As of April 1, 2022

For entrants in FY 2022

Attachment Form 1

Description of Major Program

Name of Faculty (Department) [School of Applied Biological Science (Department of Applied Biological Science)]

Name of Program	Applied Animal and Plant Science Program

1.Degree to be obtained: Bachelor of Agriculture

2.Overview

The School of Applied Biological Science aims to educate students to acquire a wide range of knowledge and understanding in the realms of the natural and social sciences related to applied biology. Specifically, we provide education that allows students to ① acquire basic knowledge regarding food production, biotic resources, and biotechnology, ② gain experience in field science, ③ understand bioethics and engineering ethics, and ④ gain abilities in foreign languages, such as English, and in data processing.

In the Applied Animal & Plant Science Program, the education is provided by faculties involved in areas represented by five keywords (animal production, plant production, production environment, biotic resources, and biological function) to students to acquire basic knowledge and skills regarding production and use of animals and plants in land and use and to be capable of widely considering situations of related areas and solving problems. In this Program, students study to develop understanding about topics such as physiology of animals and plants, environment for animal and plant production, development of new useful functionality of animals and plants, theory and technology for healthy and modern animal and plant production, the relationship among nature, human beings and animals and plants, and use of animal and plant resources. Students gain the knowledge and skills related to those areas in lectures and they also acquire intellectual and practical abilities via experience in the field and experiments using animal and plant. In addition to that, they broaden their international vision in the foreign book reading course. Furthermore, students improve their abilities comprehensively through the graduation research.

This program aims to enable students to develop basic capabilities that can be used for the animal and plant production areas related to such as the sustainable production of animal and plant resources for foods with high quality and safety, and use of animal and plant resources for improving human life and to enhance the international vision related to such areas.

This Program educates students to become experts who have acquired a higher level of expertise in the graduate school after this program or a research worker and a specialist with an international point of view in such as a public office for agriculture and fisheries or in business fields related to agriculture, foods, and chemical and pharmaceutical products.

3.Diploma policy (policy for degree conferment and target to be achieved in the program)

The Applied Animal & Plant Science Program aims to develop human resources who are capable of working as a researcher and specialist in the field related to the animal and plant production areas, related to such as the sustainable production of animal and plant resources for foods with high quality and safety and use of animal and plant resources for improving human life. Therefore, in this program, the degree of Bachelor of Agriculture will be awarded to students who acquire the capabilities described below, earn the required credits and to satisfy the specified achievement level, and pass the examination that is administered by the School of Applied Biological Science.

● Through liberal arts education subjects:

(1) The ability to study autonomously; the ability to collect, analyze, and criticize data; and putting these abilities into practice;

(2) Insight, from a broad perspective, into the essentials and the background of phenomena, and the linguistic ability and concern about peace which are required for a citizen of the world;

(3) The ability to identify a problem based on broad knowledge, integrate findings to establish a "knowledge system" that is really useful for problem solving, and examine phenomena from a top-down perspective based on this integrated knowledge; and

(4) General and basic knowledge of science that enables the student to develop the knowledge and skills required for application in any of the specialty fields of applied biological science.

● Through the specialized fundamental subjects for specialized education, the student is required to acquire:

(5) The ability to understand cutting-edge topics, as well as the basic ideas related to organisms and the biosphere;

(6) The ability to understand the value orientation and relevance to a globalized society of applied biology, and the importance of communication and consensus building in relation to the application of scientific results; and

(7) Understanding of problems regarding research misconduct and the importance of research and engineering ethics.

● Through the specialized education in this program, the student is required to acquire:

(8) Systematic understanding regarding production and use of animal and plant resources from natural phenomena in molecular, cell, and individual organism levels to that in ecosystem and production environment;

(9) Systematic capabilities for data collection, analysis, and research and practical skills for applying such capabilities in academic fields regarding production and use of animal and plant resources; and

(10) Capability of applying such as the knowledge and skills that he/she has obtained in study on production and use of animal and plant resources in an integrated manner to solve problems that he/she identifies and logically present the conclusion orally or in writing and discuss with the other persons.

4.Curriculum policy (policy for arranging and executing the educational courses)

To enable students to achieve the targets that are defined for the Applied Animal and Plant Science Program, the educational courses are organized and executed according to the following policies:

(1) Courses in the liberal arts education aim to develop a wide-ranging and in-depth education and general intelligence, and to foster in students a depth of humanity and desire for peace. They also aim to develop practical foreign language abilities, an international perspective, the ability to understand different cultures, and the ability to utilize information and communication. In addition to this, courses in fundamental subjects are incorporated into the liberal arts education in order to develop professionals with the basic scientific knowledge and skills required for application in any of the specialty fields of applied biological science.

(2) Courses in special education develop basic capabilities related to biology and the biosphere through the "specialized fundamental subjects" that are common for all courses at the School of Applied Biological Science. The courses include exercises abroad, internships, field exercises, and lectures regarding scientific and engineering ethics in order to develop the ability to make a hypothesis and basic, practical capabilities required for activities undertaken in leading positions in the international and/or local community. The courses also aim to develop the ability to understand problems regarding research misconduct and the importance of research and engineering ethics.

(3) The courses in the specialized education for this Program provide the "specialized subjects" related to animal and plant production to allow students to acquire the ability for systematically understanding animal and plant production. Furthermore, the courses of "exercise" and "experiment & practice" for the related area are provided for students to acquire skills and attitudes that can be practically applied and used. In addition to that, students develop general capabilities for problem solving including skills for communication, presentation, and practical foreign language capability while preparing his/her "graduation thesis."

5.Start time and acceptance conditions

The School of Applied Biological Science holds the entrance examination collectively for the Department of Applied Biological Science. Students mainly take the liberal arts curricula that are held for the whole of the university (seminar for developing intelligence, subject regarding peace, introduction to university education, foreign language study, data processing study, disciplinary subjects, and subject regarding health & sports) in the first and second semesters of the first year and the first semesters of the second year. Assignment of students to the Applied Animal and Plant Science Program is actually conducted in the second semester of the second year.

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.

Students are allocated either of four major programs (Integrative Hydrospheric Science Program, Applied Animal & Plant Science Program, Food Science Program, and Molecular Agricultural Biology Program) based on his/her wish and achievement level in the second semester of the second year. Students who enter the university in the fiscal year are equally divided into four programs in principle. The digits after a decimal point are rounded up.

The student must meet the specified "requirements for allocation to the program" if he/she wishes to be allocated to the program.

6.Available qualification

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

(2) Curator License

(3) Appointment qualification for food sanitation supervisor and food sanitation inspector

* For details of acquisition of those qualifications, refer to the "Students Handbook."

(4) Qualification for examination for Class A hazardous materials engineer

7.Class subjects and their contents

* For the class subjects, refer to the subject table in Attachment 1.

* For the details of the class subjects, refer to the syllabus that is published for each academic year.

Achievement evaluation	Numerical conversion
S (Excellent: 90 or more points)	4
A (Very good: 80 - 89 points)	3
B (Good: 70 - 79 points)	2
C (Passed: 60 - 69 points)	1

8.Academic achievement

The evaluation criteria are specified for each academic achievement evaluation item, and the achievement level against the criteria is determined at the end of the semester.

The evaluation score for each evaluation item is converted to a numerical value (S = 4, A = 3, B = 2, and C = 1), and the evaluation standard for academic achievement, from when the student entered the university to the end of the semester, is determined using these values while applying weightings. The evaluation standards consist of three levels, i.e. Excellent, Very Good, and Good.

Study achievement	Evaluation standard
Excellent	3.00 - 4.00
Very Good	2.00 - 2.99
Good	1.00 - 1.99

* Refer to the relationship between evaluation items and evaluation criteria described in Attachment 2.

* Refer to the relationship between evaluation items and class subjects described in Attachment 3.

* Refer to the curriculum map in Attachment 4.

9.Graduation thesis (graduation research) (meaning, student allocation, timing, etc.)

(1) Purpose

The graduation research in this program (Graduate Thesis) aims to allow the student to dedicate himself/herself to cutting-edge research in order to systematically gain understanding of problems and their background in the field of applied biological science, as well as to acquire comprehensive capabilities while analyzing and considering the obtained results and presenting the results in English both orally and in writing.

(2) Overview and meaning

Students conduct the graduate research under the guidance of their supervisor. Through their graduation research, students engage with the process consisting of understanding the situation (comprehension ability and intelligence), identification of problems (analysis ability and insight), and presentation of the results (proposal and execution ability), and, by doing so, they acquire the capability and skills required to work as experts after their graduation.

Students learn the basic concepts and attitude fundamentally required for research activities, establish a plan for their research, study methods for the research and experiments, and carry out the research under the instruction of their supervisor. Furthermore, students review the results obtained in the research and define targets for the further research. Students experience a series of research processes in order to have the chance to observe research activities at the cutting edge. They prepare a graduation thesis based on the study results and submit it before the specified date.

Students are evaluated in the thesis examination.

(3) Timing and method for determining the supervisor

① The supervisor is determined in the 2nd semester of the 3rd academic year.

② The supervisor is determined under the guidance of the tutor. The tutor holds a guidance seminar for students to explain the specialties of each member of faculty. The tutor also instructs students to attend the presentation assembly for graduation theses and Masters theses in order to understand the details of research done by faculty members. Students visit a faculty member who he/she wants to choose as supervisor, and learn about the details of the graduation thesis and environment of the laboratory. Supervisors are designated after the tutor considers students' wishes and makes adjustments. Then the faculty committee of the program approves the designated supervisors.

10.Responsibility

(1) Responsibility for PDCA (plan, do, check, and act) cycle

① The education affairs committee of school and the faculty members who provide the lectures are engaged in the processes of "plan" and "do"

② The faculty committee of the program plans and executes the major program on their own responsibility. A chief faculty member is designated as the supervisor of the program.

③ The education affairs committee of the school exercises control over the major programs provided in the school.

④ The education affairs committee of the department consists of members who are elected for each program, a chairman who is chosen by the school, and another member.

⑤ The education reform promotion committee is engaged in the process of "check."

⑥ The education reform promotion committee consists of members who are elected in each program, a chairman who is chosen by the school, the chairman of the education affairs committee of the school, an assistant chief of the graduate course, and the other member(s).

⑦ The education reform promotion committee reviews and evaluates the major programs provided in each program, reports the results to the education affairs committee of the school and the programs, and provides advice and recommendations.

⑧ The faculty committee of the program that takes the responsibility for execution of the major program is engaged in the process of "act."

⑨The faculty committee of the program and the education affairs committee of the school prepare and execute a plan for improvement taking the report, advice, and recommendations that are provided by the education reform promotion committee after the check process into consideration.

⑩ A tutor is designated for each program to provide direction regarding study and life.

⑪ A supervisor is designated in to each student in the program to provide guidance regarding the graduation thesis. The mentor guides the students through the process of the graduation research until they graduate.

The faculty committee of the program, the education affairs committee of the school, and the education reform promotion committee cooperate with each other to execute their roles with responsibility in the cycle of "plan", "do", "check", and "act" to improve the education provided at the school.

(2) Evaluation of program

① Viewpoints for evaluation of program

The Applied Animal and Plant Science Program is evaluated from the viewpoints of "educational effectiveness" and "social effectiveness."

The "educational effectiveness" is evaluated by effects of the program execution on educational achievement in students.

The "social effectiveness" is evaluated by effects of the educational achievement in the program on the society.

② Evaluation method

In this program, the achievement in the program is evaluated from the viewpoints described above for students in the second semester of the fourth year. For the "educational effectiveness", the results and achievement of the students who took the program are evaluated comprehensively by the group of faculty members who are engaged in the execution of the program. Also, the level of achievement of all the students is evaluated and reviewed. The "social effectiveness" is evaluated based on such things as the rate of employment in corporations that have a close connection with the contents of this program and the pass rate in public servant examinations. We regularly request a human resources staff member of a company that employs mainly students of this program to evaluate this program. In addition to that, we request graduates of this program to evaluate both their own achievement and that of the program. The staff in the company and graduates are requested to provide evaluation and advice regarding whether the class subjects and their contents in this program were effective for social activities, whether the contents of class appropriately corresponded to the changes in science, technology, and society, and any class subjects that would be required for the future.

③ Policy and method for feedback to students

The education reform promotion committee regularly conducts inquiries and interviews for students to review and evaluate the program, improve the contents of the program, and provide advice and recommendations for improvement.

Attachment 2

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
Knowledge & understanding	(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.

Abilities & skills	(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.
	(3)	Ability for basic biological analysis and evaluation regarding production function of animals and plants in levels of molecule, cell, and individual organism	Capable of autonomously conducting biological observation, basic physiologic, biochemical, and molecular biological analysis and evaluation. Capable of analyzing data with an appropriate method.	Capable of conducting biological observation, basic physiologic, biochemical, and molecular biological analysis and evaluation according to instruction.	Understands methods for biological observation, basic physiologic, biochemical, and molecular biological analysis and evaluation.
	(4)	Basic techniques for handling and testing of animals and plants and those for breeding, cultivation, and management	Capable of appropriately cultivating and managing plants. Capable of autonomously breeding and managing resource and experiment animals for a long period of time. Has acquired skills for holding an animal and sampling.	Capable of cultivating and managing plants. Capable of breeding and managing resource and experiment animals according to instruction. Understands skills for holding an animal and sampling.	Capable of assisting in cultivating and managing plants. Capable of assisting breeding and managing resource and experiment animals.
	(5)	Ability for basic evaluation of breeding environment in fields of animal and plant production	Capable of autonomously evaluating conditions for cultivating and managing plants, those for breeding and managing animals, and environment conditions such as breeding facilities and foods.	Capable of evaluating conditions for cultivating and managing plants, those for breeding and managing animals, and environment conditions such as breeding facilities and foods according to instruction.	Capable of measuring conditions for cultivating and managing plants, those for breeding and managing animals, and environment conditions such as breeding facilities and foods according to instruction.
	(6)	Ability 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	Has very advanced ability for reading English texts, is capable of understanding technical manuals and has acquired sufficient and profound capability for international communication.	Has advanced ability for reading English texts, is capable of understanding technical manuals to some extent, and has acquired sufficient and profound capability for international communication.	Has ability for reading English texts, is capable of partly understanding technical manuals, and has acquired sufficient and profound capability for international communication.

capability	(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.

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.

Attachment 3

Relation between evaluation items and class subjects

Subject category	Name of class subject	Number of credits	Required or Electivee	Semester when the class is provided	Evaluation item																						Total of weightings for evaluation items for the subject
					Knowledge & understanding								Ability & skills												Comprehensive capability		
					(1)		(2)		(3)		(4)		(1)		(2)		(3)		(4)		(5)		(6)		(1)		
					Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	Weighting for evaluation item for the subject	Weighting for evaluation item	
Liberal arts education subjects	Peace Science Courses	2	Required	1st semester	100	1																					100
Liberal arts education subjects	Introductory Seminar for First-Year Students	2	Required	1st semester	100	1																					100
Liberal arts education subjects	Introduction to University Education	2	Required	1st semester	100	1																					100
Liberal arts education subjects	Foreign Languages	10	Required / Elective required	1st - 2th semesters									100	1													100
Liberal arts education subjects	Information and Data Science Courses	4	Required	1st - 2th semesters									100	1													100
Liberal arts education subjects	Area Courses	10	Elective required	1st - 6th semesters	100	1																					100
Liberal arts education subjects	Health and Sports Courses	2	Elective required	1st - 2nd semesters									100	1													100
Liberal arts education subjects	"Basic Calculus" or "Elements of Calculus"	2	Required	1st semester			100	1																			100
Liberal arts education subjects	Organic Chemistry	2	Required	2nd semester			100	1																			100
Liberal arts education subjects	Species Biology	2	Required	2nd semester			100	1																			100
Liberal arts education subjects	Cell Science	2	Required	2nd semester			100	1																			100
Liberal arts education subjects	"General Chemistry" or "Basic Concepts of Chemistry"	2	Required	1st semester			100	1																			100
Liberal arts education subjects	Basic Laboratory Work in Chemistry	1	Required	1st semesters											100	1											100
Liberal arts education subjectsLiberal arts education subjects	"Experimental Methods and Laboratory Work in Biology I"	1	Required	2nd semesters											100	1											100
Specialized subjects	Introduction to Applied Biological Science	2	Required	1st semester	10	1	60	1	10	1	10	1													10	1	100

Specialized subjects	Introduction to Microbiology	2	Required	1st semester			80	1	20	1																	100
Specialized subjects	Introduction to Molecular Biochemistry	2	Required	2nd semester			80	1	20	1																	100
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 Applied Biological Sciences	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 Science III	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 achievementStudy achievementStudy achievement Evaluation items	1st year		2nd year		3rd year		4th year	
	1st semester	2nd semester	3rd semester	4th semester	5th semester	6th semester	7th semester	8th semester
①Knowledge 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 Applied Biological Sciences (〇)			Animal Welfare(〇)	Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)
	Seminar for developing intelligence (◎)	Ethics of Science and Technology(◎)		Introduction to Applied Animal and Plant Science(◎)		Public Health(〇)		
	Introduction to University Education (◎)	Agricultural Production Resources(◎)				Food Hygiene(〇)		
	Introduction to Applied Biological Science(◎)	Seminar in Field Science(〇)						
	Area Courses subjects (〇)							

edge & understanding	②Basic knowledge and understandings required for acquiring expertise	Basic Calculus / Elements of Calculus (◎)	Organic Chemistry (◎)	Statistics in Biology (◎)	Introduction to Applied Animal and Plant Science（◎）		Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)
		General Chemistry / Basic Concepts of Chemistry (◎)	Cell Science (◎)	Introduction to Physiology (〇)			Public Health(〇)		
		Introduction to Applied Biological Science(◎)	Species Biology (◎)						
		Introduction to Microbiology (◎)	Research Front of Applied Biological Sciences (〇)	Environmental Sciences for Bioproduction(◎)			Food Hygiene（〇）		
			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 (〇)						

Knowledge & understandingKnowledge & understandingKnowle	③Knowledge 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 Applied Biological Sciences (○)	Introduction to Physiology (○)	Plant Nutritional Physiology(◎)	Reproductive Biology (◎)	Food Hygiene(○)		
		Introduction to Microbiology (◎)	Physics for Applied Biological Science(◎)	Environmental Sciences for Bioproduction(◎)	Agricultural Soil Science(◎)	Production System in Livestock(◎)	Food Biochemistry (○)		
			Introduction to Molecular Biochemistry(◎)		Animal Breeding and Genetics(◎)	Laboratory and Field Works in Plant Production(◎)	Environmental Animal Physiology (○)		
					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(○)	opics 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(○)			

	④Knowledge 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 Applied Biological Sciences (○)	Introduction to Physiology (○)	Plant Nutritional Physiology(◎)	Reproductive Biology (◎)	Public Health(○)		
			Ethics of Science and Technology(◎)	Environmental Sciences for Bioproduction(◎)	Agricultural Soil Science(◎)	Production System in Livestock(◎)	Food Hygiene(○)		
			Agricultural Production Resources(◎)		Animal Breeding and Genetics(◎)	Farm Practice(◎)	Food Biochemistry (○)		
			Seminar in Field Science (○)		Animal Nutrition(◎)	Agricultural Plant Production and Biotechnology(○)	Environmental Animal Physiology (○)		
					Animal Functional Anatomy(◎)	Animal Welfare(○)	Topics in Applied Animal and Plant Science II(○)		
					Introduction to Applied Animal and Plant Science(◎)	Animal Physiology and Production(○)	opics in Applied Animal and Plant Science III(○)		
						Grassland and Feed Science(○)			
						Plant Molecular Biology(○)			
						Topics in Applied Animal and Plant Science I(○)			

Ability & skills	①Basic communication, information processing, and physical activities	Foreign Languages (○)(◎)		Statistics in Biology (◎)		Seminar in Dairy Field Science（○）	Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)
		Information and Data Sciece 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 (◎)					
				Laboratory Work in General Physics (◎)					
	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 & skills	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 Applied Biological Sciences (○)	Laboratory Work in General Biology I & II (◎)	Plant Nutritional Physiology(◎)	Reproductive Biology (◎)	Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)
			Ethics of Science and Technology(◎)	Laboratory Work in General Chemistry (◎)	Agricultural Soil Science(◎)	Production System in Livestock(◎)	Public Health(○)		
			Agricultural Production Resources(◎)	Laboratory Work in General Physics (◎)	Animal Breeding and Genetics(◎)	Laboratory and Field Works in Animal Production II(◎)	Food Biochemistry (○)		
			Seminar in Field Science (○)		Animal Nutrition(◎)	Farm Practice(◎)	Environmental Animal Physiology (○)		
					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 subjec	(○) Elective require	(△) Elective subjects

Attachment 5

List of Faculty Members of the Applied Animal and Plant Science Program

Name of faculty	Name of program and position	Extension number	Laboratory	Mail address
Naoki Isobe	Professor	７９９３	Ｂ３０９	niso@hiroshima-u.ac.jp
Taketo Obitsu	Professor	７９５５	Ｂ５０６	tobitsu@hiroshima-u.ac.jp
Toshihisa Sugino	Professor	７９５６	Ｂ５０４	sugino@hiroshima-u.ac.jp
Hajime Tanida	Professor	７９７４	Farm	htanida@hiroshima-u.ac.jp
Masaoki Tudzuki	Professor	７９５０	Ｂ４０９	tsudzuki@hiroshima-u.ac.jp
Rumi Tominaga	Professor	７９６６	Ｂ１１２	rtomi@hiroshima-u.ac.jp
Takashi Bungo	Professor	７９５７	Ｂ５０７	bungo@hiroshima-u.ac.jp
Akihiro Ueda	Associate Professor	７９６３	Ｂ１１１	akiueda@hiroshima-u.ac.jp
Shinichi Kawakami	Associate Professor	３８５７	Ｂ５０５	skawak@hiroshima-u.ac.jp
Yuzo Kurokawa	Associate Professor	７９７３	Farm	yuzokuro@hiroshima-u.ac.jp
Toshinori Nagaoka	Associate Professor	７９６９	Ｂ１１１	tnagaok@hiroshima-u.ac.jp
Takashi Umehara	Assistant Professor	７８９９	Ｂ２１１	pd7221@hiroshima-u.ac.jp
Mayumi Kikuta	Assistant Professor	５７５４	Ｂ１１２	mkikuta@hiroshima-u.ac.jp
Qin Dong	Assistant Professor		Ｂ１１２	qindong@hiroshima-u.ac.jp
Naoki Suzuki	Assistant Professor	４１８２	Farm	naosuzuki@hiroshima-u.ac.jp
Aira Seo	Assistant Professor	４５８７	Farm	airaseosan@hiroshima-u.ac.jp
Yusaku Tsugami	Assistant Professor		Ｂ３０９	ytsugami@hiroshima-u.ac.jp
Yoshiaki Nakamura	Assistant Professor	７９４３	Ｂ４０９	ynsu@hiroshima-u.ac.jp
Takahiro Nii	Assistant Professor	４１４７	Ｂ４０８	tanii@hiroshima-u.ac.jp

* To call a direct phone number, dial the extension number after "082-424."

Table of Registration Standards (Liberal Arts Education 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	Type of course registration	Year in which the subject is taken							
								1st grade		2nd grade		3rd grade		4th grade	
								Springs	Fall	Springs	Fall	Springs	Fall	Springs	Fall
Liberal Arts Education	Peace Science Courses			2		2	Required	○							
	Basic Courses in University Education	Introductory Seminar for First-Year Students		2	Introductory Seminar for First-Year Students	2	Required	◎							
		Introduction to University Education		2	Introduction to University Education	2	Required	◎							
	Common Subjects	Foreign Languages	English(Note2) Basic English Usage	2	Communication Basic I	1	Required	◎							
					Communication Basic II	1			◎						
			English(Note2) Communication I	2	Communication I A	1	Required	◎							
					Communication I B	1		◎							
			English(Note2) Communication II	2	Communication II A	1	Required		◎						
					Communication II B	1			◎						
			Non-English Foreign Languages (Select one language)	4	Basic Foreign Language I	1	Elective Required	◎							
					Basic Foreign Language II	1		◎							
					Basic Foreign Language III	1			◎						
					Basic Foreign Language IV	1			◎						
		Information and Data Science Courses		4	Introduction to Information and Data Sciences(Note3)	2	Required	◎							
					Fundamental Data Science	2	Required		◎						
		Area Courses		9	(Note4)	1 or 2	Elective/ Required	○	○	○	○	○	○		
		Health and Sports Courses		2	(Note5)	1 or 2	Elective Required	○	○						
	Foundation Courses			12	"Basic Calculus" or "Elements of Calculus" (Note6)	2	Required	◎							
					Organic Chemistry	2			◎						
					Species Biology	2			◎						
					Cell Science	2			◎						
					"General Chemistry" or	2		◎							

			""Basic Concepts of Chemistry"(Note7)										
			"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	44											

○ 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: For the information and Data Science subject, it is required to take the subject " Introduction to Information and Data Sciences " that is provided in the first semester in the first year. Only when failing to earn the credit for " Introduction to Information and Data Sciences " , is it allowed to take the subject " Elements of Information Literacy " that is provided in the second semester in the first year.

Note 4: 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 5: For health & sports subjects, it is recommended to take a practicum in sports.

Note 6: Students who studied Mathematics III in high school are required to take the subject "Basic Calculus." Students who did not study Mathematics III in high school are required to take the subject "Elements of Calculus."

Note 7: Students who did not take chemistry subjects in the entrance exam (including the University Testing Center Examination) are required to take the subject "Basic Concepts of Chemistry." For those students, the credit for the subject "General Chemistry" is not accepted for graduation.

For students who take chemistry subjects, the credit for the subject "Basic Concepts of Chemistry" is not

accepted for graduation.

Note 8: It is required to take “Basic Laboratory Work in Chemistry” that is provided in the first semester in the first year. Only when failing to earn the credit for “Basic Laboratory Work in Chemistry”, it is allowed to take the subject “Experimental Methods and Laboratory Work in Chemistry I” that is provided in the second semester in the first year.

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							
					1st grade		2nd grade		3rd grade		4th grade	
					Springs	Fall	Springs	Fall	Springs	Fall	Springs	Fall
Specialized Subjects	Specialized Fundamental Subjects	24	Introduction to Applied Biological Sciences	2	○							
			Introduction to Microbiology	2	○							
			Introduction to Molecular Biochemistry	2		○						
			Agricultural Production Resources	2		○						
			Physics for Applied Biological Science	2		○						
			Ethics of Science and Technology	2		○						
			Statistics in Biology	2			○					
			Environmental Sciences for Bioproduction	2			○					
			Laboratory Work in General Biology I	1			○					
			Laboratory Work in General Biology II	1			○					
			Laboratory Work in General Chemistry	1			○					
			Laboratory Work in General Physics	1			○					
			Required Subjects: Total 20 credits									

			Seminar in Field Science	2		○					
			Research Front of Applied Biological Sciences	2		○					
			Introduction to Physiology	2			○				
			Public Health	2						○	
			Elective Required Subjects Take 4 credits from above subjects (Redundant credits over 4 credits move to Elective Subjects in each Program)								

Table of Registration Standards(Specialized Subjects)

(Applied Animal and Plant Science Program)

Type	Subject type	Required No. of credits	Class subjects	No. of credits	Year in which the subject is taken							
					1st grade		2nd grade		3rd grade		4th grade	
					Springs	Fall	Springs	Fall	Springs	Fall	Springs	Fall
Specialized Subjects	Specialized Subjects	56	Plant Nutritional Physiology	2				○				
			Agricultural Soil Science	2				○				
			Animal Breeding and Genetics	2				○				
			Animal Nutrition	2				○				
			Animal Functional Anatomy	2				○				
			Introduction to Applied Animal and Plant Science	2				○				
			Laboratory and Field Works in Applied Animal and Plant Science	1				○	○			
			Laboratory and Field Works in Animal Production I	1				○				
			Reading of Foreign Literature in Applied Animal and Plant Science	2					○			
			Reproductive Biology	2					○			
			Production System in Livestock	2					○			
			Laboratory and Field Works in Plant Production	1					○			
			Laboratory and Field Works in Animal Production II	1					○			
			Farm Practice	1					○			
			Graduation Thesis I	2						○		
			Graduation Thesis II	2							○	
			Graduation Thesis III	2								○
			Required Subjects: Total 29credits									
			Agricultural Plant Production and Biotechnology	2					○			
				~~2~~					~~○~~			
			Animal Welfare	2					○			
			Animal Physiology and Production	2					○			
			Grassland and Feed Science	2					○			
			Plant Molecular Biology	1					○			
			Training for Animal Food Processing	2					○			
			Seminar in Dairy Field Science	1					○			
			Topics in Applied Animal and Plant Science I	2					○			
			Food Hygiene	2						○		
			Food Biochemistry	2						○		

			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 13 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 progession (?program?) cannot be included in the credits required for graduation.				
		124						

[Credits required for graduation] 124 credits (44 credits for liberal arts education subjects + 24 credits for specialized fundamental subjects + 56 credits for specialized subjects)