COURSE TITLE	**DIGITAL TRANSFORMATION-II**
COURSE CODE	**05MF0304**
COURSE CREDITS	**4**

Objective:

1. To equip students with hands-on experience in building full-stack financial applications using ReactJS, Django, and SQL.
2. To enable students to work on real-world FinTech projects involving secure transactions, API integrations, and cloud deployment.
3. To develop skills in data automation, real-time financial analytics, and security measures for financial applications.
4. To provide students with knowledge of cutting-edge digital transformation trends in banking, investments, and payment systems.

Course Outcomes: After completion of this course, student will be able to:

1. Students will be able to develop and deploy full-stack financial applications using modern web technologies.
2. Learners will gain proficiency in secure financial data management, including user authentication and payment integration.
3. Graduates will demonstrate expertise in building real-time financial dashboards and optimizing web applications for FinTech solutions.
4. Students will complete a capstone project, showcasing their ability to build a scalable and secure FinTech application.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Fundamentals of Digital Transformation in Finance** Understanding Digital Transformation in FinTech, Cloud Computing & API-based Financial Services, Front-end vs. Back-end Technologies in Finance, Database Management for FinTech, Data Pipelines and Automation in Finance, Case Studies: How Banks & Startups are Using Digital Transformation	8

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Contents : Unit	Topics	Contact Hours
2	**Full-Stack Financial Application Development** Full-Stack Development in Finance: ReactJS + Django, Frontend UI/UX for Financial Dashboards (ReactJS & Material UI/Tailwind), Backend API Development for Banking Systems (Django & DRF), SQL Database Design for Financial Transactions, Handling Secure Payments & APIs (Stripe, Razorpay, PayPal), Best Practices for Security in FinTech Apps	10
3	**Advanced Financial Web Development and API Integration** Building Secure Payment Gateways in FinTech, Integrating Third-Party Financial APIs (Stripe, Alpha Vantage, PayPal, etc.), Real-time Data Streaming and Visualization in FinTech, Optimizing Performance for Large-scale Financial Apps, AI-powered Insights in Digital Finance, Deploying FinTech Apps on Cloud (AWS, GCP, DigitalOcean)	12
4	**Capstone Project – End-to-End FinTech Application** Planning & Designing a Scalable FinTech Solution, Developing a Secure Full-Stack Finance Application, Ensuring Security in Financial Transactions & User Data, Real-time Monitoring & AI-driven Insights, Deploying a Production-Ready FinTech App, Future Trends in Digital Finance & AI Automation	15
Total Hours		**45**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**unit 1** ReactJS Financial Dashboard : Fetch and display live stock market data from an API using ReactJS.Implement real-time data updates, Django-based Banking System : Set up a Django backend with user authentication (Login, Register, JWT-based authentication).Store and retrieve user financial data in an SQL database	15
2	**unit 2** Investment Tracking Application : Build a ReactJS-based Investment Portfolio Tracker, Store and manage investment data in an SQL database with Django backend, Secure User Authentication for Banking App : Implement JWT-based authentication in Django. Secure user transactions with role-based access control	15
3	**unit 3** Payment Gateway Integration : Develop a Django-based payment gateway using the Stripe API. Allow users to perform secure financial transactions, Real-time Stock Market Data Visualization : Create a ReactJS-based stock market dashboard using WebSockets for real-time updates	15

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
4	**unit 4** Final Project (Choose One): 1. Personal Finance Management App : Track income, expenses, savings with AI-driven financial insights. Secure user authentication & cloud storage integration, 2. Stock Portfolio Management System : Users can buy/sell stocks and analyze their portfolio.Integrate real-time market data via APIs, 3. AI-powered Loan Approval System : Build a Django-based credit scoring system.Use ML algorithms to assess loan approval chances, 4. Crypto Wallet & Transaction Tracker : Securely track crypto assets using blockchain API integration.Implement two-factor authentication (2FA) for transactions.	15
Total Hours		**60**

Textbook :

1 Digital Transformation: Survive and Thrive in an Era of Mass Extinction, homas M. Siebel, Rodin Books, 2019

2 Django for Professionals: Production-Ready Web Applications, William S. Vincent, WelcomeToCode, 2020

References:

1 Full-Stack React Projects, Full-Stack React Projects, Shama Hoque, Packt Publishing, 2018

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
10.00	20.00	25.00	25.00	10.00	10.00

Instructional Method:

1 Demo, Classwork, Board work, Practical

Supplementary Resources:

1 https://www.digitalocean.com/community/tutorials/build-a-to-do-application-using-django-and-react

2 https://devcenter.heroku.com/categories/deployment

3 https://ocw.mit.edu/courses/sloan-school-of-management/15-455-fintech-shaping-the-financial-world-fall-2019/

4 https://www.alphavantage.co/documentation/

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Supplementary Resources:

5 https://www.django-rest-framework.org/

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