Master of Science in
FINANCIAL TECHNOLOGY

Unchaining the Potential of FinTech
About the Schools

**School of Business and Management**

Established in 1991, the School of Business and Management (SBM) at The Hong Kong University of Science and Technology (HKUST) is young, dynamic and well respected for the quality of its programs and the impact of its research. We are the first business school in the region to be accredited by both the US-based Association to Advance Collegiate Schools of Business (AACSB) and the European Quality Improvement System (EQUIS). The degrees offered by us are recognized worldwide. The School is recognized as one of the youngest and most respected business schools in Asia. The joint EMBA program with Kellogg School of Management at Northwestern University was ranked world’s No. 1 in 2018 and the MBA program was ranked Asia’s No.1 in 2016.

**School of Engineering**

The School of Engineering (SENG) is the largest of the five Schools within HKUST. It enrolls almost 40% of the University’s student body. SENG has a strong international reputation and consistently ranks high among major engineering schools around the world. HKUST was ranked No.17 in the QS World University Rankings in Engineering and Technology 2018. The School’s research excellence is globally recognized as well. Over the past decades, the faculty members made significant discoveries in cutting-edge research and received major honors internationally. These achievements have been important contribution to the social and economic development of Hong Kong and its transition to a knowledge-based society.

**School of Science**

The School of Science (SSCI) comprises five academic units, covering Life Science, Chemistry, Mathematics, Physics and Ocean Science. The School is committed to providing students with a high quality balanced education in an intellectually stimulating environment. To enhance students’ university experience, the School continues to improve the curriculum to make it more diverse, interdisciplinary and inquiry-driven. SSCI has recruited outstanding faculty members, many of whom are leaders in their research fields and have already attained international stature in recognition of their scientific contributions. With different backgrounds and research interests, the faculty members bring diverse, interdisciplinary perspectives to address the fundamental questions in science. With a strong commitment to both teaching and research, they instill in students the importance of scientific rigour and ethics, while serving to inspire and encourage students to achieve their full potential.
FinTech, short for financial technology, is a burgeoning multidisciplinary area where novel technologies and financial innovations are employed to improve traditional financial services. Its rapid development has changed and will continue to change the global financial system as well as our lives profoundly, and Hong Kong, as one of the leading international financial centers, has been witnessing growing needs for people with FinTech-related expertise.

To meet the increasing market demand, HKUST launches the new Master of Science program in Financial Technology (MScFinTech), which is the first one in Hong Kong and Mainland China, by combining the efforts of School of Business and Management (SBM), School of Engineering (SENG), and School of Science (SSCI).

By drawing on the expertise of our world-class faculty from diverse areas of engineering, business and science, our program provides a broad and balanced curriculum and aims to equip students with cutting-edge FinTech-related knowledge and capabilities, thereby enhancing their competitiveness in the market.

Join us. I believe that our program will help you lay a solid foundation for a successful career in the FinTech area.
Program

Program Design

FinTech is an emerging but important area that has been developing rapidly in recent years. The MScFinTech program at HKUST is designed for talents and working professionals who want to combine technical and financial knowledge to stimulate innovative solutions that meet the challenges posed by this emerging field.

The MScFinTech program provides students with fundamental knowledge and skills relating to popular financial technologies and their engineering and financial principles, thereby enhancing students’ market competitiveness in the remarkably booming FinTech space. In view of the multi-disciplinary nature of FinTech, the program, jointly run by SBM, SENG and SSCI draws expertise from timely areas such as information technology, blockchain, decision analytics, etc..

We expect graduates of the program to be able to analyse the engineering mechanisms and financial principles of new and emerging financial technologies. Students will be able to formulate and analyse FinTech-related problems and solve such problems using practical means supported by engineering methodologies and relevant quantitative techniques.
Program Schedule

The MScFinTech program is offered in both one-year full-time and two-year part-time study modes. Both full-time and part-time students are required to complete a total of 30 credits of core courses and electives.

Full-time Sample Schedule [One-year]

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<tr>
<th>Core Courses [8 courses, 16 credits]</th>
<th>Electives* [a selection of 14 credits]</th>
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<tr>
<td>• AI for FinTech (2 credits)</td>
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<td>• Economics of Financial Technology (2 credits)</td>
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<td>• Corporate Finance (2 credits)</td>
<td>• Entrepreneurship and Innovation in FinTech (2 credits)</td>
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<td>• Data Analysis (2 credits)</td>
<td>• FinTech: Algorithmic Trading (2 credits)</td>
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<td>• Statistics for Financial Analysis (2 credits)</td>
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<td>• FinTech Regulations and Compliance (2 credits)</td>
<td>• FinTech and Big Data Financial Analytics (2 credits)</td>
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<td>• Investment Analysis (2 credits)</td>
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* The electives offered in a particular year will be announced at the beginning of each academic year. Students have to take at least one elective course from each of SBM, SENG and SSCI. The offering of elective courses is subject to availability.

# Subject to the decision of the Program Director, promising students who do not have a strong mathematics background may be required to take this elective.
Part-time Sample Schedule [Two-year]

Year 1 (Sep – May)

Core Courses
(8 courses, 16 credits)

Year 2 (Sept – May)

Electives*
(a selection of 14 credits)
Curriculum

Core Courses (8 courses, 16 credits)

AI for FinTech
This course covers the basic theory of artificial intelligence and machine learning, and their applications to FinTech. Topics include natural language understanding and sentiment analysis using various deep learning architectures. The course also covers basic natural language processing methods for applications such as event and anomaly detection, fraud and fake news detection. The course will also relate sentiment and affect analysis to stock market trading, market monitoring, and to compliance and regulatory-related adverse events.

Corporate Finance
Valuation of cash flow streams (PV of cash flow streams, annuities, and perpetuities); valuation of bonds; valuation of stocks using dividend discount model; capital budgeting decisions (NPV, IRR, payback); capital structure; limits to the use of debt (trade-off models); estimation of cost of debt and equity; WACC; terminal value.

Blockchain
This course introduces basic concepts and technologies of blockchain from engineering perspectives, such as Bitcoin architecture, consensus protocol of Bitcoin, proof of work, Ethereum, Hyperledger and smart contracts, as well as the blockchain applications. The course also covers the limitations and possible improvements of the blockchain system.

Data Analysis
This course covers the basic and advanced statistical approaches to data analysis and shows how to use these techniques to analyze a financial data with a statistical package, such as Python and R. The key topics are reading and describing data, categorical data, time series data, correlation, nonparametric comparisons, ANOVA, multiple regression, general linear models and quantile regression models.

Sample Electives (a selection of 14 credits)

Cryptocurrency, Blockchain, and Their Business Applications
This course discusses cryptocurrencies (including Bitcoin, Ethereum, and others), blockchain (the technology behind the meteoric rise of cryptocurrencies), and the multidimensional business applications of blockchain technology. The course provides a basic set of skills to understand the hype about cryptocurrencies, and more importantly, its underlying technology, and to envision a future of blockchain with or without cryptocurrencies.

Economics of Financial Technology
This course focuses on using economic concepts to analyze the implications of financial technologies on the macroeconomy. It also addresses policy implications of FinTech on financial stability, central banking, and monetary policy. The aim is to highlight the importance of formulating appropriate policies to foster healthy development of the FinTech sector and at the same time ensure the financial stability of the economy.
Financial Data Mining

In this course, students will first learn basic concepts and techniques about data mining, including data preprocessing, data cleaning, clustering, classification and outlier detection. Then, students will learn how to apply these techniques to financial data, such as sentiment analysis and social network mining.

Foundations of FinTech

This course aims to provide a foundational introduction to financial technologies. More specifically, this course will cover various important financial technologies and innovations, including investment and financing technologies such as P2P lending and crowdfunding, payment technologies such as mobile payments, wealth management technologies such as robo-advisors, blockchain technologies such as cryptocurrencies, and other technologies such as InsurTech and RegTech.

FinTech Regulations and Compliance

This course provides students with frameworks, concepts, and background to understand the role of regulation, compliance and assurance in FinTech markets from both technology and business perspectives. The course will also examine the perspectives of government officials, investors, managers, and consumers in how they benefit from, guide, and influence the evolution of regulation and associated compliance activities.

Investment Analysis

An introduction to fundamental concepts in investment analysis. The first part covers risk and return tradeoff, portfolio diversification, and modern portfolio theory including the capital asset pricing model and arbitrage pricing theory. The second part covers basic analytical tools used in analyzing fixed income securities. Topics include interest rates and yield curve mathematics, duration and convexity.

Decision Analytics for FinTech

This course aims to introduce decision analytics instruments and their applications in FinTech. Main topics covered in this course include basic probability and statistics, predictive analytics, prescriptive analytics such as linear programming, integer programming, dynamic programming and sequential decision making, stochastic models, quality control, Monte Carlo simulation, game theory, and their applications in various areas of FinTech.

Statistical Machine Learning

This course provides students with an extensive exposure to the elements of statistical machine learning in supervised and unsupervised learning with real world datasets. Topics include basic models in regression and classification, resampling methods, model selection/assessment, and some standard techniques in unsupervised learning such as clustering and dimensionality reduction.
Faculty

School of Business and Management
Professor Ekkachai SAENYASIRI
Assistant Professor of Business Education, Department of Finance
PhD, The City University of New York

Research interests:
Investments; corporate finance; international finance; financial analysts

Professor Allen HUANG
Associate Professor, Department of Accounting
PhD, Duke University

Research interests:
Earnings management; financial analysts; securities regulation; executive compensation

Professor Kai Lung HUI
Deputy Head, Chair Professor, Department of Information Systems, Business Statistics and Operations Management
Co-Director, MScFinTech Program
Co-Director, Dual Degree Program in Technology and Management
PhD, The Hong Kong University of Science and Technology

Research interests:
Cybercrime economics and policy; privacy; fintech; IT policy; electronic commerce

Professor Garvin Percy DIAS
Associate Professor, Department of Information Systems, Business Statistics and Operations Management
PhD, Fudan University

Research interests:
IT auditing; network management; mobile computing; electronic commerce; web-based information systems; intelligent computing; fintech

Professor Entela BENZ-SALIASI
Adjunct Associate Professor, Department of Finance
PhD, Finance Institute & HEC University of Lausanne

Research interests:
Pricing venture capitalist contracts; asset allocation; credit risk pricing; ESG pricing; climate risk
School of Engineering

School of Science
Professor Pascale FUNG
Professor, Department of Electronic and Computer Engineering; Department of Computer Science and Engineering
Director, Centre for AI Research (CAiRE)
Fellow, IEEE
Fellow, ISCA
PhD, Columbia University

Research interests:
- Spoken language understanding; natural language processing (NLP); dialog systems; multilinguality;
- emotion, affect and mood recognition; machine learning; empathetic machines

Professor Daniel PALOMAR
Professor, Department of Electronic and Computer Engineering
Fellow, IEEE
PhD, Technical University of Catalonia

Research interests:
- Financial engineering and big data analytics using tools from convex optimization theory and signal processing

Professor Kani CHEN
Professor, Department of Mathematics
PhD, Columbia University

Research interests:
- Survival analysis; sequential analysis; boot-strapping; empirical process; stochastic modeling; missing data and EM algorithm

Professor Can YANG
Assistant Professor, Department of Mathematics
PhD, The Hong Kong University of Science and Technology

Research interests:
- Data science with statistical machine learning; computer age statistical inference; empirical Bayes and scalable algorithm; statistical genetics and genomics
Careers & Enrichment

The MScFinTech program helps prepare students for their FinTech career. The HKUST Business School’s MSc Career & Professional Development team provides career guidance and support services for all full-time MSc students, including:

• Identifying the student’s unique career-related interests, values, and capabilities;

• Enhancing job searching skills and preparing for workplace requirements and career management strategies;

• Accessing opportunities for internships and full-time employment with a diverse group of recruiting firms and organizations.

One-on-one career coaching and career-related training/workshops will be provided for students after they join the program.

The MSc Programs Office will also arrange various enrichment activities and luncheon talks for students. These activities will provide a platform for students to network with industry practitioners and senior leaders in Hong Kong and Mainland China.
Campus Life

HKUST is more than just a place to learn. We aim at developing our students to their full potential, preparing them to take the next step towards career success. We focus on creating a unique learning experience for each of our students, and developing future business leaders in Asia for the world.

Spreading over 60 hectares in a beautiful setting in Clear Water Bay, the HKUST campus provides students with a relaxing environment to study and grow. Students enjoy all benefits of a full-scale university campus with a wide range of facilities and support services.

Student amenities such as banks, medical clinics, a supermarket, a bookstore, postal services, hair salon, souvenir shop, and choices of Asian and Western catering outlets are located on campus. Other facilities include a five-storey library with over 700,000 books, periodicals, microfilms and 100 electronic databases, computer barns, wireless Internet access, a language-learning center, a self-access center with multimedia resources, swimming pools, a fitness center, tennis courts, an athletic track, and a soccer pitch.

A wide range of facilities are also provided to encourage extra-curricular activities and the pursuit of hobbies, and to enhance the quality of campus life. These include conference and meeting rooms, common and quiet rooms, workshops and a darkroom, karaoke and music rooms, and a performance stage.

Public transportation is conveniently available, with the campus located less than 30 minutes away from the city center. HKUST is nearby Hang Hau, home to the Tseung Kwan O Public Hospital, major supermarkets, an impressive range of restaurants, various shopping malls, and a wet market. Just 10 minutes from the main campus by bus is Sai Kung, famous for its seafood restaurants, water sports facilities—including one of Hong Kong’s two yacht clubs—and country parks with a wealth of hiking, mountain biking and camping possibilities.

Lee Shau Kee Campus
The Lee Shau Kee Campus—including the Lee Shau Kee Business Building and the Institute for Advanced Study, was built in 2013. Located atop the HKUST’s main campus, the Lee Shau Kee Campus occupies about 10 hectares, representing about 15% of the total campus area.

The HKUST Business School is located in this business building. Students can enjoy state-of-the-art teaching and learning facilities and an exclusive area for them to work on group projects or assignments.
Admissions

Admission Requirements

Applicants to the MScFinTech program are expected to have the following credentials:

1. A Good First Degree
   Applicants should have obtained a bachelor’s degree from a recognized institution, or an approved equivalent qualification. Applicants preferably should have programming and mathematics background.

2. English Proficiency
   Applicants whose first language is not English, and whose bachelor’s degree or equivalent qualification* was awarded by an institution where the medium of instruction was not English, are required to fulfill the minimum English Language admission requirements of the University.

3. GMAT/GRE
   Applicants are highly recommended to have a satisfactory GMAT/GRE score, but it is not a compulsory requirement.

4. Work Experience
   For full-time applicants, no minimum work experience is required. However, any relevant work or business experience will add weight to the application under consideration.

   For part-time applicants, at least two years of full-time post-qualification work experience is highly recommended, but it is not a compulsory requirement.

* qualification with duration equivalent to a full-time bachelor’s degree (i.e. at least 3 years)
Program Fee & Expenses

The total program fee for the 2020/21 intake is HK$300,000. The program fee covers tuition, selected textbooks and course materials for some of the core courses. It does not include traveling and living expenses in Hong Kong.

Scholarship

Eligible candidates will be considered for admissions scholarship.

Application Materials

Applicants should include the following materials in their applications:

• Completed online application form, including a personal statement
• Academic transcript(s)
• Degree certificate(s)
• GMAT or GRE score report (if applicable)
• TOEFL or IELTS score report (if applicable)
• Professional qualifications (if applicable)
• CV/resume with photos
• Two academic reference letters

Applicant profiles are reviewed upon full completion of online applications and full payment of application fee. Shortlisted applicants may be invited for interview upon request.

Application Deadlines

We invite applications from September 2019 onwards for the 2020/21 intake. Admissions operate on a rolling basis. We recommend non-local applicants to apply as early as possible so as to allow sufficient time for student visa application, personal preparation, and arrival at Hong Kong. Application deadlines for the 2020/21 intake are as follows:

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<th>Phase</th>
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<th>Part-time Mode</th>
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<td>1 Nov 2019</td>
<td>16 Dec 2019</td>
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<td>2</td>
<td>16 Dec 2019</td>
<td>17 Feb 2020</td>
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<td>3</td>
<td>1 Feb 2020</td>
<td>1 Apr 2020</td>
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The Hong Kong University of Science and Technology
Master of Science in Financial Technology

Room 2042, 2/F,
Lee Shau Kee Business Building
HKUST Business School
The Hong Kong University of Science & Technology
Clear Water Bay, Kowloon, Hong Kong

Phone:  (852) 3469 2994
Email:    mscfintech@ust.hk
Website:  www.mscfintech.ust.hk