

UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SYLLABUS WITH EFFECT FROM 2020-2021

BCE-DSE2C

ELECTIVE-II(C): BLOCK CHAIN TECHNOLOGY

III YEAR / VI SEM

OBJECTIVES:

- To understand the concepts of block chain technology
- To understand the consensus and hyper ledger fabric in block chain technology.

OUTCOMES:

- State the basic concepts of block chain
- Paraphrase the list of consensus and Demonstrate and Interpret working of Hyper ledger Fabric
- Implement SDK composer tool and explain the Digital identity for government

UNIT - I

History: Digital Money to Distributed Ledgers -Design Primitives: Protocols, Security, Consensus, Permissions, Privacy- : Block chain Architecture and Design-Basic crypto primitives: Hash, Signature-Hash chain to Block chain-Basic consensus mechanisms.

UNIT - II

Requirements for the consensus protocols-Proof of Work (PoW)-Scalability aspects of Block chain consensus protocols: Permissioned Block chains-Design goals-Consensus protocols for Permissioned Block chains.

UNIT - III

Decomposing the consensus process-Hyper ledger fabric components-Chain code Design and Implementation: Hyper ledger Fabric II:-Beyond Chain code: fabric SDK and Front End-Hyper ledger composer tool.

UNIT - IV

Block chain in Financial Software and Systems (FSS): -Settlements, -KYC, -Capital markets-Insurance-Block chain in trade/supply chain: Provenance of goods, visibility, trade/supply chain finance, invoice management/discounting.

UNIT - V

Block chain for Government: Digital identity, land records and other kinds of record keeping between government entities, public distribution system / social welfare systems: Block chain Cryptography: Privacy and Security on Block chain.

TEXT BOOKS:

1. 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.
2. Salman Baset, Luc Desrosiers, Nitin Gaur, Petr Novotny, Anthony O'Dowd, Venkatraman Ramakrishna, “*Hands-On Block chain with Hyper ledger: Building decentralized applications with Hyperledger Fabric and Composer*”, 2018.
3. Bahga, Vijay Madiseti, “*Block chain Applications: A Hands-On Approach*”, Arshdeep Bahga, Vijay Madiseti publishers 2017.

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REFERENCE BOOKS :

1. Andreas Antonopoulos, “*Mastering Bitcoin: Unlocking Digital Crypto currencies*”, O'Reilly Media, Inc. 2014.
2. Melanie Swa, “*Block chain* ”,O'Reilly Media 2014.

WEB REFERENCES:

- NPTEL & MOOC courses titled blockchain technology
- [blockgeeks.comguide/what-is-block-chain-technology](https://nptel.ac.in/courses/106105184/)
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