



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering Syllabus

Subject Code : 3175203

Subject Name : Block Chain Technology

WEF Academic Year :	
Semester :	7
Category of the Course :	Professional Elective-VI

Prerequisite :	Cryptography and Hashing, Operating system, Distributed system
Rationale :	<p>Blockchain technology provides enhanced security and transparency. With Blockchain, transactions are recorded in a decentralized manner across multiple computers or “nodes”. Each transaction is linked to the previous one through a cryptographic hash function, creating an immutable chain of data. Every participant in the network has access to a copy of the entire transaction history, ensuring transparency and accountability. This level of security and transparency is beneficial for industries such as finance, supply chain management, and healthcare where trust has a pivotal role.</p>

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
3		2						

Course Content:

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Blockchain 101 The growth of blockchain technology Distributed systems The history of blockchain	5	20



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	Introducing blockchain Types of blockchain Introducing decentralization Full-ecosystem decentralization Cryptographic constructs and blockchain technology Consensus Algorithms - CFT Algorithms, BFT algorithms, Choosing an algorithm		
2	Bitcoin Architecture Introducing Bitcoin Cryptographic keys Addresses Transactions Blockchain Miners Network Wallets Bitcoin payments Innovation in Bitcoin Bitcoin client information	6	20
3	Smart Contracts Introducing smart contracts Smart contract templates Oracles Deploying smart contracts The DAO	6	30
4	Ethereum Architecture Introducing Ethereum Cryptocurrency Keys and addresses Accounts Transactions and messages Ethereum virtual machine Blocks and blockchain Nodes and miners The Ethereum network Precompiled smart contracts Wallets and client software Supporting protocols Programming with Geth Setting up a development environment	10	15



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	Introducing Remix IDE Interacting with the Ethereum Blockchain with MetaMask The Solidity compiler Contract development and deployment The solidity language		
5	Tokenization Tokenization on a blockchain Types of tokens Process of tokenization Token offerings Token standards	5	10
6	Blockchain Application Government Health Media Blockchain and AI	4	5
	Total		100

Reference Book:

- 1) **Mastering Blockchain - Fourth Edition: Inner workings of blockchain, from cryptography and decentralized identities, to DeFi, NFTs and Web3 4th ed. Edition**
by [Imran Bashir](#) , Packt Publishing
- 2) **The Blockchain Developer: A Practical Guide for Designing, Implementing, Publishing, Testing, and Securing Distributed Blockchain-based Projects**
by [Elad Elrom](#) , Apress
- 3) Blockchain Technology, By Chandramouli Subramanian, Asha A George, Abhilash K A and Meena Karthikeyan, University Press

Course Outcome:



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After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level*
01	Explain Blockchain Architecture,working, cryptocurrency and tokens	UN
02	Execute decentralized application and smart contract	AP
03	Apply the Blockchain technology to given application.	AP

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Suggested Course Practical List:

- 1) Create Private Blockchain
- 2) Create Bitcoin(Public) Network.
- 3) Create A Blockchain for a particular hospital for patient records. Include patient name, address, mobile number, height, weight. Create record for each visit to the hospital by including date, blood pressure, symptoms and medicine prescribed. Develop a consensus mechanism to add patient record.
- 4) Write a smart contract to sell a land from seller to buyer. The amount should be deposited to seller's account when event called "Finalize the deal" is triggered.
- 5) Create a smart contract to pay the money for movie ticket. The movie theater should give non fungible token as a movie ticket.

List of Laboratory/Learning ResourcesRequired:

- 1) Computers/Laptops with internet connectivity

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