

Year: B. Tech IV (Semester VII)

Subject Name: Blockchain Technology and Applications

Subject Code: BTIT14702

Type of course: Professional Elective Course

Prerequisite (if any): Basic Knowledge Of Computer Security, Cryptography, Networking

Rationale: This course covers basics of Blockchain technology and its applications in various real world scenarios. The objective of this subject is to describe types of blockchain as well as the concepts behind public, private and consortium blockchain.

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	0	3	60	25	15	0	0	100

CA1: Continuous Assessment (assignments / projects / open book tests / closed book tests) CA2: Sincerity in attending classes / class tests / timely submissions of assignments / self-learning attitude / solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work / Quality of work submitted / Active participation in lab sessions / viva on practical skills learned in course.

Contents:

Sr. No.	Contents	Total Hours
1.	Fundamentals of Blockchain Introduction, Origin of Blockchain, Blockchain solution, Components of Blockchain, Block in Blockchain, The Technology Blockchain Types and Consensus Mechanism: Introduction, Decentralization and Distribution, Types of Blockchain, Consensus Protocol	08
2.	Cryptocurrency Bitcoin, Altcoin, Token: Introduction, Bitcoin and the cryptocurrency, Cryptocurrency Basics, Types of Cryptocurrency, Cryptocurrency usage	06
3.	Public Blockchain System Introduction, Public Blockchain, Popular public Blockchain, The Bitcoin Blockchain, Ethereum Blockchain Smart Contracts: Introduction, Smart Contract, Characteristics of a Smart Contract, Types of Smart contracts, Types of Oracles, Smart Contracts in Ethereum, Smart Contracts in Industry	08
4.	Private Blockchain System: Introduction, Key characteristics of Private Blockchain, Private Blockchain Examples, Smart Contract in Private Environment, State Machine, Different Algorithms of	08

	Permissioned Blockchain, Byzantine Fault	
5.	Consortium Blockchain Introduction, Key characteristics of Consortium Blockchain, Hyperledger platform, Overview of Ripple, Overview of Corda	08
6.	Applications of Blockchain: Introduction, Blockchain in Banking and Finance, Blockchain in Education, Blockchain in Energy, Blockchain in Healthcare, Blockchain in Real-estate, Blockchain in Supply Chain, The Blockchain and IoT	04
7.	Limitations and Challenges of Blockchain Blockchain Implementation – Limitation, Challenges	03

Suggested Specification table with Marks (Theory): (For B. Tech only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	10	10	-	-

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (Revised Bloom's Taxonomy)

Reference Books:

Sr no	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Blockchain Technology	Chandramouli Subramanian, Asha George, Abhilash K A and Meena Karthikeyan	Universities Press	2020	-
2	Blockchain Blueprint for a New Economy	Melanie Swan	O'Reilly	2015	1 st Edition
3	Blockchain For Dummies	Tiana Laurence	Wiley	2022	3 rd Edition

Course Outcomes (CO):

Sr. No.	CO statements	Marks % weightage
CO-1	Describe Blockchain and its types	25%
CO-2	Explain the support of Blockchain technology in a cryptocurrency or Digital currency	20%
CO-3	Comprehend public, private and consortium blockchain	40%
CO-4	Describe the use of Blockchain technology for various real world applications and identify challenges in implementation	15%

List of Open learning website:

- NPTEL Course : Blockchain and its Applications
https://onlinecourses.nptel.ac.in/noc22_cs44/preview
- NPTEL Course : Introduction to Blockchain Technology and Applications
https://onlinecourses.nptel.ac.in/noc20_cs01/preview