Training Program of Animal Science

I. Specialty introduction

Animal science is an important branch of bioscience. Its basic task is to recognize and master the genetic breeding rules of animals, growth and breeding mechanism, metabolic and digestion features, disease mechanisms and other laws of life and then provide quality, abundant and safe animal products for human beings by application of modern biotechnology. Relying on such bases as Shanghai Veterinarian Biotechnology Lab, the specialty of Animal Science is to cultivate inter-disciplinary and advanced innovation talents mastering basic theory and skills of breeding and improvement of new varieties, animal production management, feed nutrition regulation and animal disease prevention and control.

II. Training objectives and specifications

Animal Science is targeted to cultivate "industry leaders and social elites". Therefore, students are required to develop sound professional ethics, political quality and artistic appreciation, master basic theory and practical skills and ability in modern biotechnology, information technology, and animal breeding, reproduction, cultivation, management and disease prevention and control, and be competent in teaching, scientific research and animal husbandry and veterinary medicine administration, animal inspection and quarantine, feed and medicine inspection, animal production, biological product and veterinarian clinical practice as well as technology and management work in other fields.

III. Specifications and requirements

The specialty of Animal Science follows the flexible educational system and 4-6-year education system, in which students are permitted to graduate in advance after gaining at least 173.5 credits as required and also to extend the length of schooling for six years at most in general. Students will be awarded the bachelor's degree of agronomy in accordance with the *Regulations for Academic Degrees of the People's Republic of China* after completing the courses and teaching practice as

required in the training program of the profession, acquiring the required credits and passing the moral, intelligence and physical examinations.

A Knowledge structure

A1 Basic knowledge of literature, history, philosophy ad art, etc.-students are required to achieve further improvement on the basis of knowledge level fulfilled in basic education.

A2 Rudiments of research methods of social science discipline-students are allowed to learn the research methods of the discipline rather than learn simplified and relatively complete discipline outline or common knowledge through certain segment of a certain discipline after temporary academic exploration.

A3 Basic knowledge and cutting-edge knowledge of Sciences and Engineering-such knowledge should be closely related to the society and personal life and will be favorable for improving students' scientific literacy and engineering consciousness.

A4 Basic knowledge of mathematics and logistics-on the basis of basic education, students' quantitative analysis and logical thinking ability will be further improved.

A5 Core knowledge of Animal Science--demonstrate knowledge of all-round professional education and include such knowledge in the basic education courses and required courses of the specialty.

A5.1 Master the basic theory, basic knowledge and basic skills of such subjects as mathematics, physics and computer required by the specialty.

A5.1.1 Learn and understand the relevant knowledge of mathematics, chemistry and computer required for follow-up professional learning;

A5.1.2 Master such basic skills as inorganic, analytical and organic chemistry experiment operation and application of computers in animal science and the relevant fields of study;

A5.1.3 Master the basic methodology of scientific experiments (research).

A5.2 Completely master the basic knowledge of modern biology and knowledge hierarchy of animal science, and develop the skills of animal research, production and

development and also independent analytical and innovation research ability.

A5.2.1 Master the knowledge hierarchy of animal science and animal medicine, including Biochemistry (Class E), Zoology, Microbiology (Class E), General Genetics, Zoonomy, Zootomy, Biostatistics and Experiment Design, Cytobiology (Class B), Molecular Biology, Animal Immunology, Animal Nutrition, Animal Thremmatology, Animal Biotechnology, Veterinary Microbiology, Zoopathology, Animal Breeding Science (Class A), Feed Science, Animal Preventive Medicine, Animal Production Science, Literature Search Analysis and Scientific Writing, Animal Environmental Hygiene Science, Laboratory Animal Science, Zoopharmacology, Bioinformatics (Class A) and cutting-edge lectures on animal science, etc.

A5.2.2 Master necessary experiment skills of animal biotechnology and the relevant experimental data processing and analytical methods.

Table 1 Structure of Core Knowledge of Animal Science

Knowledge class	**Subdiscipline**	**Main courses and knowledge points**
Animal science fundamentals	Modern biology	General Genetics, biochemistry, cytobiology, microbiology, molecular biology
	Animal science fundamentals	Zoology, Zoonomy, Zootomy, Biostatistics and Experiment Design, Animal Immunology, Animal Nutrition, Animal Thremmatology, Animal Biotechnology, Veterinary Microbiology, Zoopathology, Animal Breeding Science (Class A), Feed Science, Animal Preventive Medicine, Animal Production Science
Application of animal science	Technical application of animal science	Literature Search Analysis and Scientific Writing, Animal Environmental Hygiene Science, Laboratory Animal Science, Zoopharmacology, Bioinformatics (Class A)
Cutting-edge animal science	Cutting-edge of animal science	Cutting-edge lecture of animal science
Animal	Animal science	Specialty practice, various scientific and

science practice	and technology practice	technological innovation projects, professional practice and graduation project

B Capacity requirements

B1 Clearing thinking and ability of accurate expression by languages and words

B2 Ability to discover, analyze and address problems.

B3 Critical thinking and ability of creative work

B4 Ability to cooperate with different types of persons

B5 Preliminary aesthetic ability of literary and artistic works

B6 Application ability of at least one foreign language

B7 Ability of lifelong learning

B8 Organization and management ability

B9 Ability of skillfully applying modern media technology to acquire scientific research information, including English information.

B10 Systematically master the basic experimental methods and skills of modern biology, animal science, animal medicine and relevant specialties; ability of experiment design and operation in hands-on activities; ability to conclude, summarize and analyze experimental results, to prepare academic paper and take part in academic exchange.

C Qualification requirements

C1 Ambitious and strong-minded--take cultural inheritance, truth pursuit, China's rejuvenation and human's welfare as self-mission and be persistent.

C2 Diligent, practical and aggressive-- be down-to-earth and do not love vanity. Be diligent and arduous and pursue for excellence.

C3 Physical and mental harmony and extensive vision-have sound physical and mental quality. Have a tolerant attitude for diversified cultures and broad international vision.

C4 Quick-witted and creative--be diligent in thinking, adept in research, have keen interest in creation, be adventurous and be skillful in problem solving.

C5 Have sound psychological quality, be able to grasp opportunities, be

courageous to counter difficulties and failure;

C6 Have sound professional ethics;

C7 Have comprehensive quality of extensive background subject knowledge.

IV. Composition of curriculum system and allocation proportion of credit hours

The graduate curriculum system of this specialty is composed of general education courses, major education courses, basic discipline courses, practice education courses and personalized education courses.

Course class	**Course subclass**	**Credit**	**Total credit hours**	**Prelection**	**Experiment Practice**	**Computer operati**
General education courses	Common required	25	496	416	80	
	Core general	12	192	192		
	General education	2	32		32	
Major education course	General	30	480	480		
	Subject	31.5	528	480	32	16
	Professional	27	432	432		
Practice education course	Various	17	532		532	
	Various practice	6	192		192	
	Military training	3	48		48	
	Graduation	10	512		512	
Personalized education course **(The 2nd specialty, or academic extension course, or**		10	160	160		
Total credits		173.5	3604	2160	1428	16

V. Arrangement of extracurricular practice teaching activities

In addition to 580 credit hours of teaching experiment (including computer operation) and 18.5 credits in the practice teaching link of this specialty, the extracurricular practice teaching also includes:

Class of extracurricular practice teaching	Credit	Number of weeks	Remarks
Extracurricular practice of general fundamental courses in general education	5	3	96 academic hours of extracurricular practice will be arranged for "Marxist theory and ideological and political
General education practice	2	2	Summer vacation time in the first academic year
Military training	3	3	Summer vacation time in the first academic year
Engineering practice (Class B)	2	2	The third semester
Innovation practice project	2	2	Graduate students are required to take part in such innovation practice programs as PRP, IPP and Nongyao Program and to acquire 2 credits at least.
Specialty practice	2	2	Summer vacation time in the third academic year
Graduation thesis (project)	10	16	2 credits are required for the second and third years and oral defense will be arranged in the 8th semester with 10 credits in
Total credits required	26	30	Experiment teaching is excluded.

VI. Main course of the specialty

Main courses of this specialty include Molecular Biology Cytobiology Microbiology Zoology General Genetics Zootomy Biochemistry Biostatistics and Experiment Design, Bioinformatics (Class A) Zoonomy Animal Nutrition, General Genetics, Animal Thremmatology, Animal Breeding Science (Class A), Animal Immunology, Veterinary Microbiology, Animal Preventive Medicine, Zoopathology, Animal Production Science, Animal Biotechnology as well as experiment and practice courses supporting the main courses.

VII. Specific information of curriculum provision

(1) Core courses of general education

The optional courses of general education are all defined by the school and divided into such models as human science, social science, natural science, engineering science and technology (please refer to Optional Courses of General Education of Shanghai Jiao Tong University). Students are required to acquire 12 credits and 2 in each class of courses. Taking courses with the same or similar contents and property with the major courses is not permitted.

(2) Basic courses

Basic courses are required courses, including general subject courses and professional basic courses.

General subject courses include Inorganic and Analytical Chemistry (Class B), Organic Chemistry, Programming Design Fundamental (C++), Advanced Mathematics (Class B), Linear Algebra (Class B), Probability Statistics (Class B) and University Physics (Class B).

Professional basic courses include Biochemistry (Class E), Zoology, Microbiology (Class E), General Genetics, Zoonomy, Zootomy, Biostatistics and Experiment Design, Cytobiology (Class B), Molecular Biology, Animal Immunology and Animal Nutrition.

(3) Required courses of the specialty

Required courses of the specialty include Animal Thremmatology Animal Biotechnology Veterinary Microbiology Zoopathology Animal Breeding Science (Class A), Feed Science, Animal Preventive Medicine and Animal Production Science.

(4) Optional courses of the specialty

Optional courses of the specialty (comprehensive class) include Literature Search Analysis and Scientific Writing, Animal Environmental Hygiene Science,

Laboratory Animal Science, Zoopharmacology, Bioinformatics (Class A) and Cutting-edge Lecture of Animal Science.

(5) Personalized education courses

Personalized education courses are optional for students and students involved are required to acquire 10 credits after completion. Credits will be acquired after completion of all courses required except for those acquired from required and optional courses in general education courses, major education course and practice education course of the specialty's training program, such as credits from the second major, optional courses, additional credits after the satisfactory completion of the restrictive modules of the specialty, specialty optional courses of certain major without credit requirements, College Basic English (3) and (4) and other recognized credits.