

## **Smart Contract Programming for Businesses**

In this 2-day course, we will do a deep dive into the many aspects of writing, testing, deploying and interfacing with smart contracts on the Ethereum blockchain. The course will cover an introduction to the Ethereum blockchain, the costs of executing a smart contract on the Ethereum blockchain, and a comprehensive overview and hands-on exercise on coding smart contracts using the Solidity programming language.

Participants will be developing several smart contracts throughout the course of the workshop and deploying the smart contract to a test network.

### **Objective**

#### **A. Knowledge and Understanding (Theory Component)**

At the end of this course, participants should be able to:

- Describe the difference between the bitcoin blockchain and the Ethereum blockchain
- Explain the principles of a smart contract
- Understand various constructs in the Solidity programming language
- Illustrate the importance of security audits

#### **B. Key Skills (Practical Component)**

At the end of this course, participants should be able to:

- Create, test, and deploy their own smart contract
- Build an interface to allow external interaction with own smart contract
- Understand and prevent major security issues on smart contracts

## Topics

Time	Agenda
<b>Day 1</b>	
09:00 – 09:15	2-Day Course Overview
09:15 – 10:45	Overview of Blockchain: <ul style="list-style-type: none"> <li>- The Bitcoin Blockchain structure</li> <li>- The difference between Bitcoin and Ethereum blockchain</li> <li>- Overview of smart contract</li> <li>- Security pitfalls (e.g., the DAO attack)</li> </ul>
10:45 – 11:00	Break
11:00 – 12:30	Ethereum Essentials <ul style="list-style-type: none"> <li>- Ether and gas</li> </ul> The Solidity programming language <ul style="list-style-type: none"> <li>- Overview of Solidity</li> <li>- Remix – your first test environment</li> <li>- Writing a simple smart contract</li> </ul>
12:30 – 14:00	Lunch
14:00 – 15:30	Solidity in more detail <ul style="list-style-type: none"> <li>- Contracts</li> <li>- Data               <ul style="list-style-type: none"> <li>o Scope</li> <li>o Visibility</li> <li>o Data types</li> </ul> </li> </ul>
15:30 – 15:45	Break
15:45 – 17:00	Solidity in more detail <ul style="list-style-type: none"> <li>- Functions               <ul style="list-style-type: none"> <li>o Payable functions</li> <li>o Constant functions</li> <li>o Visibility</li> <li>o Some Built-in capabilities</li> </ul> </li> <li>- special - the Constructor</li> <li>- Events/Logs</li> </ul>
17:00 – 17:30	Assessment

<b>Day 2</b>	
09:00 – 09:15	Overview of the Day and a quick Recap
09:15 – 10:45	Traps and Pitfalls Using Metamask Launching a contract on a test net
10:45 – 11:00	Break
11:00 – 12:30	Interacting with a contract - Etherscan - MyEtherWallet / MyCrypto More advanced test environments - Truffle - Embark
12:30 – 14:00	Lunch
14:00 – 15:30	Building a user interface with Web3.js - Metamask - Cipher / Status
15:30 – 15:45	Break
15:45 – 17:00	The importance of code audits and concluding exercises
17:00 – 17:30	Assessment

## Requirements

- Attendees should have a degree of programming capability in a language like javascript
- Attendees have to bring along their own laptop with a programming editor (e.g., VS Code), and Metamask installed on Chrome or Firefox
- Attendees should possess test Ether on the Rinkeby network - to get test ether, visit <https://faucet.rinkeby.io/>

**Duration: 2 days**

**Venue: Singapore University of Social Sciences**

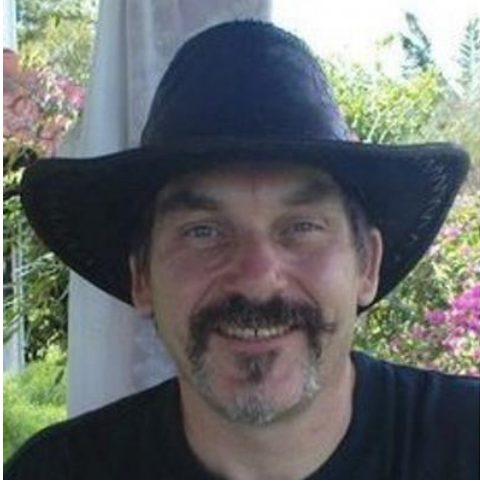
**Minimum number to run: 25 participants**

**Certificate of participation is awarded upon 75% attendance for the course**

**(As the university was renamed recently on 17 March 2017, we will be reprinting our course certificates to incorporate the new name and logo. As such, you will receive your certificate at a later date.)**

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## Trainer's Profile



**Dave Appleton**  
*Lead Blockchain Developer, HelloGold*

Dave Appleton started programming in 1968 but had to wait until 2014 to be properly introduced to the blockchain. Recently he has become active in raising awareness of phishing attacks and other scams. He spent the time in between as a programmer, hardware engineer and lecturer in Singapore and Malaysia.

Dave is now the lead blockchain developer for HelloGold in Malaysia, bringing a better means of saving to those not well served by the finance industry. He is also a senior Advisor at Akomba Labs in Singapore.

HelloGold is the first company to launch an ethereum token backed by fully allocated investment grade gold