REGULATIONS FOR THE DEGREE OF
MASTER OF SCIENCE IN FINANCIAL TECHNOLOGY AND DATA ANALYTICS
(MSc[FTDA])

(See also General Regulations and Regulations for Taught Postgraduate Curricula)

The degree of Master of Science in Financial Technology and Data Analytics (MSc(FTDA)) is a postgraduate degree awarded for the satisfactory completion of a prescribed curriculum in the Faculty of Engineering. The MSc(FTDA) curriculum is offered in part-time mode.

MScFTDA 1 Admission requirements
To be eligible for admission to the curriculum leading to the degree of MSc(FTDA), a candidate shall:

(a) comply with the General Regulations;
(b) comply with the Regulations for Taught Postgraduate Curricula;
(c) hold (i) a Bachelor's degree in Engineering or Science discipline of this University; or
(ii) a relevant qualification of equivalent standard from this University or from another university or comparable institution accepted for this purpose; and
(d) satisfy the examiners in a qualifying examination if required.

MScFTDA 2 Qualifying Examination

(a) A qualifying examination may be set to test the candidate's academic ability or his/her ability to follow the curriculum prescribed. It shall consist of one or more written papers or their equivalent and may include a dissertation.
(b) A candidate who is required to satisfy the examiners in a qualifying examination shall not be permitted to register until he/she has satisfied the examiners in the examination.

MScFTDA 3 Period of Study
The curriculum shall normally extend over two academic years of part-time study. Candidates shall not be permitted to extend their studies beyond the maximum period of registration of three academic year of part-time study, unless otherwise permitted or required by the Board of Faculty. The period of study shall include any assessment to be held during and/or at the end of each semester.

MScFTDA 4 Curriculum Requirements
To complete the curriculum, a candidate shall, within the prescribed maximum period of registration stipulated in Regulation MScFTDA3 above:

(a) satisfy the requirements prescribed in TPG6 of the Regulations for Taught Postgraduate Curricula;
(b) take not fewer than 75 credits of courses, in the manner specified in these regulations and syllabuses and pass all courses as specified in the syllabuses;
(c) follow courses of instruction and complete satisfactorily all prescribed practical / laboratory work; and
(d) satisfy the examiners in all forms of assessment as may be required in either
(i) at least 75 credits of courses which must include a project of 12 credits as capstone experience; or
(ii) at least 60 credits of courses successfully completed at this University (which must include a project of 12 credits) and not more than 15 credits of courses successfully completed at this or another university before admission to the MSc(FTDA) and approved by the Faculty Board.

MScFTDA 5 Project report

(a) A candidate is required to submit the project report by a date specified by the Board of Examiners.

(b) All candidates shall submit a statement that the project report represents his/her own work undertaken after the registration as a candidate for the degree.

MScFTDA 6 Selection of Courses

(a) A candidate shall select courses according to the guidelines stipulated in the syllabuses for the degree of MSc(FTDA).

(b) Selection of study patterns, as stipulated in the respective syllabus, shall be subject to the approval of the Head of the Department concerned.

(c) Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each academic year.

(d) Changes to the selection of courses may be made only during the add/drop period of the semester in which the course begins, and such changes shall not be reflected in the transcript of the candidate.

(e) Subject to the approval of the Committee on Taught Postgraduate Curricula on the recommendation of the Head of the Department concerned, a candidate may in exceptional circumstances be permitted to select additional course(s).

(f) Requests for changes after the designated add/drop period of the semester shall be subject to the approval of the Committee on Taught Postgraduate Curricula. Withdrawal from courses beyond the designated add/drop period will be subject to the approval of the Committee on Taught Postgraduate Curricula.

MScFTDA 7 Assessment

(a) A candidate shall satisfy the examiners in all the prescribed courses as specified in the syllabus. Examinations shall normally be held after the completion of the prescribed course of study for that course, unless otherwise specified.

(b) A candidate, who is unable to complete the requirements within the prescribed maximum period of study specified in Regulation MScFTDA 3 because of illness or circumstances beyond his/her control, may apply for permission to extend his/her period of studies.

(c) A candidate who has failed to satisfy the examiners in any course(s) is required to make up for failed course(s) in the following manners:

(i) undergoing re-assessment/re-examination in the failed courses); or

(ii) repeating the failed course(s) by undergoing instruction and satisfying the assessments; or

(iii) taking another course in lieu and satisfying the assessment requirements.

(d) A candidate who has failed to satisfy the examiners in his/her project report may be required to submit or resubmit a project report on the same subject within a period specified by the Board of Examiners.

(e) In accordance with G9(h) of the General Regulation and TPG8(d) of the Regulations for Taught Postgraduate Curricula, there shall be no appeal against the results of examinations and all other forms of assessment.

MScFTDA 8 Grading system

Individual courses shall be graded according to the following grading system as determined by the Board of Examiners:

Standard	Grade	Grade Point
Excellent	A+	4.3
	A	4.0
	A-	3.7
Good	B+	3.3
	B	3.0
	B-	2.7
Satisfactory	C+	2.3
	C	2.0
	C-	1.7
Pass	D+	1.3
	D	1.0
Fail	F	0

MScFTDA 9 Discontinuation of Studies

Unless otherwise permitted by the Board of the Faculty, a candidate will be recommended for discontinuation of their studies in accordance with General Regulation G12 if he/she has:

(a) failed to pass 12 credits in an academic year; or
(b) failed to satisfy the examiners at a second attempt in his/her project report within the specified period; or
(c) failed to achieve a cumulative grade point average (CGPA) of 1.0 or higher for two consecutive semesters with course enrolment; or
(d) exceeded the maximum period of registration specified in Regulation MScFTDA3.

MScFTDA 10 Advanced Standing

Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum in accordance with TPG3 of the Regulations for Taught Postgraduate Curricula. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for Advanced Standing shall be determined by the Board of the Faculty, in accordance with the following principles:

(a) a candidate may be granted a total of not more than 20% of the total credits normally required under a curriculum for Advanced Stranding unless otherwise approved by the Senate; and
(b) credits granted for advanced standing shall not be included in the calculation of the GPA but will be recorded on the transcript of the candidate.

MScFTDA 11 Award of Degree

To be eligible for the award of the degree of MSc(FTDA), a candidate shall:

(a) comply with the General Regulations and the Regulations for Taught Postgraduate Curricula;
(b) complete the curriculum and satisfy the examiners in accordance with the regulations set out; and
(c) achieve a cumulative grade point average (CGPA) of 1.0 or higher.

MScFTDA 12 Assessment results

On successful completion of the curriculum, candidates who have shown exceptional merit of achieving a cumulative grade point average (CGPA) of 3.6 or higher may be awarded a mark of distinction, and this mark shall be recorded on the candidates' degree diploma.

SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN FINANCIAL TECHNOLOGY AND DATA ANALYTICS [MSc(FTDA)]

[This syllabus is applicable to students admitted to the curriculum in the academic year 2021-22 and thereafter]

Definition and Terminology

Discipline course – any course on a list of courses in the discipline of curriculum, which a candidate must pass at least a certain number of credits as, specified in the Regulations.

Elective course – any course at taught postgraduate level offered by the Departments of the Faculty of Engineering for the fulfilment of the curriculum requirements of the degree of MSc(FTDA) that are not classified as discipline courses.

Capstone Experience – a 12-credit project, which is an integral part of the curriculum focusing on the integration and application of knowledge, and skills that candidates have acquired throughout their studies.

Curriculum Structure

Students are required to complete not fewer than 75 credits nor more than 84* credits.

Course Category	No. of Courses	No. of Credits
Discipline Courses (including 3 Disciplinary compulsory courses)	≥ 8	Not less than 51
Elective Courses	≤ 2	Not more than 12
Capstone Experience	Project	12
	Total:	75 to 84 *

* Most courses in the curriculum have 6 credits. However, courses offered by Faculty of Law have 9 credits. Candidates who choose one, two, or three more 9-credit courses, in addition to the Disciplinary compulsory course in Law, are required to complete 78, 81 or 84 credits respectively for satisfying the curriculum requirement.

Curriculum

List-A Disciplinary compulsory courses *(3 courses)*		
Discipline	**Course**	
Technology	FITE7409 # or COMP7408 #	Blockchain and cryptocurrency *(6 credits)* Distributed ledger and blockchain technology (6 credits)
Finance	MFIN7002	Investment analysis and portfolio management *(6 credits)*
Law	LLAW6093	Regulation of financial markets *(9 credits)*

List-B Disciplinary courses *(at least 3 courses)*			
List-B-1 *(with at least one course from List-B-1)*		**List-B-2** *(with at least one course from List-B-2)*	
COMP7802	Introduction to financial computing (6 credits)	FITE7407	Securities transaction banking *(6 credits)*
COMP7906	Introduction to cyber security *(6 credits)*	FITE7410	Financial fraud analytics *(6 credits)*
ECOM6016	Electronic payment systems *(6 credits)*	STAT6013	Financial data analysis *(6 credits)*

List-C Disciplinary courses *(At least 2 courses)*			
List-C-1 *(with at least one course from List-C-1)*		**List-C-2** *(with at least one course from List-C-2)*	
FITE7405	Techniques in computational finance *(6 credits)*	COMP7412	Banking in Web3.0 – Metaverse, DeFi, NFTs and beyond *(6 credits)*
FITE7406	Software development for quantitative finance *(6 credits)*	ECOM6023	E-financial services *(6 credits)*
FITE7801	Topics in financial technology *(6 credits)*	ECOM7126	Machine learning for business and e-commerce *(6 credits)*
COMP7103	Data mining *(6 credits)*	FITE7411	RegTech in finance *(6 credits)*
COMP7305	Cluster and cloud computing *(6 credits)*	IMSE7310	Financial engineering *(6 credits)*
COMP7404	Computational intelligence and machine learning *(6 credits)*	LLAW6046	Privacy and data protection *(9 credits)*
COMP7409	Machine learning in trading and finance *(6 credits)*	LLAW6126	E-finance: law, compliance and technology challenges *(9 credits)*
DASC7606	Deep learning *(6 credits)*	LLAW6256	Law of anti-money laundering and counter-terrorist financing and compliance issues *(9 credits)*
STAT8020	Quantitative strategies and algorithmic trading *(6 credits)*	MFIN7034 ^ or MFIN7037 ^	Machine learning and artificial intelligence in finance *(6 credits)* Quantitative trading *(6 credits)*
		STAT6015	Advanced quantitative risk management *(6 credits)*

Capstone requirement
FITE7001 Project (12 credits)

Candidates shall select courses in accordance with the regulations of the degree. Candidates must complete a Project and 10 courses with the following requirements.

a) Candidates must complete 3 courses in List-A Disciplinary compulsory courses.

b) Candidates must complete at least 3 courses in List-B Disciplinary courses, which must include at least 1 course from List-B-1 and at least 1 course from List-B-2.

c) Candidates must complete at least 2 courses in List-C Disciplinary courses, which must include at least 1 course from List-C-1 and at least 1 course from List-C-2.

d) Candidates may also in exceptional circumstances select at most 2 taught postgraduate level courses (at most 12 credits in total) offered by the Departments in the Faculty of Engineering that are not classified as discipline courses as their elective courses. All course selection will be subject to approval by the Programme Directors concerned.

Candidates holding a non-computer science major should select FITE7409 Blockchain and cryptocurrency while candidates holding a computer science major should select COMP7408 Distributed ledger and blockchain technology.
^ Candidates can only select either MFIN7034 Machine learning and artificial intelligence in finance or MFIN7037 Quantitative trading.

All course selection will be subject to approval by the Programme Directors.

COURSE DESCRIPTION

The following is a list of discipline courses. The list of courses below is not final and some courses may not be offered every year.

All courses are assessed through examination and / or coursework assessment, the weightings of which are subject to approval by the Faculty Board.

List-A Compulsory courses

FITE7409. Blockchain and cryptocurrency (6 credits)

This course is for students who are not computer science majors. In this course, students will learn the rationales behind the design of blockchain and cryptocurrency, the key technical / cryptographic elements that build up the blockchain technology, classifications of different types of blockchains, the comparisons of different blockchain platforms, what applications fit the best for the blockchain technology, and example applications in a wide range of disciplines. This course will also introduce some popular cryptocurrencies, e.g. Bitcoin, discuss in details about bitcoin transactions, briefly introduce what a cryptocurrency exchange is, and the evil sides of cryptocurrencies (e.g. being the ransoms of ransomware and money laundry).

Mutually exclusive with COMP7408 Distributed ledger and blockchain technology

Assessment: 50% coursework and 50% examination

COMP7408. Distributed ledger and blockchain technology (6 credits)

In this course, students will learn the key technical elements behind the blockchain (or in general, the distributed ledger) technology and some advanced features, such as smart contracts, of the technology. Variations, such as permissioned versus permissionless and private blockchains, and the available blockchain platforms will be discussed.

Students will also learn the following issues: the security, efficiency, and the scalability of the technology. Cyber-currency (e.g. Bitcoin) and other typical application examples in areas such as finance will also be introduced.

Prerequisites: COMP7906 Introduction to cyber security or ICOM6045 Fundamentals of e-commerce security and experience in programming is required.

Mutually exclusive with FITE7409 Blockchain and cryptocurrency

Assessment: 50 % coursework and 50% examination

MFIN7002. Investment analysis and portfolio management (6 credits)

This course aims to provide candidates with understanding of (i) fundamental knowledge for asset valuation, (ii) portfolio management techniques for risk management and speculation, (iii) investment strategies adopted in financial market, and (iv) the recent development of portfolio management tools and investment strategies. On the theoretical side, this course introduces fundamental knowledge for asset pricing, investment strategies, and portfolio management. On the practical side, this course covers recent topics that are related to the investment strategies and portfolio management in both Hong Kong and United States. Some projects about portfolio management and asset valuation are specially designed to let candidates apply the theoretical knowledge into practice. This course is highly recommended for candidates who intend to pursue a career or

further studies in investment strategies and portfolio management. Of course, the knowledge will also be very useful when candidates make their own personal investment decision.

Assessment: 50% coursework and 50% examination

LLAW6093. Regulation of financial markets (9 credits)*

Designed for students considering or planning to work in the financial sector, this is an overview perspective course, for LLM (and JD) students, and also offered to MSc(FTDA) and MFFinTech students without financial background. Specifically, the course will examine, from legal and policy perspectives, the fundamentals respecting regulation of the primary financial intermediaries and markets: i.e., money and banking, investment banking, and asset management and insurance. Emphasis will be on the on-going phenomenon of globalisation and interdependence/interconnection of financial markets and intermediaries, and the need for economies to develop viable and robust financial markets, with a particular focus on the current global financial crisis. Use of international, comparative (especially PRC, US and EU) and interdisciplinary materials will be made.

Assessment: 80% take home examination, 20% group research project and in-class group presentation

---

List-B Disciplinary courses

COMP7802. Introduction to financial computing (6 credits)

This course introduces the students to different aspects of financial computing in the investment banking area. The topics include yield curve construction in practice, financial modelling and modern risk management practice, etc. Financial engineering is an area of growing demand. The course is a combination of financial product knowledge, financial mathematics and computational techniques. This course will be suitable for students who want to pursue a career in this fast growing area.

Prerequisites: This course does not require any prior knowledge in the area of finance. Basic calculus and numeric computational techniques are useful. Knowledge in Excel spreadsheet operations is required to complete the assignments and final project.

Assessment: 50% coursework and 50% examination

COMP7906. Introduction to cyber security (6 credits)

The aim of the course is to introduce different methods of protecting information and data in the cyber world, including the privacy issue. Topics include introduction to security; cyber-attacks and threats; cryptographic algorithms and applications; network security and infrastructure.

Mutually exclusive with: ICOM6045 Fundamentals of e-commerce security

Assessment: 50% coursework and 50% examination

ECOM6016. Electronic payment systems (6 credits)

The course covers banking systems, e-payment security, foreign exchange, Internet banking, wireless payments, stored-value cards, micropayments, peer-to-peer payments, electronic and virtual currencies such as Bitcoin, large-scale B2B payments and the future of money. Particular attention is given to Hong Kong and Mainland China banking and payment systems.

Assessment: 40% coursework and 60% examination

FITE7407. Securities transaction banking (6 credits)

The course introduces the business and technology scenarios in the field of Transaction Banking for financial markets. It balances the economic and financial considerations for products and markets with the organisational and technological requirements to successfully implement a banking function in this scenario. It is a crossover between studies of economics, finance and information technology, and features the concepts from basics of the underlying financial products to the latest technology of tokenization of assets on a Blockchain.

Assessment: 40% coursework and 60% examination

FITE7410. Financial fraud analytics (6 credits)

This course aims at introducing various analytics techniques to fight against financial fraud. These analytics techniques include descriptive analytics, predictive analytics, and social network learning. Various data sets will also be introduced, including labelled or unlabelled data sets, and social network data set. Students learn the fraud patterns through applying the analytics techniques in financial frauds, such as, insurance fraud, credit card fraud, etc.

Key topics include: Handling of raw data sets for fraud detection; Applications of descriptive analytics, predictive analytics and social network analytics to construct fraud detection models; Financial Fraud Analytics challenges and issues when applied in business context.

Required to have basic knowledge about statistics concepts.

Assessment: 50% coursework and 50% examination

STAT6013. Financial data analysis (6 credits)

This course aims at introducing statistical methodologies in analysing financial data. Financial applications and statistical methodologies are intertwined in all lectures. Contents include: recent advances in modern portfolio theory, copula, market microstructure, stochastic volatility models and high frequency data analysis.

Assessment: 40% coursework and 60% examination

List-C discipline courses

COMP7103. Data mining (6 credits)

Data mining is the automatic discovery of statistically interesting and potentially useful patterns from large amounts of data. The goal of the course is to study the main methods used today for data mining and on-line analytical processing. Topics include data mining architecture; data preprocessing; mining association rules; classification; clustering; on-line analytical processing (OLAP); data mining systems and languages; advanced data mining (web, spatial, and temporal data).

Assessment: 50% coursework and 50% examination

COMP7305. Cluster and cloud computing (6 credits)

This course offers an overview of current cloud technologies, and discusses various issues in the design and implementation of cloud systems. Topics include cloud delivery models (SaaS, PaaS, and IaaS) with motivating examples from Google, Amazon, and Microsoft; virtualisation techniques implemented in Xen, KVM, VMWare, and Docker; distributed file systems, such as Hadoop file system; MapReduce and Spark programming models for large-scale data analysis, networking techniques in cluster and hyper-scale data centres. The students will learn the use of Amazon EC2 to deploy applications on cloud, and implement a SPARK application on a Xen-enabled PC cluster as part of their term project.

Prerequisites: The students are expected to install various open-source cloud software in their Linux cluster, and exercise the system configuration and administration. Basic understanding of Linux operating system and some programming experiences (C/C++, Java, or Python) in a Linux environment are required.

Assessment: 50% coursework and 50% examination

COMP7404. Computational intelligence and machine learning (6 credits)

This course will teach a broad set of principles and tools that will provide the mathematical, algorithmic and philosophical framework for tackling problems using artificial intelligence (AI) and machine learning (ML). AI and ML are highly interdisciplinary fields with impact in different applications, such as, biology, robotics, language, economics, and computer science. AI is the science and engineering of making intelligent machines, especially intelligent computer programs, while ML refers to the changes in systems that perform tasks associated with AI. Ethical issues in advanced AI and how to prevent learning algorithms from acquiring morally undesirable biases will be covered.

Topics may include a subset of the following: problem solving by search, heuristic (informed) search, constraint satisfaction, games, knowledge-based agents, supervised learning (e.g., regression and support vector machine), unsupervised learning (e.g., clustering), dimension reduction learning theory, reinforcement learning, transfer learning, and adaptive control and ethical challenges of AI and ML.

Pre-requisites: Nil, but knowledge of data structures and algorithms, probability, linear algebra, and programming would be an advantage.

Assessment: 50% coursework and 50% examination

COMP7409. Machine learning in trading and finance (6 credits)

The course introduces our students to the field of Machine Learning, and help them develop skills of applying Machine Learning, or more precisely, applying supervised learning, unsupervised learning and reinforcement learning to solve problems in Trading and Finance.

This course will cover the following topics. (1) Overview of Machine Learning and Artificial Intelligence, (2) Supervised Learning, Unsupervised Learning and Reinforcement Learning, (3) Major algorithms for Supervised Learning and Unsupervised Learning with applications to Trading and Finance, (4) Basic algorithms for Reinforcement Learning with applications to optimal trading, asset management, and portfolio optimization, (5) Advanced methods of Reinforcement Learning with applications to high-frequency trading, cryptocurrency trading and peer-to-peer lending.

Assessment: 65% coursework and 35% examination

COMP7412. Banking in Web 3.0 – Metaverse, DeFi, NFTs and beyond (6 credits)

The course introduces students to new concepts of Banking with Web3.0 Technologies. Firstly, it will review the evolution from traditional banking towards decentralized finance and token economies. It will then assess the opportunities for new customer experiences with virtual reality and in the Metaverse as well as examine the opportunities and risks of NFTs (non-fungible tokens). The course will thoroughly examine the different types of Digital Assets, Digital Currencies and special forms like Central Bank Digital Currencies (e-CNY, e-HKD). A critical factor in the evolution towards Web3-Finance are the required regulations, a proper risk management and compliance of products and processes. The course will elaborate on these with the help of case studies and contemporary scenarios at the time of the lecture.

Assessment: 50% coursework and 50% examination

DASC7606. Deep learning (6 credits)

Machine learning is a fast growing field in computer science and deep learning is the cutting edge technology that enables machines to learn from large-scale and complex datasets. Ethical implications of deep learning and its applications will be covered first and the course will focus on how deep neural networks are applied to solve a wide range of problems in areas such as natural language processing, and image processing. Other applications such as financial predictions, game playing and robotics may also be covered. Topics covered include linear and logistic regression, artificial neural networks and how to train them, recurrent neural networks, convolutional neural networks, generative models, deep reinforcement learning, and unsupervised feature learning.

Prerequisites: Basic programming skills, e.g., Python is required.

Assessment: 40% coursework and 60% examination

ECOM6023. E-financial services (6 credits)

This course provides students with the fundamentals of financial services in the context of e-Commerce and mobile devices. Payment systems in general and various payment transaction systems in particular will be examined. Similarly, eFinance has brought new concepts into e-Brokerage, e-Insurance, e-Lending and other fields. The course covers technology, operations, customer experience as well as demonstrates how regulations and security aspects are impacted by developments like Bitcoin and Blockchain. Studies of established banks as well as new FinTech Players serve as examples and reinforcements for many of the concepts.

Assessment: 40% coursework and 60% examination

ECOM7126. Machine learning for business and e-commerce (6 credits)

This course provides the necessary fundamental concepts, theory and tools in Machine Learning (ML) to enable students to understand how Artificial Intelligence (AI) and ML can be applied in typical business applications in general, and for E-Commerce in particular. As AI is a broad field of study, the course will focus on ML including an introduction to the fundamentals of ML, supervised and unsupervised learning, ML workflow, dataset preparation, handling and analysis, selection and training of ML models: regression, classification and clustering models; Support Victor Machines (SVM), decision trees, ensemble learning and random forests; introduction to Artificial Neural Networks (ANN) and other neural network models. The course will use ML projects and applications to demonstrate how ML can be used to solve real business problems.

Assessment: 100% coursework

FITE7405. Techniques in computational finance (6 credits)

This course introduces the major computation problems in the field of financial derivatives and various computational methods/techniques for solving these problems. The lectures start with a short introduction on various financial derivative products, and then move to the derivation of the mathematical models employed in the valuation of these products, and finally come to the solving techniques for the models.

Pre-requisites: No prior finance knowledge is required. Students are assumed to have basic competence in calculus and probability (up to the level of knowing the concepts of random variables, normal distributions, etc.). Knowledge in at least one programming language is required for the assignments/final project.

Assessment: 40% coursework and 60% examination

FITE7406. Software development for quantitative finance (6 credits)

This course introduces the tools and technologies widely used in industry for building applications for Quantitative Finance. From analysis and design to development and implementation, this course covers: modelling financial data and designing financial application using UML, a de facto industry standard for object oriented design and development; applying design patterns in financial application; basic skills on translating financial mathematics into spreadsheets using Microsoft Excel and VBA; developing Excel C++ add-ins for financial computation.

Pre-requisites: This course assumes basic understanding of financial concepts covered in COMP7802. Experience in C++/C programming is required.

Assessment: 50% coursework and 50% examination

FITE7411. RegTech in finance (6 credits)

The course studies the use of regulatory technology, or RegTech, in the context of regulatory monitoring, reporting and compliance. It demonstrates that the true potential of RegTech lies in its ability to effect a profound transition from a Know Your Customer (KYC) to a Know Your Data (KYD) approach, which relies on efficient processes for the collection, formatting and analysis of reported data. The course covers the RegTech landscape and global challenges, the use of innovative technologies and disruption, RegTech investment, application for authorized institutions and industry adoption, illustrated with initiatives and examples in the Hong Kong context. It also discusses social impact and regulation, and the future development of RegTech.

Assessment: 60% coursework and 40 % examination

FITE7801. Topics in financial technology (6 credits)

Selected topics in financial technology that are of current interest will be discussed.

Assessment: 50% coursework and 50% examination

IMSE7310. Financial engineering (6 credits)

Basics of financial markets; cash flow analysis; capital asset pricing model (CAPM); portfolio optimisation; arbitrage and fundamental theorem of asset pricing; types of derivatives including forward, futures and options

for various underlying assets; returns, value-at-risk (VaR), utility functions; pricing and hedging of derivative securities; numerical studies.

Assessment: 30% coursework and 70% examination

LLAW6046. Privacy and data protection (9 credits) *

This course will explore privacy and data protection in an increasingly interconnected data economy. The Personal Data (Privacy) Ordinance and the data protection principles in particular will be studied in depth, making reference to relevant court judgments and Administrative Appeal Board cases. Privacy protection under other ordinances and common law principles (such as breach of confidence, misuse of private information, nuisance, trespass, copyright infringement and defamation) will also be covered. Emphasis will be made to the balance between privacy on the one hand and other rights as well as public and social interests on the other. The challenges posed by technological innovations and applications such as the internet, social media, mobile applications, cloud computing and Big Data will be highlighted. Specific topics to be addressed will include: (a) the concept of privacy and the genesis and development of its political, philosophical and economic underpinnings; (b) global development and international cooperation;(c) privacy and media intrusion; (d) regulation of direct marketing; (e) Privacy Commissioner for Personal Data: powers, functions and enforcement. The course will focus on the Hong Kong situation but reference will be made to relevant international human rights instruments and the global and regional trends and developments.

Assessment: 40% research assignment, 60% take home examination

---

LLAW6126. e-Finance: law, compliance and technology challenges (9 credits) *

The overall aim of this is to help students understand how regulatory compliance and enforcement processes are being transformed by increased global competition and accelerating technological innovation in financial markets.

Topics covered will include how the role of information technology in the delivery of modern financial services has evolved over time as well as how recent developments in information technology are transforming compliance processes inside firms and enforcement efforts of regulators.

The impact of digital transformation of compliance in financial services on law firms, legal departments in companies, government attorneys, compliance managers, internal and external auditors, and system administrators will be considered.

A case study examining the impact of global competition and technology innovation on data protection/information privacy compliance efforts under Hong Kong, European Union and US law will be used to integrate theoretical and practical perspectives on the delivery of e-finance services.

Assessment: 10% class participation, 40% coursework, 50% take home examination

---

LLAW6256. Law of anti-money laundering and counter-terrorist financing and compliance issues (9 credits) *

Money laundering and terrorist financing are examples of financial crimes that can, among other things, undermine the integrity and stability of financial institutions and the economic system at large, deter foreign investment, and distort international capital flows. Money launderers and terrorist financiers are now deploying increasingly sophisticated methods and schemes to disguise and achieve their illicit purposes, and are particularly attracted to exploit those jurisdictions with weak or ineffective anti-money laundering ("AML") and counter-terrorist financing ("CTF") controls. Thus, developing a solid and comprehensive understanding of the concepts of money laundering and terrorist financing as well as keeping abreast of the respective

regulatory frameworks are crucial to appreciating and managing such risks and challenges in the context of a financial services business.

This course is designed to not only provide students with an overview of the legal and regulatory aspects of AML and CTF, but also to equip students with practical skills and best practices to detecting and managing these types of financial crime risks in a financial institution setting. To achieve these objectives, this course is made up of three main modules. The first module explores the concepts and typologies of money laundering and terrorist financing. These concepts will be contextualised against the international efforts that been deployed to combat these illicit activities. The Hong Kong AML and CTF framework, and the roles of the respective enforcement agencies, will also be discussed. The second module examines the key components of a sound AML and CTF compliance programme in a financial institution. The way how this programme should be embedded within the broader internal control, risk management, and governance framework will also be considered. The third module focuses on some thematic issues of an AML and CTF compliance programme, including customer due diligence, escalation and exit strategies, suspicious activities, suspicious transaction reporting, and dealing with customers and regulators.

In this course, students will be learning through different activities. Besides the lecture component, students will be provided with an opportunity to deliver presentations and participate in in-class discussion on different case studies and court cases. Where appropriate, practitioners in the relevant field will be invited to share with students their experience and insights on how different AML and CTF issues come into play and handled in practice.

Assessment: 80% take home examination, 20% group presentation

---

MFIN7034. Machine learning and artificial intelligence in finance (6 credits)

Machine learning and artificial intelligence are the apex technologies of the information era. These methods are getting increasingly popular in the financial market. This course provides students the fundamental models and methods of machine learning and apply them to solve real-world financial problems. The topics include regression, classification, clustering methods, model selection, topic modelling and policy search. The first part of the course focuses on supervised learning techniques for regression and classification. The second part of the course covers unsupervised learning techniques for clustering and matrix factorisation. The third part of the course covers reinforcement learning algorithm. The last part provides the fundamental concepts of artificial intelligence and its implications. The course provides introductions to the latest datasets in financial markets and practices applying learning algorithms to these datasets in a variety of topics. The primary mode of learning is based on assignments and projects.

Assessment: 60% coursework and 40% examination

MFIN7037. Quantitative trading (6 credits)

This course provides a foundation for advanced quantitative trading in financial markets. The course has two parts. First, the course reviews stylised facts and methods used for time-series predictability, cross-sectional asset pricing and strategy performance evaluation. The second part of the course uses these tools to study recent advances in investment strategies sourcing from academic and practitioner literature. For example, the course will discuss new theories on risk premia, intermediation-based asset pricing, and quantifiable soft information and alternative data. The primary method of learning will be a combination of problem sets and projects. Subject to availability, learning will be supplemented with exposure to industry speakers from the local financial industry.

Prerequisite: MFIN7002 Investment Analysis and Portfolio Management

Assessment: 100% coursework

STAT6015. Advanced quantitative risk management (6 credits)

This course covers statistical methods and models of risk management, especially of Value-at-Risk (VaR). Contents include: Value-at-risk (VaR) and Expected Shortfall (ES); univariate models (normal model, log-normal model and stochastic process model) for VaR and ES; models for portfolio VaR; time series models for VaR; extreme value approach to VaR; back-testing and stress testing.

Assessment: 50% coursework and 50% examination

STAT8020. Quantitative strategies and algorithmic trading (6 credits)

Quantitative trading is a systematic investment approach that consists of identification of trading opportunities via statistical data analysis and implementation via computer algorithms. This course introduces various methodologies that are commonly employed in quantitative trading.

The first half of the course focuses at strategies and methodologies derived from the data snapshotted at daily or minute frequency. Some specific topics are: (1) techniques for trading trending and mean-reverting instruments, (2) statistical arbitrage and pairs trading, (3) detection of "time-series" mean reversion or stationarity, (4) cross-sectional momentum and contrarian strategies, (5) back-testing methodologies and corresponding performance measures, and (6) Kelly formula, money and risk management. The second half of the course discusses statistical models of high frequency data and related trading strategies. Topics that planned to be covered are: (7) introduction of market microstructure, (8) stylised features and models of high frequency transaction prices, (9) limit order book models, (10) optimal execution and smart order routing algorithms, and (11) regulation and compliance issues in algorithmic trading.

Pre-requisites: Pass in STAT6013 Financial data analysis or equivalent

Assessment: 50% coursework and 50% examination

** Candidates who choose LLAW6046 / LLAW6126 / LLAW6256 offered by Faculty of Law are required to complete 3 more credits per each LLAW course, in addition to the minimum of 75 credits in total, for satisfying the curriculum requirement.*

Capstone Requirement

FITE7001. Project (12 credits)

This project-based course aims to provide students with capstone experience to work on a real-world problem and carry out a substantial fintech project which requires integration of the knowledge they have learnt in the curriculum. Students will work in small groups under the guidance of their supervisor(s). A substantial written report is required.

Assessment: 100% coursework