

ABUSVAC05 - Block Chain Technology

Learning Objectives

The Objective of this course is

To assess blockchain applications in a structured manner.

To impart knowledge in block chain techniques and able to present the concepts clearly and structured.

To get familiarity with future currencies and to create own crypto token.

Course Outcomes

Upon completion of this course the students will be able to

- Understand the various technologies and its business use.
- Analyse the block chain applications in a structure manner.
- Explain the modern concepts of block chain technology systematically.
- Handle the cryptocurrency.
- Understand the modern currencies and its market usage

Unit I Basic Concepts

Introduction - Decentralized society - Disturbed Database, Byzantine General problem - Fault tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete - P2P network - Private key - Public key - Cryptography - Hash Function - Digital Signature - ECDSA - Memory Hard Algorithm - Zero Knowledge Proof.

Unit II Block Chain

Introduction - Advantage over conventional distributed database - Network and protocols - Block chain network - Mining - Mechanism - Life Cycle of Block chain - Distributed consensus - Merkle Patricia Tree - Gas Limit -

Transactions and Fee - Anonymity - Reward - Chain policy- Life of Block chain applications -Soft and Hard Fork - Private and Public blockchain.

Unit III Distributed Consensus

Nakamoto consensus - Proof of work - Proof of Stake - Proof of Burn - Difficulty level - Sybil Attack - Energy Utilization and alternate - Fabric model - SDKs - Components of Fabric Model - Architecture of Hyperledger fabric.

Unit IV Cryptocurrency

History - Distributed ledger - Bitcoin protocols - Mining strategy and rewards - Ethereum - construction - Truffle - DAO - dApps - Smart Contract - Boot strapping - GHOST Vulnerability - Attacks - Sidechain - Namecoin.

Unit V Cryptocurrency Regulations

Stakeholders - Roots and Bitcoin - Legal Aspects - Crypto currency exchange - Black market and Global economy. Applications : IoT - Medical Record Management system - Domain Name Service and future of Blockchain - Business applications and assessing blockchain projects.

Text Books:

Daniel Drescher, Block chain basics A non-technical introduction in 25 steps, Apress , 2017.

Paul Vigna and Michael J.Casey. The Age of Cryptocurrency, 2015.

Supplementary Readings:

Antonopoulos, Mastering Bitcoin : Unlocking Digital Cryptocurrencies.

Mastering Blockchain - Imar Bashir - Second edition - Packt - 2018.

Satoshi Nakamoto, Bitcoin : A peer-to-peer electronic Cash system.