Course Code	Course Title	L	T	P	C
OLMCA610	Blockchain Technologies	3	1	0	4
Pre-requisite	NIL	Syllabus version			
		1.0			

Course Objectives:

1. To provide conceptual understanding of Blockchain technologies.
2. To impart an in-depth understanding of basic building blocks and comprehend the issues related to Blockchain
3. To articulate the technical aspects of Blockchain networks and explore application areas, current practices, and research activity

Course Outcomes:

1. Understand and analyze the mechanism of Blockchain, decentralization and cryptographic concepts.
2. Analyze and determine various crypto transactions in blockchain
3. Develop smart contracts using Ethereum Framework
4. Recognize the Explore Hyper ledger Fabric development
5. Apply and implement blockchain based solutions for real time problems.

Module:1	Introduction

Introduction of Blockchain - History of Blockchain and Bitcoin - Features of a Blockchain- Tier of Blockchain – Types of Blockchain – Architectures - Base technologies – Hashing -Benefits and Limitations of Blockchain - Consensus mechanism – Types of Consensus mechanism

Module:2	Decentralization and Cryptography

Decentralization using Blockchain - Methods of Decentralization - Routes to Decentralization -Decentralized Organizations - Cryptography and Technical Foundations: Cryptographic Primitives - Asymmetric Cryptography - Public and Private keys - Cryptography constructs and Blockchain Technology

Module:3	Digital Currency

Fundamentals - Properties of Bitcoin - Bitcoin Transactions - Transaction Life Cycle - Types of Transaction – Mining - Bit Coin P2P Networks - Block Generation at Bitcoin - Bitcoin Clients and APIs – Alternative Coins

Module:4	Smart Contract

Smart Contract Basics - Processing Smart Contracts - Deploying Smart Contracts - Best Practices: Evaluating Smart Contracts

Module:5	Hyperledger

Introduction to Hyperledger - Reference Architecture - Blockchain Services - Distributed Ledger Technology – Challenges - Hyperledger Fabric - Hyperledger Composer - Fabric Architecture –Implementation –Networking - Fabric Transactions – Demonstration – Tokenization – Types of tokens – Token Standards

Module:6	Solidity Programming

Solidity - Language of Smart Contracts - Installing Solidity and Ethereum 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

Blockchain Applications - e-Governance -Smart Cities -Smart Industries - Anomaly Detections -Use Cases -Trends on Blockchain –Serverless Blocks -Scalability Issues -Blockchain on Clouds		
	Total Lecture hours:	**120 hours**
Text Book(s)		
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). Bitcoin 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: Quiz / Assignment / Mid-Term, FAT		
Recommended by Board of Studies	01-11-2023	
Approved by Academic Council	No. 72	Date: 13-12-2023