

**REGULATIONS FOR THE DEGREE OF
BACHELOR OF SCIENCE (QUANTITATIVE FINANCE)
(BSc(QFin))**

These regulations apply to students admitted in the academic year 2010-2011 and thereafter.

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

Admission to the degree

BSC(QF) 1 To be eligible for admission to the degree of Bachelor of Science (Quantitative Finance), candidates 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 the regulations that follow and the syllabuses of the degree.
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Period of study

BSC(QF) 2 The curriculum for the degree of Bachelor of Science (Quantitative Finance) shall normally require six semesters of full-time study, spreading over three academic years, and shall include any assessment to be held during and/ or at the end of each semester. Candidates shall in any case be required to complete the curriculum within five academic years, unless otherwise required or permitted by the Board of the Faculty.

Curriculum requirements and progression in curriculum

BSC(QF) 3 To complete the curriculum, candidates

- (a) shall satisfy the requirements prescribed in UG 5 of the Regulations for First Degree Curricula;
 - (b) shall enroll and attempt examination in not fewer than 180 credits of courses, in the manner specified in the syllabuses;
 - (c) shall normally be required to enroll in at least 60 credits of courses in an academic year¹, in a manner as prescribed in the syllabuses;
 - (d) shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester), or except in the last semester of study when candidates may be required to take fewer than 24 credits to satisfy the outstanding curriculum requirements;
 - (e) may, of their own volition, take further credits during the regular or summer semesters², accumulating up to a maximum of 72 credits in one academic year¹;
 - (f) may, with the approval of the Board of Faculty, exceed 72 credits in an academic year¹ provided that the total number of credits taken shall not exceed 216 credits; or where courses taken to make up for failed credits are inclusive, the total number of credits shall not exceed 360 credits;
 - (g) shall select courses accumulating 96 credits to declare a major in Quantitative Finance, as prescribed in the syllabuses, and to take electives to make up the balance of 180 credits;
 - (h) may be required by the Board of the Faculty to take a reduced study load if their academic progression is unsatisfactory.
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Advanced standing

BSC(QF) 4 Advanced standing may be granted to candidates in recognition of studies completed successfully in an approved institution of higher education elsewhere in accordance with UG 2 of the Regulations for First Degree Curricula. Advanced standing credits granted shall not be included in the calculation of the Semester, Year or Cumulative GPA nor taken into consideration for the honours classification of the degree to be awarded.

Selection of courses

BSC(QF) 5 Candidates shall select 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 during an add-drop period designated for each semester, and such changes shall not be reflected in the transcript of the candidates. Requests for changes after the designated add-drop period of a semester shall not be considered, and candidates withdrawing from any course without permission after the designated add-drop period of a semester shall be given an F grade.

BSC(QF) 6 Candidates shall not be permitted to select a second- or third-year course for which a failed course forms a prerequisite unless permission is given by the department concerned to sit a qualifying examination in the failed course and satisfy the examiners in this.

Assessment

BSC(QF) 7 Candidates shall be assessed for each of the courses which they have registered for, and assessment may be conducted in any one or any combination of the following manners: written examinations or tests, continuous assessment of performance, laboratory work, field work, research or project reports, or in any other manner as specified in the syllabuses.

Grades

BSC(QF) 8 Grades shall be awarded in accordance with UG 8(a) of the Regulations for First Degree Curricula.

BSC(QF) 9 Candidates shall not be permitted to repeat courses for which they have received a pass grade for upgrading purpose.

Absence from examination

BSC(QF) 10 Failure to take the examination as scheduled will automatically result in course failure under normal circumstances. Candidates who are unable, because of illness or other acceptable reason, to be present at any examinations of a course, may apply for permission to present themselves for a supplementary examination to be held not later than the beginning of the first semester of the following academic year. Failure to sit for the supplementary examination as arranged shall automatically result in course failure. 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.

Failure in examination

BSC(QF) 11 Candidates are required to make up for a failed course 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 an elective course, taking another course in lieu and satisfying the assessment requirements.

BSC(QF) 12 The maximum number of attempts for a particular course or requirement is three.

Unsatisfactory performance

BSC(QF) 13 Candidates shall be recommended for discontinuation under the provisions of General Regulations G 12 and UG4(e) if they have:

- (a) failed 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) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters, or
 - (c) exceeded the maximum period of registration specified in BSC(QF) 2.
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Award of degree

BSC(QF) 14 To be eligible for the award of the degree of Bachelor of Science (Quantitative Finance), candidates shall have

- (a) achieved a cumulative GPA of 1.0 or above;
 - (b) accumulated a minimum of 180 credits and passed all the compulsory courses required in the syllabuses; and
 - (c) satisfied the requirements in UG 5 of the Regulations for First Degree Curricula.
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Degree classification

BSC(QF) 15 The classification of honours shall be determined by the Board of Examiners at its full discretion by taking into account the overall performance of the candidates and other relevant factors as appropriate.

A list of the successful candidates for the degree Bachelor of Science (Quantitative Finance) shall be published in five divisions:

First Class Honours
Second Class Honours Division One
Second Class Honours Division Two
Third Class Honours
Pass

and a pass list shall be posted on Faculty notice boards.

¹ An 'academic year' comprises two regular semesters, with dates as prescribed by the Senate each year. A 'summer semester' may be organised in addition to the two regular semesters.

² Students are normally not allowed to take summer course(s) in their final-year of study.

SYLLABUSES FOR THE DEGREE OF BACHELOR OF SCIENCE (QUANTITATIVE FINANCE)

These syllabuses apply to students admitted in the academic year 2010-2011 and thereafter.

1. Candidates must enroll and attempt examination in not fewer than 180 credits of courses in accordance with the regulations and the syllabuses. In addition, the 180 credits of courses should be completed in the following manner:

UG 5 requirements [21 credits]	
Language*	9 credits
HKU Common Core Curriculum*	12 credits
Major in Quantitative Finance [96 credits]	
- First year Core courses	36 credits
- Second year Core courses	48 credits
- Third year Core courses	12 credits
Free Electives [63 credits]	63 credits
Total credits for degree programme	180 credits

2. To fulfill the graduation requirement of this degree as specified in the Board of the Faculty of Business and Economics in accordance with UG 5 of the Regulations for the First Degree Curricula, candidates must satisfactorily complete the credits of courses identified by an asterisk (*). Those courses include the following areas of study: English language enhancement (6 credits), Chinese language enhancement (3 credits), and Common Core courses (12 credits).
3. The Common Core courses are categorized under four Areas of Inquiry (AoI): Scientific and Technological Literacy, Humanities, Global Issues, and China: Culture, State, and Society. Candidates must complete a total of 12 credits, selecting no more than 6 credits from each Area of Inquiry.
4. The courses listed in the syllabus will not necessarily be offered every year, depending on the exigencies of staffing, additional courses may be offered. The School of Economics and Finance will only offer electives for which sufficient demand has been expressed in any one year.
5. For courses offered by the School of Economics and Finance, the final examination is normally 2 hours in length, unless otherwise specified by individual teacher at the start of the semester. Final grading will be determined by performance in the examination (40-60%) and an assessment of coursework (40-60%) except for final project/ final papers which will be assessed by 100% coursework.
6. Candidates may take a maximum of 78 credits of junior level courses, unless otherwise specified in the syllabuses. "CAES2905 English for professional communication for economics and finance students" is counted as a junior level course for this purpose.
7. Additional Major/ Minor
Candidates are allowed to pursue additional FBE minors according to the criteria listed in the section of "Minor Programs Available to FBE students". Candidates are also free to pursue additional majors or minors in disciplines outside of this Faculty. In pursuing a major/minor candidates are likely to take additional credits which will exceed 180 credits, up to a maximum of 216 credits for the entire degree programme.
8. To gain international or global perspectives, candidates are strongly encouraged to enroll in a course with international or global content or by taking a Common Core course in Global Issues (AoI). A suggested list of "International/Global courses for FBE students" can be found on page 92.
9. Candidates are not permitted to enroll in courses where significant portions of the course contents overlap with each other, or where the courses are mutually exclusive. See the list of "Mutually Exclusive Course for FBE Students" on page 93.
10. Final year candidates may select up to four courses offered under the syllabuses for the Master of

Economics (MEcon) as third year economics electives, subject to availability and the approval of the Director of the School of Economics and Finance. Each of these MEcon courses carries 6 credits, unless otherwise specified.

1. UG 5 requirements [21 credits]

(a) Language [9 credits]

<i>Course code</i>	<i>Course title</i>	<i>Credits</i>
CBBA0001.^	Practical Chinese language course for business, economics and finance students* (Year I)	3
CAES1904.	English for academic communication for economics and finance students* (Year I)	3
CAES2905.	English for professional communication for economics and finance students* (Year II)	3

^ Putonghua-speaking students must take CUND0002 or CUND0003. Students who have not studied the Chinese language during their secondary education or who have not attained the requisite level of competence in the Chinese language to take CBBA0001 can apply to the Faculty:

- (i) to take credit-bearing Cantonese or Putonghua language courses offered by the School of Chinese (especially for international and exchange students), or
- (ii) for exemption from Chinese language requirement and take an elective course in lieu.

(b) HKU Common Core Curriculum* [12 credits] 12

2. Major in Quantitative Finance [96 credits]

(a) Core courses in Year I [36 credits]

<i>Course code</i>	<i>Course title</i>	<i>Credits</i>
BUSI1002.	Introduction to accounting	6
ECON1001.	Introduction to economics I	6
ECON1002.	Introduction to economics II	6
FINA1003.	Corporate finance	6
MATH1111.	Linear algebra	6
STAT1301.	Probability and statistics I	6

(b) Core courses in Year II [48 credits]

<i>Course code</i>	<i>Course title</i>	<i>Credits</i>
FINA0301.	Derivatives	6
FINA2802.	Investments and portfolio analysis	6
FINA0804.	Fixed income securities	6
FINA0402.	Mathematical finance	6
FINA0404.	Spreadsheet financial modeling	6
CSIS1117.	Computer programming	6
MATH1211.	Multivariable calculus	6
STAT2303.	Probability modeling	6

(c) Core courses in Year III [12 credits]

<i>Course code</i>	<i>Course title</i>	<i>Credits</i>
FINA0601.	Quantitative risk management	6
FINA0602.	Operational issues and cases in Quantitative Finance or	6
FINA0403.	Financial engineering	
Total credits for major in Quantitative Finance		96

REFERENCE TABLE

Year	Lang.	Common Core	Major (Core)	Free Electives	Total
I	6 credits	12 credits	36 credits	6 credits	60 credits
II	3 credits	-	48 credits	9 credits	60 credits
III	-	-	12 credits	48 credits	60 credits
Total	9 credits	12 credits	96 credits	63 credits	180 credits

**DESCRIPTIONS FOR COURSES IN THE
BACHELOR OF SCIENCE (QUANTITATIVE FINANCE) CURRICULUM**

UNIVERSITY REQUIREMENTS

CBBA0001. Practical Chinese language course for business, economics and finance students (3 credits)

This course will cover the following topics: (1) practical Chinese writing skills (2) Chinese characters (3) letter-writing (4) office documents (5) Chinese for special purposes (6) presentation and communication techniques and (7) information technology in Chinese.

Assessment: 50% coursework, 50% examination.

CAES1904. English for academic communication for economics and finance students (3 credits)

The course prepares students to respond effectively to the communicative demands of academic study in English. Through text-based activities in class and assigned work related to language and disciplinary issues, the course develops abilities to analyze and evaluate extended texts, and to produce clear and coherent spoken and written discourses. Particular emphasis is given to the use of source material: how to cite and refer to material, and how to make use of and attribute ideas without copying. Stress is also put on acquiring an academic vocabulary, oral presentation skills, plus careful revision and editing of essays to ensure that lexical and grammatical choices are appropriate.

Assessment: 100% coursework.

CAES2905. English for professional communication for economics and finance students (3 credits)

The course prepares students to communicate effectively and accurately and prepare themselves for workplace situations which entail the use of English. It requires students to investigate an issue relevant to their studies, improve their interview and presentation skills, and write a variety of professional documents.

Assessment: 100% coursework.

XXXX. HKU Common Core Curriculum (12 credits)

COMPULSORY COURSES IN BUSINESS OFFERED BY THE SCHOOL OF BUSINESS

BUSH1002. Introduction to accounting (6 credits)

This course involves a study of basic accounting procedures, accounting concepts and principles and to explore the use of financial accounting information to support operating and strategic decisions.

Assessment: 50% coursework, 50% examination.

COMPULSORY COURSES IN ECONOMICS OFFERED BY THE SCHOOL OF ECONOMICS AND FINANCE

ECON1001. Introduction to economics I (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, and resource allocation efficiency.
Assessment: 50% coursework, 50% examination.

ECON1002. Introduction to economics II (6 credits)

This course is an introduction to macroeconomics – the study of business cycle fluctuations and long run economic growth. Topics include the national economic performance, the problems of recession, unemployment, and inflation; fiscal and monetary policies for full employment and price stability in an open economy, balance of payments, exchange rate determination, international trade and capital flows.
Assessment: 50% coursework, 50% examination.

COMPULSORY COURSES IN FINANCE AND QUANTITATIVE FINANCE OFFERED BY THE SCHOOL OF ECONOMICS AND FINANCE

FINA1003. Corporate finance (6 credits)

This is an introductory course that develops the basic concepts and tools applicable to corporate financial decisions. Three main tasks of financial managers are studied: (i) investment evaluation, (ii) financing decisions, and (iii) payout decisions. Specific topics include present value calculation, valuation of stocks and bonds, investment criteria and capital budgeting, risk and return, cost of capital, capital structure, raising capital, dividend policy, and working capital management.

Assessment: 50% coursework, 50% examination.

Prerequisite: BUSI1002 Introduction to accounting

Mutually exclusive courses:

BUSI0016/FINA1002 Introduction to finance

STAT2807 Corporate finance for actuarial science

FINA2802. 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 on equity part and the main topics include: portfolio theory, equilibrium in capital markets, equity valuation, portfolio performance evaluation, and relevant institutional details. This course is essential to those planning to become an investment professional or a sophisticated individual investor.

Assessment: 50% coursework, 50% examination.

Prerequisite: FINA1003 Corporate finance

Mutually exclusive course: STAT 2309 The Statistics of Investment Risk *and*
STAT3806 Investment and asset management

FINA0301. Derivatives (6 credits)

To provide a comprehensive analysis on the properties of options and futures and to offer a theoretical framework within which all derivatives can be valued and hedged. Topics covered: simple arbitrage relationships for forward and futures contracts, hedging and basis risk, stock index futures, swaps, trading strategies involving options, valuation of options using a binomial model and the Black-Scholes formula, option on stock indices, currencies and futures, and exotic options.

Assessment: 50% coursework, 50% examination.

Prerequisite: FINA1003 Corporate finance

Remarks: Not open to students taking or having taken MATH2906 Financial calculus.

Mutually exclusive courses: ISME3010 Financial engineering, STAT2820 Introduction to Financial Derivatives, STAT3303 Derivatives and Risk Management *and* STAT2812 Financial Economics I

FINA0804. Fixed income securities (6 credits)

An integrated analysis of the market institutions, theory and empirical evidence in the area of fixed-income markets. Topics covered: Treasury markets, bond mathematics, arbitrage-free models of the term structure, corporate-debt pricing, convertible bonds, primary mortgage markets and securitization, immunization and portfolio insurance, valuation of futures and options on bonds, embedded options, and interest rate risk management.

Assessment: 50% coursework, 50% examination.

Prerequisite: FINA0301 Derivatives and FINA2802 Investment and portfolio analysis

FINA0402. 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, Black-Scholes equation, risk-neutral probability and martingale. The purpose of this course is to lay down a solid mathematical foundation for students to learn more advanced topics in financial engineering, such exotic options, interest rate derivatives and credit risk models.

Assessment: 50% coursework, 50% examination.

Pre-requisites: FINA0301 Derivative securities or FINA0301 Derivatives, *and* FINA2802 Investments and portfolio analysis, *and* MATH1111 Linear algebra, *and* MATH1211 Multi-variable calculus, *and* STAT2303 Probability modeling.

Mutually exclusive course: MATH2906 Financial calculus

FINA0403. Financial engineering (6 credits)

Financial engineering is the process of constructing new instruments by using bonds and individual derivatives such as forwards, calls, puts, and common exotic options as basic building blocks. The process involves designing, pricing and managing the instruments. In this course, we anatomize a few popular structural products sold by the commercial banks in Hong Kong, such as equity-linked high yield notes and capital guarantee funds. We then discuss how to price these products by studying the price of the embedded exotic options. Finally we discuss the risk exposure of the retail investors and how to manage the risk for the commercial banks.

Assessment: 50% coursework, 50% examination.

Pre-requisites: FINA0402 Mathematical finance
FINA0404 Spreadsheet financial modeling

FINA0404. Spreadsheet financial modeling (6 credits)

This course studies the design and implementation of computer programs for financial modeling using spreadsheets and structured programming techniques. The course will focus on developing skills in translating financial models into spreadsheets and programs using Microsoft Excel and Visual Basic for Applications (VBA), examining popular financial and investment models, integrating spreadsheet functionalities, programming, and interfaces in financial applications, and hands-on experience in designing, coding, and debugging computer programs.

Assessment: 50% coursework, 50% examination.

Prerequisites: FINA2802 Investments and portfolio analysis
FINA0301 Derivatives
CSIS1117 Computer Programming

FINA0601. Quantitative risk management (6 credits)

This course studies the financial risks from the point of view of a multinational corporation. Systemic risks from the global equity, fixed income securities, foreign exchange, and derivative markets in developed and emerging economies are identified. The course covers a variety of advanced risk models and simulation techniques that are applied to assess and control these risks for the purposes of hedging and investment.

Assessment: 50% coursework, 50% examination.

Pre-requisites: FINA0402 Mathematical finance
FINA0404 Spreadsheet financial modeling

FINA0602. Operational issues and cases in quantitative finance (6 credits)

This course addresses a number of practical issues in quantitative finance. They include compliance, tax, operational risk, best practices, and professional codes of ethics as practiced in the quantitative finance industry. These issues are taught in the context of case study so that students can appreciate the peculiar company-specific and market-specific factors in decision making. Famous cases such as Enron, Long-term Capital Management, and Lehman Brothers are examined.

Assessment: 70% coursework, 30% examination

Pre-requisites: FINA0402 Mathematical finance
FINA0404 Spreadsheet financial modeling

COMPULSORY COURSES IN COMPUTER PROGRAMMING OFFERED BY THE DEPARTMENT OF COMPUTER SCIENCE

CSIS1117. Computer programming (6 credits)

The goal of this course is for students to learn the general principles of programming, including how to design, implement, document, test, and debug programs.

Assessment: 50% coursework, 50% examination.

COMPULSORY COURSES IN MATHEMATICS OFFERED BY THE DEPARTMENT OF MATHEMATICS

MATH1111. Linear algebra (6 credits)

Linear algebra has wide applications to diverse areas in natural science, engineering, management, and social science. This course provides students an introduction to the theory and techniques of linear algebra. It is a foundation course for all mathematics students, to be followed by other more advanced courses in mathematics such as MATH2301, MATH 2303. Contents include:

- Systems of linear equations.
- Row equivalence of matrices.
- Matrix algebra, determinant and rank of matrices.
- Vector spaces, subspaces, basis and dimension.
- Linear transformation, change of bases.
- Diagonalization of matrices.

Assessment: 50% coursework, 50% examination.

Pre-requisite: HKCEE Additional Mathematics and AS Mathematics and Statistics, or MATH1804, or equivalent

MATH1211. Multivariable calculus (6 credits)

Students of this course will learn the theory of multivariable calculus in a rather rigorous manner, and learn how to apply the theory to solve practical problems. This is a foundation course for all mathematics students, to be followed by other more advanced courses in mathematics. Contents include:

- Infinite series, Taylor series, and approximation of functions.
- Review on integration, integration techniques, improper integrals, line integrals.
- Polar coordinates, parametric curves, vectors and surfaces in space.
- Partial differentiation: limits and continuity, directional derivatives, critical points, extrema and saddle points, Lagrange multipliers.
- Multiple integrals: double and triple integrals, integration in cylindrical and spherical coordinates, surface area, change of variables.
- Vector calculus: vector fields and line integrals, Green's Theorem, Divergence Theorem, Stokes' Theorem

Assessment: 50% coursework, 50% examination.

Pre-requisite: HKCEE Additional Mathematics and AS Mathematics and Statistics, or MATH1804, or equivalent

COMPULSORY COURSES IN STATISTICS OFFERED BY THE DEPARTMENT OF STATISTICS

STAT1301. Probability & statistics I (6 credits)

The discipline of statistics is concerned with situations in which uncertainty and variability play an essential role and forms an important descriptive and analytical tool in many practical problems. Against a background of motivating problems this course develops relevant probability models for the description of such uncertainty and variability and provides an introduction to the concepts, principles and methodology of statistical analysis.

Contents: Sample spaces; Operations of events; Probability and probability laws; Conditional probability; Independence; Discrete random variables; Cumulative distribution function (cdf); Probability mass function (pmf); Bernoulli, binomial, geometric, and Poisson distributions; Continuous random variables; Cumulative distribution function (cdf); Probability density function

(pdf); Exponential, Gamma, and normal distributions; Functions of a random variable; Joint distributions; Marginal distributions; Independent random variables; Functions of jointly distributed random variables; Expected value; Variance and standard deviation; Covariance and correlation; Moment-generating function; Population and sample; Parameter and statistics; χ^2 , t , and F distributions; Sample mean and sample variance; Concepts of statistical inference; Estimation of mean and variance; Confidence intervals and tests of hypotheses concerning means and variances of normal populations.

Assessment: 50% coursework, 50% examination.

Prerequisites: A-level Pure Mathematics or AS-level Mathematics & Statistics or equivalent.

STAT2303. Probability modeling (6 credits)

This is an introductory course in probability modeling. A range of important topics in stochastic processes will be discussed.

Contents: Introduction to probability theory, Conditional probability and expectation, Markov chains, random walk models, Poisson process, and Brownian Motion. Birth-and-death process, branching process and renewal process may also be covered (if time permits).

Assessment: 50% coursework, 50% examination.

Prerequisites: STAT1301 or STAT1000 or STAT1007 or STAT0601
