As of April 1, 2016

For entrants in FY 2018

Appended Form 1

Specifications for Major Program

Name of School (Program) [School of Applied Biological Science (Program of Applied Biological Science)]

Program name (Japanese)	生物圏環境学プログラム
(English)	Integrated Ecoscience Program

1. Degree: Bachelor (Agriculture)

2. Outline

The five major programs of the School of Applied Biological Science (Integrated Ecoscience, Fisheries Biology, Animal Science, Food Science, and Applied Molecular & Cellular Biology) aim to give students a broad knowledge and acumen from natural science as it relates to biological production, to social science. Specifically, these programs provide an education that will enable students to ① acquire basic knowledge on bioresources & food production, biotechnology, and preservation of the biological environment; ② experience hands-on learning in the field science field; ③ understand bioethics and engineering ethics; and ④ acquire English and other language skills and information processing capabilities.

The Integrated Ecoscience Program, which is provided by faculty members experienced in six subjects (Marine Ecosystem Dynamics, Aquatic Ecosystem Management, Plant Nutritional Physiology, Plant Environmental Science, Food Production Management, and Agricultural Marketing), provides broad education and research related to life phenomena and substance circulation that will enable students to generally understand the activities of life in the biosphere and the use of those activities by humans.

In this Program, students can go on to gain a deeper understanding and research into more concrete targets after being assigned to a laboratory, while broadly studying the three fields that make up the biosphere: biological production (plant production that provides the basis of biological production and the structure and functions of the soil, which support plant production) in land areas, biological production and the structures of ecosystems in water areas, and human activities from food production to consumption & disposal, and the relevant social system. With analytical methods that differ according to the target field, this Program also gives students an education through which they can acquire broad physical and chemical methods, biological methods and socio-economic methods.

Students who complete this Program are expected to go on to a graduate school or to become a researcher or a professional engineer with an international perspective on agricultural, forestry and fisheries-related government agencies, and the environmental, food, chemical, pharmaceutical and other related industries after graduation.

3. Diploma policies (degree conferment policy & program attainment goals)

(Degree conferment policy)

In the Integrated Ecoscience Program, students can study in depth specific targets in the biosphere while broadly studying the three fields—land areas, water areas, and human society, based on a general understanding of the biosphere. This Program will foster human resources who can play an active role through the studies explained above as a professional engineer in a company or a corporation involved in the agricultural, forestry and fishery fields as well as environmental & energy fields, which are involved in food production, and the recycling and efficient use of resources, and who can contribute to improving food & biological production as well as environmental preservation function in the

biosphere.

To this end, this Program will confer a bachelor degree in agriculture on students who acquire the abilities listed below and the standard number of credits set by the curriculum.

(Goals of the Program)

- To be able to generally understand the activities of life in the biosphere and the use of those activities by humans in the biosphere through life phenomena and substance circulation,
- To be able to understand plant production in land areas, and structures and functions of the soil that support plant production,
- To be able to understand biological production in water areas and the structure of ecosystems,
- To be able to understand human food production activities, and their social system,
- To acquire the techniques and concrete approaches to the sites of life in the biosphere and the use of those activities by humans, and
- To be able to summarize their own ideas on, give a presentation on, and exchange opinions about concrete events in the biosphere.

4. Curriculum policies (policies for organizing & providing curricula)

The Integrated Ecoscience Program will organize and provide the curricula under the policies as described below to enable students to achieve this Program's goals.

In the first and second semesters of the first year and the first semester of the second year, students mainly take Liberal Arts Education subjects (liberal arts seminar, peace-related subjects, subjects according to packages, foreign language subjects, information-related subjects, field subjects, and health sports subjects), which are offered across the whole university.

In the School of Applied Biological Science, students will pursue their education and basic academic abilities mainly through Fundamental Subjects and Liberal Arts Education Subjects in the first year. In the first semester of the second year, the common Basic Specialized Subjects in the School of Applied Biological Science will give students the common basic knowledge required by the School. From the second semester in the second year, this Program will give students a general understanding of the biosphere and offer specialized education related to the three fields of the land areas, water areas, and human society. From the second semester in the third year, students will be assigned to respective laboratories, and cultivate their communication skills, presentation ability and other related abilities through their entire major programs, in addition to comprehensive abilities through their graduation theses.

5. Start of the Program / admission conditions

The School of Applied Biological Science will administer an entrance examination collectively for the Program of Applied Biological Science. After admission in the first and second semesters in the first year, and in the first semester of the second year, students will take Liberal Arts Education Subjects (liberal arts seminar, peace-related subjects, subjects according to packages, foreign language subjects, information-related subjects, field subjects, and health sports subjects) which are offered across the whole university. Students will be assigned to their major program of the Integrated Ecoscience Program in the second semester of the second year.

During the year after admission, students will take fundamental subjects, and study the basic knowledge necessary to study specialized fields. After that, in the first semester in the second year, students will take Basic Specialized Subjects common across the School of Applied Biological Science. Specifically, they will take Basic Chemical Experiments, Basic Physical Experiments, Basic Biological Experiments I & II (including Computer Seminar) as experimental

subjects common across the School of Applied Biological Science, and take basic experimental training in wide-ranging fields required in common across the School of Applied Biological Science. By the first semester of the second year, each student will have acquired a broad education; English and other foreign language skills; information processing abilities; and basic knowledge, life ethics, and engineering ethics, which are required in common across the School of Applied Biological Science, and they will select the most suitable major after they fully understand the educational goals and features of each program.

The School of Applied Biological Science offers five courses—Integrated Ecoscience, Fisheries Biology, Animal Science, Food Science, and Applied Molecular & Cellular Biology Courses, and these courses respectively offer five major programs with the same names as those of the courses: Integrated Ecoscience, Fisheries Biology, Animal Science, Food Science, and Applied Molecular & Cellular Biology. In the second semester in the second year, students will be grouped into the five courses based on their academic achievements and own wishes through the course grouping method shown below. After being grouped into a course, students will take as their major program with the same name as the course.

(How to group students into courses)

Target students for each year shall be grouped into courses by a proportional distribution of the number of education subjects in principle. In the calculation, however, decimal fractions shall be rounded up.

Reference: Integrated Ecoscience (6 Education Subjects), Fisheries Biology(7 Education Subjects), Animal Science (6 Education Subjects), Food Science (6 Education Subjects), and Applied Molecular & Cellular Biology (5 Education Subjects)

To be grouped into courses, students must meet the Requirements for Grouping into Courses.

6. Qualification(s)

○ Qualification for school teacher's license

1. Type-1 High School Teaching License (science)

○ Qualification to become a curator

○ Qualifications to become a food sanitation supervisor and a food sanitation inspector

* For details of these qualifications, see the Handbook for Students.

7. Class subjects and class content

* See the Table of Registration Standards on Attached Sheet 1 for your class subjects. (Attach the Table of Registration Standards.)

* See the syllabus announced for each fiscal year for class content.

8. Academic achievements

At the end of each semester, evaluation criteria will be shown with a clear indication of attainment levels according to the evaluation items for academic achievements.

Students' learning outcomes from admission to the current semester will be indicated as one of three levels: "Excellent," "Very Good," and "Good," based on evaluation criteria calculated by adding the weighted values to numerically converted evaluations of their academic achievements (S = 4, A = 3, B = 2, and C= 1) in each subject being evaluated.

Evaluation of academic achievement	Converted values
S (Excellent: 90 points or higher)	4
A (Superior: 80 – 89 points)	3
B (Good: 70 – 79 points)	2
C (Fair: 60 – 69 points)	1

Academic achievement	Evaluation criteria
Excellent	3.00 – 4.00
Very Good	2.00 – 2.99
Good	1.00 – 1.99

* See the relationships between evaluation items and evaluation criteria on Attached Sheet 2.

* See the relationships between evaluation items and class subjects on Attached Sheet 3.

* See the Curriculum Map on Attached Sheet 4.

9. Graduation thesis (graduation research) (placement and method & time of assignment)

○ Purpose

The purpose of graduation research shall be to acquire knowledge in the selected research field while observing faculty members' research. In preparation for their graduation theses, students will organize and summarize their knowledge and skills in Integrated Ecoscience that they have acquired by their third year, and will be able to understand the problems and solutions to the problems they have pursued, and will acquire problem-discovering and -solving abilities for themselves through graduation research.

○ Outline

Students shall be assigned to one of the six laboratories (Marine Ecosystem Dynamics, Aquatic Ecosystem Management, Plant Nutritional Physiology, Plant Environmental Science, Food Production Management, and Agricultural Marketing), and select their academic advisor. After being assigned to a laboratory, students will decide on the theme of their graduation research after consulting with their academic advisor, and start their research activities. Although the content of graduation research varies according to the assigned laboratory, students will learn about the ethics necessary for their research under each theme, will learn research methods under their academic advisor's guidance after planning and drafting their research, and will conduct their research. They will then establish the goals for their next research based on the research results they obtain. Through the experience of this series of research activities, students will enjoy the fun of research, and finally summarize their research results into a graduation thesis. Presentations will be held for all graduation theses for the entire Program.

○ Method & time of assignment

1. Assignments shall be given in second semester of the third year.
2. Assignments will follow the method prescribed by each major program under the guidance of the tutor in charge.

The tutors in charge will hold a guidance session in the second year, to assist students in learning about each faculty member's specialty. They will also require students to participate in the presentation meeting for graduation theses and the presentation meeting for master's theses so that students will be familiar with the research details of each faculty member. In the first semester of the third year, each faculty member will hold a session in which they explain research

details and the situations in their own laboratories. Students will visit their assigned laboratory in advance so that they can become familiar with the details of the graduation thesis and the situation in their laboratory.

Students for assignment will voluntarily assign themselves evenly to the six laboratories (within ±10% of the capacity will be allowed for each laboratory) in principle. When voluntary adjustment is not successful, tutors in charge will adjust the assignments based on the students' academic achievements.

10. Responsibility system

(1) PDCA responsibility system ("Plan," "Do," "Check," and "Act")

1. "Plan" and "Do" shall be carried out by the Academic Affairs Advisory Committee and the lecturers themselves.
2. Each major program will be responsibly planned and implemented, and a head of course will be appointed to be responsible for the planning and implementation.
3. The Academic Affairs Advisory Committee shall administer major programs provided by the School of Applied Biological Science.
4. The Academic Affairs Advisory Committee shall comprise five members selected from each course and a Chair selected from the School of Applied Biological Science.
5. Assessment and examination (check) shall be carried out by the Educational Reform Promotion Committee.
6. The Educational Reform Promotion Committee shall comprise five members selected from each course, a Chair selected from the School of Applied Biological Science, the Chair of the Academic Affairs Advisory Committee, and the Assistant to the Dean of the Graduate School.
7. The Educational Reform Promotion Committee shall assess and examine the major program implemented by each course, and report, advise, and make recommendations on the assessment results to the Academic Affairs Advisory Committee.
8. Measures (Act) shall be taken by the Course Committee, which is the parent body of the major program.
9. The Course Committee and the Academic Affairs Advisory Committee shall create and implement a plan for improvement, respecting the content of the report, advice and recommendations that the Educational Reform Promotion Committee gives after their assessment and examination.

The Course Committee, the Academic Affairs Advisory Committee, and the Educational Reform Promotion Committee shall work to improve undergraduate education by discharging their roles responsibly, and shall follow the "Plan, "Do," "Check," and "Act" cycle for undergraduate education in cooperation with each other.

(2) Program assessment

(a) Criteria for program assessment

The educational effect and social effect of the Program shall be used as assessment criteria.

The educational effect will judge the effect on students' learning of the Program's implementation.

The social effect will judge the social availability of the results learned in the Program.

(b) Implementing the assessment

In this Program, the Program's achievements shall be assessed in the second semester of the fourth year based on the above criteria.

In assessing the educational effect, the academic achievements and attainment level of students who have taken this

Program will be evaluated comprehensively by the group of faculty members who implemented this Program. The group will also evaluate the attainment levels of all students on the Program.

In assessing the social effect, the rate of employment of graduates by companies closely related to the contents of this Program and the pass rate in the civil service examination will be used. In every specified period, we will request persons in charge of personnel affairs at companies in which students will be employed to assess the Program. We will also request graduates to self-evaluate their academic achievements and their assessment of the Program. We will request companies and graduates to inform us of their assessment of the Program, and we shall request them to give us their opinion on whether subjects in the Program and their contents are useful in performing social activities, whether the class contents have adapted to changes in scientific technologies and social changes, and whether there are any class subjects that will be required in the future.

(c) Idea and method of feedback for students

The Educational Reform Promotion Committee will send out questionnaires to students and interview them in every specified period to establish their assessment of the Program, and to give advice and recommendations in order to review and improve the content of the Program.

○ Table of Registration Standards for Major Programs in the Integrated Ecoscience Course (Specialized Subjects)

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	
					Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
Specialized Education Subjects	Specialized Subjects	56	Food Distribution System	2				○				
			Seminar of Food Socio-Economics	2				○				
			Plant Nutritional Physiology	2				○				
			Laboratory and Field Works of Plant Nutritional Physiology	1					○			
			Environmental Soil Science	2				○				
			Plankton Ecology	2				○				
			Food Production Management	2				○				
			Laboratory and Field Works in Marine Biology	1				○				
			Laboratory Work in Plant Environmental Science	1				○				
			Laboratory and Field Works of Environmental Biology	1					○			
			Graduation Thesis	6						○		
			Required subjects: 22 total credits									

			Marine Environmental Science	2				○			
			Biological Oceanography	2					○		
			Distribution of Agricultural Products	2					○		
			Seminar on Socio-economics of Food Production	2					○		
			Physiology of Crop Production	2					○		
			Managements of Soil Fertility	2					○		
			System of Regional Agriculture	2						○	
			Food and Environmental Economics	2					○		
			Topics in Integrated Ecoscience I	1					○		
			Topics in Integrated Ecoscience II	1					○		
			Elective or required subjects: 10 credits are required from a total of 18 credits. (Credits obtained beyond the 10 credits shall be regarded as credits obtained in elective subjects)								
			Fisheries Ecology	2						○	
			Benthic Ecology	2					○		
			Field Work on Training Ship	2					○		
			Farm Practice	1							○
			Plant Molecular Biology	2					○		
			Introduction to Fisheries Biology	2						○	
			Specialized Practical Work in Marine Biology	1							○
			Elective subjects: At least 24 credits must be obtained. ・Students are required to take subjects from elective subjects of the Program appearing in the Table. ・Specialized subjects from other Applied Biological Science programs outside the table can be included in the elective subjects. ・Up to 16 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 profession cannot be included in the credits required for graduation.								
合　　計		124									

[No. of credits required for graduation]

124 credits (Liberal Arts Education Subjects: 44 credits + Basic Specialized Subjects: 24 credits + Specialized Subjects: 56 credits)

Academic achievements of Integrated Ecoscience Program

Relationships between the evaluation items and evaluation criteria

Academic achievements			Evaluation criteria		
Evaluation items			Excellent	Very Good	Good
Knowledge and Understanding	(1)	To have knowledge for considering academically and comprehensively in order to learn a specialty. Also, to understand the knowledge.	To be able to advanced explanations on academic and comprehensive knowledge of biosphere environment studies by linking them with other items.	To be able to explanations on academic and comprehensive knowledge of biosphere environment studies by linking them with other items.	To be able to basic explanations on academic and comprehensive knowledge of biosphere environment studies.
	(2)	To have basic knowledge required for learning a specialty. Also, to understand the knowledge.	To be able to give advanced explanations concerning basic knowledge of biosphere environmental studies by linking them with other items.	To be able to give explanations concerning basic knowledge of biosphere environmental studies by linking them with other items.	To be able to give basic explanations concerning basic knowledge of biosphere environmental studies by linking them with other items.
	(3)	To be able to comprehensively understand on life activities in biosphere and human utilization of them, with consideration of life phenomena and material circulation.	To be able to give advanced explanations on life activities in biosphere and human utilization of them, by linking the items with other relevant items.	To be able to give explanations on life activities in biosphere and human utilization of them, by linking the items with other relevant items.	To be able to give basic explanations on life activities in biosphere and human utilization of them.
	(4)	Being able to understand about plant production of continental areas and suporting soil structure and function	Being able to apply and give a explanation of plan production of continental areas and suporting soil structure and function relating to other items	Being able to give a explanation of plan production of continental areas and suporting soil structure and function relating to other items	Being able to give a basic explanation of plan production of continental areas and suporting soil structure and function
	(5)	To be able to explain biological production in hydrosphere and its eco-field structures.	To be able to give an advanced explanation on ecological system and biological production in hydrosphere, by linking these items with other items.	To be able to give an explanation on ecological system and biological production in hydrosphere, by linking these items with other items.	To be able to give a basic explanation on ecological system and biological production in hydrosphere.

Academic achievements			Evaluation criteria		
Evaluation items			Excellent	Very Good	Good
	(6)	To be able to understand human's food production activities and social system.	To be able to give an advanced explanation on human's food production activities and social system, by linking these items with other items.	To be able to give an explanation on human's food production activities and social system, by linking these items with other items.	To be able to give a basic explanation on human's food production activities and social system.

Academic achievements			Evaluation criteria		
Evaluation items			Excellent	Very Good	Good
Abilities and Skills	(1)	To acquire basic experimental ability and skills needed to learn a specialty.	Being able to fully use basic experiment ability and skills.	Being able to use basic experiment ability and skills.	Being able to partially use basic experiment ability and skills.
	(2)	To acquire basic communication, information processing, and physical abilities and skills, which are required for learning a specialty.	Being able to fully use ability and skills of basic communication・information processing・physical activity.	Being able to use ability and skills of basic communication・information processing・physical activity.	Being able to partially use ability and skills of basic communication・information processing・physical activity.
	(3)	Acquiring concrete approach skills or ways for a plan production field of continental areas	Being able to sufficiently utilize concrete approach skills or ways for a plan production field of continental areas	Being able to utilize concrete approach skills or ways for a plan production field of continental areas	Being able to generally utilize concrete approach skills or ways for a plan production field of continental areas
	(4)	To acquire specific skills and methods to approach biological production and eco-field in hydrosphere.	To be able to sufficiently utilize specific skills and methods to approach biological production and eco-field in hydrosphere.	To be able to utilize specific approach and methods concerning biological production and eco-field in hydrosphere.	To be able to give a rough explanation on ecological system and biological production in hydrosphere, by linking these items with other items.
	(5)	To acquire a certain approach to apply the human's food production activities and social system to the field and communication skills relating to presentation and responding.	To be able to sufficiently utilize a certain approach for human's food production activities and social system and communication ability.	To be able to utilize a certain approach for human's food production activities and social system and communication ability.	To be able to utilize a certain approach for human's food production activities and social system and communication ability.
	(6)	With regard to biosphere, to be acquire reading and communication abilities, including presentation and question-and-answer skills.	With regard to biosphere, to be able to sufficiently utilize reading and communication abilities, including presentation and question-and-answer skills.	With regard to biosphere, to be able to utilize reading and communication abilities, including presentation and question-and-answer skills.	With regard to biosphere, to be able to roughly utilize reading and communication abilities, including presentation and question-and-answer skills.

Academic achievements			Evaluation criteria		
Evaluation items			Excellent	Very Good	Good
Comprehensive Abilities	(1)	With regard to specific biosphere phenomena, to be able to find targets, summarize opinions, deliver presentations or reports logically, and answer questions.	To be able to adequately utilize abilities and skills concerning the following elements: to set up a target, information processing, summarizing statistical data, logical expression and responsive communication.	To be able to utilize abilities and skills concerning the following elements: to set up a target, information processing, summarizing statistical data, logical expression and responsive communication.	To be able to roughly utilize abilities and skills concerning the following elements: to set up a target, information processing, summarizing statistical data, logical expression and responsive communication.

Placement of the Liberal Arts Education in the Major Program

The liberal arts education in this Program plays the role of creating an academic foundation for specialized education to enable students to develop a voluntary and independent learning attitude; to cultivate scientific thinking based on their ability to gather information, their analytical capacity, and critical powers; to gain deep insight into the nature of and background to things from a broad perspective; to strengthen their language skills to enable them to live as an international person and to develop their interest in peace; to integrate their extensive knowledge into a body of knowledge truly useful for solving problems; and to develop the ability to look at things from a comprehensive perspective.

Relationships between the evaluation items and class subjects

Subject Classification	Subject Name	Credits	Type of course registration	Grade	Evaluation items																												Total weighted values of evaluation items in the
					Knowledge and Understanding												Abilities and Skills												Comprehensive Abilities					
					(1)		(2)		(3)		(4)		(5)		(6)		(1)		(2)		(3)		(4)		(5)		(6)		(1)					
					Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items		
Liberal Arts Education	Introductory Seminar for Freshmen	2	Required	1 semester	80	1	20	1																									100
Liberal Arts Education	Peace Science Courses	2	Elective/required	1-2semester	80	1	20	1																									100
Liberal Arts Education	Integrated Courses	6	Elective/required	1-2semester	80	1	20	1																									100
Liberal Arts Education	Foreign Languages	12	Required/Elective/required	1-4semester	10	1													40	1							50	1					100
Liberal Arts Education	Information Literacy	2	Elective/required	1 semester	10	1													90	1													100
Liberal Arts Education	Area Courses	10	Elective/required	1-6semester	20	1	80	1																									100
Liberal Arts Education	Health and Sports Courses	2	Elective/required	1-2semester	20	1													80	1													100
Liberal Arts Education	Basic Calculus/Elements of	2	Required	1 semester	20	1	80	1																									100
Liberal Arts Education	Organic Chemistry	2	Required	2 semester	20	1	80	1																									100
Liberal Arts Education	Species Biology	2	Required	1 semester	20	1	80	1																									100
Liberal Arts Education	Cell Science	2	Required	2 semester	20	1	80	1																									100
Liberal Arts Education	General Chemistry/Basic	2	Required	1 semester	20	1	80	1																									100
Liberal Arts Education	Experimental Methods and	1	Elective/required	1-2semester			10	1									90	1															100
Liberal Arts Education	Experimental Methods and	1	Elective/required	1-2semester			10	1									90	1															100
Liberal Arts Education	Experimental Methods and	1	Elective/required	1-2semester			10	1									90	1															100
Specialized Education	Introduction to Applied Biological	2	Required	1 semester	20	1	80	1																									100
Specialized Education	Introduction to Biochemistry	2	Required	2 semester	20	1	80	1																									100
Specialized Education	Agricultural Production Resources	2	Required	2 semester	20	1	80	1																									100
Specialized Education	Physics for Applied Biological Science	2	Required	2 semester	20	1	80	1																									100
Specialized Education	Ethics of Science and Technology	2	Required	2 semester	20	1	80	1																									100
Specialized Education	Environmental Sciences for	2	Required	3 semester	20	1	80	1																									100
Specialized Education	Basic Molecular Biology	2	Required	3 semester	20	1	80	1																									100
Specialized Education	Laboratory Work in General Biology I	1	Required	3 semester			10	1									90	1															100
Specialized Education	Laboratory Work in General Biology II	1	Required	3 semester			10	1									90	1															100
Specialized Education	Basic Experiments in Chemistry	1	Required	3 semester			10	1									90	1															100
Specialized Education	Laboratory Work in General Physics	1	Required	3 semester			10	1									90	1															100
Specialized Education	Reading of Foreign Literature	2	Required	4 semester					50	1																	50	1					100
Specialized Education	Introduction to Microbiology	2	Elective/required	1 semester	10	1	90	1																									100
Specialized Education	Seminer in Field Science	2	Elective/required	2 semester	10	1	90	1																									100
Specialized Education	Ecology	2	Elective/required	3 semester	10	1	90	1																									100
Specialized Education	Animal Physiology	2	Elective/required	3 semester	10	1	90	1																									100
Specialized Education	Genetics	2	Elective/required	3 semester	10	1	90	1																									100
Specialized Education	Introduction to Biological Science of	2	Elective/required	3 semester	10	1	90	1																									100
Specialized Education	Introduction to Plant Biological Science	2	Elective/required	3 semester	10	1	90	1																									100
Specialized Education	Biological Statistics	2	Elective/required	3 semester	10	1	90	1																									100
Specialized Education	Biophysical Chemistry	2	Elective/required	3 semester	10	1	90	1																									100
Specialized Education	Public Hygiene	2	Elective/required	5semester	10	1	90	1																									100

Subject Classification	Subject Name	Credits	Type of course registration	Grade	Evaluation items																										Total weighted values of evaluation items in the
					Knowledge and Understanding												Abilities and Skills												Comprehensive Abilities		
					(1)		(2)		(3)		(4)		(5)		(6)		(1)		(2)		(3)		(4)		(5)		(6)		(1)		
					Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	
Specialized Education	Food Distribution System	2	Required	4semester					90	1					10	1															100
Specialized Education	Aquatic Environmental	2	Required	5semester					90	1			10	1																	100
Specialized Education	Plant Nutritional Physiology	2	Required	4semester					10	1	90	1																			100
Specialized Education	Environmental Soil Science	2	Required	4semester					10	1	90	1																			100
Specialized Education	Physiology of Crop Production	2	Elective/required	5semester					10	1	90	1																			100
Specialized Education	Managements of Soil Fertility	2	Elective/required	5semester					10	1	90	1																			100
Specialized Education	Plankton Ecology	2	Required	4semester					10	1			90	1																	100
Specialized Education	Marine Environmental	2	Elective/required	4semester					10	1			90	1																	100
Specialized Education	Biological Oceanography	2	Elective/required	5semester					10	1			90	1																	100
Specialized Education	Food Production Management	2	Required	4semester					10	1					90	1															100
Specialized Education	System of Regional Agriculture	2	Elective/required	6semester					10	1					90	1															100
Specialized Education	Laboratory Work in Plant Environmental	1	Required	4semester													10	1			90	1									100
Specialized Education	Laboratory and Field Works of Plant	1	Required	5semester													10	1			90	1									100
Specialized Education	Laboratory and Field Works in Marine	1	Required	4semester													10	1					90	1							100
Specialized Education	Laboratory and Field Works of	1	Required	5semester													10	1					90	1							100
Specialized Education	Seminar of Food Socio-Economics	2	Required	4semester													10	1							90	1					100
Specialized Education	Seminar on Socio-economics of Food	2	Elective/required	5semester													10	1							90	1					100
Specialized Education	Graduation Thesis	6	Required	8·9semester																									100	1	100
Specialized Education	Food and Environmental	2	Elective/required	5semester					10	1					90	1															100
Specialized Education	Topics in Integrated Ecoscience I	1	Elective/required	5semester					10	1			90	1																	100
Specialized Education	Topics in Integrated Ec	1	Elective/required	5semester					10	1	90	1																			100

Curriculum Map of Integrated Ecoscience Program

Academic achievements	Evaluation items	1st grade Spring semester	1st grade Fall semester	2nd grade Spring semester	2nd grade Fall semester	3rd grade Spring semester	3rd grade Fall semester	4th grade Spring semester	4th grade Fall semester
Knowledge and Understanding	To have knowledge for considering academically and comprehensively in order to learn a specialty. Also, to understand the knowledge.	Introductory Seminar for Freshmen(◎)	Organic Chemistry(◎)	Ecology(○)		Public Hygiene(○)			
		Peace Science Courses Ⅱ(○)	Cell Science(◎)	Animal Physiology(○)					
		Health and Sports Courses(○)		Genetics(○)					
		Health and Sports Courses(○)	Introduction to Biochemistry(◎)	Introduction to Biological Science of Animal Production and Fishery(○)					
		Foreign Languages(◎)	Agricultural Production Resources(◎)	Introduction to Plant Biological Science(○)					
		Information Courses(○)	Physics for Applied Biological Science(◎)	Biological Statistics(○)					
		Area Courses(○)	Ethics of Science and Technology(◎)	Biophysical Chemistry(○)					
		Basic Calculus・Elements of Calculus(◎)	Seminer in Field Science(○)	Environmental Sciences for Bioproduction(◎)					
		Species Biology(◎)		Basic Molecular Biology(◎)					
		General Chemistry・Fundamental Chemistry(◎)							
		Introduction to Applied Biological Sciences(◎)							
		Introduction to Microbiology(○)							
	To have basic knowledge required for learning a specialty. Also, to understand the knowledge.	Introductory Seminar for Freshmen(◎)	Organic Chemistry(◎)	Environmental Sciences for Bioproduction(◎)		Public Hygiene(○)			
		Peace Science Courses(○)	Cell Science(◎)	Basic Molecular Biology(◎)					
		Intergrated Courses(○)	Introduction to Biochemistry(◎)	Laboratory Work in General Biology Ⅰ, Ⅱ(◎)					
		Area Courses(○)	Agricultural Production Resources(◎)	Basic Experiments in Chemistry(◎)					
		Basic Calculus・Elements of Calculus(◎)	Physics for Applied Biological Science(◎)	Laboratory Work in General Physics(◎)					
		Organic Chemistry(◎)	Ethics of Science and Technology(◎)	Ecology(○)					
		Species Biology(◎)	Seminer in Field Science(○)	Animal Physiology(○)					
		General Chemistry・Fundamental Chemistry(◎)		Genetics(○)					
		Experimental Methods and Laboratory Work in Physics(○)		Introduction to Biological Science of Animal Production and Fishery(○)					
		Experimental Methods and Laboratory Work in Chemistry(○)		Introduction to Plant Biological Science(○)					
		Experimental Methods and Laboratory Work in Biology(○)		Biological Statistics(○)					
		Introduction to Applied Biological Sciences(◎)		Biophysical Chemistry(○)					
		Introduction to Microbiology(○)							
	To be able to comprehensively understand on life activities in biosphere and human utilization of them, with consideration of life phenomena and material circulation.				Food Distribution System(◎)	Reading of Foreign Literature	System of Regional Agriculture(○)		
					Plant Nutritional Physiology(◎)	Aquatic Environmental Science(◎)			
					Environmental Soil Science(◎)	Physiology of Crop Production(○)			
					Plankton Ecology(◎)	Managements of Soil Fertility(○)			
					Marine Environmental Science(○)	Biological Oceanography(○)			
					Food Production Management(◎)	Topics in Integrated Ecoscience Ⅰ(○)			
						Topics in Integrated Ecoscience Ⅱ(○)			
						Food and Environmental Economics(○)			
	Being able to understand about plant production of continental areas and suporting soil structure and function				Plant Nutritional Physiology(◎)	Physiology of Crop Production(○)			
					Environmental Soil Science(◎)	Managements of Soil Fertility(○)			
						Topics in Integrated Ecoscience Ⅱ(○)			
	To be able to explain biological production in hydrosphere and its eco-field structures.				Marine Environmental Science(○)	Biological Oceanography(○)			
					Plankton Ecology(◎)	Aquatic Environmental Science(◎)			
						Topics in Integrated Ecoscience Ⅰ(○)			
	To be able to understand human's food production activities and social system.				Food Production Management(◎)	Food and Environmental Economics(○)	System of Regional Agriculture(○)		
					Food Distribution System(◎)				

Academic achievements		1st grade		2nd grade		3rd grade		4th grade	
Evaluation items		Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester
Abilities and Skills	To acquire basic experimental ability and skills needed to learn a specialty.	Experimental Methods and Laboratory Work in Physics(○)		Laboratory Work in General Biology Ⅰ, Ⅱ(◎)	Laboratory Work in Plant Environmental Science(◎)	Laboratory and Field Works of Plant Nutritional Physiology(◎)			
		Experimental Methods and Laboratory Work in Chemistry(○)		Basic Experiments in Chemistry(◎)	Laboratory and Field Works in Marine Biology(◎)	Laboratory and Field Works of Environmental Biology(◎)			
		Experimental Methods and Laboratory Work in Biology(○)		Laboratory Work in General Physics(◎)	Seminar of Food Socio-Economics(◎)	Seminar on Socio-economics of Food Production(○)			
	To acquire basic communication, information processing, and physical abilities and skills, which are required for learning a specialty.	Foreign Languages(◎)	Foreign Languages(◎)	Foreign Languages(◎)	Foreign Languages(○)				
		Health and Sports Courses(○)							
		Information Courses(○)							
	Acquiring concrete approach skills or ways for a plan production field of continental areas				Laboratory Work in Plant Environmental Science(◎)	Laboratory and Field Works of Plant Nutritional Physiology(◎)			
	To acquire specific skills and methods to approach biological production and eco-field in hydrosphere.				Laboratory and Field Works in Marine Biology(◎)	Laboratory and Field Works of Environmental Biology(◎)			
	To acquire a certain approach to apply the human's food production activities and social system to the field and communication skills relating to presentation and responding.				Seminar of Food Socio-Economics(◎)	Seminar on Socio-economics of Food Production(○)			
	With regard to biosphere, to be acquire reading and communication abilities, including presentation and question-and-answer skills.	Foreign Languages(◎)	Foreign Languages(◎)	Foreign Languages(◎)	Foreign Languages(○)	Reading of Foreign Literature(◎)			
Comprehensive Abilities	With regard to specific biosphere phenomena, to be able to find targets, summarize opinions, deliver presentations or reports logically, and answer questions.						Graduation Thesis(◎)		

Liberal Arts Education Subjects | Basic Specialized Subjects | Specialized Education Subjects | Graduation Thesis

(◎)Required (○)Elective/required (△)Free elective