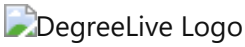

B.Com Honours | Semester III | Calicut University

FINTECH

Course Code: COM3MN206 • Module 3 Notes

Module III: Blockchain & Cryptocurrency

Blockchain technology provides a decentralized, tamper-resistant distributed ledger underlying cryptocurrencies, smart contracts, and modern digital asset settlements.

Unit 9: Introduction to Blockchain & How It Works – Cryptographic Hashing

1. Core Architecture: A peer-to-peer distributed ledger where transactions are bundled into blocks linked sequentially via SHA-256 cryptographic hashes.
2. Consensus Mechanisms: *Proof of Work (PoW)* requiring computational mining energy vs. *Proof of Stake (PoS)* validating blocks based on native token holdings.

Unit 10: Blockchain in Banking – Smart Contracts & Cross-Border Payments

1. Smart Contracts: Self-executing digital contracts stored on blockchain whose terms execute automatically upon condition verification (e.g., automated letter of credit disbursement).
2. Cross-Border Settlement: Replaces multi-day SWIFT intermediary hops with near-instantaneous, low-cost token transfers.

Unit 11: Benefits & Limitations of Blockchain in Finance

Benefits: Immutable audit trails, elimination of counterparty risk, 24/7 availability.
Limitations: Throughput scalability bottlenecks (low transactions per second - TPS), high energy consumption (PoW), and regulatory compliance uncertainty.

Unit 12: Cryptocurrencies – Definition, Features, & Decentralization

Digital assets designed to function as a medium of exchange using cryptography to secure transactions, control unit creation, and verify transfers.

Unit 13: Types of Cryptos – Bitcoin, Ethereum, Stablecoins, & E-Rupee (CBDC)

Bitcoin (BTC): Digital gold / store of value.
Ethereum (ETH): Decentralized application (dApp) & smart contract platform.
Stablecoins (USDT/USDC): Tokens pegged 1:1 to fiat currency reserve balances.
CBDC (Digital Rupee e₹): Sovereign digital currency issued directly by the Reserve Bank of India (RBI).

Unit 14: Regulatory Framework of Cryptocurrency in India – VDA 30% Tax & 1% TDS

Under Section 115BBH of the Income Tax Act, Virtual Digital Assets (VDAs) are taxed at a flat rate of 30% without expense set-offs, plus 1% TDS under Section 194S on transfers.

Practical Case Problem (Indian VDA Cryptocurrency Income Tax & TDS Computation): An investor buys 1.0 Bitcoin for Rs. 20,00,000 and later sells it for Rs. 30,00,000. In a separate crypto trade, the investor buys Altcoin X for Rs. 5,00,000 and sells it at a loss for Rs. 2,00,000. Calculate (a) 1% TDS deducted at source on total sales, (b) Taxable VDA gains under Section 115BBH (considering loss set-off rules), and (c) Net Tax Payable at 30% rate (excluding cess).

Step-by-Step Solved Tax Computation:

- **1. 1% TDS Deduction under Section 194S:**
  On Bitcoin Sale (Rs. 30,00,000): (30,00,000 imes 1% = ext{Rs. 30,000}).
  On Altcoin Sale (Rs. 2,00,000): (2,00,000 imes 1% = ext{Rs. 2,000}). Total TDS = **Rs. 32,000**.
- **2. Taxable VDA Income under Section 115BBH:**
  Bitcoin Capital Gain = (30,00,000 - 20,00,000 = ext{Rs. 10,00,000}).
  Altcoin Loss = (2,00,000 - 5,00,000 = ext{-Rs. 3,00,000}).
  Statutory Restriction: Under Section 115BBH, **no loss set-off is permitted against other VDA gains**!

  > **Taxable VDA Gain = Gross Bitcoin Gain = Rs. 10,00,000 (Altcoin loss ignored)**
- **3. Net Income Tax Liability (30% Flat Rate):**

  > **Gross Tax Payable = 10,00,000 × 30% = Rs. 3,00,000**

  Less: Total TDS Already Deducted = Rs. 32,000.
  Net Tax Payable to Govt: (3,00,000 - 32,000 = mathbf{ ext{Rs. 2,68,000}}).