

Blockchain Course Overview

Aron Kondoro & Anthony Kigombola

College of Information and Communication Technologies (CoICT)

Trainers

- **Anthony Kigombola**

- Assistant Lecturer
- Computer Science and Engineering Department
- PhD research on improving the performance of PoW in Blockchain implementations

- **Aron Kondoro**

- Assistant Lecturer
- Computer Science and Engineering Department
- Publications in the applications of Blockchain in supporting power trading in power systems

Overview

- Explore and understand the underlying concepts Blockchain technology
- Knowledge about the practical implementation of blockchain
- Covers
 - Fundamental design principles of blockchains
 - Implementation concepts
 - Tools/Framweorks

Objectives

- Master theoretical and technical foundations of Blockchain technology
- Understand the underlying concept of decentralization and its relation to Blockchain
- Understand the mechanisms behind cryptocurrencies such as Bitcoin and Ethereum
- Investigate alternative Blockchain solutions including Hyperledger and others

Focus on hands-on expertise

- How to implement and build your own private Blockchain
 - Creating and connecting nodes
 - Creating accounts
 - Performing transactions
 - Mine blocks
 - Check balances
 - Trace transactions
 - Monitor blockchain statistics
- Using Blockchain-based tools
 - Geth - Official Go implementation of the Ethereum protocol
 - Explorers
 - Hyperledger

Prerequisites

- Familiarity with command line environment and tools
- Basic knowledge of high-level programming language
- Familiarity with virtualization technology using containers

Mode of Delivery

- Discussion of Concepts + Practice sessions
- Hands-on approach using a docker container to build an Ethereum test chain and operate on it
- Interactive/collaborative

Topics

1. Blockchain Foundations
2. Crypto Assets
3. Blockchain Mining
4. Consensus Mechanisms
5. Privacy and Anonymity
6. Bitcoin
7. Hyperledger
8. Ethereum Project
9. Blockchain Applications and Use Cases

Tools

- Laptop
- Docker
- Geth – Official Go implementation of the Ethereum protocol
- Internet Connection