20CS021 BLOCKCHAIN TECHNOLOGIES

Hours Per Week :

L	T	P	C
3	-	-	3

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
45	-	-	15	30	-	5	5	-

Course Description and Objectives:

To understand the types of blockchain technologies that are being used by various applications along with digital cash.

Course Outcomes:

Upon the Completion of the course, students will be able to:

- ✓ Understand blockchain technology and its immutable property, and then working Process of distributed ledger

- ✓ Analyse the different consensus protocols

- ✓ Use different blockchain platforms

- ✓ Apply blockchain techniques in different applications

SKILLS:

- ✓ Application of Block chain in Real Estate

- ✓ Application of Block chain in Health

- ✓ Application of Block chain in Insurance

UNIT I

Introduction to Cryptography & Cryptocurrencies: Cryptographic Hash Functions- Hash Pointers and Data Structures- Digital Signatures- Public Keys as Identities- A Simple Cryptocurrency

UNIT II

How Bitcoin Achieves Decentralization: Centralization vs. Decentralization- Distributed consensus- Consensus without identity using a block chain- Incentives and proof of work-Mining economics

UNIT III

Mechanics of Cryptocurrencies: Bitcoin-Bitcoin transactions -Bitcoin Scripts- Applications of Bitcoin scripts- Bitcoin blocks- The Bitcoin network- Limitations and improvements -Ethereum-Forks

UNIT IV

Blockchain Technology: Basics of blockchain Technology- Public Blockchains- Private Blockchains-

UNIT V

Applications of Blockchain technology: Blockchain Genomics- Blockchain Technology as a Universal Order-of-Magnitude Progress Model- Blockchain Health Notary- Doctor Vendor RFP Services and Assurance Contracts

TEXT BOOKS:

1.   A. Narayanan, J. Bonneau, E. Felten, A. Miller, S. Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press, 2016

2.   Melanie Swan, *Blockchain - Blueprint for a new economy*, O'Reilly Media, Inc., 2015.

3.   A. Narayanan, J. Bonneau, E. Felten, A. Miller, S. Goldfeder, *Bitcoin and Cryptocurrency Technologies:*

REFERENCE BOOKS:

1.   Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System

2.   DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger,"Yellow paper.2014.

3.   Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli, A survey of attacks on Ethereum smart contracts