

# Program of Statistics for International Students (2019)

## I. Introduction

Southern University of Science and Technology is a young university aiming to become a first-class research university in the world. In recent years, the university has recruited many outstanding scholars. The Department of Mathematics currently has 39 full-time faculty members. All research professors have Ph.D. degrees and overseas work or study experiences. They have a wide range of research interests in pure mathematics, applied mathematics, financial mathematics, computational mathematics, and probability theory and statistics. In addition to the 23 research professors, there are 9 teaching professors. All faculty members are dedicated to high quality teaching, and the department is expected to grow quickly in coming years.

The graduates of the Bachelor Program in Statistics can pursue postgraduate studies in China and overseas. They can also find job opportunities in government agencies and a wide variety of companies including banks, securities investment companies, pharmaceutical companies, medical and scientific research institutions, insurance companies, advertising companies and other high-tech enterprises engaged in data analysis, market research or electronic commerce etc.

## II. Objectives and Learning Outcomes

The objective for undergraduates majoring in statistics is to cultivate statistical talents who are interested in statistics, scientific research or data analysis. Moreover, statistics undergraduates should possess good professional ethics, solid theoretical basis of mathematics and statistics, superior abilities in computer programming and be good at statistical modeling and analysis of real data. Besides, they can do further research work related to statistics, engaging in data analysis, data mining, statistical investigation, statistical information management in enterprises and government departments. In the big data era, there are many opportunities and challenges for statistics. Graduates of this field will have strong statistical theoretical foundations and a wide range of knowledge to seize these opportunities and meet these challenges. Graduates in statistics who have strong statistical theoretical foundations and a wide range of knowledge will take the opportunities and meet the challenges.

## III. Study Length and Graduation Requirements

Study length: 4 years

Degree conferred: Bachelor of Science

The minimum credit requirement for graduation: 129 credits (not including English courses);

Category	Module	Minimum Credit Requirement
General Education (GE) Required Courses (48 credits)	Science	28
	Physical Education	4
	Chinese Languages & Culture	16

General Education (GE) Elective Courses (13 credits)	Humanities	4
	Social Sciences	4
	Arts	2
	Science	3
Major Course (58 credits)	Major Foundational Courses	12
	Major Core Courses	22
	Major Elective Courses	24
	Research Projects, Internship and Undergraduate Thesis / Projects	10
Total (not including English courses)		129

#### IV. Discipline

Statistics

#### V. Main Courses

The Bachelor Program in Statistics has the following foundation and core courses: Calculus I&II and Real Analysis, Linear Algebra A, Probability Theory, Ordinary Differential Equations A, Mathematical Statistics, Statistical Linear Models, Sample Surveys, Applied Stochastic Processes, Time Series Analysis, Multivariate Statistical Analysis, Statistical Computation and Software, Statistical Data Analysis with SAS.

#### VI. Practice-Based Courses

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

#### VII. Pre-requisites for Major Declaration

Major Declaration Time	Course Code	Course Name	Prerequisite
Declare major at the end of Second Year	MA101B	Calculus I A	
	MA102B	Calculus II A	MA101B
	MA107A	Linear Algebra A	
	PHY103B	General Physics B (I)	
	PHY105B	General Physics B (II)	PHY103B
	CS102B	Introduction to Computer Programming B	
	MA215	Probability Theory	MA102a/ MA122/ MA102B
	MA204	Mathematical Statistics	MA215

## VIII. Requirements for GE Required Courses

### (I) Science Module

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Language Instruction	Prerequisite	Dept
MA101B	Calculus I A	4		4	1/Fall	B/E		MATH
MA102B	Calculus II A	4		4	1/Spr	B/E	MA101B	
MA107A	Linear Algebra A	4		4	1/Fall	B/E		MATH
PHY103B	General Physics B (I)	4		4	1/Fall	B/E		PHY
PHY105B	General Physics B (II)	4		4	1/Spr	B/E	PHY103B	
BIO102B	Introduction to Life Science	3		3	1/Spr/Fall	B/E		BIO
PHY104B	Experiments of Fundamental Physics	2	2	4	1/Spr/Fall	B/E		PHY
CS102B	Introduction to Computer Programming B	3	1	4	1/Spr/Fall	B/E		CSE
<b>Total</b>		<b>28</b>	<b>3</b>	<b>31</b>				

### (II) Physical Education

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Language Instruction	Prerequisite	Dept
GE131	Physical Education I	1		2	1/Fall	C	NA	PE Center
GE132	Physical Education II	1		2	1/Spr	C	NA	
GE231	Physical Education III	1		2	2/Fall	C	NA	
GE232	Physical Education IV	1		2	2/Spr	C	NA	
<b>Total</b>		<b>4</b>		<b>8</b>				

### (III) Chinese Languages & Culture

Course Code	Course Name	Credit	Hours/week	Term	Language Instruction	Prerequisite	Dept
CLE008	Elementary Chinese I	2	4	1/Fall	B	NA	CLE
CLE009	Elementary Chinese II	2	4	1/Spr	B	CLE008	
CLE027	Intermediate Chinese I	2	4	2/Fall	B	CLE009	
CLE028	Intermediate Chinese II	2	4	2/Spr	B	CLE027	
CLE031	Advanced Chinese I	2	4	3/Fall	B	CLE028	

CLE032	Advanced Chinese II	2	4	3/Spr	B	CLE031	
CLE033	Chinese Culture	2	2	Spr/Fall	B/E	NA	CLE/ HUM/ SSC
CLE034	Chinese History	2	2	Spr/Fall	B/E	NA	
Total		16	28				

#### (IV) English Language

All students are required to undertake the English Placement Test before selecting courses, based on which students will be assigned to 3 levels to be ready for the courses with English as the instruction language.

SUSTech English III, English for Academic Purposes are required for Level A.

SUTech English II, SUSTech English III, English for Academic Purposes for Level B.

SUSTech English I, SUSTech English II, SUSTech English III, English for Academic for Level C.

Course Code	Course Name	Credit	Hours/week	Instruction Language	Prerequisite	Dept
CLE021	SUSTech English I	4	4	E	NA	CLE
CLE022	SUSTech English II	4	4	E	CLE021	
CLE023	SUSTech English III	4	4	E	CLE022	
CLE030	English for Academic Purposes	2	2	E	CLE023	

#### IX. Requirements for GE Elective Courses

(I). Students are required to complete 4 credits for the Humanities Module and Social Sciences Module respectively, and 2 credits for the Music and Art Module. (Information about the available courses and the instruction language will be announced before the course selection session)

(II). Students are required to complete 3 credits for Science Module

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Language Instruction	Prerequisite	Dept
CH101B	General Chemistry B	3		3	1/Spr/ Fall	E		CHEM
CS205	C/C++ Program Design	3	1	4	1/Spr	E		CSE
Total		6	1	7				

## X. Major Course Arrangement

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

### Statistics

Course Category	Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	take the course Advised term to	Instruction language	Prerequisite	Dept.
Major Foundational Courses	MA213-16	Real Analysis	5		4	Fall	2/Fal	E	MA102B	MATH
	MA215	Probability Theory	4		3	Fall	2/Fal	E	MA102B	MATH
	MA204	Mathematical Statistics	3		3	Spr	2/Spr	E	MA215 or MA212	MATH
	<b>Total</b>		11		14					
Major Core Courses	MA201a0	Ordinary Differential Equations A	4		3	Spr	2/Spr	E	(MA213-16) and MA109	MATH
	MA208	Applied Stochastic Processes	3		3	Spr	2/Spr	E	MA213-16 and MA215 (or MA212) and MA109	MATH
	MA309	Time Series Analysis	3		3	Fall	3/Fall	C&E	MA204 or MA212	MATH
	MA308	Statistical Computation and Software	3		3	Fall	3/Fall	E	MA204 or MA212	MATH
	MA329	Statistical Linear Models	3		3	Fall	3/Fall	E	MA204 or MA212	MATH
	MA304	Multivariate Statistical Analysis	3		3	Spr	3/Spr	C&E	MA204 or MA212	MATH
	MA409	Statistical Data Analysis with SAS	3		3	Spr	3/Spr	E	MA329	MATH
	<b>Total</b>		22		21					
Comprehensive practice course	MA490	Undergraduate Thesis/Project	8	8	4	Spr	4/Spr	E		MATH
	MA480	Research Projects**	2	2	2	Fall	Any Semester			MATH
	MA470	Internship**	2	2	16	Smr	Smr			MATH
	<b>Total</b>		10	12	22					

\*\*Note: Students must choose a research innovation project (including various scientific research activities, scientific and technological innovation projects, awards for provincial and above competitions, publications, domestic and foreign advanced studies, participation in a certain number of seminars, etc., credits recognized by the department) or internships. Students can choose a research innovation projects or internships in any semester after the first year. The minimum requirement for the internship is 4 weeks.

**Table 2: Major Elective Courses**

**Statistics**

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	take the course Advised term to	Instruction language	Prerequisite	Dept.
MA109/MA111/MA121	Advanced Linear Algebra/ Advanced Linear Algebra II/ Advanced Linear Algebra II (H)	4		4	Spr	1/Spr	E	MA107/M A107A	MATH
CS203	Data Structures and Algorithm Analysis B	3	1	4	Fall	2/Fall		CS205	CSE
CS205	C/C++ Program Design	3	1	4	Spr	1/Spr			CSE
CS201	Discrete Mathematics	3		3	Spr	2/Spr	C&E	MA107A/MA102B	CSE
MA206	Mathematical Modeling	3		3	Spr	2/Spr	E	MA201a/MA230/M A201b	MATH
MA214/MA219	Abstract Algebra/ Abstract Algebra (H)	3		3	Spr	2/Spr	E	MA109/M A111/MA121	MATH
MA202/MA232	Complex Analysis/ Complex Analysis (H)	3		3	Spr	2/Spr	E	MA203a/MA213-16	MATH
MA322	Life Insurance Actuarial Science	3		3	Spr	2/Spr	C&E	MA215 or MA212	MATH
MAS221	The Basic Principle of Statistical Learning	2		8	Smr	2/Smr	E	MA215 or MA212	MATH
MA329	Statistical Linear Models	3		3	Fall	3/Fall	E	MA204 or MA212	MATH
MA333	Introduction to Big Data Science	3		3	Fall	3/Fall	C&E	MA215 or MA212	MATH
MA228	Nonlife actuarial models	3		3	Fall	3/Fall	E	MA215 or MA212	MATH
MA303	Partial Differential Equations*	3		3	Fall	3/Fall	E	MA201a or MA201b	MATH
MA301	Theory of Functions of a Real Variable*	3		3	Fall	3/Fall	E	MA203a or MA213-16	MATH
MA305	Numerical Analysis	3		3	Fall	3/Fall	C&E	MA203a or MA213-16	MATH
MA314	Sample Surveys	3		3	Spr	3/Spr	C&E	MA204 or MA212	MATH
MAT7041	Bayesian Statistics	3		3	Spr	3/Spr	C&E	MA329	MATH
MAT7036	Nonparametric Statistics	3		3	Spr	3/Spr	E	MA212 or MA204	MATH
MAT7055	Generalized Linear Models	3		3	Spr	3/Spr	E	MA329	MATH

MA325	Numerical Solution of Partial Differential Equations	3		3	Spr	3/Spr	E	MA303	MATH
MAT7002	Measure Theory and Integration(PG)	3		3	Fall	4/Fall	E	MA302	MATH
MAT7008	Advanced Statistics(PG)	3		3	Fall	4/Fall	C&E	MA204	MATH
CS405	Machine Learning	3	1	4	Fall	4/Fall	C&E	MA107A MA212	CSE
MAT7035	Computational Statistics	3		3	Fall	4/Fall	E	MA329	MATH
MA405	Survival Analysis	3		3	Fall	4/Fall	E	MA329	MATH
MA318	Experiment Design	3		3	Fall	4/Fall	E	MA329	MATH
MAT8011	Advanced Probability	3		3	Fall	4/Fall	E	MA329	MATH
MAT7029	Stochastic Analysis	3		3	Spr	4/Spr	E	MA215 and MA301	MATH
<b>Total</b>		84	3	93					

Note:

1. Students are required to complete 24 credits for the Major Elective Courses.

2 Abstract algebra (H), complex analysis (H), real analysis (H), partial differential equation (H) can respectively certify abstract algebra, complex analysis, real analysis, and partial differential equation course credits.

**Table 3: Overview of Practice-Based Courses**

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Advised term to take the course	Instruction language	Prerequisite	Dept.
MA470	Internship*	2	2	16	Smr	Smr			MATH
MA480	Research Projects*	2	2	2	Fall	Any Semester			MATH
MA490	Undergraduate Thesis/Project	8	8	4	Spr	4/Spr	C&E		MATH
CS102B	Introduction to Computer Programming B	3	1	4	Spr & Fall	1/Spr & Fall	E		
MA207	Mathematical Experiments	3	1	4	Fall	2/Fall	E	MA203a/ MA231 /MA213-16	MATH
MA110	MATLAB Programming and Application	3	1	3	Spr	2/Spr	E		MATH
CS205	C/C++ Program Design	3	1	4	Spr	1/Spr	C		CSE
CS203	Data Structures and Algorithm Analysis	3	1	4	Fall	2/Fall		CS205	CSE
CS405	Machine Learning	3	1	4	Fall	4/Fall	C	MA107A MA212	CSE
PHY104B	Experiments of Fundamental Physics	2	2	4	Spr	1/Spr	B		PHY
<b>Total</b>		32	20	49					



**Table 4: Overview of Course Hours and Credits**

<b>Course Category</b>	<b>Total Course Hours</b>	<b>Total Credits</b>	<b>Credit Requirements</b>	<b>Percentage of the Total*</b>
<b>General Education (GE) Required Courses (not including English courses)</b>	768	48	48	41.48%
<b>General Education (GE) Elective Courses</b>			13	9.63%
<b>Major Foundational Courses</b>	192	12	12	8.89%
<b>Major Core Courses</b>	352	22	22	16.30%
<b>Major Elective Courses</b>	1344	84	24	16.30%
<b>Research Projects, Internship and Undergraduate Thesis/Projects</b>		32	10	7.41%
<b>Total (not including English courses)</b>			129	

\* Percentage of the total= Credit requirements of each line / Total credit requirements

# Curriculum Structure of Statistics

## Statistics



