

FOUNDATIONS OF BLOCKCHAIN TECHNOLOGY SYLLABUS

Module 1: Foundations of Blockchain

- Blockchain Architecture
- Challenges
- Applications
- Blockchain Design Principles
- The Blockchain Ecosystem
- The Consensus Problem
- Asynchronous Byzantine Agreement
- AAP Protocol and Its Analysis
- Peer-to-Peer Network
- Abstract Models: GARAY Model, RLA Model
- Proof of Work (PoW)
- Proof of Stake (PoS) Based Chains
- Hybrid Models

Module 2: Distributed Ledger Technology

- Origin of Ledgers
- Types and Features of Distributed Ledger Technology (DLT)
- Role of Consensus Mechanism
- DLT Ecosystem
- Distributed Ledger Implementations: Blockchain, Ethereum
- Public and Private Ledgers
- Registries
- Keyless Technologies
- Transparency as a Strategic Risk
- Transparency as a Strategic Asset
- Usage of Multiple IDs
- Zero Knowledge Proofs
- Implementation of Public and Private Blockchain

Module 3: Smart Contracts

- Anatomy of Smart Contracts
- Life Cycle
- Usage Patterns
- DLT-Based Smart Contracts
- Use Cases: Healthcare Industry and Property Transfer

Module 4: Decentralized Organization

- Decentralization Versus Distribution
- Centralized-Distributed (Ce-Di) Organizations
- Decentralized-Distributed (De-Di) Organizations
- Decentralized Autonomous Organizations: Aragon, DAOstack, DAOhaus, Colony

Module 5: Types of Blockchain Ecosystem

- One-Leader Ecosystem
- Joint Venture or Consortia Ecosystems
- Regulatory Blockchain Ecosystems
- Components in Blockchain Ecosystem: Leaders, Core Group, Active Participants, Users, Third-Party Service Providers
- Governance for Blockchain Ecosystems

Module 6: Blockchain Protocols

- Ethereum Tokens
- Augur
- Golem
- Understanding Ethereum Tokens
- App Coins and Protocol Tokens
- Blockchain Token Securities Law Framework
- Token Economy
- Token Sale Structure
- Ethereum Subreddit

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Module 7: High Performance Computing

- Integrity of High Performance Systems
- Data Provenance
- Cluster Construction and Deployment
- Mock Workload
- Blockchain Software Evaluation
- Blockchain Storage of Integrity Data



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