

Title of Certification Course: Certificate Course In blockchain technology

Name of Institution: Smt. R.P. Chauhan Arts & Shri J.K. Shah & Smt. K.D. Shah Commerce College & Department Of KRP Darjee Indo-American Institute Of Computer Science, Vyara

Course Credit for Proposed Course: 3

Total Course Hours: 45

Objective of the Course: To make students aware about blockchain and cryptocurrencies

Pre-requisite: None

Expected Outcomes of the Course: Students will have basic theoretical understanding of blockchain and various cryptocurrencies.

Course Nature: (Theory / Practical / Field based or Blended) Theory

Eligibility Criteria of Participants: Any Undergraduate Student

Course Syllabus

1. Introduction to Blockchain

Need of block chain (Example Of SCM), Decentralization & block chain, Definition & working of block chain, Evolution & properties of block chain, Types of block chain & structure of a block, Distributed systems—History & Needs

2. Blockchain Pillars

Basic concepts of cryptography, Public key cryptography, Digital Signature using public key cryptography, RSA encryption and decryption, Hashchain to Blockchain, Hashing & its types (SHA-256), Basic consensus mechanisms, Requirements for the consensus protocols, PoW and PoS, Scalability aspects of Blockchain consensus protocols, Merkle Tree.

3. Permissioned and Public Blockchains:

Design goals, Consensus protocols for Permissioned Blockchains, Hyperledger Fabric, Decomposing the consensus process, Hyperledger fabric components, Smart Contracts, Chain code design, Hybrid models (PoS and PoW), Ethereum Platform Introduction Ethereum, Architecture, Ethereum Operations, Incentive Model, Transactions in Ethereum, Introduction Solidity

4. Legal Regulations & Applications of Blockchain

Criminal Use of Payment Blockchains, The Role of Financial Regulations for Blockchain, Does Blockchain Need Legal Regulations? Global Digital Assets Regulatory Trends, Decentralized Cryptocurrency, Distributed Cloud Storage, E-Voting, Insurance Claims, Cross-Border Payments, Asset Management, Smart Appliances, Cryptocurrencies-Bitcoin: Definition, Need, buying, selling and storing, Bitcoin mining & eco system, Structure of bitcoin transaction, Smart contracts & permissioned block chain

Reference Books:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press.
- Reference

- 2 Wattenhofer, Roger, The science of the blockchain, CreateSpace Independent Publishing Platform.
3. Bahga, Arshdeep, and Vijay Madisetti,. Blockchain Applications: A Hands-on Approach, VPT.
4. Antonopoulos, Andreas M, Mastering Bitcoin: Programming the open blockchain, O'Reilly Media, Inc .
5. Diedrich, Henning, Ethereum: Blockchains, digital assets, smart contracts, decentralized autonomous organizations, Wildfire Publishing (Sydney).
6. Nakamoto, Satoshi, Bitcoin: A peer-to-peer electronic cash system, Research Paper.