Applied Statistics

(Grade 2024)

Course code: 071202

I. Cultivation Objectives

1. General cultivation objective

This Program of Applied Statistics cultivates high quality statistical talents with good moral and talent to meet the needs of national and regional economic development. Students will not only master the basic ideas, basic theories and methods of statistics and related computer technology, but also have knowledge of economics, finance and business, and will be able to engage in statistical investigation, statistical information management, data analysis and consultation, quantitative modelling and forecasting in government departments at all levels, enterprises and institutions in various industries, and the financial, securities and insurance industries.

2. Objective of value guidance

Takes the spirit of the model worker and the spirit of craftsmanship as the value orientation, this program cultivates craftsmanship and nurture talents with this spirit. In the implementation of education and teaching, we focus on cultivating a sense of integrity and a strong sense of social responsibility among students, establishing a sound professional personality and a sense of the rule of law, and inspiring a work ethic of excellence in data analysis and a love for statistics. Using professional knowledge, competence and literacy, students will contribute their wisdom and strength to statistics and economic development in China.

3. Five years after graduation, students in this programme should achieve the following objectives:

Have a clear career plan and good career prospects in various industries, achieve certain work achievements and be promoted in their posts, and become the mainstay and core player of their units. The sense of social responsibility will be further enhanced, and the ability to coordinate and manage work will be more prominent, with a certain degree of leadership ability. Further enhance comprehensive capabilities to better adapt to the needs of social development, cultivate the ability to work independently with professional competence, and make greater contributions to China's statistical undertaking and economic advancement.

II. Graduation requirements

This program primarily focuses on the study of fundamental theories of statistics, relevant knowledge in mathematics, common programming languages, and foundational knowledge of databases. Students systematically master key methodologies for data collection, processing, analysis, and modeling, developing the ability to apply statistical methods in practical contexts across related fields and initially cultivating the capacity and competence to address complex issues. Specifically, graduates should meet the following nine requirements:**1.**

1.Morality and Ethics: Possess humanistic cultivation, scientific thinking, social responsibility, and a positive outlook on life; uphold the value of labor; demonstrate understanding of national conditions, social dynamics, and public welfare; and actively practice the core socialist values.

1-1 Have correct values, moral values and legal consciousness, be patriotic, honest and law-abiding.

1-2 Possess robust physical health and strong psychological resilience, and demonstrate the ability to effectively adapt to the evolving social and environmental landscape.

1-3 Cultivate a well-rounded cultural foundation and scientific literacy, while acquiring a robust understanding of the scientific worldview and methodologies.

2. Professional Ethics: Demonstrate the ability to comprehend and adhere to professional ethics and standards in statistical practice, comply with statistical laws and regulations, and fulfill work responsibilities.

2-1 Approach data processing tasks with meticulousness, patience, and artisanal precision, while maintaining unwavering professional dedication to all work duties.

2-2 Possess the capacity to understand, uphold, and practice statistical professional ethics and norms in real-world applications, ensuring accountability in all statistical work.

3. Academic Proficiency: Demonstrate a solid foundation in fundamental knowledge, specialized expertise, and technical proficiency; master core research methodologies of the discipline; and stay informed about the latest advancements and emerging trends within the field and interdisciplinary domains.

3-1 Possess comprehensive mathematical knowledge and rigorous logical reasoning abilities, enabling the application of advanced mathematical principles to solve practical workplace challenges.

3-2 Systematically grasp statistical fundamentals and theories, with competencies in quantitative data analysis, statistical modeling, and accurate interpretation of analytical/modeling outcomes.

3-3 Maintain foundational understanding of market research, economics, e-commerce, environmental science, big data, and related interdisciplinary fields.

3-4 Demonstrate proficiency in programming languages and database management, with the ability to develop practical applications using relevant software tools.

4. Ability to use knowledge: Ability to address complex problems through integrated analysis and strategic solution development for specialized domain challenges.

4-1 Apply statistical principles to identify, formulate, and resolve real-world problems, delivering actionable results.

4-2 Conduct evidence-based research on complex practical issues using scientific methods, including experimental design, data analysis/interpretation, and synthesis of findings into valid conclusions.

5. Innovative Capacity: Demonstrate logical reasoning and innovative thinking through the identification, critical evaluation, and original interpretation of phenomena and challenges in statistical and related fields.

5-1 Leverage creative thinking in scientific research, exhibiting strong entrepreneurial spirit and innovative capabilities.

5-2 Track cutting-edge theories, methodologies, and emerging hot topics in global statistics.

5-3 Cultivate entrepreneurial awareness and proactively explore pathways for innovation and business development.

6. Tool Utilization: Ability to employ appropriate technologies, resources, software, and IT tools in statistical practice/research for complex problem prediction and simulation, while acknowledging technical limitations.

6-1 Conduct efficient literature searches and information retrieval from domestic and international sources.

6-2 Operate statistical software, database systems, and demonstrate programming proficiency for data-driven tasks.

7. Communication Expertise: Effectively engage in oral and written communication with industry professionals and public stakeholders regarding complex project issues.

7-1 Exhibit active listening and collaborative communication skills across project phases, with competencies in

report writing, technical documentation, presentations, and clear instructional responses.

7-2 Demonstrate cross-cultural communication competence in global contexts.

8.Team Collaboration: Work harmoniously within teams, contributing effectively as both member and leader.

8-1 Fulfill individual roles, comply with leadership directives, proactively assume responsibilities, and support teammates.

8-2 After 1-2 years of professional experience, lead teams and coordinate members to achieve project objectives.

9. Sustainable Development: Maintain physical health, mental well-being, and a commitment to lifelong learning through self-directed continuous education, ensuring adaptability to societal and personal growth demands.

9-1 Demonstrate strong self-directed learning proficiency, enabling rapid acquisition of new knowledge and emerging technologies.

9-2 Exhibit adaptive capacity for continuous knowledge renewal, proactively mastering new competencies required for evolving job roles, domains, and responsibilities.

III. Schooling System

Four years.

IV. Length of Study

Flexible study period, generally four years, the minimum length of flexibility is not less than three years, the longest not more than six years.

V. Requirements for Graduation and Degree Conferring

In order to graduate, students must complete the minimum number of credits required by the Instructive Cultivation Plan for each category of study and all the content required by the Extracurricular Class, with a total of 163 credits, and a Bachelor of Science degree if they meet the requirements for the award of a Bachelor's degree.

VI. Discipline

Statistics.

VII. Core Courses

Mathematical Analysis, Advanced Algebra, Fundamentals of Probability, Microeconomics, Macroeconomics, Introduction to Statistics, Mathematical Statistics, Sampling Techniques and Applications, Applied Multivariate Statistical Analysis, Applied Time Series Analysis, Applied Regression Analysis, Non-parametric Statistics, Data Mining, Fundamentals of Programming (C Language), Python Language Fundamentals, Introduction to Database Systems.

VIII. Course Structure and Course Hours (excluding Extracurricular Class)

Category	Total Credit	%	Total Course Hours	Theory Learning	Practical Training
Public Fundamental Course	39. 5	25	768	678	90
General Education	10	6	160	160	0

Professional Fundamental Course	41	25	656	592	64
Professional Course	42	26	672	552	120
Professional Practice	29. 5	18	856	0	856
Total	162	100	3112	1982	1130
Theory:Practical (%)	64: 36				

IX. Teaching schedule (1)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Public Fundamental Course	required	School of Marxism	b1080001	Basic Principles of Marxism	test	3	48	42	6	Autumn 1
	required	School of Marxism	b1080009	Ethics and the Rule of Law	non-test	3	48	42	6	Autumn 1
	required	School of Marxism	b1080006	Outline of Modern Chinese History	non-test	3	48	42	6	Spring 1
	required	School of Marxism	b1080010	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics	test	3	48	42	6	Autumn 2
	required	School of Marxism	b1080011	Introduxtion to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	test	3	48	42	6	Spring 2
	required	School of Marxism	-----	Situation and Policy (Modules 1 to 4)	non-test	2	32	28	4	Autumn 1 to Spring 2
	required	School of Marxism	b1080008	Labour Education A	non-test	0.5	16	16		Spring 1
	required	School of Foreign Languages and Cultural	b1020018	Academic Chinese	non-test	2	32	32		Autumn 1
	required	College of Physical Education	-----	Physical Education I to VI	non-test	3	160	160		Autumn 1 to Autumn 4
	required	Others	b1110003	Military skills	non-test	0.5	2W			Autumn 1
	required	Others	b1110002	Military theory	non-test	0.5	32	32		Spring 1
	required	Engineering Training	b1090001	Basic Engineering Training	non-test	2	32		32	Autumn 1
	required	Others	b1110004	Mental Health Education for University Students	non-test	2	32	16	16	Spring 1
	required	School of Computer and Information	b1012001	Applications and Practice of Artificial Intelligence	non-test	1	16	8	8	Spring 1
	required	School of Resources and Environment	b1013002	Low-carbon and Ecological Civilization	non-test	1	16	16		Autumn 1
	★ Academic English(Select 1 Module for 10 Credits)	Module A	b1020003	General English III	test	3	48	48		Autumn 1
			b1020004	General English IV	test	3	48	48		Spring 1
			b1020005	General Academic English A	test	2	32	32		Autumn 2
			---	English Knowledge Expansion	non-test	2	32	32		Spring 2
		Module B	b1020002	General English II	test	3	48	48		Autumn 1
			b1020003	General English III	test	3	48	48		Spring 1
			b1020006	General Academic English B	test	2	32	32		Autumn 2
			---	English Knowledge Expansion	non-test	2	32	32		Spring 2
		Module C	b1020001	General English I	test	4	64	64		Autumn 1
			b1020002	General English II	test	3	48	48		Spring 1
			b1020003	General English III	test	3	48	48		Autumn 2
	★ Academic German	School of Foreign Languages and Cultural	b1020040	Academic German I	test	3	48	48		Autumn 1
		School of Foreign Languages and Cultural	b1020041	Academic German II	test	3	48	48		Spring 1
		School of Foreign Languages and Cultural	b1020042	Academic German III	test	4	64	64		Autumn 2
	★ Academic Japanese	School of Foreign Languages and Cultural	b1020077	Academic Japanese I	test	3	48	48		Autumn 1
		School of Foreign Languages and Cultural	b1020078	Academic Japanese II	test	3	48	48		Spring 1
		School of Foreign Languages and Cultural	b1020079	Academic Japanese III	test	4	64	64		Autumn 2
Subtotal (Public Fundamental Course)						**39.5**	**768**	**678**	**90**	
General Education	selective	Art Education Center	b0-----	Aesthetic Education	non-test	2	32	32		Autumn, Spring
	selective	Each College	b0-----	Social Sciences and Humanistic Qualities	non-test	4	64	64		Autumn, Spring
				Natural Sciences and Technology Innovation	non-test	4	64	64		Autumn, Spring
Subtotal (General Education)						**10**	**160**	**160**		

(★Note: The first foreign language is 10 credits in total, including 3 languages: Academic English, Academic German and Academic Japanese, choose the appropriate

language as required; when Academic English is chosen, please choose the appropriate module in Module A, B, C)

IX. Teaching schedule (2)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Professional Fundamental Course	required	School of Mathematics, Physics and Statistics	b2022019	Mathematical Analysis I	test	6	96	96		Autumn 1
	required	School of Mathematics, Physics and Statistics	b2022140	Higher Algebra	test	4	64	64		Autumn 1
	required	School of Mathematics, Physics and Statistics	b2022114	Microeconomics	test	3	48	48		Autumn 1
	required	School of Mathematics, Physics and Statistics	b2022011	Principles of Accounting	test	2	32	32		Autumn 1
	required	School of Mathematics, Physics and Statistics	b2022138	Python Language Fundamentals	non-test	3	48	24	24	Spring 1
	required	School of Mathematics, Physics and Statistics	b2022020	Mathematical Analysis II	test	6	96	96		Spring 1
	required	School of Mathematics, Physics and Statistics	b2022116	Fundamentals of Probability Theory	test	4	64	64		Spring 1
	required	School of Mathematics, Physics and Statistics	b2022117	Introduction to Statistics	test	3	48	32	16	Spring 1
	required	School of Mathematics, Physics and Statistics	b2022118	Macroeconomics	test	3	48	48		Spring 1
	required	School of Mathematics, Physics and Statistics	b2022120	Mathematical Statistics	test	3	48	40	8	Autumn 2
	required	School of Mathematics, Physics and Statistics	b2022165	Fundamentals of Programming (C)	test	4	64	48	16	Autumn 2
subtotal (Professional Fundamental Course)						**41**	**656**	**592**	**64**	
	required	School of Mathematics, Physics and Statistics	b2022029	Operations Research	test	2	32	32		Autumn 2
	required	School of Mathematics, Physics and Statistics	b2022127	National Economic Statistics	test	2	32	32		Autumn 2
	required	School of Mathematics, Physics and Statistics	b2022123	Applying multivariate statistical analysis	test	4	64	48	16	Spring 2
	required	School of Mathematics, Physics and Statistics	b2022124	Applied Regression Analysis	test	3	48	32	16	
	required	School of Mathematics, Physics and Statistics	b2022131	Categorical Data Analysis	test	2	32	32		Spring 2
	required	School of Mathematics, Physics and Statistics	b2022125	Sampling techniques and applications	test	2	32	32		Spring 2
	required	School of Mathematics, Physics and Statistics	b2022143	Introduction to Database Systems	non-test	2	32	24	8	Spring 2
	required	School of Mathematics, Physics and Statistics	b2022126	Applied time series analysis	test	3	48	32	16	Autumn 3
	required	School of Mathematics, Physics and Statistics	b2022006	Non-parametric statistics	test	2	32	32		Autumn 3
	required	School of Mathematics, Physics and Statistics	b2022002	Bayesian statistics	test	2	32	32		Autumn 3
	required	School of Mathematics, Physics and Statistics	b2022142	Market Research and Market Analysis	non-test	2	32	16	16	Autumn 3
	required	School of Mathematics, Physics and Statistics	b2022018	Data mining	non-test	3	48	32	16	Spring 3
	required	School of Mathematics, Physics and Statistics	b2022036	Econometrics	test	3	48	32	16	Spring 3
	required	School of Mathematics, Physics and Statistics	b2022003	E-commerce data analysis	non-test	2	32	32		Autumn 4
	Subtotal(Required Professional Course)					**34**	**544**	**440**	**104**	
	Select different courses in different modules for 8 credits	Module A	b2022174	Cloud Computing and Data Centers	test	2	32	24	8	Spring 3
			b2022136	Machine Learning	non-test	2	32	32		Autumn 4
			b2022175	Network and Data Security	test	2	32	24	8	Autumn 4
			B2022136	Machine Learning	non-test	2	32	24	8	Autumn 4
		Module B	b2022167	Advanced Probability Statistics	non-test	2	32	32		Autumn 4
			b2022132	Experimental design and analysis	test	2	32	32		Spring 3
			b2022023	Statistical forecasting and decision making						
			b2022171	Introduction to Environmental Engineering	non-test	2	32	32		Autumn 4
			b2022172	Introduction to Environmental Protection and Sustainability						
	Subtotal (Selective Professional Course)					**8**	**128**	**112**	**16**	
Subtotal (Professional Course)						**42**	**672**	**552**	**120**	

IX. Teaching schedule (3)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Professional Practice	required	School of Mathematics, Physics and Statistics	b4022068	Introduction to Applied Statistics	non-test	1	24		24	Autumn 1
	required	School of Mathematics, Physics and Statistics	b4022047	Spss statistical software	non-test	2	48		48	Summer 1
	required	School of Mathematics, Physics and Statistics	b4022048	R Language Fundamentals	non-test	2	48		48	Summer 1
	required	School of Mathematics, Physics and Statistics	b4022057	Database technology and applications	non-test	3	72		72	Summer 2
	required	School of Mathematics, Physics and Statistics	b4022014	Excel data processing and analysis	non-test	3	72		72	Summer 2
	required	School of Mathematics, Physics and Statistics	b4022018	Integrated training in social research and statistical analysis	non-test	3	72		72	Spring 3
	required	School of Mathematics, Physics and Statistics	b4000043	the Program of Applied Statistics Innovation and Entrepreneurship	non-test	2	48		48	Spring 3
	required	School of Mathematics, Physics and Statistics	b4020003	Labour Education B	non-test	0.5	16		16	Spring 3
	required	School of Mathematics, Physics and Statistics	b4022053	Python Language and Artificial Intelligence Applications	non-test	3	72		72	Summer 3
	required	School of Mathematics, Physics and Statistics	b4022051	R Advanced	non-test	2	48		48	Summer 3
	required	School of Mathematics, Physics and Statistics	b4022052	Selecting and writing a topic for a statistics paper	non-test	1	24		24	Autumn 4
	required	School of Mathematics, Physics and Statistics	b4022054	Comprehensive training of professional ability	non-test	1	24		24	Spring 4
	required	School of Mathematics, Physics and Statistics	b4022056	Applied Statistics Graduation Internship and Final Design (Thesis)	non-test	6	288		288	Spring 4
	Subtotal (Professional Practice)					**29.5**	**856**		**856**	
Extracurricular Class	required	Others	b5110001	Extracurricular Class	non-test	**1**	-	-	-	Autumn, Spring, Summer
Total						**161**	**3112**	**1982**	**1130**	

★1, Description of Selective Professional Course:

Selective Professional Courses are divided into modules according to different competency requirements, and students must take one of the modules and achieve the required credits for that module.

Module A: Focuses on big data analysis and modelling in addition to integrated basic competencies.

Module B: Focuses on environment statistics and industrial statistics in addition to integrated basic competencies.

2, Explanation of the relevance of professional certificates to the course:

The types and names of vocational qualifications relevant to the profession are as follows.

(1) Issued by the National Bureau of Statistics and the Ministry of Personnel: Junior Statistician Certificate (Certificate of Professional and Technical Qualification in Statistics).

(2) Issued by the National Bureau of Statistics and the Ministry of Education: Junior Survey Analyst (Certificate of Professional and Technical Qualification in Statistics).

(3) Issued by the Ministry of Personnel and the Ministry of Finance of the People's Republic of China: Junior Accountant's Certificate (Professional and Technical Accounting Qualification Certificate).

Students will be able to sit for the Technical Qualification Examination in Statistics and obtain the Junior Statistician Certificate through courses such as Introduction to Statistics, Mathematical Statistics, National Economic Statistics, Applied Multivariate Statistical Analysis, Applied Regression Analysis and Applied Time Series Analysis.

Students can take the Introduction to Statistics, Mathematical Statistics, Applied Multivariate Statistical Analysis, Applied Regression Analysis, Applied Time Series Analysis, Sampling Techniques and Applications, and Market Research and Market Analysis to obtain the Junior Survey Analyst qualification.

Students will be able to sit for the Professional Technical Accounting Qualification Examination and obtain the Junior Accountant qualification through the Principles of Accounting course.

X. Credit of Extracurricular Class

Through taking extracurricular classes, students are encouraged to take part in academic lectures, social practice activities, campus cultural and sports activities, innovative and entrepreneurial activities, voluntary activities, etc. to improve their social adaptability and enhance the competitiveness in the job market. Details are specified in Students' Manual.

Appendix I: Matrix of Supporting Relationships of Graduation Requirements to Cultivation Objectives（√）

Cultivation Objective / Graduation Requirements	Cultivation Objective 1	Cultivation Objective 2	Cultivation Objective 3
Graduation Requirement 1	√	√	√
Graduation Requirement 2			√
Graduation Requirement 3	√		√
Graduation Requirement 4	√		√
Graduation Requirement 5	√		√
Graduation Requirement 6	√		√
Graduation Requirements 7	√		√
Graduation Requirement 8	√		√
Graduation Requirement 9	√		√

Appendix II: Matrix of Supporting Relationships of Programs to Graduation Requirements（H/M/L）

Notes:

The strength of a course’s support for graduation requirements is indicated by “H/high, M/medium, L/weak”;

Strength of support is defined as the extent to which the course covers the graduation requirement indicator points, with H covering at least 80%, M at least 50%, and L at least 30%.