

**Year: B. Tech IV (Semester VII)**

**Subject Name:** Advanced Blockchain technologies and Use cases      **Subject Code:** BTEA19726  
**Type of course:** Honors (Group: Blockchain Technology)  
**Prerequisite (if any):** Basics of Blockchain Technology

**Rationale:** Since last decade, the Blockchain technology has got much attention in scientific community as well as industry. This course focuses on the advanced BlockChain technologies (Corda, Hyperledger ) and their usages in industries. The primary objective behind this course is to encourage students to study the existing research papers and propose new work in the field of BlockChain.

**Teaching and Examination Scheme:**

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	1	0	4	60	25	15	00	00	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.	Blockchain : Enterprise and Industry Perspective: Core building blocks of blockchain frameworks, Fundamentals of the secure transaction processing protocol, Blockchain in the enterprise, Enterprise design principles, Business considerations for choosing a blockchain framework, Technology considerations for choosing a blockchain framework.	10
2.	Introduction to Hyperledger : Fundamentals of the Hyperledger project, Hyperledger frameworks, tools, and building blocks, Hyperledger Fabric component design, Consensus mechanism, Transaction Flow, MSP (Membership Service Provider), Developer interaction	06
3.	Introduction to Corda : Corda Network, Nodes, States, Ledger, Transaction, Contracts, Commands, Flows, Concensus, Services [ Corda Training and Tutorial]	06

4.	Blockchain in IoT : Introduction to Blockchain for Internet of Things [Debarika], Blockchain based IoT Architecture[Block-based IoT Architecture.pdf], Security of IoT Blockchain-Based Systems [Rashmi ]	08
5.	Block Chain Use Cases : Business Use Cases, Technology Uses Cases, Legal and Government Use Cases	05
6.	Study of various Research Papers	10

**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	5	15	-	-

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 like ISBN	Year of publication	Publication Edition
1	Hands-On Blockchain with Hyperledger: Building decentralized applications with Hyperledger Fabric and Composer	Nitin Gaur, Luc Desrosiers, Venkatraman Ramakrishna, Petr Novotny, Dr. Salman A. Baset Anthony O'Dowd	Packt Publishing	2018	
2	Blockchain: A Practical Guide to Developing Business, Law, and Technology Solutions	Joseph J. Bambara, Paul Allen, Kedar Iyer	McGrawHill	2018	
3	Mastering Hyperledger Fabric: Master The Art of Hyperledger Fabric on Kubernetes	Narendranath Reddy Thota	Packt Publishing	2018	

4	Mastering Corda	Jamiel Sheikh	O'Reilly Media, Inc.	2020	
5	Blockchain for IoT	Debarka Mukhopadhyay, Siddhartha Bhattacharyya, Balachandran Krishnan, Sudipta Roy			
6	Blockchain Technology and the Internet of Things: Challenges and Applications in Bitcoin and Security	Rashmi Agrawal Jyotir Moy Chatterjee, Abhishek Kumar			1st Edition

**Course Outcomes (CO):**

Sr. No.	CO statements	Marks % weightage
CO-1	Distinguish Permissioned/non-permissioned as well as public/private BlockChain technology and identify their business perspectives.	20
CO-2	Acquire knowledge of various components and architecture of Hyperledger Fabrics and Corda.	20
CO-3	Comprehend the use of Block-Chain technology in the field of Internet of Things.	20
CO-4	Understand the real-life applications of block chain.	20
CO-5	Explore the existing research work in the field of Block chain technology.	20

**List of Open learning website:**

