



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Subject Code: ME03000141

Subject Name : Introduction to Fintech

| | |
|-------------------------|---------------|
| w. e. f. Academic Year: | 2024-25 |
| Semester: | 3 |
| Category of the Course: | Open Elective |

| | |
|----------------------|---|
| Prerequisite: | Computer networks, Cloud computing, Machine learning, Deep learning |
| Rationale: | The introduction of FinTech as a subject in engineering equips students with the necessary technical and analytical skills to innovate in the rapidly evolving financial sector. As digital payments, blockchain, AI-driven financial services, and cybersecurity become integral to banking and investments, engineers play a crucial role in developing secure and efficient financial technologies. This subject bridges the gap between finance and technology, fostering interdisciplinary knowledge and preparing students for emerging career opportunities in FinTech |

Course Outcome:

After Completion of the Course, Student will able to:

| No | Course Outcomes | RBT Level |
|----|---|-----------|
| 01 | Understand basic concepts of Fintech and digital identity | U, R |
| 02 | Learn and experiment with various Fintech enablers like blockchain and digital payments | U, R |
| 03 | Understand various AI and ML algorithms used in Fintech and apply them on dataset | U, R |
| 04 | Simulate various blockchain concepts like distributed ledger technology (DLT) | A |

*Revised Bloom's Taxonomy (RBT)

Teaching and Examination Scheme:

| Teaching Scheme (in Hours) | | | Total Credits L+T+ (PR/2) | Assessment Pattern and Marks | | | | Total Marks |
|-------------------------------|---|----|---------------------------------|------------------------------|----------------|-----------|----------------------|-------------|
| L | T | PR | | C | Theory | | Tutorial / Practical | |
| | | | ESE (E) | | PA / CA (M) | PA/CA (I) | ESE (V) | |
| 3 | 0 | 0 | 3 | 70 | 30 | 0 | 0 | 100 |



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Course Content:

| Unit No. | Content | No. of Hours | % of Weightage |
|--------------|---|--------------|----------------|
| 1. | Introduction: What is Fintech? Fintech revolution drivers, Fintech types / areas, Challenges faced by Fintech industries | 4 | 5 |
| 2. | Fintech Enablers - Digital identity: What is digital identity, need of digital identity, Components of digital identity, impact of digital identity on business, A Digital Identity Application Use Case: Aadhaar | 8 | 20 |
| 3. | Blockchain & Cryptographic Technologies in Finance: Distributed Ledger Technologies (DLT), Hyperledger, Corda, Ethereum, Blockchain consensus mechanisms: PoW, PoS, DPoS, PBFT, Smart Contracts development with Solidity | 8 | 20 |
| 4. | Digital Payments & Transaction Processing: Card Networks (Visa, Mastercard, SWIFT, UPI) How transactions flow, Real-time payments (RTP), NEFT, RTGS, and instant settlement systems, Tokenization & Encryption in digital payments, Cross-border payment solutions: Ripple, Stellar | 8 | 20 |
| 5. | Artificial Intelligence & Machine Learning in FinTech: AI for Credit Scoring & Loan Approval, Logistic Regression, Random Forests, Gradient Boosting, Fraud Detection Models, Anomaly detection (Isolation Forest, Autoencoders), Supervised vs. unsupervised fraud detection, Algorithmic Trading & Robo-Advisors, Sentiment Analysis for market trends, Reinforcement Learning for trading strategies | 8 | 20 |
| 6 | Cloud-Native FinTech Architecture (AWS, Google Cloud, Azure), Serverless Computing in FinTech: AWS Lambda, Google Cloud Functions, Database Systems for FinTech: SQL (PostgreSQL, MySQL) vs. NoSQL (MongoDB, Firebase) | 6 | 15 |
| Total | | 42 | 100 |

Suggested Specification Table with Marks (Theory):

| Distribution of Theory Marks (in %) | | | | | |
|-------------------------------------|---------|---------|---------|---------|---------|
| R Level | U Level | A Level | N Level | E Level | C Level |
| 20 | 60 | 20 | | | |

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:



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1. The Future of Finance the Impact of FinTech, AI, and Crypto on Financial Services Henri Arslanian and Fabrice Fischer Palgrave Macmillan publications
2. Fintech Fundamentals Big Data Cloud Computing Digital Economy Len Mei, Ph.D., MERCURY LEARNING AND INFORMATION
3. Sanjay Phadke FinTech Future The Digital DNA of Finance Sage Publications 2020 / latest edition
4. Pranay Gupta and T. Mandy Fintech: The New DNA of Financial Services Gruyter 2019 / latest edition

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