Fundamentals of Block Chain Technology

Course Code	19CS4702D	Year	IV	Semester	I
Course Category	Program Elective-V	Branch	CSE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Database Management System, Distributed Systems, Cryptography
Continuous Internal Evaluation :	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes		
Upon Successful completion of course, the student will be able to		
CO1	Understand the basic principles of block chain technology	**L2**
CO2	Apply cryptographic functions along with their implementation strategies.	**L3**
CO3	Analyze the various protocols and mining techniques in Block chain	**L4**

	Syllabus	
Unit No	**Contents**	**Mapped CO**
I	**Block chain Fundamentals:** Tracing Block chain's Origin, Revolutionizing the Traditional Business Network, How Blockchain Works, What Makes a Blockchain Suitable for Business? **Introduction to Cryptography:** Cryptographic Hash Functions, SHA256, Hash Pointers and Data Structures, Merkle tree.	**CO1**
II	**Digital Signatures:** Elliptic Curve Digital Signature Algorithm (ECDSA), Public Keys as Identities, A Simple Crypto currency.	**CO1,CO2**
III	Centralization vs. Decentralization, Distributed Consensus, Consensus without identity using a block chain, Incentives and proof of work. **Mechanics of Bit coin**: Bit coin transactions, Bit coin Scripts, Applications of Bit coin scripts, Bit coin blocks, The Bit coin network.	**CO1,CO3**
IV	**Storage of and Usage of Bit coins:** Simple Local Storage, Hot and Cold Storage, Splitting and Sharing Keys, Online Wallets and Exchanges, Payment Services, Transaction Fees, Currency Exchange Markets.	**CO1,CO3**

V	**Bit coin Mining:** The Task of Bit coin miners, Mining Hardware, Mining pools, Mining incentives and strategies. **Bit coin and Anonymity:** Anonymity Basics, Mixing, Zero coin and Zero cash	**CO3**

Learning Resources

Text Books

1. BlockChain for dummies, Manav Gupta, Second IBM Limited Edition, 2018, John Wiley & Sons.

2. Bitcoin and Cryptocurrency Technologies, Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, 2016.

References

1. Blockchain: Blueprint for a New Economy,Melanie Swan, First edition, 2015, O'Reilly Media.

2. Bitcoin: Programming the Open Blockchain, Andreas M. Antonopoulos, Mastering, Second edition, 2017, O'Reilly Media.

e-Resources and other Digital Material

1. https://nptel.ac.in/courses/106/104/106104220/
2. https://nptel.ac.in/courses/106/105/106105184/