

As Per NEP 2020

University of Mumbai



Syllabus for Basket of OE	
Board of Studies in Information Technology	
UG First Year Programme	
Semester	III/IV/V
Title of Paper	Digital Currency and Blockchain Technology
Credits	2
From the Academic Year	2024-25

Sr. No.	Heading	Particulars
1	Description the course :	The study of digital currencies and blockchain technology is increasingly relevant in today's world as these innovations reshape the financial landscape. Understanding their evolution, from Bitcoin to Ethereum and smart contracts, is crucial for anyone interested in finance, technology, or economics. These concepts are not only academically stimulating but also highly useful, with applications ranging from secure digital payments to transparent supply chain management. Their growing importance connects with other courses like economics, computer science, and business management, offering interdisciplinary insights. As demand for blockchain expertise rises across industries, mastering these topics opens up promising job prospects in sectors like fintech, cybersecurity, and beyond, making them an essential part of a modern education.
2	Vertical :	Open Elective
3	Type :	Theory
4	Credit:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	Hours Allotted :	30 Hours
6	Marks Allotted:	50 Marks
7	Course Objectives:	1. Understand the evolution of money from barter to digital currencies, and compare traditional fiat currencies with digital money. 2. Understand the fundamentals of cryptocurrencies and Bitcoin, transaction mechanisms, wallet types, and economic implications. 3. Understand the fundamentals of Blockchain technology. 4. Understand the features of the Ethereum blockchain, the role of Ether, the concept and benefits of smart contracts. 5. Analyze practical applications and case studies of digital payments and Blockchain. 6. Understand the global regulations for digital currencies, the implications of Blockchain.

8	Course Outcomes: 1. Explain the characteristics of digital currencies and payment systems. 2. Explain the fundamentals of cryptocurrencies and Bitcoin. 3. Explain the basics of Blockchain technology, its components, the concept of a decentralized ledger, and the importance of consensus mechanisms. 4. Explain the concept and benefits of Ethereum and smart contracts. 5. Analyze real-world Fintech use cases and evaluate successful and unsuccessful cryptocurrency and Blockchain applications. 6. Explain the global regulation of digital currencies, ethical and social impacts of Blockchain, and its benefits, including significance of decentralized finance (DeFi).
9	Modules:
	Module 1: Introduction to Digital Money, Payment Systems, and Banking Hours: 03
	Historical evolution of money: from barter to digital currencies; Characteristics of traditional fiat currencies; Introduction to Digital Money; Definition and types of digital money: e-money, virtual currencies, cryptocurrencies; Advantages and challenges of digital money over traditional cash; Overview of traditional vs. digital payment systems: Evolution and current landscape of digital payments; Payment processing models and emerging trends; Centralized vs. Decentralized banking system Self-learning: Impact of digital currencies on society and traditional financial systems
	Module 2: Introduction to Crypto currencies and Bitcoin Hours: 06
	Basics of Cryptocurrencies: Key characteristics and benefits, Overview of popular cryptocurrencies; Cryptocurrency Markets and Trading: Operation of cryptocurrency markets, Basics of buying, selling, and trading cryptocurrencies, Introduction to cryptocurrency exchanges. Introduction to Bitcoin: Importance of decentralized currency; Mining and Bitcoin transactions: How transactions work, Public and private keys, Wallet types (hardware, software, paper wallets); Economic implications and global adoption trends of cryptocurrencies; Economics of Bitcoin: Supply and Demand Dynamics, Price Volatility and Market Behavior Self-learning: Websites - CoinDesk, CoinTelegraph, CryptoSlate
	Module 3: Blockchain Technology Fundamentals Hours: 05
	Blockchain vs. Traditional Database; Basics of Blockchain: Definition, structure, and decentralized ledger concept; Key components: blocks, nodes, and cryptographic hashing; Consensus mechanism concept with example and importance; Types of Blockchain: Public vs. Private. Self-learning: Private Blockchain platform
	Module 4: Ethereum and Smart Contracts Hours: 06

	Overview of Ethereum Blockchain and its features; Role of Ether (ETH) as a cryptocurrency in Ethereum ecosystem; Smart Contracts: Definition and benefits in commerce, Examples of smart contract applications in Finance/Commerce; Introduction to MetaMask and Ethereum dApps. Self-learning: Ripple (Demo)
	Module 5: Practical Applications and Case Studies Hours: 06 Financial Sector Potential Use Cases: Venture Capital - Crowdfunding through Initial Coin Offerings (ICOs), Payment Systems - Cross border, Large interbank, & Retail, Loan Issuance & Trade Finance - Digitizing paper-based processes, Clearing, Settlement and Processing – Securities & Derivatives, Digital IDs and Data Reporting – Central Bank Digital Currency & Private Stable Value Tokens. Case Studies in Digital Payments: PayPal, Square, Apple Pay. Real-world applications of cryptocurrencies and Blockchain; Case Studies in Cryptocurrencies and Blockchain: Analysis of successful and failed projects. Self-learning: Blockchain in e-commerce
	Module 6: Regulatory Frameworks, Ethical and Social Implications Hours:04 Legal and Regulatory Framework: Global regulatory landscape for cryptocurrencies and digital payments compliance, risk management, and consumer protection. Ethical Implications; Environmental Impact: Energy consumption of Bitcoin mining, Sustainable mining practices; Social Implications: Financial inclusion through Bitcoin, Bitcoin as a tool for empowerment. Self-learning: Cultural and traditional Implications/ challenges
10	Text Books: 1. A. Franciska, <i>Digital Payments System in India</i>, Notion Press, 2022. 2. R. Yathish R and N. Tejaaswini, <i>Blockchain for Beginners</i>, Shroff Publications, 2019. 3. D. Drescher, <i>Blockchain Basics: A Non-Technical Introduction in 25 Steps</i>, Apress, 2017. 4. D. Tapscott and A. Tapscott, <i>Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies is Changing the World</i> by, Portfolio Penguin, 2016.
11	Reference Books: 1. J. Sing, <i>Digital Payments in India: Background, Trends and Opportunities</i>, New Century Publications, 2019. 2. C. Subramanian A. George, A. Abhilash, Karthikeyan, <i>Blockchain Technology</i>, Universities Press (India) Pvt. Ltd., 2020. 3. A. Narayanan, J. Bonneau, E. Felten, A. Miller, S. Goldfeder, <i>Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction</i>, Princeton University Press, 2016. 4. A. Antonopoulos, <i>Mastering Bitcoin: Unlocking Digital Cryptocurrencies</i>, O'Reilly Media, 2015.

12	Internal Continuous Assessment: 40%	Semester End: 60%
13	Continuous Evaluation through: IAT-1 : 15 marks IAT-2: 15 marks Average of IAT-1 & IAT-2 = 15 marks. Projects, Presentation and assignments, (5 marks)etc.	Semester End Examination (30 marks) - Duration 1 hours.
14	Format of Question Paper: End-semester examination • Question Paper will comprise three questions each with 10 marks. All modules must be covered. All three questions need to be answered.	

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