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n in this program, the student is required to acquire:

Students study the fundamental subjects for one year after entering the university to acquire the basic knowledge required for studying the expertise. Then they mainly study the specialized fundamental subjects common for the all students of School of Applied Biological Science in the second semester of the second year. Particularly, they take the subjects of Laboratory Work in General Chemistry, Laboratory Work in General Physics, and Laboratory Work in General Biology I & II (including computer exercise) as those regarding experiments that are common for all students of the School of Applied Biological Science that consist of to get basic training for experiments in a wide area that is commonly required for the students of the School of Applied Biological Science. Students acquire a wide range of intelligence, capability in foreign languages such as English, data processing skills, basic knowledge common for the students of the School of Applied Biological Science, understanding for bioethics and ethics of science by the first semester of the second year to allow themselves to understand the aim and characteristics of each major program and select the most appropriate program.

6. Available qualification

(1) Educational personnel certification: Type 1 License for High School Teacher (science)

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		“Basic Laboratory Work in Chemistry” or “Experimental Methods and Laboratory Work in Chemistry I” (Note5)	1		⊙	⊙							
		“Experimental Methods and Laboratory Work in Biology I”	1	Required		⊙							
	Total	40											

Table of Registration Standards(Specialized Fundamental Subjects)

(Integrative Hydrospheric Science Program, Applied Animal and Plant Science Program, Food Science Program, Molecular Agro-Life Science Program)

Type	Subject type	Required No. of credits	Class subjects	No. of credits	Year in which the subject is taken															
					1 st grade		2 nd grade		3 rd grade		4 th grade									
					Springs	Fall	Springs	Fall	Springs	Fall	Springs	Fall								
Specialized Subjects	Specialized Fundamental Subjects	24	Introduction to Applied Biological Sciences	2	<input type="radio"/>															
			Introduction to Microbiology	2	<input type="radio"/>															
			Introduction to Molecular Biochemistry	2		<input type="radio"/>														
			Agricultural Production Resources	2		<input type="radio"/>														
			Physics for Applied Biological Science	2		<input type="radio"/>														
			Ethics of Science and Technology	2		<input type="radio"/>														
			Statistics in Biology	2			<input type="radio"/>													
			Environmental Sciences for Bioproduction	2			<input type="radio"/>													
			Laboratory Work in General Biology I	1			<input type="radio"/>													
			Laboratory Work in General Biology II	1			<input type="radio"/>													
			Laboratory Work in General Chemistry	1			<input type="radio"/>													
			Laboratory Work in General Physics	1			<input type="radio"/>													
			Required Subjects: Total 20 credits																	

			Seminar in Field Science	2		<input type="radio"/>						
			Research Front of Bioresource Sciences	2		<input type="radio"/>						
			Research Front of Food and AgriLife Science	2		<input type="radio"/>						
			Introduction to Physiology	2			<input type="radio"/>					
			Public Health	2						<input type="radio"/>		
<p>Elective Required Subjects</p> <p>Take 6 credits from above subjects</p> <p>(Redundant credits over 6 credits move to Elective Subjects in each Program)</p>												

○ Instruction regarding credits

Note 1: The year indicated with a circle mark represents that in which students typically take the subject. The year with a double circle mark indicates the year in which students are highly recommended to take the subject. Students are allowed to take the subject in any year after that indicated with a circle or double circle mark. It is required to confirm the semester in which the subject is provided in the class schedule for liberal arts education subjects in the Students' Handbook because some subjects might be provided in different semester from that which is provided in this document.

Note 2: The credit for "Field Research in the English-speaking World" that is earned through such as a short-term study abroad and that for "Online English Seminar I," "Online English Seminar II," and "Online English Seminar III" that is earned through a self-study, are accepted as the credit for English required for graduation. Achievement in a foreign language skill test and language training might be accepted as a credit. For further information, refer to the description regarding English subjects in the liberal arts education and the item "Credit based on Achievement in Foreign Language Skill Test" in the Students Handbook.

(PP. 30 - 31, Liberal Arts)

Note 3: It is required to earn 4 credits or more for the natural science subjects and 4 credits or more for the human & social science subjects.

However, "Fundamentals of Biology" of the natural science subjects is a subject for which students are requested to take if he/she did not take biology subjects in the entrance exam (including the University Testing Center Examination).

For the other students, the credit for the subject "Fundamentals of Biology" is not accepted as that for graduation.

It is allowed to include up to 4 credits for society-related subjects as credits for the Human & Social Science Subjects.

Note 4: For health & sports subjects, it is recommended to take a practicum in sports.

Note 5: It is required to take "Basic Laboratory Work in Chemis

Table of Registration Standards(Specialized Fundamental Subjects)

(Integrative Hydrospheric Science Program, Applied Animal and Plant Science Program, Food Science Program, Molecular Agro-Life Science Program)

Type	Subject type	Required No. of credits	Class subjects	No. of credits	Year in which the subject is taken															
					1 st grade		2 nd grade		3 rd grade		4 th grade									
					Springs	Fall	Springs	Fall	Springs	Fall	Springs	Fall								
Specialized Subjects	Specialized Fundamental Subjects	24	Introduction to Applied Biological Sciences	2	<input type="radio"/>															
			Introduction to Microbiology	2	<input type="radio"/>															
			Introduction to Molecular Biochemistry	2		<input type="radio"/>														
			Agricultural Production Resources	2		<input type="radio"/>														
			Physics for Applied Biological Science	2		<input type="radio"/>														
			Ethics of Science and Technology	2		<input type="radio"/>														
			Statistics in Biology	2			<input type="radio"/>													
			Environmental Sciences for Bioproduction	2			<input type="radio"/>													
			Laboratory Work in General Biology I	1			<input type="radio"/>													
			Laboratory Work in General Biology II	1			<input type="radio"/>													
			Laboratory Work in General Chemistry	1			<input type="radio"/>													
			Laboratory Work in General Physics	1			<input type="radio"/>													
			Required Subjects: Total 20 credits																	

			Seminar in Field Science	2		<input type="radio"/>						
			Research Front of Bioresource Sciences	2		<input type="radio"/>						
			Research Front of Food and AgriLife Science	2		<input type="radio"/>						
			Introduction to Physiology	2			<input type="radio"/>					
			Public Health	2						<input type="radio"/>		
<p>Elective Required Subjects</p> <p>Take 6 credits from above subjects</p> <p>(Redundant credits over 6 credits move to Elective Subjects in each Program)</p>												

		Environmental Animal Physiology Topics in Applied Animal and Plant Science II Topics in Applied Animal and Plant Science III					○			
		Elective Required Subjects: Take 14 credits from above subjects (Redundant credits over 14 credits move to Elective Subjects)								
		Elective Subjects At least 15 credits must be obtained. • Specialized subjects from other Applied Biological Science programs can be included in the elective subjects. • Up to 10 credits obtained from specialized subjects at another School and from subjects offered by the AIMS Program completed at the dispatch destination can be included in the credits required for graduation. • Credits obtained from Liberal Arts Education Subjects and subjects related to the teaching program cannot be included in the credits required for graduation.								
		124								

[Credits required for graduation] 124 credits (40 credits for liberal arts education subjects + 26 credits for specialized fundamental subjects + 58 credits for specialized subjects)

Results of study in Applied Animal and Plant Science Program

Relation between evaluation items and evaluation criteria

Study achievement		Evaluation criteria			
Evaluation items		Excellent	Very Good	Good	
K n o w l e d g & u n d e r s t a n d i n g	(1)	Ability for comprehensive and cross-disciplinary thinking and knowledge / understandings required to see a phenomena from a broad, top-down perspective and to take action for solving problems regarding the specialized area.	Has superior ability for comprehensive and cross-disciplinary thinking and capability to see a phenomenon from a broad, top-down perspective and to take action for solving problems regarding the specialized area.	Has sufficient ability for comprehensive and cross-disciplinary thinking and capability to see a phenomenon from a broad, top-down perspective and to take action for solving problems regarding the specialized area.	Has basic ability for comprehensive and cross-disciplinary thinking and capability to see a phenomenon from a broad, top-down perspective and to take action for solving problems regarding the specialized area.
	(2)	Basic knowledge and understanding required for acquiring expertise	Has fundamental knowledge and profound understanding required for acquiring expertise, and is capable of explaining this knowledge while associating it with items related to other areas.	Has fundamental knowledge and profound understanding required for acquiring expertise, and is capable of sufficiently explaining this knowledge while associating it with items related to other areas.	Has fundamental knowledge and profound understanding required for acquiring expertise, and is capable of providing basic explanation of this knowledge while associating it with items related to other areas.
	(3)	Knowledge and understanding regarding natural phenomena related to animal and plant production in levels of molecule, cell, and individual organism and production environment that supports the phenomena	Capable of providing detailed explanation regarding natural phenomena related to animal and plant production in levels of molecule, cell, and individual organism and production environment that supports the phenomena.	Capable of providing explanation regarding natural phenomena related to animal and plant production in levels of molecule, cell, and individual organism and production environment that supports the phenomena.	Capable of providing basic explanation regarding natural phenomena related to animal and plant production in levels of molecule, cell, and individual organism and production environment that supports the phenomena.
	(4)	Knowledge and understanding regarding the mechanism of animal and plant production in fields and relation between animals and the human society and natural environment.	Sufficiently understands the mechanism of animal and plant production in fields and relation between animals and the human society and natural environment.	Understands the mechanism of animal and plant production in fields and relation between animals and the human society and natural environment.	Substantially understands the mechanism of animal and plant production in fields and relation between animals and the human society and natural environment.
	(1)	Basic ability in communication, information processing, and physical activities required for acquiring expertise	Has superior ability in all the elements regarding communication, information processing, and physical activities required for acquiring expertise.	Has sufficient ability in all the elements regarding communication, information processing, and physical activities required for acquiring expertise.	Has basic ability in all the elements regarding communication, information processing, and physical activities required for acquiring expertise.

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| (2) Basic experimentation abilities and skills required for acquiring expertise | Has sufficient basic experimentation abilities and skills required for acquiring expertise, and is capable of autonomously applying them. | Has sufficient basic experimentation abilities and skills required for acquiring expertise, and is capable of autonomously applying them under instruction. | Generally has sufficient basic experimentation abilities and skills required for acquiring expertise, and is capable of supporting their execution. |
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Ability for basic biological analysis and

(3)

c a n p a s i b i v i l i	(1) Ability to identify issues that he/she should pursue for a specific phenomenon related to animal and plant production, organize his/her own opinion, logically publish them orally and/or in writing, and discuss the topic	Has advanced capabilities regarding elements of comprehensive ability and skills for such as identification of targeted issues, information processing, statistical analysis, and responsive communication.	Has capabilities regarding elements of comprehensive ability and skills for such as identification of targeted issues, information processing, statistical analysis, and responsive communication.	Has basic capabilities regarding elements of comprehensive ability and skills for such as identification of targeted issues, information processing, statistical analysis, and responsive communication.
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Role of liberal arts education in this program

The liberal arts education in this program aims to build both the language skills and the academic foundation required for the specialized education. It develops not only a capability for studying autonomously and a scientific intelligence based on the ability to collect, analyze and criticize data, but also language skills that allow the student to exchange ideas with others in English. Also, it enhances insight from a broad perspective for the essentials and the background of phenomena, and the linguistic ability and concern for peace which are required for a citizen of the world. It enables students to acquire the ability to integrate findings and establish a "knowledge system" that is really useful for problem solving, and to examine phenomena using a top-down perspective based on this integrated knowledge.

Specialized subjects	Agricultural Production Resources	2	Required	2nd semester\	10	2	70	1			10	1											10	1	100
Specialized subjects	Physics for Applied Biological Science	2	Required	2nd semester			80	1	20	1															100
Specialized subjects	Ethics of Science and Technology	2	Required	2nd semester	10	2	70	1			10	1											10	1	100
Specialized subjects	Statistics in Biology	2	Required	3rd semester			70	1					20	3	10	3									100
Specialized subjects	Environmental Sciences for Bioproduction	2	Required	3rd semester			80	1	10	1	10	1													100
Specialized subjects	Laboratory Work in General Biology I	1	Required	3rd semester			10	1							80	1							10	1	100
Specialized subjects	Laboratory Work in General Biology II	1	Required	3rd semester			10	1							80	1							10	1	100
Specialized subjects	Laboratory Work in General Chemistry	1	Required	3rd semester			10	1							80	1							10	1	100
Specialized subjects	Laboratory Work in General Physics	1	Required	3rd semester			10	1							80	1							10	1	100
Specialized subjects	Seminar in Field Science	2	Elective required	2nd semester	10	2	60	1			10	1			10	2							10	1	100
Specialized subjects	Research Front of Bioresource Science	2	Elective required	2nd semester	10	1	60	1	10	1	10	1											10	1	100
Specialized subjects	Research Front of Food and AgriLife Science	2	Elective required	2nd semester	10	1	60	1	10	1	10	1											10	1	100
Specialized subjects	Introduction to Physiology	2	Elective required	3rd semester			80	1	10	1	10	1													100
Specialized subjects	Public Health	2	Elective required	6th semester	10	3	60	1			20	1											10	1	100
Specialized subjects	Plant Nutritional Physiology	2	Required	4th semester					80	1	10	1											10	1	100
Specialized subjects	Agricultural Soil Science	2	Required	4th semester					80	1	10	1											10	1	100
Specialized subjects	Animal Breeding and Genetics	2	Required	4th semester					80	1	10	1											10	1	100
Specialized subjects	Animal Nutrition	2	Required	4th semester					80	1	10	1											10	1	100
Specialized subjects	Animal Functional Anatomy	2	Required	4th semester					80	1	10	1											10	1	100
Specialized subjects	Introduction to Applied Animal and Plant Science	2	Required	4th semester	10	1	60	1	10	1	10	1											10	1	100
Specialized subjects	Laboratory and Field Works in Applied Animal and Plant Science	1	Required	4th semester					10	1						30	1	30	1	30	1				100
Specialized subjects	Laboratory and Field Works in Animal Production I	1	Required	4th semester					10	1					5	3	75	1					10	1	100
Specialized subjects	Reading of Foreign Literature in Applied Animal and Plant Science	2	Required	5th semester									50	1								50	1		100
Specialized subjects	Reproductive Biology	2	Required	5th semester					80	1	10	1											10	1	100

Specialized subjects	Production System in Livestock	2	Required	5th semester					10	1	80	1												10	1	100	
Specialized subjects	Laboratory and Field Works in Plant Production	1	Required	5th semester					10	1						30	1	30	1	30	1						100
Specialized subjects	Laboratory and Field Works in Animal Production II	1	Required	5th semester					10	1								75	1	5	3			10	1	100	
Specialized subjects	Farm Practice	1	Required	5th semester							10	1						10	3	70	1			10	1	100	
Specialized subjects	Agricultural Plant Production and Biotechnology	2	Elective required	5th semester					80	1	20	1														100	
Specialized subjects	Animal Welfare	2	Elective required	5th semester	10	3					80	1												10	1	100	
Specialized subjects	Animal Physiology and Production	2	Elective required	5th semester					20	1	70	1												10	1	100	
Specialized subjects	Grassland and Feed Science	2	Elective required	5th semester					10	1	80	1												10	1	100	
Specialized subjects	Plant Molecular Biology	2	Elective required	5th semester					90	1	10	1														100	
Specialized subjects	Training for Animal Food Processing	1	Elective required	5th semester							80	1			20	1										100	
Specialized subjects	Seminar in Dairy Field Science	2	Elective required	5th semester							10	1							10	3	70	1		10	1	100	
Specialized subjects	Topics in Applied Animal and Plant Science I	1	Elective required	5th semester					20	1	80	1														100	
Specialized subjects	Food Hygiene	2	Elective required	6th semester	10	1	10	1	10	1	70	1														100	
Specialized subjects	Food Biochemistry	2	Elective required	6th semester					80	1	10	1												10	1	100	
Specialized subjects	Environmental Animal Physiology	2	Elective required	6th semester					10	1	80	1												10	1	100	
Specialized subjects	Topics in Applied Animal and Plant Science II	1	Elective required	6th semester					20	1	80	1														100	
Specialized subjects	Topics in Applied Animal and Plant	1	Elective required	6th semester					20	1	80	1														100	
Specialized subjects	Graduate Thesis I -III	6	Required	6th-8th semester	10	3	5	3						5	3	5	3						10	3	65	10	100

Attachment 4

Curriculum map for Applied Animal and Plant Science Program

Study achievement Study achievement	1st year		2nd year		3rd year		4th year	
	1st semester	2nd semester	3rd semester	4th semester	5th semester	6th semester	7th semester	8th semester
① Knowledge and understanding required to see a phenomenon from a broad, top-down perspective and for action based on comprehensive and cross-disciplinary thinking	Peace Science Courses (◎)	Research Front of Bioresource Science (○)			Animal Welfare (○)	Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)
	Seminar for developing intelligence (◎)	Research Front of Food and AgriLife Science (○)		Introduction to Applied Animal and Plant Science (◎)		Public Health (○)		
	Introduction to University Education (◎)	Ethics of Science and Technology (◎)				Food Hygiene (○)		
	Introduction to Applied Biological Science (◎)	Agricultural Production Resources (◎)						
		Seminar in Field Science (○)						

knowledge & understanding

②Basic knowledge and understandings required for acquiring expertise	Area Courses subjects (○)							
	Introduction to Applied Biological Science(◎)	Organic Chemistry (◎)	Statistics in Biology (◎)	Introduction to Applied Animal and Plant Science (◎)		Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)
	Introduction to Microbiology (◎)	Cell Science (◎)	Introduction to Physiology (○)			Public Health(○)		
	Introduction to Applied Biological Science(◎)	Research Front of Bioresource Science (○)						
	Introduction to Microbiology (◎)	Research Front of Food and AgriLife Science (○)	Environmental Sciences for Bioproduction(◎)			Food Hygiene(○)		
		Ethics of Science and Technology(◎)	Laboratory Work in General Biology I & II (◎)					
		Agricultural Production Resources(◎)	Laboratory Work in General Chemistry (◎)					
		Physics for Applied Biological Science(◎)	Laboratory Work in General Physics (◎)					
		Introduction to Molecular Biochemistry(◎)						
	Seminar in Field Science (○)							

Knowledge & understandingKnowledge & understandingKn

Knowledge and understanding regarding natural phenomena related to animal and plant production in levels of molecule, cell, and individual organism and production environment that supports the phenomena

Introduction to Applied Biological Science(◎)	Research Front of Bioresource Science (○)	Introduction to Physiology (○)	Plant Nutritional Physiology(◎)	Reproductive Biology (◎)	Food Hygiene (○)		
Introduction to Microbiology (◎)	Research Front of Food and AgriLife Science (○)	Environmental Sciences for Bioproduction(◎)	Agricultural Soil Science(◎)	Production System in Livestock (◎)	Food Biochemistry (○)		
	Physics for Applied Biological Science(◎)		Animal Breeding and Genetics (◎)	Laboratory and Field Works in Plant Production (◎)	Environmental Animal Physiology (○)		
	Introduction to Molecular Biochemistry(◎)		Animal Nutrition (◎)	Laboratory and Field Works in Animal Production II (◎)	Topics in Applied Animal and Plant Science II (○)		
			Animal Functional Anatomy (◎)	Agricultural Plant Production and Biotechnology (○)	Topics in Applied Animal and Plant Science III (○)		
			Introduction to Applied Animal and Plant Science (◎)	Animal Physiology and Production (○)			
			Laboratory and Field Works in Applied Animal and Plant Science (◎)	Grassland and Feed Science (○)			
				Plant Molecular Biology (○)			
				Topics in Applied Animal and Plant Science I (○)			

④ Knowledge and understanding regarding the mechanism of animal and plant production in fields and relation between animals and the human society and natural environment.	Introduction to Applied Biological Science(◎)	Research Front of Bioresource Science (○)	Introduction to Physiology (○)	Plant Nutritional Physiology(◎)	Reproductive Biology (◎)	Public Health(○)		
		Research Front of Food and AgriLife Science (○)	Environmental Sciences for Bioproduction(◎)	Agricultural Soil Science(◎)	Production System in Livestock (◎)	Food Hygiene (○)		
		Ethics of Science and Technology(◎)		Animal Breeding and Genetics (◎)	Farm Practice (◎)	Food Biochemistry (○)		
		Agricultural Production Resources(◎)		Animal Nutrition (◎)	Agricultural Plant Production and Biotechnology (○)	Environmental Animal Physiology (○)		
		Seminar in Field Science (○)		Animal Functional Anatomy (◎)	Animal Welfare (○)	Topics in Applied Animal and Plant Science II (○)		
				Introduction to Applied Animal and Plant Science (◎)	Animal Physiology and Production (○)	Topics in Applied Animal and Plant Science III (○)		
					Grassland and Feed Science (○)			
					Plant Molecular Biology (○)			
					Topics in Applied Animal and Plant Science I (○)			
				Seminar in Dairy Field Science (○)				

Ability & skills	①Basic communication, information processing, and physical activities	Foreign Languages (○)(◎)		Statistics in Biology (◎)		Reading of Foreign Literature in Applied Animal and Plant Science (◎)	Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)
		Information and Data Science Courses (◎)							
		Health and Sports Courses (○)							
	②7Basic experiment abilities and skills required for acquiring expertise				Laboratory and Field Works in Animal Production I (◎)	Training for Animal Food Processing (○)	Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)
		"Basic Laboratory Work in Chemistry"							
				"Experimental Methods and Laboratory Work in Biology I"					
				Seminar in Field Science (○)	Statistics in Biology (◎)				
					Laboratory Work in General Biology I & II (◎)				
					Laboratory Work in General Chemistry (◎)				
	③Ability for basic biological analysis and evaluation regarding production function of animals and plants in levels of molecule, cell, and individual organism				Laboratory and Field Works in Applied Animal and Plant Science (◎)	Laboratory and Field Works in Plant Production (◎)			
			Laboratory and Field Works in Animal Production I (◎)						

Ability & skill	④Basic techniques for handling and testing of animals and plants and those for breeding, cultivation, and management				Laboratory and Field Works in Applied Animal and Plant Science (◎)	Laboratory and Field Works in Plant Production (◎)			
						Laboratory and Field Works in Animal Production II (◎)			
						Farm Practice (◎)			
						Seminar in Dairy Field Science (○)			
	⑤Ability for basic evaluation of breeding environment in fields of animal and plant production				Laboratory and Field Works in Applied Animal and Plant Science (◎)	Laboratory and Field Works in Plant Production (◎)			
						Laboratory and Field Works in Animal Production II (◎)			
						Farm Practice (◎)			
						Seminar in Dairy Field Science (○)			
	⑥Ability regarding scientific English that is required as a basis for understanding technical English manuals and international communication capabilities based on the acquired knowledge and approach method for the field					Reading of Foreign Literature in Applied Animal and Plant Science (◎)	Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)

Comprehensive capability	①Ability to identify issues that he/she should pursue for a specific phenomenon related to animal and plant production, organize his/her own opinion, logically publish them orally and/or in writing, and discuss the topic	Introduction to Applied Biological Science(◎)	Research Front of Bioresource Science (○)	Laboratory Work in General Biology I & II (◎)	Plant Nutritional Physiology (◎)	Reproductive Biology (◎)	Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)
			Research Front of Food and AgriLife Science (○)	Laboratory Work in General Chemistry (◎)	Agricultural Soil Science (◎)	Production System in Livestock (◎)	Public Health(○)		
			Ethics of Science and Technology(◎)	Laboratory Work in General Physics (◎)	Animal Breeding and Genetics (◎)	Laboratory and Field Works in Animal Production II(◎)	Food Biochemistry (○)		
			Agricultural Production Resources(◎)		Animal Nutrition (◎)	Farm Practice(◎)	Environmental Animal Physiology (○)		
			Seminar in Field Science (○)		Animal Functional Anatomy (◎)	Animal Welfare(○)			
					Introduction to Applied Animal and Plant Science (◎)	Animal Physiology and Production(○)			
					Laboratory and Field Works in Animal Production I(◎)	Grassland and Feed Science (○)			
						Seminar in Dairy Field Science (○)			

(Example) Liberal arts subjects Specialized fundame Specialized subjects Graduation thesis (◎) Required subject (○) Elective require (Δ) Elective subjects

