Program of Financial Mathematics for Class 2018

I. Introduction

Established in 2012, Southern University of Science and Technology is a young university aiming to become a top research university in the world. In recent years, the university has attracted many outstanding researchers. The Department of Mathematics currently has 34 full-time faculty members, including 6 chair professors, 7 professors, 5 associate professor, 7 assistant professors and 3 visiting assistant professors. Three of the professors are members of the "Recruitment Program of Global Experts" and 2 are "Chang Jiang Scholars", 2 are winners of the National Science Foundation Award for Distinguished Young Scholars, and 1 has received the "Young Overseas High-level Talents" award. In addition to the 21 research professors, there are 9 teaching professors dedicated to high quality teaching, and the department is expected to grow quickly in coming years.

Faculty members examine all aspects of mathematics including basic mathematics, applied mathematics, financial mathematics, computational mathematics and statistics. They have a broad vision, profound knowledge, a strong sense of responsibility and experience in teaching and scientific research in well-known universities and research institutions both in China and abroad. They teach the basic theories and methods of mathematical sciences, with a focus on developing students' ability to design mathematical models and solve practical problems with computers.

In 2012 the Chinese Ministry of Education approved financial mathematics as a major in the field of economics. At present, more than 60 universities have been granted the right confer degrees in financial mathematics. Students enroll in schools or departments of mathematics and can obtain a Bachelor's degree in Economics.

In China option trading began in 2015. With the rapid development of networks, the scale of high-frequency trading via networks and aided by computer programming will also increase. In order to prevent financial crisis and to maintain the stability of financial markets, talents of financial risk management who have solid abilities in financial modeling and quantitative analysis are in urgent need. As a result, there is an urgent need in financial markets for talents with excellent foundation of mathematics, superb computer programming skills and a good understanding of finance. It is of great significance to develop the financial mathematics major well in order to cultivate high-end financial talents for China's financial industry.

II. Objectives

The objective for undergraduates majoring in financial mathematics is to cultivate high-level, applied and interdisciplinary financial talents who possess good professional ethics, solid theoretical basis of financial mathematics, superior abilities in data processing and computer programming, high level of foreign languages as well as innovative and entrepreneurial spirit, and are able to engage in financial data processing, model analysis, quantitative investment and risk management in all kinds of financial institutions, and to lay a theoretical foundation for them to pursue postgraduate studies.

III. Period of Study and Degree Requirement

Time length: 4 years

Degree conferred: Bachelor of Economics

The minimum credit requirement for graduation: 135 credits (not including English courses)

IV. Discipline

Bachelor of Economics

V. Main Courses

Foundational core courses: Mathematical Analysis I&II&III, Linear Algebra A-I&II, Ordinary Differential Equations A, Theory of Functions of a Real Variable, Probability Theory, Mathematical Statistics, Applied Stochastic Processes, Macroeconomics, Microeconomics, Econometrics, Security Investments, Financial Economics, Models and Pricing of Financial Derivatives, Asset Pricing and Risk Management, and etc.

VI. Practice-Based Courses

Undergraduate Thesis/Project, Research Projects and Internship, etc.

VII. Course Structure and Credit Requirements

General Education (GE) Required Courses: 56 credits (not including English courses);

General Education (GE) Elective Courses: 10 credits;

Major Foundational Courses: 20 credits;

Major Core Courses: 22 credits;

Major Elective Courses: 17 credits;

Undergraduate Thesis/Projects: 8 credits;

Research Projects/Internship: 2 credits;

The minimum credit requirement for graduation: 135 credits.

VIII. Requirements for Science Module of GE Required Courses

Course Cod	Course Name	Credit	Lab Credits	Hours/week	Term	Instruction Language	Prerequisite	Dept
MA101B	Calculus I A	4		4	Spr/ Fall	B		MATH
MA102B	Calculus II A	4		4	Spr/ Fall	B	MA101B	MATH
MA213-16	Real Analysis	5		5	2/Fall	B	MA102B	MATH
MA103A	Linear Algebra I-A	4		4	Spr /Fall	B		MATH
PHY103B	General Physics B (I)	4		4	Spr/ Fall	B		PHY
PHY105B	General Physics B (II)	4		4	Spr/F all	B	PHY103B	PHY
CH101B	General Chemistry B	3		3	Spr/ Fall	B		CHEM
CS102B	Introduction to Computer Programming B	3	1	4	Spr/ Fall	B		CSE
BIO102B	Introduction to Life Science	3		3	Spr /Fall	B		BIO
PHY104B	Experiments of Fundamental Physics	2	2	4	Spr/ Fall	B		PHY
Total		36	3	39				

IX. Pre-requisites for Major Declaration

Course Code	Course Name	Notes
MA101B	Calculus I A	
MA102B	Calculus II A	
MA213	Real Analysis	
MA103A	Linear Algebra I-A	
MA104b	Linear Algebra II	
PHY103B	General Physics B (I)	
PHY105B	General Physics B (II)	
CS102B	Introduction to Computer Programming B	
PHY104	Probability Theory	
MSE201	Mathematical Statistics	

X. Course Arrangement

Table 1: Major Required Course (Foundational and Core Courses)

Course Category	Course Code	Course Name	Credits	Lab Credits	Hours/week	Terms	Advised term to take the	Instruction language	Prerequisite	Dept.
Major Foundational Courses	MA104b	Linear Algebra II	4		4	Fall	1/Fall	C or E or C&E	MA103A	MATH
	MA215	Probability Theory	4		4	Fall	2/Fall	E	MA203a or MA213	MATH
	FIN201	Microeconomics	3		3	Fall	1/Fall	C&E	NA	FIN
	MA204	Mathematical Statistics	3		3	Spr	2/Spr	C or E or C&E	MA215	MATH
	FIN204	Macroeconomics	3		3	Spr	1/Spr	C&E	NA	FIN
	MA208	Applied Stochastic Processes	3		3	Spr	2/Spr	E	MA212 or MA204	MATH
		Total	20		20					
Major Core Courses	MA201a	Ordinary Differential Equations A	4		3	Spr	2/Spr	C or E or C&E	MA203a or MA213, MA104b	MATH
	MA301	Theory of Functions of a Real Variable	3		3	Fall	3/Fall	C or E	MA203a or MA213	MATH
	FMA303	Security Investments	3		3	Fall	3/Fall	C or E	MA212 or MA204	MATH
	FMA301	Econometrics	3		3	Fall	3/Spr	C	MA212 or MA204	MATH
	FMA307	Models and Pricing of Financial Derivatives	3		3	Spr	3/Spr	C&E	MA212 or MA204	MATH
	FMA302	Financial Economics	3		3	Spr	3/Spr	C&E	MA212 or MA204	MATH
	FMA304	Asset Pricing and Risk Management	3		3	Spr	3/Spr	C	MA212 or MA204	MATH
	Total		22		22					
MA490		Undergraduate Thesis/Project	8	8	16	Fall & Spr	4/Spr& Fall	C&E		MATH
MA480		Research Projects*	2	2	4	Fall or Spr or Smr	Any semester after the first school year	C&E		MATH
MA470		Internship*			16	Smr	Any summer after	C&E		MATH

						the first school year			
Total		**57**	**10**	**67**					

*Note: Students are required to choose Research Projects (including all kinds of scientific research activities, scientific and technological innovation projects, wining prizes in competitions above the provincial level, publishing papers, engaging in advanced studies both at home and abroad as well as attending a certain number of seminars or public lectures, and related credits are identified by the Department) and one course in Internship to carry out practice. Students can also choose to carry out Research Projects and Internship in any semester after the first school year, and the minimum required period for Internship is 4 weeks.

Table 2: Major Elective Courses

Course Code	Course Name	Credits	Lab Credits	Hours /week	Terms	Advised term to take the	Instruction language	Prerequisite	Dept.
MA216	Computational Finance	3		3	Fall	3/Fall	C&E	MA203a or MA213	MATH
FIN203	Financial Accounting	3		3	Fall	2/Fall	C&E	NA	FIN
FIN206	Corporate Finance	3		3	Spr	2/Spr	C&E	FIN203	FIN
FIN207	Financial Market, Institutions and Regulations	3		3	Fall	2/Fall	C&E	NA	FIN
MA206	Mathematical Modelling	3		3	Spr	2/Spr	C&E	MA203a or MA213	MATH
MA202	Complex Analysis	3		3	Spr	2/Spr	C&E	MA203a or MA213	MATH
FIN301	Financial Investments	3		3	Fall	3/ Fall	B	FIN201 FIN204 MA212	FIN
MA303	Partial Differential Equations	3		3	Fall	3/Fall	C or E or C&E	MA201a or MA201b	MATH
GGC5001	Mathematics Writing in English（PG）	2		2	Smr	2/Smr	C&E		MATH
MA309	Time Series Analysis	3		3	Fall	3/Fall	C	MA212 or MA204	MATH
FIN409	Financial Modeling and Analysis	3	1	4	Fall	4/Fall	B	MA212 MA102B MA104	FIN
FIN413	Quantitative Investment Analysis	3	1	4	Fall	4/Fall	C&E	FIN303 FIN301	FIN
MA304	Multivariate Statistical Analysis	3		3	Spr	3/Spr	C	MA212 or MA204	MATH
MA302	Functional Analysis	3		3	Spr	3/Spr	C&E	MA301, MA202	MATH
FIN302	Empirical Methods in Finance	3		3	Spr	3/Spr	B	FIN301 FIN303	FIN
FIN306	Fixed Income: Models and Applications	2		2	Spr	3/Spr	B	FIN305	FIN
FIN407	Investment Banking	3		3	Spr	3/Spr	C&E	FIN206	FIN
FINS301	Behavioral Finance	1		1	Smr	3/Smr	C&E	FIN206	FIN
Total		**50**	**2**	**52**					

Note 1: Each student is required to take at least 17 credits.
Note 2: Beginning time for Elective Courses is subject to the actual beginning time.

Table 3: Overview of Practice-Based Courses

Course Code	Course Name	Credits	Lab Credits	Hours/week	Terms	Advised term to take the	Instruction language	Prerequisite	Dept.
FIN409	Financial Modeling and Analysis	3	1	4	Spr	4/Fall	C&E	MA102B、MA104、 MA212	FIN
FIN413	Quantitative Investment Analysis	3	1	4	Spr	4/Fall	C&E	FIN303 FIN301	FIN
MA490	Undergraduate Thesis/Project	8	8	16	Fall & Spr	4/Spr&Fall	C&E		MATH
MA480	Research Projects*	2	2	4	Fall or Spr or Smr	Any semester after the first school year	C&E		MATH
MA470	Internship*	2	2	16	Smr	Any summer after the first school year	C&E		MATH
	Total	**18**	**14**	**24**					

*Note: Students are required to choose Research Projects (including all kinds of scientific research activities, scientific and technological innovation projects, wining prizes in competitions above the provincial level, publishing papers, engaging in advanced studies both at home and abroad as well as attending a certain number of seminars or public lectures, and related credits are identified by the Department) and one course in Internship to carry out practice. Students can also choose to carry out Research Projects and Internship in any semester after the first school year, and the minimum required period for Internship is 4 weeks.

Table 4: Overview of Course Hours and Credits

Course Category	Total Course Hours	Total Credits	The Minimum Credit Requirement
General Education (GE) Required Courses (not including English courses)	1008	56	56
General Education (GE) Elective Courses			10
Major Foundational Courses	320	20	20
Major Core Courses	352	22	22
Major Elective Courses	912	57	17
Research Projects, Internship and Undergraduate Thesis/Projects	320	10	10
Total (not including English courses)	2912	**165**	135

Financial Mathematics

