Fintech and Its Application

Title of the course: Fintech and Its Application

Instructor: Jie Peng

Course code:

Teaching Language: English **Targeted students:** Master

Contact Hours: 36 **Self-learning Hours:** 68

Prerequisites: Basic Statistics, Python programming

Number of learners: Less than 55

Academic Year: **Credits:** 2

Profile of Teaching Staff

Jie Peng

Assistant Professor at the Advanced Institute of Business, School of Economics and Management, Tongji University, with a PhD in Decision Sciences and Business Economics from The Chinese University of Hong Kong. Specializes in empirical research in the interaction between supply chains and finance. Utilizes extensive corporate data, employing theoretical modelling and empirical research methods to deeply analyse business models and address practical corporate challenges. Recently, two of her papers have recently been accepted by top international journals in business schools. The paper titled "Global Supply Chains and Cross-Border Financing" has been published in Production and Operations Management, and the paper titled "Financial Statement Comparability and Global Supply Chain Relations" has been published in the Journal of International Business Studies.

1. Course Description

"Fintech and Its Application" is designed to introduce students to the fundamental building blocks of various financial technologies and real-world applications through case studies and quantitative analyses. The course provides a comprehensive framework from data and models to business applications. The course is helpful for students who target careers in financial industry, and useful for students who target careers in manufacturing, high-tech, and platform economics where FinTech also plays an indispensable role.

Students will learn the essential components of technology-driven financial applications, including the disruptive forces of digital payment, modern investment theory driven robot investing, quantitative investment and trading, platform lending, and innovative financing and funding schemes (crowdfunding, supply chain financing, etc.). We will also discuss the blockchain technologies (applications such as cryptocurrency and asset tokenization) as well as the Large Language Model (LLM) in financial applications.

2. Course Objectives

- Expose graduate students to essential knowledge, primary principles, and research methods in fintech applications
- Introduce key concepts and models of fintech, including blockchain technology, digital currencies, and financial innovations
- Empower students with knowledge of the latest advances in the fintech field.
- Enable students to improve their ability to analyze and solve practical problems arising in financial technology and management from theoretical and practical perspectives

At the end of the course, it is expected that students will be able to

1. Understand FinTech and its implications on the global banking and financial services industry.
2. Acquire basic industry, financial, and entrepreneurial knowledge and skills to identify and evaluate FinTech companies.
3. Able to analyze real-world big data using appropriate software
4. Use acquired knowledge and skills to potentially develop a business plan for deploying financial technologies in business.

3. Course Requirements and Assessment

Assessment	Ratio	Requirements
Group project	45%	Three group projects for Fintech and Its

		Application will be assigned. Each group project accounts for 15% of the final grade. A report will be delivered for each project. Groups will be formed at the beginning of the course, with **3-5 students per group** fixed throughout the term. Collaboration is key to learning and doing well on these projects. Group members can evaluate each other's performance by providing comments on the peer evaluation form. Those who under-contribute may be penalized (**up to 100% grade deduction**).
Final exam	35%	The final exam for Fintech and Its Application will be held at the end of the course. The final exam accounts for 35% of the final grade. The exam will cover all topics discussed throughout the course, including key principles, industry knowledge, and practical applications of fintech. It will consist of multiple-choice questions, short answer questions, and problem-solving scenarios to test students' understanding and ability to apply what they have learned. Students are expected to demonstrate a comprehensive understanding of the course material and the ability to analyze and solve fintech-related problems effectively. Preparation and thorough review of the course content are essential for success in the final exam.
Class participation	20%	10%: attendance 10%: active participation

*** Group Projects Report:**

Instructor will provide sample data. You are required to use the models and tools learned in class to analyze the data and write a report. You are encouraged to follow the report outline when you submit your report:

1. Show some summary statistics (at least 5 tables or figures).
2. Run models to analyze the data and present the results in tables.

3. Based on the above results, provide at least 3 insights for managers.

The report must not exceed 20 single-sided pages including all materials, with margin size of 2.54 cm (for top, bottom, left, and right margins), 12-point Times New Roman font, 1.5-line spacing. You should assign a leader for project submissions. The team leader should email your zipped homework (.ipynb code, knitted HTML, PDF report, if any) by the deadline (23:59 on the due date). We do not accept late submissions.

5. Course Arrangement

Course Name		Fintech and Its Application	**Contact Hours**	36
Unit	**Credit hours**	**Contents**	**Assignments**	
1	10	**Introduction** 1. FinTech Landscape and Digital Footprints 2. Alternative Data in FinTech Applications 3. Digital Banking and FinTech Regulation 4. Python Introduction		
2	3	**Robo-Advisory**	Group Project 1	
3	6	**Quantitative Investing** 1. Behavioral finance and China A-share Market 2. Empirical Asset Pricing: CAPM, APT, and market efficiency 3. Alpha factors vs. beta factors 4. Technical, fundamental, and sentiment factors 5. Economic link factors: supply chains, executive friendship 6. Machine learning in quantitative hedge funds	Group Project 2	

4	3	**Blockchain: from Bitcoin to Asset Tokenization** 1. Blockchain technology (distributed ledger technology) 2. Bitcoin and its protocols	
5	4	**Platform Lending** 1. Consumer credit market 2. Peer-to-peer lending platforms 3. Regulatory treatment in FinTech lending	Group Project 3
6	5	**Alternative Finance** 1. Supply chain finance (SCF) 2. Crowdfunding and "the wisdom of crowds" 3. Impact Investing	
7	5	**Large Language Model in FinTech** 1. Financial Large Language Models (FinLLMs) 2. Applications of LLMs in finance (e.g., robo-advising, algorithmic trading, financial reasoning)	

6. Textbook and References

The most important materials are my lecture slides. The coverage and requirement of the course is solely defined by the lecture slides. Homework projects and exams are subject to the scope of weekly lectures. FinTech is an emerging topic. It is so new that there is no ideal textbook. You are encouraged to read related news and journal articles. For recommendation purposes, below are some high-quality books relevant to this course that you may find useful as reference books.

- Financial Services Technology: Processes, Architecture, and Solutions, 2nd Edition 2nd Edition by Randall E. Duran, Cengage Asia
- Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, by Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven

Goldfeder, Princeton University Press.

Supplementary materials:

- Paper: The Fintech Opportunity
  http://pages.stern.nyu.edu/~tphilipp/papers/FinTech.pdf
- Paper: On the Rise of FinTech – Credit Scoring using Digital Footprints
  https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3163781
- Paper: Digital Footprints as Collateral for Debt Collection
  https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4135159
- Paper: Alternative Data for FinTech and Business Intelligence
  https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3521349