

## CERTIFICATE COURSE BLOCKCHAIN TECHNOLOGY

### 3.Etherum, Smart contract, Hyper ledger, Solodity programming and block chain applications

#### UNIT-I

**Introduction to Ethereum :** What is Ethereum, Introduction to Ethereum, Consensus Mechanisms, Ethereum blockchain, Elements of the Ethereum blockchain.

#### Unit-II Introduction to smart contract :

Smart Contracts: Definition, Ricardian contracts How Smart Contracts Work, Metamask Setup, Ethereum Accounts, Receiving Ether's What's a Transaction?, Smart Contracts. Precompiled contracts.

#### Unit-III

**Introduction to Hyperledger:** What is Hyperledger? Distributed Ledger Technology & its Challenges, Hyperledger & Distributed Ledger Technology, Hyperledger Fabric, Hyperledger Composer.

#### Unit-IV

**Solidity Programming:** Solidity - Language of Smart Contracts, Installing Solidity & Ethereum Wallet, Basics of Solidity, Layout of a Solidity Source File & Structure of Smart Contracts, General Value Types (Int, Real, String, Bytes, Arrays, Mapping, Enum, address)

#### Unit-V

**Blockchain Applications:** Internet of Things, Medical Record Management System, Domain Name Service and Future of Blockchain, Alt Coins. Course outcomes: At the end of the course the student will be able to: 1. Understand the types, benefits and limitation of blockchain. 2. Explore the blockchain decentralization and cryptography concepts. 3. Enumerate the Bitcoin features and its alternative options. 4. Describe and deploy the smart contracts 5. Summarize the blockchain features outside of currencies

### Course outcomes:

#### At the end of the course the student will be able to:

1. Understand the types, benefits and limitation of block chain.
2. Explore the block chain decentralization and cryptography concepts.
3. Enumerate the Bitcoin features and its alternative options.
4. Describe and deploy the smart contracts
5. Summarize the block chain features outside of currencies

**Textbook/ Textbooks :** Mastering Bitcoin: Unlocking Digital Cryptocurrencies, Andreas M. Antonopoulos, O'Reilly Media, First Edition, 2014

Text Book 1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).

#### Reference Books

1. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies
2. Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System
3. DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger," Yellow paper.2014.
4. Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli, A survey of attacks on Ethereum smart contracts