**Course Title**

Blockchain theory and application MA5104701

**Prerequisites**

Some basic programming background – understand loops, conditional statements and variables.

Able to read, write and understand English.

**Course** **Objectives**

To understand the technical workings of a cryptocurrency system such as Bitcoin and Ethereum

To be able to critically evaluate any application implementation on a blockchain

To be able to implement smart contracts on Ethereum as Dapps

**Outline of Lectures**

The double spending problem

Cryptographic keys, Addresses and Wallets

Transaction, Mining and Consensus

Scripting and Advanced Transactions

Blockchain Applications I

Blockchain Applications II

Ethereum and Smart Contracts

Ethereum Virtual Machine, Address and Transactions

Solidity programming – metamask, remix

Solidity programming – truffle

Solidity programming erc20, erc721, fungible and non fungible

Solidity creating DAPPS

**Textbooks**

Melanie Swan, Blockchain Blueprint for a New Economy, O’Reilly, 2015

Andreas Antonopoulos, Mastering Bitcoin – programming the open blockchain, O’Reilly, 2017

**Reference**

<https://docs.soliditylang.org/en/v0.7.4/>

<https://remix-ide.readthedocs.io/en/latest/compile.html>

**Notice**

This course provides technical treatment of block chain and smart contracts. This course also hopes to inspire development of new ideas and innovations in the use of Smart Contracts.

**Grading**

Coursework, presentation, reports and project.

**Software**

Electrum wallet

Metamask extension for browser

Remix Ethereum ide (website)

Truffle Suite