

Course Code	Course Name	Course Type	C d	L	T	P	Marks		
							Sessional	Final Exam	Total
COM-602	Fundamentals of Blockchain Technology	PCC	4	3	1	0	50	100	150

Course Outcomes:

At the end of the course the student will be able to:	
CO1	Articulate the history, types and applications of Blockchain.
CO2	Explain the Blockchain architecture in context of different crypto currency.
CO3	Comprehend different consensus algorithms and justify their appropriateness for different applications.
CO4	Gain appreciation of different decentralized applications over Blockchain frameworks.
CO5	Formulate solutions using Blockchain technology for real world applications.

Detailed Syllabus**Section-A**

Unit 1: Introduction to Blockchain: Introduction to Block chain – History, Definition, Distributed Ledger, Blockchain Categories – Public, Private, Consortium, Blockchain Network and Nodes, Peer-to-Peer Network, Mining Mechanism, Generic elements of Blockchain, Features of Blockchain and Types of Blockchain, Uses of Blockchain.

(8 Hrs)

Unit 2: Blockchain Architecture: Abstract Models for Blockchain - GARAY model - RLA Model. Multichain: Objective of Multichain, Features, Operation of Bitcoin Blockchain, Blockchain Architecture – Block, Hash, Distributed P2P, Fundamentals of Bitcoin, Ethereum and other popular crypto currencies.

(8 Hrs)

Unit 3: Consensus: Importance of Consensus mechanism, Proof of Work (PoW), Proof of Stake (PoS), Byzantine Fault Tolerance (BFT), Proof of Authority (PoA) and Proof of Elapsed Time (PoET). Scalability aspects of Blockchain consensus protocols.

(8 Hrs)**Section-B**

Unit 4: Blockchain Decentralized Applications: Characteristics of Decentralized application, De-Fi (Decentralized Finance) Applications and use-cases, Smart contracts and decentralized oracle networks (DONs).

(8 Hrs)

Unit 5: Block Chain- Case Studies: Case studies on applications of Blockchain technology in real world applications

(8 Hrs)**Text Books**

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Blockchain Technology From Theory to Practice	Sudeep Tanwar	Springer	1 st (2022)
2	Blockchain Technology: Concepts and Applications	Kumar Saurabh, Ashutosh Saxena	Wiley	1 st (2020)

Reference Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Bitcoin and Cryptocurrency Technologies	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder	Princeton University Press	1 st (2016)