framework using Typescript.

### 3.Module 3: Writing Test Scripts with Lucid and Typescript

- Overview of Lucid for smart contract interaction.
- Create and building an transaction using Blockfrost Provider, Lucid and Typescript.
- Create test scripts from an Excel template

Activities:

- Lectures: How Lucid interacts with smart contracts.
- Hands-on Lab: Write test script to interact with a smart contract.
- Exercise: Convert test cases from an Excel template into TypeScript test script.

### 4. Module 4: Executing Tests with Bun

- Introduction to Bun: Setting up and running tests.
- Automating test execution.

- Handling test failures and exceptions.

Activities:

- Lectures: Overview of Bun as a test execution tool.
- Hands-on Lab: Execute test scripts using Bun.