INTRODUCTION TO BITCOIN SYLLABUS

Module 1: Fundamentals of Cryptography

- Cryptographic Hash Functions
- Hash Pointers and Data Structures
- Digital Signatures
- Public Keys as Identities
- A Simple Cryptocurrency

Module 2: Features of Bitcoin

- Bitcoin Transactions
- Bitcoin Scripts
- Applications of Bitcoin Scripts
- Bitcoin Blocks
- Bitcoin Network and Limitations

Module 3: Bitcoin Techniques

- Techniques to Store and Use Bitcoins
- Hot and Cold Storage
- Splitting and Sharing Keys
- Online Wallets and Exchanges
- Payment Services
- Transaction Fees
- Bitcoin Trading

Module 4: Bitcoin Mining

- Task of Bitcoin Miners
- Mining Hardware
- Energy Consumption and Ecology
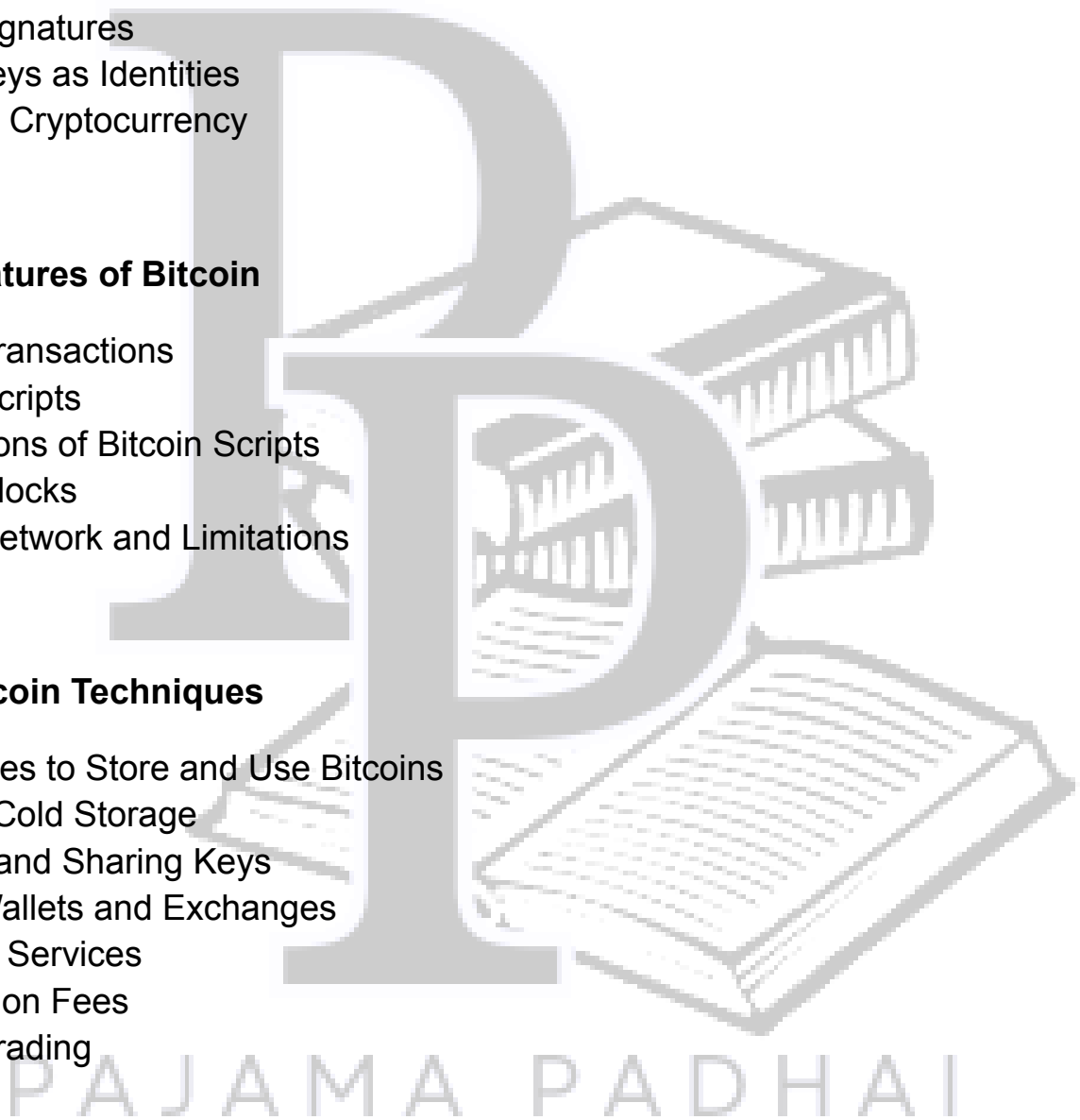
- Mining Pools
- Mining Incentives
- Merkle Tree
- Hardness of Mining
- Transaction Verifiability

Module 5: Bitcoin and Anonymity

- Anonymity
- Re-identification of Bitcoin
- Mixing and Decentralization of Bitcoin
- ZeroCoin and ZeroCash

Module 6: Mining Strategies

- Essential Puzzle Requirements
- Application-Specific Integrated Circuit (ASIC) Resistant Puzzles
- Proof of Volunteer Computing
- Non-externalization of Puzzles
- Proof of Stake Virtual Mining

Module 7: Bitcoin as a Platform

- Bitcoin as an Append-Only Log
- Bitcoin as Smart Property
- Secure Multi-Party Lotteries in Bitcoin
- Bitcoin as a Randomness Source
- Prediction Markets and Real-World Data Feeds