**Detailed Syllabus: (unit wise)**

Unit	Description	Duration
1	**Introduction and Basics of Distributed Computing:** Need for Distributed Record Keeping, Modeling faults and adversaries Byzantine Generals problem, Consensus algorithms and their scalability problems, Why Nakamoto Came up with Blockchain based cryptocurrency? Technologies Borrowed in Blockchain – hash pointers, consensus, byzantine fault-tolerant distributed computing, digital cash. Atomic Broadcast, Consensus, Byzantine Models of fault tolerance.	07
2	**Basic Crypto primitives and Blockchain 1.0:** Hash functions, Puzzle friendly Hash, Collison resistant hash, digital signatures, public key crypto, verifiable random functions, Zero-knowledge systems. Bitcoin blockchain, the challenges, and solutions, proof of work, Proof of stake, alternatives to Bitcoin consensus, Bitcoin scripting language and their use.	07
3	**Blockchain 2.0:** Ethereum and Smart Contracts, The Turing Completeness of Smart Contract Languages and verification challenges, using smart contracts to enforce legal contracts, comparing Bitcoin scripting vs. Ethereum Smart Contracts.	07
4	**Blockchain 3.0:** Hyperledger fabric, the plug and play platform and mechanisms in permissioned blockchain. The Linux Foundation's Hyperledger Fabric and Microsoft Azure's Blockchain as a Service.	07
5	**Privacy, Security Issues in Blockchain:** Pseudo-anonymity vs. anonymity, Zcash and Zk-SNARKS for anonymity preservation, attacks on Blockchains such as Sybil attacks, selfish mining, 51% attacks advent of algorand, and Sharding based consensus algorithms to prevent these attacks.	07
6	**Blockchain Applications and DiFi Foundations:** Applications of Blockchain in Healthcare, Automotive, Government, Insurance, Media and Entertainment. Distributed Ledger Technology: Governance and Regulations, Applications in Governance, Global Perspectives, Case Study: – Estonian block chains transform paying, trading, and signing. DiFi Foundations, Role of quantum computing in crypto ecosystem. a key ingredient for Distributed Finance.	07