

Branch Name:	Cyber Security
Program Code:	ET203
Course Title:	Block chain Application, Security and Investigation
Course Code:	2ET2070306T
Pre-requisite Course:	Basic knowledge of blockchain technology.

Course Objectives:

The main objective of this course is: This course provides an in-depth understanding of block chain technology, focusing on security aspects and investigative techniques. Students will learn about the fundamental principles of block chain, common security vulnerabilities, best practices for securing blockchain applications, and methods for investigating block chain-related incidents.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Course Contents:

Unit No	Topics	Total Hours	Weightage (%)
1	Introduction: Introduction to Blockchain, Types of Blockchain - Public Blockchains, Consortium Blockchains, Private Blockchains. Blockchain Implementations - Bitcoin, Namecoin, Ripple, Ethereum, Blockchain Collaborative Implementations - Hyperledger, Corda, Categories of Blockchain, Private Blockchain Use Cases, Private Blockchain Technology, AlphaPoint Distributed Ledger Platform, Chain Core, Corda, Domus Tower, The Elements Project, HydraChain, Hyperledge, Stellar, Consensus: Consensus Mechanism and Types,	12	30%
2	Decentralization: Decentralization using blockchain, Blockchain and full ecosystem decentralization, Smart contract, Decentralized organizations and platforms for decentralization.	5	10
3	Blockchain Technology, Legal and Governance Use Cases : Web 3.0, Distributed Storage Systems, Distributed Computation, Decentralized Communications, Cryptocurrencies as Legal Tender, Blockchain and Privacy Laws, Blockchain and Privacy Laws, Smart Contract, Smart Contract Design, Decentralized Autonomous Organizations.	7	20
4	Blockchain Challenges : Blockchain Governance Challenges, Bitcoin Blocksize Debate, Blockchain Technical Challenges, Bugs in the Core Code, Denial-of-Service Attacks, Security in Smart Contracts, Scaling, Sharding.	6	10
5	Blockchain Business Use Cases: Currency and Tokens, Cryptocurrency, Digital Tokens, Financial Services Use Cases viz. Know Your Customer (KYC) Use Case, Asset Management Settlement Use Case, Insurance Claims Processing Use Case, Trade Finance (Supply Chain) Use Case, Global Payments Use Case, Smart Property, Smart Contracts on the Blockchain.	7	20
6	Non-Financial Application of Blockchain: Internet of things: physical, device, Network, Management and Application layers – IoT blockchain Experiment- government: Border control, voting, citizen Identification – health- finance: Insurance, post –trade, financial crime prevention-media	6	10

Reference Books:

1. Blockchain: A Practical Guide to Developing Business, Law, and Technology Solutions by Joseph J. Bambara and Paul R. Allen, McGraw-Hill Education. 2018
2. Hands-On Blockchain with Hyperledger, Nitin Gaur et al., Packt Publishing. 2018
3. Mark Gates, "Block chain: Ultimate guide to understanding block chain, bit coin, crypto currencies, smart contracts and the future of money", Wise Fox Publishing and Mark Gates 2017.

List of Open-Source Software/learning website:

1. NPTEL & MOOC courses titled blockchain technology
2. blockgeeks.com/guide/what-is-block-chain-technology <https://nptel.ac.in/courses/106105184/>

Course Learning Outcomes (CLO):

Course Outcomes	Description	Bloom's Taxonomy Level
COL1	Understand the concepts of blockchain technology.	2. Understanding
COL2	Apply the blockchain for technology, legal and governance applications.	3. Applying
COL3	Analyze the various private blockchain platform that are accessible.	4. Analyze
COL4	Evaluate various blockchain challenges for real world applications.	5. Evaluate
COL5	Apply blockchain technologies other than financial applications.	3. Applying

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	H	H	H	H									H			
CLO2	M				M								H			
CLO3		L				H							M			
CLO4	L	H	H						H					L		
CLO5		H	H						M					H		

H: High, M: Medium, L: Low