

<b>For entrants in FY 2021</b>
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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 Biological Science Program
1. Degree to be obtained: Bachelor of Agriculture	
2. Overview	
<p>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.</p> <p>In the Applied Biological Science Program, students begin by studying liberal arts subjects provided in English for the whole university, together with English and other foreign languages, in order not only to establish a foundation for their academic studies at the School of Applied Biological Sciences, but also to enable them to acquire the language skills required for working in international fields. In addition to this, specialized fundamental subjects that constitute introductory courses for applied biological science, and experimentation and practice courses, including overseas exercises, are provided together with the liberal arts subjects. Students commence their studies in a wide range of academic areas at the School of Applied Biological Science during the second semester of the second academic year. Specifically, they take lectures in specialized subjects, and experimentation and practice courses in integrated hydrosphere science, applied animal and plant science, food science, and molecular agricultural and life science under a tailor-made curriculum (specialized subjects packaged together for each area) for each specialized area that the student selects. This is so that students are enabled to achieve wide-ranging scholarship and the various skills required in areas of applied biological science. In addition to this, students join specialized classes for exchange students and attend lectures, exercises, and task-based research provided at an overseas partner university (packaged subjects provided in overseas partner universities) in order to acquire the abilities required to work overseas. In the second semester of the second year, while engaging in ongoing discussion with their tutor, students undertake graduate research in a particular area of specialization and go on to identify and solve problems while fostering their ability to present their results in English.</p> <p>This program educates students to become experts who go on to acquire a higher level of expertise in the graduate school after this program, or who become researchers and a specialists who are able to work in international fields with an international perspective in such institutions as public</p>	

organizations for agriculture and fisheries, or in fields of business related to agriculture, foods, and chemical-pharmaceutical products.

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

In the Applied Biological Science Program, students are required to take subject classes provided in English or Japanese for the core areas of 4 major programs (integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science) (hereinafter referred to as "the 4 core areas") to acquire expertise and specialized skills in wide range of academic areas. This program provides students with education enabling them to exercise their thinking abilities and creativity as future scientists in companies, universities, and the other public organizations. 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) The ability to systematically and hierarchically understand expertise relating to the 4 core areas;
- (9) Data collection and analysis capabilities, and systematic skills for research in the academic fields belonging to an academic realm that has as its core one of the four core areas, as well as the ability to make practical use and application of those skills; and
- (10) The ability to apply knowledge, skills, and attitudes such as he/she has obtained in an integrated manner in order to solve problems that he/she identifies, as well as to logically present

his/her conclusions, orally or in writing, and discuss them with the other persons in academic fields related to an academic area that has as its core one of the four core areas.

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

To enable students to achieve the targets that are defined for the Applied Biological 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) For the "specialized subjects" provided in the specialized education in this program, students are required to take English subjects in which they study a wide range of specialized areas beyond bounds of the specialized subjects for the four core areas. In addition to this, students take the "packaged subjects provided in overseas partner university" that consist of lectures, exercises, and task-based research provided in English in an overseas partner university in order to develop the practical abilities that will allow them work overseas. Furthermore, students select one of the four core areas to take the "specialized subjects packaged for each area" in which they acquire knowledge of the subjects included in their chosen core specialized area in order to foster their ability to establish practical scientific study based on life phenomena. In terms of their ability to identify and solve problems, students develop general capabilities for problem solving including skills for communication, presentation, and practical foreign language abilities while preparing their "Graduate Thesis (a graduation thesis that is prepared and presented in English)" in a core area that is selected from among the four core areas.
- (4) Achievement in education is evaluated based on the grade scores for the subjects and the achievement level against the target defined for this program.

\* "Specialized subjects packaged for each area" comprise a group of subjects that is selected from class subject groups for each of the four core areas according to the study plan prepared by the tutor. This is intended to allow students to sufficiently acquire the "intellectual ability and skills in a study area related to applied biological science". The subject group consists of different subjects

for each student.

#### 5. Start time and acceptance conditions

The School of Applied Biological Science holds the entrance examination collectively for the Department of Applied Biological Science. For the Applied Biological Science Program, students' wishes in terms of allocation are considered at an early stage in the 1st semester of the 1st academic year. Then selection of students is conducted based on their grades (principally for English) when the student entered the university, as well as the score of an external test of English language ability. From the first semester of the first academic year onward, students take special liberal arts subjects that mainly consist of subjects provided in English that are directed towards studying abroad for a short time (seminar for developing intelligence, Peace Science Courses, Introduction to University Education, Information Courses, disciplinary subjects, and subjects regarding health & sports). They take specialized fundamental subjects along with liberal arts subjects in order to acquire the basic knowledge that is common to the various academic areas studied in the School of Applied Biological Science. From the second semester of the second academic year onward, students take subjects provided in English in order to study specialized areas studied at the School of Applied Biological Science, crossing the borders between them. In addition to this, they study under a curriculum that is tailor-made for each student by combining specialized subjects provided for the four core areas with lectures, exercises, and task-based research at the overseas partner university.

#### 6. 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.

#### 7. 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

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

\* 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.

## 8. 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 2nd 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.

## 9. 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."
- ⑨ The 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 Fisheries Biology 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.





## ○ 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: It is required to first take subjects that are provided in English.

Note 3: It is required to take more than 4 subjects from the fields of Arts and Humanities/Social Sciences and more than 4 subjects from Natural Sciences.

Note 4: 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 5: 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)

(Applied Biological Science Program)

Type	Subject type	Required No. of credits	Class subjects	No. of credits	Year in which the subject is taken												
					1 <sup>st</sup> grade		2 <sup>nd</sup> grade		3 <sup>rd</sup> grade		4 <sup>th</sup> grade						
					Springs	Fall	Springs	Fall	Springs	Fall	Springs	Fall					
Specialized Subjects	Specialized Fundamental Subjects	24	Introduction to Applied Biological Science I	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														

		Introduction to Applied Biological Science II	2	<input type="radio"/>						
		Seminar in Field Science	2	<input type="radio"/>						
		Research Front of Applied Biological Sciences	2	<input type="radio"/>						
		Overseas Exercise of Applied Biological Science I	2		<input type="radio"/>					
		Overseas Exercise of Applied Biological Science II	1~2		<input type="radio"/>					
		Introduction to Physiology	2		<input type="radio"/>					
		Public Health	2					<input type="radio"/>		
		<p>Elective Required Subjects</p> <p>Take 4 credits from above subjects</p> <p>(Redundant credits over 4 credits move to Elective Subjects in Applied Biological Science Program)</p>								

Table of Registration Standards(Specialized Subjects)

(Applied Biological Science Program)

Type	Subject type	Required No. of credits	Class subjects	No. of credits	Year in which the subject is taken										
					1 <sup>st</sup> grade				1 <sup>st</sup> grade						
					Spings	Fall	Spings	Fall	Spings	Fall	Spings	Fall			
Specialized Subjects	Specialized Subjects	56	Specialized subjects packaged for each area (Note1)	10				○	○	○	○	○	○		
			Graduate Thesis I	2					○						
			Graduate Thesis II	2						○					
			Graduate Thesis III	2							○				
			Graduate Thesis IV	2									○		
			Required Subjects: Total 18credits												
			Specialized English subject group (Note2)	Global Environmental Issues and Managements	3					○					
				Modern Food Science	3					○					
				Insect Science	3					○					
				Fish Production	3					○					
				Plankton Biology	3					○					
				Animal Science and Technology	3					○					
				Physiology of Field Crop Production	3					○					
Introduction Physiology of Domestic Animals	3						○								
Molecular-level Understanding of Functionality of Foods	3						○								
Resource Management	3						○								
Molecular Agro-life Science															
Packaged subjects provided in overseas partner university (Note3)	1~3						○								
Elective Required Subjects: Total 30credits															
Elective Subjects: Total 8credits(Note4~7)															

		<p>(Note 1) "Specialized subjects packaged for each area" are composed as a subject group that consists of subjects selected from core disciplines for each of the 4 major programs (Integrated Hydrosphere Science, Applied Animal &amp; Plant Sciences, Food Science, and Molecular Agricultural and Life Science) according to the study plan prepared by the mentor. Subject groups consist of different subjects for each student.</p> <p>(Note 2) For "Specialized English subject group," it is required to take 3 unit subjects that include the exercise class for foreign students in AIMS program and earn 18 credits for 6 subjects or more. Note that the classes of the subject are provided from the last 10 days of September to the end of December.</p> <p>(Note 3) For the "Packaged subjects provided in overseas partner university," students are required to select a specific subject by themselves to earn the credit in the destination university.</p> <p>(Note 4) Any credit for a specialized subject for the four other major programs is accepted as a credit for elective subject.</p> <p>(Note 5) Any credit for an elective required subject among specialized fundamental subjects is accepted as a credit for elective subject.</p> <p>(Note 6) Any credit for a subject in the specialized English subjects group that is earned beyond the requirement of 18 credits is accepted as a credit for elective subject.</p> <p>(Note 7) It is not allowed to include liberal arts subjects and subjects in the teacher training courses.</p>
Total	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)

## Results of study in Applied Biological Science Program

## Relation between evaluation items and evaluation criteria

Study achievement		Evaluation criteria			
Evaluation items		Excellent	Very Good	Good	
u n K d n e o r w s l t e a d v a n c e 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 applied biological sciences	Has fundamental knowledge of areas regarding integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science that are related to applied biological science, and is capable of fully understanding, explaining, and applying this knowledge.	Has fundamental knowledge of areas regarding integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science that are related to applied biological science, and is capable of fully understanding and explaining this knowledge.	Has fundamental knowledge of areas regarding integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science that are related to applied biological science.

A b i l i t i e s & s k i l l s	(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.
	(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)	Intellectual abilities and skills for research areas related to applied biological sciences	Has sufficient intellectual abilities and skills for areas related to integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science that are related to applied biological science, and is capable of exercising them.	Has intellectual abilities and skills for areas related to integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science that are related to applied biological science, and is capable of exercising them.	Has sufficient intellectual abilities and skills for areas related to integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science that are related to applied biological science.
	(4)	Scientific English ability required for reading specialized treatises and providing presentations in English	Capable of exercising ample English language skills, fully understanding specialized treatises, organizing study results in English with excellent writing ability, and fully presenting the results in English.	Capable of exercising fundamental English language skills, understanding the whole story of specialized treatises, organizing study results in English with fundamental writing ability, and presenting the results in English.	Capable of exercising basic English language skills, understanding the main point of specialized treatises to some extent, organizing study results in English with basic writing ability, and presenting the results in English.
C o m p r e h e n s i v e	(1)	Ability to collect information related to peripheral disciplines to complement the knowledge regarding the specialized area, and to consider issues regarding applied biological science from diverse points of view	Capable of collecting information related to peripheral disciplines to complement the knowledge related to the specialized area to consider issues in areas of integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science that are related to applied biological science from diverse points of view, explain the issues to other persons, and apply the results of consideration for any specific purpose.	Capable of collecting information related to peripheral disciplines to complement the knowledge regarding the specialized area to consider issues in areas of integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science that are related to applied biological science from diverse points of view, and to explain the issues to other persons.	Capable of collecting information related to peripheral disciplines to complement the knowledge regarding the specialized area to consider issues from diverse points of view in areas of integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science that are related to applied biological science.
	(2)	Ability to organize own ideas, demonstrate an apprehension of those ideas, logically represent own conclusion orally or in writing, and exchange ideas in English regarding areas of applied biological sciences in which themes in integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science are discussed from diverse points of view.	Capable of organizing own ideas, demonstrating an apprehension based on those ideas, logically representing own conclusion in English, and exchanging ideas in English on a higher level regarding areas of applied biological sciences in which themes in integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science are discussed from diverse points of view.	Capable of organizing own ideas, demonstrating an apprehension based on those ideas, logically representing own conclusion in English, and sufficiently exchanging ideas in English regarding areas of applied biological sciences in which themes in integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science are discussed from diverse points of view.	Capable of organizing own ideas, demonstrating an apprehension based on those ideas, logically representing own conclusion in English, and exchanging ideas in English regarding areas of applied biological sciences in which themes in integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science are discussed from diverse points of view.

## 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	Fish Production	3	Elective required	4th semester					100	1												100
Specialized subjects	Plankton Biology	3	Elective required	4th semester					100	1												100
Specialized subjects	Animal Science and Technology	3	Elective required	4th semester					100	1												100
Specialized subjects	Physiology of Field Crop Production	3	Elective required	4th semester					100	1												100
Specialized subjects	Introduction physiology of Domestic Animals	3	Elective required	4th semester					100	1												100
Specialized subjects	Molecular Agro-life Science	3	Elective required	4th semester					100	1												100
Specialized subjects	Molecular-level Understanding of Functionality of Foods	3	Elective required	4th semester					100	1												100
Specialized subjects	Resource Management	3	Elective required	4th semester					100	1												
Specialized subjects	Packaged subjects provided in overseas partner university	12	Elective required	4th, 6th, and 8th semesters												80	1			20	1	100
Specialized subjects	Specialized subjects packaged for each area	10	Required	5th - 8th semesters										100	1							100
Specialized subjects	Graduate Thesis I	2	Required	5th semester														20	1	80	1	100
Specialized subjects	Graduate Thesis II	2	Required	6th semester														20	1	80	1	100
Specialized subjects	Graduate Thesis III	2	Required	7th semester														20	1	80	1	100
Specialized subjects	Graduate Thesis IV	2	Required	8th semester														20	1	80	1	100

# Attachment 4

## Curriculum map for Applied Biological 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	
e & understanding Knowledge & understanding	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 Applied Biological Sciences (○)							
		Seminar for developing intelligence (☉)								
		Introduction to University Education (☉)								
		Area Courses subjects (○)								
	Basic knowledge and understandings required for acquiring expertise	Basic Calculus / Elements of Calculus (☉)	Organic Chemistry (☉)	Statistics in Biology (☉)				Public Health (○)		
		General Chemistry (☉)	Cell Science (☉)	Environmental Sciences for Bioproduction (☉)						
		Introduction to Applied Biological Science I (☉)	Species Biology (☉)							
		Introduction to Microbiology (☉)	Introduction to Molecular Biochemistry (☉)	Introduction to Physiology (○)						
			Agricultural Production Resources (☉)	Overseas Exercise of Applied Biological Science I (○)						
			Physics for Applied Biological Science (☉)	Overseas Exercise of Applied Biological Science II (○)						
	Introduction to Applied Biological Science II (○)									

Knowledge & understandingKnowledge		Ethics of Science and Technology (©)							
		Introduction to Molecular Biochemistry (©)							
		Seminar in Field Science (O)							
	Knowledge and understanding regarding applied biological sciences				Global Environmental Issues and Managements (O)				
					Modern Food Science (O)				
					Insect Science (O)				
					Fish Production (O)				
					Plankton Biology (O)				
					Animal Science and Technology (O)				
					Physiology of Field Crop Production (O)				
					Introduction physiology of Domestic Animals (O)				
					Molecular Agro-life Science (O)				
					Molecular-level Understanding of Functionality of Foods (O)				
			Resource Management (O)						

Ability & skills	Basic communication, information processing, and physical activities	Foreign Languages (O)(◎)						
		Information and Data Science Courses (◎)						
		Health and Sports Courses (O)						
	Basic experiment abilities and skills required for acquiring expertise	"Basic Laboratory Work in Chemistry"						
			"Experimental Methods and Laboratory Work in Biology I"					
				Laboratory Work in General Biology I & II (◎)				
				Laboratory Work in General Chemistry (◎)				
				Laboratory Work in General Physics (◎)				
	Intellectual ability and skills for research areas regarding applied biological sciences					Specialized subjects packaged for each area (◎)		
Scientific English ability required for reading specialized treatises and providing presentations in English			Overseas Exercise of Applied Biological Science I (O)	Packaged subjects provided in overseas partner university (◎)		Packaged subjects provided in overseas partner university (◎)	Packaged subjects provided in overseas partner university (◎)	
			Overseas Exercise of Applied Biological Science II (O)					
	Foreign Languages (O)(◎)							

Comprehensive capability	Ability to collect information related to peripheral disciplines to complement the knowledge regarding the specialized area and consider issues regarding applied biological science from diversified points of view		Research Front of Applied Biological Sciences (O)			Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)	Graduate Thesis IV (◎)
	Ability to organize own ideas, demonstrate an apprehension based on those ideas, logically represent own conclusion orally or in writing, and exchange ideas in English regarding areas of applied biological sciences in which themes in integrated hydrosphere science, applied animal & plant science, food science, and molecular agricultural and life science are discussed from diverse points of view.					Graduate Thesis I (◎)	Graduate Thesis II (◎)	Graduate Thesis III (◎)	Graduate Thesis IV (◎)
					Packaged subjects provided in overseas partner university (◎)		Packaged subjects provided in overseas partner university (◎)		Packaged subjects provided in overseas partner university (◎)

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

# Attachment 5

## List of Faculty Members of the Applied Biological Science Program

The curriculum for this program is composed to allow students studying beyond borders between the major programs, i.e. the Integrated Hydrosphere Science Program, Applied Animal & Plant Science Program, Food Science Program, and Molecular Agricultural and Life Science Program. Therefore, faculty members of this program consist of the chief tutors of each grade and chiefs of each program.

In addition to that, faculty members who are engaged in tutorials for graduation theses may join as faculty members of this program.

The list of the faculty members of the program is separately provided to students who are allocated to the program.

Name of faculty	Name of program and position	Extension number	Laboratory	Mail address
	Chief tutor			
	Chief of Integrated Hydrosphere Science Program			
	Chief of Applied Animal & Plant Sciences Program			
	Chief of Food Science Program			
	Chief of Molecular Agricultural and Life Science Program			