

# **REGULATIONS FOR THE DEGREE OF BACHELOR OF ARTS AND SCIENCES IN FINANCIAL TECHNOLOGY [BASc(FinTech)]**

These regulations apply to students admitted to the BASc(FinTech) degree in the academic year 2020-21 and thereafter.

*(See also General Regulations and Regulations for First Degree Curricula)*

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## **Admission to the Degree**

**FITE 1** To be eligible for admission to the BASc(FinTech) degree, a candidate shall

- (a) comply with the General Regulations;
  - (b) comply with the Regulations for First Degree Curricula; and
  - (c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.
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## **Period of Study**

**FITE 2** The curriculum for the BASc(FinTech) degree shall normally require eight semesters of full-time study, extending over not fewer than four academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of six academic years, unless otherwise permitted by the Board of the Faculty of Engineering.

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## **Curriculum Requirements and Progression in Curriculum**

**FITE 3**

- (a) Candidates shall satisfy the requirements prescribed in UG5 of the Regulations for First Degree Curricula;
- (b) Candidates shall take not fewer than 240 credits of courses, comprising 96 credits in Major in Financial Technology (including 54 credits of Discipline Core Courses, 30 credits of Discipline Elective Courses and 12 credits of Capstone experience), 6 credits in English language enhancement, 6 credits in Chinese language enhancement, 24 credits of Common Core Courses, 18 credits of BASc core courses and 90 credits of elective courses; candidates are also required to pass all courses as specified in the syllabuses;
- (c) Candidates shall normally select not fewer than 24 credits nor more than 30 credits of courses in any one semester (except the summer semester), unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements is fewer than 24 credits;
- (d) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. Candidates may, with the approval of the Board of the Faculty, exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load of 288 credits for the normative period of study as specified in FITE2, save as provided for under FITE3(e); and
- (e) Where candidates are required to make up for failed credits, the Board of the Faculty may give permissions for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load of 432 credits for the maximum period of registration specified in FITE2.

**FITE 4** Candidates with unsatisfactory academic progress may be required by the Board of the Faculty to take a reduced study load.

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### **Selection of Courses**

**FITE 5** Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each semester. 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. Requests for changes after the designated add/drop period of the semester shall be subject to the approval of the Board of the Faculty. Withdrawal from courses beyond the designated add/drop period will be subject to the approval of the Board of the Faculty.

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### **Assessment and Grades**

**FITE 6** Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any one or any combination of the following manners: written examinations or tests, continuous assessment, laboratory work, field work, project reports, or in any other manner as specified in the syllabuses. Only passed courses will earn credits. Grades shall be awarded in accordance with UG8 of the Regulations for First Degree Curricula.

**FITE 7** Written examinations or tests shall normally be held at the end of each semester unless otherwise specified in the syllabuses.

**FITE 8** Candidates are required to make up for failed courses in the following manner:

- (a) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or
- (b) re-submitting failed coursework, without having to repeat the same course of instruction; or
- (c) repeating the failed course by undergoing instruction and satisfying the assessments; or
- (d) for elective courses, taking another course in lieu and satisfying the assessment requirements.

**FITE 9** Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.

**FITE 10** There shall be no appeal against the results of examinations and all other forms of assessment.

**FITE 11** Unless otherwise permitted by the Board of the Faculty, a candidate will be recommended for discontinuation of his/her studies if

- (a) he/she fails to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters; or
  - (b) he/she fails to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester); or
  - (c) he/she has exceeded the maximum period of registration specified in FITE2.
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## Absence from Examination

**FITE 12** Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within seven calendar days of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.

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## Advanced Standing

**FITE 13** Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the University in accordance with UG2 of the Regulations for First Degree Curricula. 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 minimum of four semesters of study at this University shall be required before a candidate is considered for the award of the degree; and
- (b) at least half of the credits requirements of the degree curriculum shall be accumulated through study at this University, or from transfer of credits for courses completed at other institutions in accordance with UG4(d) of the Regulations for First Degree Curricula.

Credits granted for advanced standing shall not normally be included in the calculation of the GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

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## Degree Classification

**FITE 14** To be eligible for the award of the BSc(FinTech) degree, candidates shall have:

- (a) achieved a Graduation GPA of 1.00 or above;
- (b) satisfied all the requirements in UG5 of the Regulations for First Degree Curricula;
- (c) passed not fewer than 240 credits, comprising
  - i) 54 credits of discipline core courses;
  - ii) 30 credits of discipline elective courses;
  - iii) 12 credits of capstone experience;
  - iv) 12 credits of language enhancement courses<sup>1</sup>, including one course in Chinese language enhancement<sup>2</sup> and one in English in the Discipline;
  - v) 24 credits of Common Core courses (with one course from each Area of Inquiry);
  - vi) 18 credits of BSc core courses;
  - vii) 90 credits of elective courses; and
  - viii) non-credit bearing courses as required by the University.

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<sup>1</sup> Candidates who have achieved Level 5 or above in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, are exempted from taking CAES1000 Core University English. In exceptional circumstances, strong candidates who have achieved Level 4 may be considered for admission but they will be required to take CAES1000 as supplementary credits and complete 246 credits for graduation from the University.

<sup>2</sup> Students are required to successfully complete the 6-credit Faculty-specific Chinese language enhancement course, except for:

- (a) Putonghua-speaking students who should take CUND9002 (Practical Chinese and Hong Kong Society) or CUND9003 (Cantonese for Non-Cantonese Speaking Students); and
- (b) students who have not studied Chinese language during their secondary education or who have not attained the requisite level of competence in the Chinese language to take the Chinese language enhancement course should seek approval from the Board of the Faculty of Engineering for exemption from the Chinese language requirement, and
  - (i) take a 6-credit Cantonese or Putonghua language course offered by the School of Chinese especially for international and exchange students; OR
  - (ii) take an elective course in lieu.

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**FITE 15** The degree of BAsC(FinTech) shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the degree of BAsC(FinTech) in accordance with the following Graduation GPA (GGPA) scores, with all courses taken (including failed courses) carrying weightings which are proportionate to their credit values:

<i>Class of honours</i>	<i>GGPA range</i>
First Class	3.60 – 4.30
Second Class	(2.40 – 3.59)
Division One	3.00 – 3.59
Division Two	2.40 – 2.99
Third Class	1.70 – 2.39
Pass	1.00 – 1.69

**FITE 16** Honours classification may not be determined solely on the basis of a candidate’s Graduation GPA and the Board of Examiners for the BAsC(FinTech) degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Graduation GPA falls below the range stipulated in FITE15 of the higher classification by not more than 0.1 Grade Point.

**FITE 17** A list of candidates who have successfully completed all degree requirements shall be posted on Faculty notice boards.

## **Bachelor of Arts and Sciences in Financial Technology [BASc(FinTech)]**

### **SYLLABUS**

The syllabus applies to students admitted in the academic year 2022-23 and thereafter under the four-year curriculum.

### **Curriculum**

The Curriculum comprises 240 credits of courses as follows:

#### University Requirements

Students are required to complete:

- a) 12 credits in language enhancement courses, including 6 credits in an English in the Discipline course, “CAES9542 Technical English for Computer Science” and 6 credits in Chinese language enhancement course, “CENG9001 Practical Chinese for engineering students”;
- b) 24 credits of courses in the Common Core Curriculum, comprising at least one course from each Area of Inquiry; and
- c) non-credit bearing courses as required by the University.

#### BASc Core Courses

Students are required to complete 18 credits of BASc core courses.

#### Major in Financial Technology

Students are required to complete:

- a) Discipline Core Courses (54 credits)
- b) Discipline Elective Courses (30 credits)
- c) Capstone experience (12 credits)

#### Elective Courses

Students are required to complete 90 credits of elective courses offered by any department, except for Common Core Courses.

**The details of the distribution of the above course categories are as follows:**

#### **University Requirements (36 credits)**

<b>Course Code</b>	<b>Course</b>	<b>No. of credits</b>
CAES9542	Technical English for Computer Science	6
CENG9001	Practical Chinese for engineering students	6
CC##XXXX	University Common Core Course (4 courses)*	24
XXXXxxxx	Non-credit bearing courses as required by the University	0
<b>Total for University Requirements</b>		<b>36</b>

\* Students have to complete 24 credits of courses in the Common Core Curriculum, comprising at least one course from each Area of Inquiry.

#### **BASc Core Courses (18 credits)**

<b>Course Code</b>	<b>Course</b>	<b>No. of credits</b>
BASC9001	Foundations of human knowledge	6
DESN9002	Sustainable leadership	6

STAT1005	Essential skills for undergraduates: foundations of data science	6
<b>Total for BSc Core Courses</b>		<b>18</b>

### Discipline Core Courses (54 credits)

Course Code	Course	No. of credits
ENGG1330	Computer programming I	6
FITE1010	Introduction to financial technologies	6
FITE2000	Foundations of FinTech Programming	6
FITE2010	Distributed ledger and blockchain	6
MATH1853	Linear algebra, probability and statistics**	6
ACCT1101	Introduction to financial accounting	6
ECON1210	Introductory microeconomics	6
FINA1310	Corporate finance	6
LLAW3069	Regulation of financial markets	6
<b>Total for Discipline Core Courses</b>		<b>54</b>

\*\* For candidates without taking Extended Module 1 or 2 in the Hong Kong Diploma of Secondary Education examinations, or equivalent, they have to take “MATH1011 University mathematics I” (6 credits) in the first semester of their first year of studies.

### Discipline Elective Courses (30 credits)

6 credits of courses to be chosen from the following list:

Course Code	Course	No. of credits
LLAW3150	Introduction to information technology law	6
LLAW3244	Alternative Finance	6
LLAW3254	Law, Innovation, Technology and Entrepreneurship (LITE)	6
LLAW3255	Law, Innovation, Technology and Entrepreneurship (LITE) Internship	6

24 credits of courses to be chosen from the following list:

Course Code	Course	No. of credits
COMP3314 / ELEC4544	Machine learning / Artificial intelligence and deep learning	6
COMP3322	Modern technologies on World Wide Web	6
COMP3340	Applied deep learning	6
COMP3355	Cyber security	6
COMP3362	Hands-on AI: experimentation and applications	6
FINA2320	Investments and portfolio analysis	6
FINA2322	Derivatives	6
FINA3350	Mathematical finance	6
FINA3353	Regulatory, operational and valuation issues in finance institutions	6
FINA4350	Text analytics and natural language processing in finance and fintech	6
FITE3010	Big data and data mining	6
FITE3012	E-payment and crypto-currency	6
ENGL1015	Introduction to English linguistics	6
ENGL2050	English corpus linguistics	6
<b>Complete at least five Discipline Elective courses for a total of 30 credits</b>		<b>30</b>

### Capstone Experience (12 credits)

Course Code	Course	No. of credits
FITE4801	Project	12
<b>Total for Capstone Experience</b>		<b>12</b>

### Electives (90 credits)

Any courses except Common Core Courses.

### Summary of curriculum structure of BAsC(FinTech)

Course Categories	No. of credits
University Requirements	36
BAsC Core Courses	18
Major in Financial Technology	96
Discipline Core Courses (54 credits)	
Discipline Elective Courses (30 credits)	
Capstone Experience (12 credits)	
Electives	90
<b>Total</b>	<b>240</b>

A sample study plan is given as follows:

#### FIRST YEAR

##### University Requirements (12 credits)

CC##XXXX Two Common Core Courses 12

##### BAsC Core Courses (12 credits)

BASC9001 Foundations of human knowledge 6

STAT1005 Essential skills for undergraduates: foundations of data science 6

##### Discipline Core Courses (30 credits)

ENGG1330 Computer programming I 6

FITE1010 Introduction to financial technologies 6

FITE2000 Foundations of FinTech Programming 6

ACCT1101 Introduction to financial accounting 6

ECON1210 Introductory microeconomics 6

**Elective Courses (6 credits) 6**

#### SECOND YEAR

##### University Requirements (12 credits)

CC##XXXX Two Common Core Courses 12

##### BAsC Core Courses (6 credits)

DESN9002 Sustainable leadership 6

##### Discipline Core Courses (18 credits)

FITE2010 Distributed ledger and blockchain 6

MATH1853	Linear algebra, probability and statistics	6
FINA1310	Corporate finance	6
<b>Discipline Elective Courses (6 credits)</b>		<b>6</b>
<b>Elective Courses (18 credits)</b>		<b>18</b>

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### THIRD YEAR

<b>University Requirements (6 credits)</b>		
CENG9001	Practical Chinese for engineering students	6
<b>Discipline Core Courses (6 credits)</b>		
LLAW3069	Regulation of financial markets	6
<b>Discipline Elective Courses (18 credits)</b>		<b>18</b>
<b>Elective Courses (30 credits)</b>		<b>30</b>

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### FOURTH YEAR

<b>University Requirements (6 credits)</b>		
CAES9542	Technical English for Computer Science	6
<b>Capstone Experience (12 credits)</b>		
FITE4801	Project	12
<b>Discipline Elective Courses (6 credits)</b>		<b>6</b>
<b>Elective Courses (36 credits)</b>		<b>36</b>

#### **Non-credit bearing courses as required by the University**

Students will have the flexibility to take the courses in any semester throughout the period of studies.

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### **COURSE DESCRIPTIONS**

Candidates will be required to do the coursework in the respective courses selected. Not all courses are offered every semester.

#### **University Requirements on Language Enhancement Courses**

##### **CAES9542. Technical English for Computer Science (6 credits)**

Running alongside Computer Science, Financial Technology, Data Science related final-year / capstone project courses, this one-semester, 6-credit course will build and consolidate students' ability to compose technical reports, and make technical oral presentations. The focus of this course is on helping students to report on the progress of their Final Year Project in an effective, professional manner in both written and oral communication. Topics include accessing, abstracting, analyzing, organizing and summarizing information; making effective grammatical and lexical choices; technical report writing; and technical presentations. Assessment is wholly by coursework.



Co-requisite: COMP4501 or COMP4502 or COMP4801 or FITE4801  
Assessment: 100% continuous assessment

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### **CENG9001. Practical Chinese for engineering students (6 credits)**

The course is designed to enable students to gain a mastery of the varieties of the Chinese language as used in the field of Engineering. It introduces students to various techniques for the effective use of practical Chinese. The course will familiarize students with traditional Chinese characters, simplified Chinese characters, modern Chinese grammar and rhetoric through outcomes-based assignments. Special training that is intended to sharpen students' presentation skills in Cantonese and Putonghua will also be provided.

Assessment: 50% continuous assessment, 50% examination.

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### **University Common Core Curriculum**

Successful completion of 24 credits of courses in the Common Core Curriculum, comprising one course from each Area of Inquiry with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits:

- Science, Technology and Big Data
  - Arts and Humanities
  - Global Issues
  - China: Culture, State and Society
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### **BASc Core Courses**

#### **DESN9002. Sustainable leadership (6 credits)**

"Leadership" often conjures up images of hierarchy, the top down power that creates unnecessary tension between the haves and the have nots. Such leadership can exacerbate social inequalities, alienation and environmental destruction. In a society that is increasingly connected, and evolving ever rapidly, this form of centralised concentrated leadership cannot answer to change fast enough.

So, what kind of leadership do we need to guarantee humans are best able to care for and support each other and the environment? What are the other models of leadership we need? Where will this change come from? How will we adapt and evolve the current conception of leadership towards a more sustainable world? What is the difference between "leadership", "Thought Leadership" and "Sustainable Leadership"?

It is clear that our generation has the duty to reinvent leadership and implement it in society overall. The University of Hong Kong Bachelor of Arts and Science (BASc) are uniquely positioned to address such questions galvanising strong domain knowledge in science, technology, finance, design and social sciences.

Hong Kong and the world needs a new generation of leaders that understand empathy, interdependency, that is creative, resilient, visionary, and highly cooperative. Such qualities are better learned by experience than merely by theory. Not only is it about acquiring knowledge, but it is really about creating the knowledge about the new form of leadership we need.

Assessment: 100% coursework

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**BASC9001. Foundations of human knowledge (6 credits)**

How does knowledge emerge from different disciplines? What is the nature and limit of knowledge generated by different methods? This foundations course will open up an interdisciplinary discourse about knowledge building and integration in arts and humanities, social sciences, and sciences. It will consist of three parts:

1. A philosophical and historical perspective of human knowledge.

In this part students will engage in debates about the nature of knowledge, ways of knowing, and integrating knowledge. Students will also study how certain forms of knowledge formation have become dominant in our society, and learn how humans have come to know what we know today about ourselves and our planet.

2. From knowledge to judgement.

Knowledge is not just about information and facts. Knowledge calls for wisdom to interpret data and to make decisions about how to act upon them; it also requires critical reflections about the human condition and our roles and responsibilities as individuals and as a collective. In this part of the course, we will examine moral principles and ethical dilemmas during the process of building and responding to knowledge.

3. Knowledge sharing.

We will look at traditional and creative methods of knowledge dissemination, and explore opportunities and challenges in knowledge transfer in the information society. This course will help students build a solid foundation on knowledge creation, sharpen their critical thinking skills when they confront new information and ideas, and prepare them to become effective analysts and communicators of knowledge.

Assessment: 100% coursework

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**STAT1005. Essential skills for undergraduates: foundations of data science (6 credits)**

The course introduces basic concepts and methodology of data science to junior undergraduate students. The teaching is designed at a level appropriate for all undergraduate students with various backgrounds and without pre-requisites.

Students will engage in a full data work-flow including collaborative data science projects. They will study a full spectrum of data science topics, from initial investigation and data acquisition to the communication of final results.

Specifically, the course provides exposure to different data types and sources, and the process of data curation for the purpose of transforming them to a format suitable for analysis. It introduces elementary notions in estimation, prediction and inference. Case studies involving less-manicured data are discussed to enhance the computational and analytical abilities of the students.

Assessment: 100% coursework

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## **Discipline Core Courses**

### **ACCT1101. Introduction to financial accounting (6 credits)**

The course will cover the principles of double entry book-keeping, the interpretation of financial statements, the issues raised by corporate regulation, and the use of management information for decision making.

Assessment: 50% continuous assessment, 50% examination

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### **ECON1210. Introductory microeconomics (6 credits)**

An introduction to the basic concepts and principles of microeconomics – the study of demand and supply, consumer theory, cost and production, market structure, incentives, and resource allocation efficiency, political economy, and ethics and public policy.

Assessment: 50% continuous assessment, 50% examination

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### **ENGG1330. Computer programming I (6 credits)**

This is an introductory course designed for first-year engineering students to learn about computer programming. Students will acquire basic Python programming skills, including syntax, identifiers, control statements, functions, recursions, strings, lists, dictionaries, tuples and files. Searching and sorting algorithms, such as sequential search, binary search, bubble sort, insertion sort and selection sort, will also be covered.

Mutually exclusive with: COMP1117 or ENGG1111

Assessment: 70% continuous assessment, 30% examination

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### **FINA1310. Corporate finance (6 credits)**

This is an introductory finance course that develops the basic concepts and tools applicable to corporate financial decisions. Two main tasks of financial managers are studied: project evaluation and financing decisions. Specific topics include present value calculation, valuation of stocks and bonds, investment criteria and capital budgeting, risk and return, cost of capital, and capital structure. Corporate ethics is also incorporated in the discussion.

Prerequisite: ACCT1101

Mutually exclusive with: STAT3904

Assessment: 45% continuous assessment, 55% examination

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### **FITE1010. Introduction to financial technologies (6 credits)**

An introduction to the basic concepts of financial technologies, such as e-payment system, cryptocurrency, blockchain, data mining, and artificial intelligence.

Assessment: 40% continuous assessment, 60% examination

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**FITE2000. Foundations of FinTech Programming (6 credits)**

This course introduces concepts and applications of basic data structures. Commonly used data structures, which include stacks and queues, trees, lists, arrays and graphs, will be discussed. Basic algorithms, both recursive and non-recursive, to manipulate these data structures will also be discussed. Basic object-oriented programming principles, which are abstraction, encapsulation, inheritance and polymorphism, will be introduced. The practical work of the course will use an object-oriented programming language and corresponding data structure library. Students will be required to apply the data structures to solve practical and/or FinTech problems.

Prerequisite: COMP1117 or ENGG1330

Mutually exclusive with: COMP2396 and ELEC2543

Assessment: 50% continuous assessment, 50% examination

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**FITE2010. Distributed ledger and blockchain (6 credits)**

This course introduces basic theories of blockchain and distributed ledger, which includes basic cryptography, public key cryptosystem, distributed computing and consensus protocols. Financial applications of blockchain and distributed ledger will be discussed.

Prerequisites: FITE1010 or MATH1853 or MATH2101; and COMP2119 or ELEC2543 or FITE2000

Assessment: 40% continuous assessment, 60% examination

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**LLAW3069. Regulation of financial markets (6 credits)**

This course addresses the nature and operation of financial markets and the role of regulation. Coverage, based on comparative analysis and international standards, will include major financial sectors (banking, securities, insurance), supporting legal and institutional structures, and current issues and trends. Core themes are: the nexus between finance, technology and regulation (FinTech and RegTech), competition between globalisation and fragmentation, and the role of finance in crises and sustainable development.

Assessment: 10% class participation, 90% take home examination

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**MATH1853. Linear algebra, probability and statistics (6 credits)**

As the complementary course of MATH1851, students will be introduced to more topics of mathematics commonly applied in engineering so that students could be further enhanced with a concrete skill in mathematics underpinned for different engineering subjects. The course emphasizes mathematical concepts, principles, analysis, and their relationship to the modelling of engineering systems. Students could be furnished with the essential mathematical skills to analytically tackle some typical engineering problems to prepare for all the engineering subjects.

Prerequisite: Level 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1011, or take MATH1011 and MATH1853 concurrently in the same semester. (This course is exclusively for Engineering students.)

Assessment: 20% continuous assessment, 80% examination

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## **Discipline Elective Courses**

### **COMP3314. Machine learning (6 credits)**

This course introduces algorithms, tools, practices, and applications of machine learning. Topics include core methods such as supervised learning (classification and regression), unsupervised learning (clustering, principal component analysis), Bayesian estimation, neural networks; common practices in data pre-processing, hyper-parameter tuning, and model evaluation; tools/libraries/APIs such as scikit-learn, Theano/Keras, and multi/many-core CPU/GPU programming.

Prerequisites: MATH1853 or MATH2014; and COMP2119 or ELEC2543 or FITE2000

Assessment: 50% continuous assessment, 50% examination

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### **COMP3322. Modern technologies on World Wide Web (6 credits)**

Selected network protocols relevant to the World Wide Web (e.g., HTTP, DNS, IP); World Wide Web; technologies for programming the Web (e.g., HTML, style sheets, PHP, JavaScript, Node.js.; other topics of current interest (AJAX, HTML5, web services, cloud computing).

Prerequisite: COMP1117 or ENGG1330

Mutually exclusive with: IIMT3663

Assessment: 60% continuous assessment, 40% examination

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### **COMP3340. Applied deep learning (6 credits)**

An introduction to algorithms and applications of deep learning. The course helps students get hands-on experience of building deep learning models to solve practical tasks including image recognition, image generation, reinforcement learning, and language translation. Topics include: machine learning theory; optimization in deep learning; convolutional neural networks; recurrent neural networks; generative adversarial networks; reinforcement learning; self-driving vehicle.

Prerequisites: COMP2119 or ELEC2543 or FITE2000; and MATH1853 or MATH2014

Mutually exclusive with: ELEC4544

Assessment: 50% continuous assessment, 50% examination

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### **COMP3355. Cyber security (6 credits)**

This course introduces the principles, mechanisms and implementation of cyber security and data protection. Knowledge about the attack and defense are included. Topics include notion and terms of cyber security; network and Internet security, introduction to encryption: classic and modern encryption technologies; authentication methods; access control methods; cyber attacks and defenses (e.g. malware, DDoS).

Prerequisite: COMP2119 or ELEC2543 or FITE2000

Mutually exclusive with: ELEC4641

Assessment: 50% continuous assessment, 50% examination

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### **COMP3362. Hands-on AI: experimentation and applications (6 credits)**

This course comprises two main components: students first acquire the basic know-how of the state-of-

the-art AI technologies, platforms and tools (e.g., TensorFlow, PyTorch, scikit-learn) via example-based modules in a self-paced learning mode. Students will then identify a creative or practical data-driven application and implement an AI-powered solution for the application as the course project. Students will be able to experience a complete AI experimentation and evaluation cycle throughout the project.

Prerequisite: COMP3314

Mutually exclusive with: COMP3359

Assessment: 100% continuous assessment

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### **ELEC4544. Artificial intelligence and deep learning (6 credits)**

This course aims at providing students with a basic understanding on deep learning technology. The topics to be covered are neural network, backpropagation, deep auto-encoder, Restricted Boltzmann Machines (RBM), Convolutional Neural Network (CNN), Multi-Layer Perceptron (MLP), strategies for training deep architectures, handling overfitting, cross-validation, meta-heuristic searching for parameter tuning. This is followed by hands-on implementation of deep learning algorithms using Python, with applications ranging from image classification, speech processing, and financial data analysis.

After finish the course, students will be able to

1. Master the basic concept of deep learning in artificial intelligence.
2. Master the Python programming language for implementing deep learning model.
3. Apply deep learning in novel applications.

Prerequisite: ELEC3241 Signals and linear systems

Assessment: 55% continuous assessment, 45% examination

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### **FINA2320. Investments and portfolio analysis (6 credits)**

This course introduces students to the fundamental principles of investments and to major issues currently of concern to all investors. The concepts and skills developed from this course enable students to conduct a sophisticated assessment of current issues and debates covered by both the popular media as well as more-specialized finance journals. We emphasize equity investments and the main topics include: portfolio theory, equilibrium in capital markets, equity valuation, portfolio performance evaluation, and relevant institutional details.

Prerequisites: ECON1210 and FINA1310

Co-requisite: ECON1280 or STAT1600 or STAT1601 or STAT1602 or STAT1603 or STAT2601 or STAT2901 or MATH1853

Mutually exclusive with: STAT3609 and STAT3952

Assessment: 50% continuous assessment, 50% examination

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### **FINA2322. Derivatives (6 credits)**

The major objective of this course is to promote an in-depth understanding of basic derivatives. Derivatives have become a popular hedging and investment tool over the last several decades and derivatives concepts are required for every advanced finance topic. This course provides students with a framework to understand the fundamental concepts of derivative products (forward and futures, options, swaps, and basic structured products), to develop the necessary skills used in valuing derivative

contracts, and to understand a wide variety of issues related to risk management and investment decisions using derivatives.

Prerequisites: ECON1210 and FINA1310

Mutually exclusive with: IMSE4110 and STAT3618 and STAT3905 and STAT3910

Remarks: NOT OPEN to students taking or having taken MATH3906

Assessment: 45% continuous assessment, 55% examination

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### **FINA3350. Mathematical finance (6 credits)**

This course provides students with the necessary mathematical techniques used in continuous-time finance. It covers stochastic calculus, partial differential equation and applied probability. After taking this course, one should be able to fully understand no-arbitrage theory, the Black-Scholes equation, risk-neutral probability and martingales. The purpose of this course is to lay down a solid mathematical foundation for students to learn more advanced topics in financial engineering, such as exotic options, interest rate derivatives and credit risk models.

Prerequisite: FINA2322

Mutually exclusive with: MATH3906

Assessment: 40% continuous assessment, 60% examination

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### **FINA3353. Regulatory, operational and valuation issues in finance institutions (6 credits)**

This course examines with students' practical issues involving financial institutions, with a focus on banks. These include how banks shapes and, in the meantime, are bounded by regulations the regulatory environment. In turn, how the macro regulatory environment then transformed into operational practices in financial markets. The course will also go into how these issues are incorporated into models for analysis and valuation purposes. The course will be very practical, putting a blend of classroom concepts, theories and frameworks to work, preparing students for real life situations.

Prerequisite: FINA2320

Assessment: 50% continuous assessment, 50% examination

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### **FINA4350. Text analytics and natural language processing in finance and fintech (6 credits)**

This course covers the main elements of natural language processing (NLP), text analytics, and text mining, providing students with a foundation in collecting, managing, and analyzing textual data with financial and economic applications in mind, such as FinTech. Examples of potential applications include understanding and responding to sentiment in financial newspapers and social media, using social media to improve performance in asset/investment management, due diligence, Fed watching, monitoring of company events, and detecting insider trading. Although students write their own computer programs in this course, they are not required to implement most algorithms from scratch. Instead, the focus of this course is on how to use existing state-of-the-art open-source software libraries and how to apply them in a financial context. This course consists of three parts. In the first part, we work with real-world textual data sets to obtain proficiency in collecting, importing, organizing, and cleaning textual data from sources related to finance and economics. Among others, we cover web scraping, textual corpora, text processing, tokenization, stemming, and stop word removal. In the second part we delve into a more detailed analysis of NLP, text analytics, and machine learning with a particular focus on FinTech. For instance, we examine bag-of-words, word weighting schemes, document classification, document clustering, sentiment analysis, and topic models. The third part consists of

summarizing, displaying, and visualizing results obtained from NLP and text analytics for applications in finance and economics.

Assessment: 70% continuous assessment, 30% examination

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**FITE3010. Big data and data mining (6 credits)**

The goal of the course is to study the main methods used today for data mining and on-line analytical processing. Topics include Big Data Architecture, Data Mining Algorithms, Classification, and Clustering.

Prerequisites: FITE1010 or MATH1853 or MATH2101; and COMP2119 or ELEC2543 or FITE2000  
Mutually exclusively with: COMP3323

Assessment: 40% continuous assessment, 60% examination

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**FITE3012. E-payment and crypto-currency (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 crypto-currencies such as Bitcoin, large-scale B2B payments and the future of money.

Prerequisites: FITE1010 or MATH1853 or MATH2101; and COMP2119 or ELEC2543 or FITE2000

Assessment: 40% continuous assessment, 60% examination

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**LLAW3150. Introduction to information technology law (6 credits)**

This is a basic course in the LLM IP/IT stream introducing students to the information technology and the legal issues arising from the technology. The course will begin by examining the essential features of information technology and the characteristics of the Internet, followed by investigations into the legal issues created by the technology. Discussions will primarily be based on the laws of Hong Kong, with references made to the laws of other leading jurisdictions. Topics to be covered include, but are not not limited to, the following:

- Introduction to information technology and the Internet
- Intellectual property issues
- Illegal contents on the Internet (e.g. defamatory or obscene materials)
- Online trading
- Data privacy
- E-crimes
- Jurisdictional issues

Assessment: 100% research paper

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**LLAW3244. Alternative Finance (6 credits)**

Innovative technology creation and development, including financial technology (FinTech) and regulatory technology (RegTech), are increasingly being used by financial institutions and their regulators to enhance regulatory compliance in and supervision of a sophisticated and fast-changing financial sector.



The course will critically evaluate the claim that FinTech portmanteau of finance and technology, including blockchain, artificial intelligence, robo adviser solution, big data and automated suspicious transaction monitoring technology systems, has the ability to revolutionise financial inclusion. Furthermore, it examines whether and how RegTech can be used by regulators for tracking and monitoring financial institutions compliance activities. Specifically, RegTech aims to more effectively regulate new commercial transactions facilitated by FinTech, such as payments made through mobile devices and equity crowdfunding through the internet portals which are cornerstones of the course on alternative finance (i.e. internet financing).

The course sheds light on the legal/regulatory requirements and supervisory and policy measures towards FinTech alternative finance at both local and international levels. These requirements and measures will be further compared with standards set by international regulatory bodies such as the Global Partnership for Financial Inclusion, the G20, the OECD, the Financial Stability Board and the Bank for International Settlements. Combining supervisory approaches—for instance, the principle-based approach and the cost-benefit approach—with academic approaches, the course promotes and enables technical, theoretical, comparative, and interdisciplinary studies for students who are interested in or preparing to enter a FinTech-related career. The course is also practical and industry focused as it reflects on and closely follows industry reports such as KPMG’s annual banking and anti-money laundering reports, along with Deloitte’s RegTech and FinTech survey reports. Designed to enhance creativity, critical thinking and deep learning, the course will foster an intimate understanding of regulations and policies on FinTech, RegTech and SupTech. Topics and issues covered in this course are diverse and wide-ranging such as financial inclusion and digital financial inclusion, the digital banking model (implemented by virtual banks, which are also known as digital banks), FinTech and RegTech (with subordinated themes such as Sandbox, Open Banking, Application Programming Interface, and Wealth Management Technology), P2P Lending, Equity Crowdfunding, Payments and Payment Technology (including Central Bank Digital Currency and Stablecoins).

The course will begin by expounding the role of FinTech in both the shadow banking and traditional banking systems, followed by an exploration of the types of FinTech-enabled products and payment services such as crowdfunding and P2P lending, and ending with a forward-looking approach in tackling some critical and timely issues related to FinTech, including, but not limited to, financial democratisation, improving access to financial systems, the sharing economy and privacy protection for consumers.

The course is distinctively interdisciplinary and methodically strong, designed for students with different academic backgrounds. It is particularly relevant for those with department major(s) in Law (including BBA (Law) & LLB and BSocSc (Govt & Laws) & LLB), Financial Technology, Computer Science, Entrepreneurship, Design and Innovation, Marketing and Wealth Management, to name a few.

Assessment: 20% oral presentation, 80% research paper

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### **LLAW3254. Law, Innovation, Technology and Entrepreneurship (LITE) (6 credits)**

This course focuses on the legal environment impacting entrepreneurs, startups and new innovative businesses and ideas. It addresses the core aspects of setting up a new business, including legal structures, hiring staff, protecting intellectual property, raising finance, licensing considerations, data protection and usage, and cross-border operations. It is designed for upper year students in any discipline who are considering a new venture or already involved in a startup or innovative project.

Assessment: 80% short assignments, 20% class participation

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**LLAW3255. Law, Innovation, Technology and Entrepreneurship (LITE) Internship (6 credits)**

This is an experiential learning course in which students will be placed with startups and innovation labs in order to gain an understanding of the environment in which such firms operate. It will include a taught as well as an assessed component.

Assessment: 100% internship report

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**ENGL1015. Introduction to English linguistics (6 credits)**

This survey course offers a comprehensive first introduction to the linguistic study of English, covering the various levels of analysis (and the core branches of linguistics that study them): sounds (phonetics and phonology), words (morphology and lexicology), meanings (semantics and pragmatics), grammar (syntax), text and discourse (discourse analysis). It will also offer a first introduction to a number of key aspects of language use (and the linguistic disciplines dealing with them): language acquisition and processing (psycholinguistics), language change (historical linguistics), regional and social variation (sociolinguistics), [literary] style (stylistics). Finally, the course will introduce a number of methodological and theoretical approaches one can take in the academic study of a language, and consequently also in English language research.

Assessment: 100% coursework.

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**ENGL2050. English corpus linguistics (6 credits)**

Corpus linguistics is a rapidly-developing methodology in the study of language. It exploits the power of modern computer technology to manipulate and analyse large collections of naturally occurring language ('corpora'). This course will introduce students to the use of computers and computerized corpora as tools for exploring the English language.

Assessment: 100% coursework.

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**Capstone Experience****FITE4801. Project (12 credits)**

Student individuals or groups, during the final year of their studies, undertake full end-to-end development of a substantial project, taking it from initial concept through to final delivery. The project will be the application of technology to finance discipline.

Assessment: 100% continuous assessment

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