Course Objective: This course provides a comprehensive introduction to blockchain technology, covering its fundamental concepts, key platforms, and cryptographic solutions. Students will explore security, privacy, scalability, and interoperability challenges, along with the consensus protocols that maintain blockchain integrity. By the end of the course, students will be prepared to understand and apply blockchain technology in various real-world scenarios.

S. NO	Course Outcomes (CO)
CO1	To understand the fundamentals of blockchain technology.

CO2	To acquire the knowledge on various blockchain platforms.
CO3	To study the Cryptographic Solution in Blockchain and understand their security and privacy issues.
CO4	To study the various consensus protocols used in the blockchain technology.
CO5	To understand the scalability, interoperability issues and their proposed solutions in current scenarios.

S. NO	Contents	Contact H...
UNIT 1	Introduction: Decentralised System: Difference between centralised, decentralised and distributed system, Introduction and need of decentralised ledger system. Blockchain Technology: Introduction of blockchain, Architecture of Blockchain, detailed knowledge of Block Structure, Working of Blockchain, main barrier to blockchain adoption, use-case of blockchain in various fields.	**8**
UNIT 2	Blockchain Platform: Introduction of Public/permissionless, Private/Permissioned Ethereum: Basics, Ethereum clients, Wallets, Tokens, Oracles, Ethereum Virtual Machine, Smart Contract, Introduction to Solidity	**8**
UNIT 3	Cryptography: Public key cryptography, Digital Signature, Hashing, SHA256, AES, RSA, Security and privacy: Issues in blockchain, attacks on Blockchains – such as Sybil attacks, selfish mining, 51% attacks, Smart Contract Vulnerability, Hard fork/ soft Fork, Mitigatation Techniques.	**8**
UNIT 4	Consensus: Foundation od Consensus, Classical Consensus, Nakamoto Consensus, Ethereum Merge, Blockchain Selfish Mining, Proof based consensus: PoW, Pos, PoA, PoET, Voting Based Consensus: Paxos, RAFT, PBFT	**10**
UNIT 5	Scalability and Interoperability: Addressing the Issue of Scalability and Interoperability, Blockchain scalability solutions: Layer 1, Layer 2, Various Off-chain Storage.	**8**
	TOTAL	**42**

REFERENCES

S.No.	Name of Books/Authors/Publishers	Year of Publication/...
1	Mastering Blockchain: Inner workings of blockchain, from cryptography and decentralized identities, to DeFi, NFTs and Web3, 4th Edition "imran bashir", Packt Publishing	2023
2	Mastering Ethereum: Building Smart Contracts and DApps by Andreas M. Antonopoulos and Gavin Wood, Shroff/O'Reilly	2018
3	Mastering Bitcoin: Programming the Open Blockchain (Second Edition) "Andreas Antonopoulos", O'Reilly Media	2017

B.Tech. Information Technology

Course code: Course Title	Course Structure			Pre-Requisite
Digital Image Processing	L	T	P	-
	3	-	2	