



Nallamuthu Gounder Mahalingam College

Department of Computer Science (SF)



Value Added Course **2021 - 2022**

21PCSV A1 – " BLOCKCHAIN AND CRYPTOCURENCY"

Duration : 30 Hours

Course Objective

The main objective of this course is to impart knowledge on Blockchain and Cryptocurrency and make the students to design, build and deploy distributed applications by integrating the ideas from Blockchain technology.

Dr.M.Sakthi
HoD

Module 1

Basics, Distributed Database, Cryptography

Module 2

Distributed Consensus, Proof of Work, Proof of Stake, Proof of Burn, Cryptocurrency

Module 3

Cryptocurrency, Regulation, Roots of Bit coin, Applications

Dr.S. Saravanababu
Dean - Academic

Dr. R. Muthukumaran
Principal



Programme Code:		M.Sc CS	Programme Title:		Master of Science (Computer Science)	
Course Code:	21PCS	Course Title:	Blockchain and Cryptocurrency		Batch :	2021-2023
Lecture Hrs./Week Or Practical Hrs./Week		2	Tutorial Hrs/Sem	30	Semester:	III
					Credits:	2

Course Objective

To impart knowledge on Blockchain and Cryptocurrency and make the students to design, build and deploy distributed applications by integrating the ideas from Blockchain technology.

Course Outcomes (CO)

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the basics of cryptography.	K1
CO2	Understand emerging abstract models for Blockchain technology.	K2
CO3	Design, build, and deploy a distributed application.	K3
CO4	Analyze the differences between proof-of-work and proof-of-stake consensus.	K4
CO5	Evaluate security, privacy, and efficiency of a Blockchain system.	K5

MAPPING

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	M	H	M	M	H	H	M	M	H	M	M	M	H	M
CO2	H	M	M	H	H	M	M	M	M	H	H	M	M	H	M
CO3	H	H	H	M	M	M	M	M	M	H	M	M	M	M	M
CO4	H	H	H	H	M	H	M	M	M	M	H	M	M	H	M
CO5	H	H	M	H	M	H	M	H	M	M	H	M	M	M	H

H: High; M: Medium; L: Low.

Units	Contents	Hrs
UNIT I	Basics: Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete. Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof. Blockchain: Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public Blockchain.	10
UNIT II	Distributed Consensus: Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate. Cryptocurrency: History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Namecoin.	10
UNIT III	Cryptocurrency Regulation: Stakeholders, <i>Roots of Bit coin</i> , Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain.	10

Pedagogy and Assessment Methods:

**Italicized texts are for self study*

Direct Instruction, Flipped Class, Digital Presentation, Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS/EDITION	YEAR OF PUBLICATION
1	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder.	Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction	Princeton University Press	2016

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS/EDITION	YEAR OF PUBLICATION
1	Joseph Bonneau et al, SoK	Research perspectives and challenges for Bitcoin and cryptocurrency	IEEE Symposium on security and Privacy	2015
2	Dr. Gavin Wood	ETHEREUM: A Secure Decentralized Transaction Ledger	Yellow paper	2014
3	William Mougayar	Business Blockchain Promise, Practice and Application of the Next Internet Technology	John Wiley & Sons	2016

Web References

1. <https://www.tutorialspoint.com/blockchain/index.htm>
2. <https://www.javatpoint.com/blockchain-cryptocurrency>
3. <https://www.udemy.com/course/introduction-to-cryptocurrencies/>
4. <https://www.simplilearn.com/tutorials/blockchain-tutorial/blockchain-technology>
5. <https://www.coursera.org/learn/cryptocurrency>

M. Sanyal
 Dr. M.SAKTHI, M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 PG Department of Computer Science
 XGM College, Pollachi - 642 004.



CERTIFICATE OF COMPLETION



NGM COLLEGE

(Autonomous), Pollachi

Re-Accredited by NAAC and ISO 9001 : 2015 Certified Institution
Ranked 72nd among Colleges in India by MHRD - NIRF
Affiliated to Bharathiar University, Coimbatore.



Value Added Course

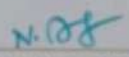
This is to certify that Mr./Ms. S. Balaji (21MC01)

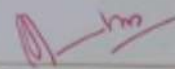
of M.Sc. Computer Science department

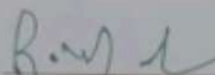
has successfully completed a Value Added Course

entitled Block Chain & Crptocurrency and

secured a mark of 84 out of 100


COURSE TEACHER


DEAN - ACADEMIC


IQAC CO-ORDINATOR


PRINCIPAL