Department of Computer Science and Engineering
1T22-PE Blockchain Technology
Academic Year 2024-2025
Subject Incharge- Dayanand Ambawade

Consolidated Syllabus: MSE Syllabus:
MSE Syllabus Update
The MSE syllabus will include all topics covered up to March 25, 2025.

Module/Topic	Syllabus	Keywords	References
Fundamentals of Blockchain	Blockchain Basic, Four Core building blocks of blockchain, the Life cycle of Blockchain, Blockchain working, Difference between blockchain and databases, Centralized, Decentralized and Distributed system, Distributed Ledger Technology, Blockchain ecosystem and structure, Features of Blockchain, Advantages of Blockchain. Blockchain Primitives-Cryptography, PKI, Hash functions, properties of Hash Functions, Merkle Tree, Zero Knowledge Proof (ZKP), z-SNARK	Block, Blockchain, Genesis Block, Decentralized, Distributed, Ledger, Immutability, Cryptographically Secure, Append-only, Linked List, Distributed database, Proof-of-Work (PoW), Proof-of-Stake (PoS), SHA-256, Nonce, Timestamp, Public-key Cryptography, Trust, Tracking, Fraud, tamper resistance, Public Permissionless, Private Permissioned, Mining, Miner, Nodes, Full Nodes, Lite	[1] Imran Bashir Chapter-1 Blockchain 101

		Node, Archives, Linked List, Cryptography, PKI, Cryptographic Hash Functions, Merkle Tree, ZKP	
Cryptocurrency-Bitcoin	History of Cryptocurrency, Cryptography in blockchain, Hash Functions, SHA hash Function, Merkle Tree, Digital Signatures, How does bitcoin transaction works,	Bitcoin, Monetary Policy, The Halving, Block Frequency, Bitcoin Ecosystem, Bitcoin Network, Bitcoin Mining, Mining Pool, Mining Systems-CPU, GPU, FPGA and ASIC, Nonce range, Timestamp, Wallet, Wallet Address, Bitcoin Network Payment and API, Bitcoin-core, bitcoind, bitcoin-cli, bitcoin-qt	[1]Imran Bashir Chapter 6,7
Ethereum Ecosystem	Introduction to ethereum, Ethereum Technology Stack, Ethereum Virtual Machine (EVM) - Advantages and Drawbacks of ethereum,	Ethereum Characteristics, Vitalik Buterin, Types of Ethereum, Ethereum Network, Nodes, Smart contract, Solidity, Consensus, Gas, Gas Price, Gas Limit, Out	Refer [1] Imran Bashir Chapter 9: Ethereum Architecture Chapter 10: Ethereum in Practice

	Blockchain: Enterprise use cases. NFTs, DeFi,	of Gas, Mining, DApps, EVM, DAOs, NFTs, DeFi,	

Refer to Google Classroom: Shared Slides, Online Articles, pdf

Book References:

[1] Mastering Blockchain, 4th Edition by Imran Bashir, Packt Publications

[2] Blockchain in Action by Beena Ramamurthy, Manning Publications.
   Chapter-1, Chapter-2, Chapter-3