

Course Code	Course Title	L	T	P	C
BITE414L	Blockchain Technology	3	0	0	3
Pre-requisite	NIL	Syllabus version			
		1.0			
Course Objectives:					
<ol style="list-style-type: none"> 1. To impart an in-depth understanding of Blockchain technologies 2. To apply and analyze the concepts, tools, and frameworks for building blockchain decentralized applications 3. To articulate the technical aspects of Blockchain networks and explore application areas, current practices, and research activity 					
Course Outcomes:					
<ol style="list-style-type: none"> 1. Analyze and determine the decentralization and cryptographic concepts 2. Determine different crypto transaction in blockchain 3. Apply and implement various applications using Proof of Stake Blockchain 4. Investigate the Hyperledger Fabric development environment 5. Design blockchain based solutions for the real time problems 					
Module:1	Introduction to Blockchain Technology	7 hours			
Introduction of Blockchain - History of Blockchain - Features of a Blockchain- Tier of Blockchain – Types of Blockchain – Architectures - Base technologies – Hashing - Benefits and Limitations of Blockchain					
Module:2	Decentralization and Cryptography	6 hours			
Decentralization using Blockchain - Methods of Decentralization - Routes to Decentralization -Decentralized Organizations - Cryptography and Technical Foundations: Cryptographic Primitives - Asymmetric Cryptography - Public and Private keys					
Module:3	Proof of Work Blockchain	6 hours			
Fundamentals - Properties of Proof of work - Proof of work Transactions - Transaction Life Cycle - Types of Transaction – Block Generation at Proof of works - Consensus Algorithms					
Module:4	Proof of Stake	7 hours			
Introduction to Proof of Stake -The Proof of Stake Stack - Proof of Stake Blockchain – Cryptocurrency - Transactions - Elements of Proof of Stake Blockchain - Transaction Validation and Execution – Mining/Staking – Applications					
Module:5	Hyperledger	6 hours			
Introduction to Hyperledger - Reference Architecture - Blockchain Services - Distributed Ledger Technology – Challenges - Hyperledger Fabric - Hyperledger Composer - Fabric Architecture –Implementation –Networking - Fabric Transactions - Demonstration					
Module:6	Solidity Programming	7 hours			

Solidity - Language of Smart Contracts - Installing Solidity and Proof of Stake Wallet - Basics of Solidity - Layout of a Solidity Source File - Structure of Smart Contracts - General Value Types - Control Structures – Events – Libraries -Functions			
Module:7	Blockchain Applications		4 hours
Blockchain Applications - e-Governance -Smart Cities -Smart Industries - Anomaly Detections -Use Cases -Trends on Blockchains -Serverless Blocks -Scalability Issues -Blockchain on Clouds			
Module:8	Contemporary Issues		2 hours
			Total Lecture hours: 45 hours
Text Book			
1.	Bashir, I. (2017). Mastering blockchain Distributed ledgers, Decentralization and Smart Contracts Explained. Packt Publishing Ltd.		
Reference Books			
1.	Narayanan, A., Bonneau, J., Felten, E., Miller, A., and Goldfeder, S. (2016). Proof of work and cryptocurrency technologies: a comprehensive introduction. Princeton University Press.		
2.	Josh Thompson (2017), 'Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming', Create Space Independent Publishing Platform.		
Mode of Evaluation: Continuous Assessment Tests, Assignment, Quiz, Final Assessment Test			
Recommended by Board of Studies		12-10-2022	
Approved by Academic Council		No. 68	Date 19-12-2022