Semester	3
Course Title	Block chain Technology
Course Code	MMCB311B
Credits	3
Total Hours of Pedagogy	40
L–T–P-S	3-0-0-0
CIE	50
SEE	50
TOTAL	100
Exam Type	Theory
Exam Hours	3 Hrs

Course Learning Objectives:

1. Know the basics of Block chain concept
2. Illustrate the working of Block chain
3. Explore the working of bitcoin & Ethereum
4. Illustrate the working of Dapps

Module I

Introduction to Blockchain: Backstory of Blockchain, What is Blockchain?, Centralized vs. Decentralized Systems, Centralized Systems, Decentralized Systems, Layers of Blockchain, , Why is Blockchain Important? Blockchain Uses and Use Cases	
Text Book	1
Chapter	1
RBT	L2, L4

Module II

Laying the Blockchain Foundation, Cryptography, Symmetric Key Cryptography (DES, AES Algorithm), Cryptographic Hash Functions, MAC and HMAC, Asymmetric Key Cryptography(RSA Algorithm), Diffie-Hellman Key Exchange, Symmetric vs. Asymmetric Key Cryptography, Merkle Trees.	
Text Book	1
Chapter	2
RBT	L2, L4

Module III

How Bitcoin Works: The History of Money, Dawn of Bitcoin, What is Bitcoin?, Working with Bitcoins, The Bitcoin Blockchain, Block Structure, The Genesis Block, The Bitcoin Network, Network Discovery for a New Node, Bitcoin Transactions, Consensus and Block Mining, Block Propagation.	
Text Book	1
Chapter	3
RBT	L2, L4

Module IV

How Ethereum Works: From Bitcoin to Ethereum, Ethereum as a Next-Gen Blockchain, Design Philosophy of Ethereum, Enter the Ethereum Blockchain, Ethereum Blockchain, Ethereum Accounts, The Usage, Merkle Patricia Tree, RLP Encoding, Ethereum Transactions and Message Structure, Ethereum State Transaction Function, Gas and Transaction Cost, Ethereum Smart Contracts, Contract Creation.	
Text Book	1
Chapter	4

RBT	L2, L4

Module V

Building an Ethereum DApp: The DApp, Setting up a Private Ethereum Network, Install go-ethereum (geth), Create geth Data Directory, Create a geth Account, Create genesis.json Configuration File, Run the First Node of the Private Network, Run the Second Node of the Network, Creating the Smart Contract, Deploying the Smart Contract, Setting up web3 Library and Connection, Deploy the Contract to the Private Network, Client Application	
Text Book	1
Chapter	6
RBT	L2, L4

Course Outcomes (Course Skill Set):
At the end of the course, the student will be able to:

Sl. No.	Course Outcomes	PO	RBT
1	Demonstrate the basics of Block chain concepts using modern tools/technologies.	1	L2
2	Analyze the role of block chain applications in different domains including cybersecurity.	1,2	L2,L4
3	Exemplify the usage of bit coins, ethereum and its impact on the economy.	1,2	L2,L4
4	Analyze and implement the application of specific block chain architecture for a given problem.	1,2	L2,L4

Suggested Learning Resources:

Text Books:

Sl. No.	Name of the author	Title of the Book	Name of the publisher	Edition and Year
1	Arshdeep Bikramaditya and gautham dharmeja	Beginning Block chain, Beginners guide to build block chain solution	Standard Apress	1st 2018
2	Bahga, Vijay Madisetti	Blockchain Applications: A Hands-On Approach	White Falcon Publishing	1st 2018

Reference Books:

Sl. No.	Name of the author	Title of the Book	Name of the publisher	Edition and Year
1	Aravind Narayan. Joseph Bonneau	Bitcoin and Cryptocurrency Technologies	Princeton University Press,	2016.
2	Arthur T. Brooks	Bitcoin and Blockchain Basics: A non-technical introduction for beginners	Independent	2019

Web links and Video Lectures (e-Resources):

1. (PDF) Blockchain 1.0 to Blockchain 4.0—The Evolutionary Transformation of Blockchain Technology
2. https://youtu.be/gKA1mzajwyA
3. https://youtu.be/V6Yqr7prI2I://youtu.be/V6Yqr7prI2I