As of April 1, 2025

For entrants in AY 2025

Attachment Form 1

Description of Major Program

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

Name of Program	Food 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.

The Food Science Program provides education and conducts research activities in wide ranges regarding food and food material such as production management and distribution, manufacture and processing, food safety, nutrition, living body control function, palatability, physical characteristics, and new effective use. Students are allowed to study food science from the basics to the application while experiencing the cutting edge of findings through this program.

From the viewpoint described above, this program aims to provide general education regarding the fundamental knowledge and technologies related to the production management and distribution of food, function evaluation and advanced use of food material, and production and development of safe food with high quality and functionality to develop human resources who can contribute to the creation of rich and healthy dietary life from a wide point of view.

This Program educates students to become an expert who have acquired 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 Food Science Program aims to provide general education regarding the fundamental knowledge and technologies related to the production management and distribution of food, function evaluation and advanced use of food material, and production and development of safe food with high quality and functionality to develop human resources who can be engaged in the creation of rich and healthy dietary life from a wide point of view. 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) Has acquired professional knowledge regarding production management and distribution of food and be capable of generally considering measures for ensuring stable supply of safe food.

(9) Has acquired professional knowledge and general skills regarding manufacture and processing of food and be capable of understanding practical measures for converting food material to safe food with high quality and functionality.

(10) Has acquired basic and professional knowledge and skills regarding evaluation and regulation of safety, nutrition, palatability, living body control function, and physical characteristics and new effective use and be capable of exercising them.

(11) Has comprehensively learned the flow from the production of food to the consumption by consumers to understand it as a unified system. The student is also acquired to become capable of applying such as the knowledge, skills, and attitude that he/she has obtained in an integrated manner to solve problems that he/she identifies and logically present the conclusion orally or in writing and discuss with 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 Food 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 such as production management and distribution of food, function evaluation and advanced use of food material, and manufacture and development of safe food with high functionality to enable students to acquire capability of systematically and hierarchically understanding the food science from the basics to application. Also the courses of "exercise" and "experiment & practice" for the related area are provided for students to acquire skills and attitudes to practically apply and use the results. 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 Food 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) Curator License

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

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

(3) 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 Food 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.

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	○							
	Common Subjects	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	◎							
			Development Seminar	0	(Note3)	1		○	○	○	○	○	○		
		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) (Note2)	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(Note3)	2	Required		◎						
		Area Courses		12	(Note3)	1 or 2	Elective/ Required	○	○	○	○	○	○		
		Social Cooperation Courses		0	(Note3)			○	○	○	○	○	○		
		Health and Sports Courses		2	(Note4)	1 or 2	Elective Required	○	○						
	Foundation Courses			6	Organic Chemistry	2	Required		◎						
					Cell Science	2			◎						
					“Basic Laboratory Work	1		◎	◎						

			in Chemistry" or "Experimental Methods and Laboratory Work in Chemistry I" (Note5)											
			"Experimental Methods and Laboratory Work in Biology I"	1			◎							
	Total	40												

○ 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 "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.

Note 3: Area Courses are 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.

Credits earned in Information and Data Science Courses exceeding 4 credits may be included in Natural Sciences. Up to 4 credits of Social Cooperation Courses may be included in Humanities/Social Sciences. Development Seminars may be included in Area Courses.

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

Note 5: It is required to take “Basic Laboratory Work in 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	26	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 Bioresource Sciences	2		○						
			Research Front of Food and AgriLife Science	2		○						
			Introduction to Physiology	2			○					
			Public Health	2						○		
			Elective Required Subjects Take 6 credits from above subjects (Redundant credits over 6 credits move to Elective Subjects in each Program)									

Table of Registration Standards(Specialized Subjects)

(Food 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	58	Food Biochemistry	2				○				
			Applied Biophysics	2				○				
			Food Engineering	2				○				
			Food Hygiene	2				○				
			Seafood Chemistry and Biochemistry	2				○				
			Food Production Management	2				○				
			Laboratory Work in Applied Biophysics	1				○				
			Laboratory Works in Food Engineering	1				○				
			Laboratory Work in Food Hygiene	1				○				
			Reading of Foreign Literature in Food Science	2					○			
			Nutrition	2					○			
			Laboratory Work in Food Chemistry	1					○			
			Laboratory Work in Marine Bioresources Chemistry	1					○			
			Laboratory work in Nutritional Biochemistry	1					○			
			Field Works of Food Production Management	1					○			
			Graduation Thesis I	2						○		
			Graduation Thesis II	2							○	
			Graduation Thesis III	2								○
			Required Subjects: Total 29 credits									
			Science and Technology for Food Development	2				○				
			Food Function (Functional Food Science)	2					○			
			Food Physical Property Science	2					○			
			Food Microbiology	2					○			
			Bioresource Utilization Science	2					○			
			Food System	2					○			
			Agricultural Products and Food Processing	2					○			
			Training for Marine Food Processing	1					○			
			Training for Animal Food Processing	1					○			
			Food Factor Inspection	1					○			
			Food Information Management	1					○			
			Elective Required Subjects: Take 13 credits from above subjects (Redundant credits over 13 credits move to Elective Subjects)									

			Genome Science I	2					○		
			Genome Science II	2					○		
			Molecular Cell Biology	2					○		
			Animal Nutrition	2					○		
			Plant Nutritional Physiology	2					○		
			Elective Subjects: At least 16 credits must be obtained. ・Specialized subjects from other Applied Biological Science programs can be included in the elective subjects. ・Up to 12credits 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.							
		124									

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

Attachment 2

Results of study in Food Science Program

Relation between evaluation items and evaluation criteria

Study achievement			Evaluation criteria		
Evaluation items			Excellent	Very Good	Good
Knowledge & understand	(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)	Basic knowledge of such as chemistry, biology, biochemistry, microbiology, physics, and mathematics required for understanding food science.	Capable of sufficiently applying the basic knowledge of such as chemistry, biology, biochemistry, microbiology, physics, and mathematics required for understanding food science.	Capable of applying the basic knowledge of such as chemistry, biology, biochemistry, microbiology, physics, and mathematics required for understanding food science.	Capable of generally applying the basic knowledge of such as chemistry, biology, biochemistry, microbiology, physics, and mathematics required for understanding food science.
	(4)	Expertise regarding methods for identifying the mechanism of function expression in food and food material and for application of the function.	Capable of providing practical explanation regarding methods for identifying the mechanism of function expression in food and food material and application of the function while associating it with knowledge of the other items.	Capable of providing explanation regarding methods for identifying the mechanism of function expression in food and food material and application of the function while associating it with knowledge of the other items.	Capable of providing basic explanation regarding methods for identifying the mechanism of function expression in food and food material and application of the function.
	(5)	Expertise and ethics of science and technology regarding analysis and evaluation methods for safety of food and food material.	Capable of providing practical explanation regarding expertise and ethics of science and technology on analysis and evaluation methods for safety of foods and food materials while associating it with knowledge of the other items.	Capable of providing explanation regarding expertise and ethics of science and technology on analysis and evaluation methods for safety of foods and food materials while associating it with knowledge of the other items.	Capable of providing basic explanation regarding expertise and ethics of science and technology on analysis and evaluation methods for safety of foods and food materials.

ding	(6)	Expertise regarding production management and distribution of foods	Capable of providing practical explanation regarding production management and distribution of foods while associating it with knowledge of the other items.	Capable of providing explanation regarding production management and distribution of foods while associating it with knowledge of the other items.	Capable of providing explanation regarding production management and distribution of foods.
	(7)	Expertise regarding food processing technologies and development of useful materials.	Capable of providing practical explanation regarding food processing technologies and development of useful materials while associating it with knowledge of the other items.	Capable of providing explanation regarding food processing technologies and development of useful materials while associating it with knowledge in other fields.	Capable of providing basic explanation regarding food processing technologies and development of useful materials.
Abilities & skills	(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)	Basic techniques and methodologies for handling foods and food materials, ability to understand various phenomena regarding foods from scientific points of view, and capability of organizing the study result in a report	Has sufficiently and profoundly acquired basic techniques, methodologies, and understanding and is capable of sufficiently applying them. Also capable of logically organizing the result of research in a report and discussing it with others.	Has sufficiently acquired basic techniques, methodologies, and understanding and is capable of sufficiently applying them. Also capable of logically organizing the result of research in a report.	Has substantially acquired basic techniques, methodologies, and understanding and is capable of generally applying them. Also capable of organizing the result of research in a report.
	(4)	Acquisition of techniques for production of foods from marine and animal resources and capability of consideration of practical measures for conversion to safe and highly functional foods	Has sufficiently acquired techniques and knowledge regarding production of foods from marine and animal resources and is capable of fully considering practical measures.	Has acquired techniques and knowledge regarding production of foods from marine and animal resources and is capable of considering practical measures.	Has generally acquired techniques and knowledge regarding production of foods from marine and animal resources and is capable of considering practical measures.
	(5)	Capable of organizing and considering own issues to explore in the fields of food science from a social point of view based on experience of such as observation of a food manufacturing scene	Capable of applying findings and knowledge obtained in the observation of a food factory, lecture, and experiment to be conscious of the connection to the society and organizing and considering own issues to explore in the fields of food science by actively comparing the experience to that in the lecture and experiment in the university.	Capable of applying findings and knowledge obtained in the observation of a food factory, lecture, and experiment to be conscious of the connection to the society and organizing and considering own issues to explore in the fields of food science based on the experience.	Capable of applying findings and knowledge obtained in the observation of a food factory, lecture, and experiment to be conscious of the connection to the society and identifying own issues to explore in the fields of food science.

	(6)	Ability to read and understand technical explanations and basic reading capabilities of scientific English	Capable of reading English texts and understanding technical explanations	Has a basic ability for reading English texts and capable of understanding technical explanations to some extent.	Has a basic ability for reading English texts and capable of partly understanding technical explanations
Comprehensive capability	(1)	Capability of collecting information of the peripheral disciplines and organizing his/her own idea based on the information, validating the idea based on the information, logically presenting the conclusion orally or in a document, and exchanging opinions with others in the area that studies scientific issues regarding foods and food materials	Capable of collecting information of the peripheral disciplines and organizing his/her own idea based on the information, validating the idea based on the information, logically presenting the conclusion orally or in a document, and exchanging opinions with others in the area that studies scientific issues regarding foods and food materials.	Capable of collecting information of the peripheral disciplines and organizing his/her own idea based on the information, validating the idea based on the information, presenting the conclusion orally or in a document, and exchanging opinions with others in the area that studies scientific issues regarding foods and food materials.	Capable of collecting information of the peripheral disciplines and organizing his/her own idea based on the information, validating the idea based on the information, and presenting the conclusion orally or in a document in the area that studies scientific issues regarding foods and food materials.

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	Core subject	Evaluation item																												Total of weightings for evaluation items for the subject
						Knowledge & understanding														Ability & skills												Comprehensive capability		
						(1)		(2)		(3)		(4)		(5)		(6)		(7)		(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	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	12	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	Organic Chemistry	2	Required	2nd semester				100	1																									100
Liberal arts education subjects	Cell Science	2	Required	2nd 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	○			100	1																									100
Specialized subjects	Introduction to Microbiology	2	Required	1st semester	○			100	1																									100
Specialized subjects	Introduction to Molecular Biochemistry	2	Required	2nd semester	○			100	1																									100
Specialized subjects	Agricultural Production Resources	2	Required	2nd semester\	○			50	1																			50	1					100
Specialized subjects	Physics for Applied Biological Science	2	Required	2nd semester	○			100	1																									100
Specialized subjects	Ethics of Science and Technology	2	Required	2nd semester	○	50	1	50	1																									100
Specialized subjects	Statistics in Biology	2	Required	3rd semester	○			100	1																									100
Specialized subjects	Environmental Sciences for Bioproduction	2	Required	3rd semester	○			100	1																									100

Specialized subjects	Laboratory Work in General Biology I	1	Required	3rd semester	○																	100	1													100
Specialized subjects	Laboratory Work in General Biology II	1	Required	3rd semester	○																	100	1													100
Specialized subjects	Laboratory Work in General Chemistry	1	Required	3rd semester	○																	100	1													100
Specialized subjects	Laboratory Work in General Physics	1	Required	3rd semester	○																	100	1													100
Specialized subjects	Seminar in Field Science	2	Elective required	2nd semester				100	1																											100
Specialized subjects	Research Front of Bioresource Sciences	2	Elective required	2nd semester				100	1																											100
Specialized subjects	Research Front of Food and AgriLife Science	2	Elective required	2nd semester				100	1																											100
Specialized subjects	Introduction to Physiology	2	Elective required	3rd semester				100	1																											100
Specialized subjects	Public Health	2	Elective required	6th semester				100	1																											100
Specialized subjects	Food Biochemistry	2	Required	4th semester	○					40	1	40	1													20	1									100
Specialized subjects	Applied Biophysics	2	Required	4th semester	○					40	1	40	1					20	1																	100
Specialized subjects	Food Engineering	2	Required	4th semester	○									20	1			60	1									20	1							100
Specialized subjects	Food Hygiene	2	Required	4th semester	○					20	1			60	1											20	1									100
Specialized subjects	Seafood Chemistry and Biochemistry	2	Required	4th semester	○					60	1			20	1											20	1									100
Specialized subjects	Food Production Management	2	Required	4th semester	○									20	1	80	1																			100
Specialized subjects	Laboratory Work in Applied Biophysics	1	Required	4th semester	○																			60	1	20	1	20	1							100
Specialized subjects	Laboratory Works in Food Engineering	1	Required	4th semester	○																			60	1	20	1	20	1							100
Specialized subjects	Laboratory Work in Food Hygiene	1	Required	4th semester	○																			60	1	20	1	20	1							100
Specialized subjects	Nutrition	2	Required	5th semester	○																				1	20	1		1							20
Specialized subjects	Laboratory Work in Food Chemistry	1	Required	5th semester	○																			60	1	20	1	20	1							100
Specialized subjects	Laboratory Work in Marine Bioresources Chemistry	1	Required	5th semester	○																			60	1	20	1	20	1							100
Specialized subjects	Laboratory Work in Nutritional Biochemistry	1	Required	5th semester	○																			60	1	20	1	20	1							100
Specialized subjects	Field Works of Food Production Management	1	Required	5th semester	○																			40	1			60	1							100
Specialized subjects	Reading of Foreign Literature in Food Science	2	Required	4th semester	○																									100	1					100
Specialized subjects	Science and Technology for Food Development	2	Elective required	4th semester														60	1									40	1							100
Specialized subjects	Food Function (Functional Food Science)	2	Elective required	5th semester								80	1	20	1																					100
Specialized subjects	Food Physical Property Science	2	Elective required	5th semester						40	1	40	1					20	1																	100
Specialized subjects	Food Microbiology	2	Elective required	5th semester						60	1			40	1																					100
Specialized subjects	Bioresource Utilization Science	2	Elective required	5th semester								40	1					40	1							20	1									100
Specialized subjects	Food System	2	Elective required	5th semester												80	1											20	1							100

Specialized subjects	Agricultural Products and Food Processing	2	Elective required	5th semester						40	1	20	1	20	1												20	1							100
Specialized subjects	Training for Marine Food Processing	1	Elective required	5th semester														20	1							60	1	20	1					100
Specialized subjects	Training for Animal Food Processing	1	Elective required	5th semester														20	1							60	1	20	1					100
Specialized subjects	Food Factory Inspection	1	Elective required	5th semester																								100	1					100
Specialized subjects	Food Information Management	1	Elective required	5th semester												100	1																	100
Specialized subjects	Genome Science I	2	Elective	6th semester		50	1			50	1																							100
Specialized subjects	Genome Science II	2	Elective	6th semester		50	1			50	1																							100
Specialized subjects	Molecular Cell Biology	2	Elective	6th semester		50	1			50	1																							100
Specialized subjects	Animal Nutrition	2	Elective	6th semester		50	1			50	1																							100
Specialized subjects	Plant Nutritional Physiology	2	Elective	6th semester		50	1			50	1																							100
Specialized subjects	Graduation Thesis I-III	6	Required	6th-8th semester	○																											100	1	100

Attachment 4

Curriculum map for Food Science Program

Study achievement		1st year		2nd year		3rd year		4th year	
Evaluation items		1st semester	2nd semester	3rd semester	4th semester	5th semester	6th semester	7th semester	8th semester
Knowled	①Ability 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.	Seminar for developing intelligence (◎)	Ethics of Science and Technology(◎)						
		Introduction to University Education (◎)							
		Peace Science Courses (◎)							
		Area Courses subjects (○)							
	②Basic knowledge and understanding required for acquiring expertise		Organic Chemistry (◎)	Environmental Sciences for Bioproduction(◎)			Public Health(○)		
			Cell Science (◎)	Statistics in Biology (◎)					
		Introduction to Applied Biological Science(◎)							
		Introduction to Microbiology (◎)	Agricultural Production Resources(◎)	Introduction to Physiology (○)					
			Physics for Applied Biological Science(◎)						
			Ethics of Science and Technology(◎)						
			Seminar in Field Science (○)						
			Introduction to Molecular Biochemistry(◎)						
			Research Front of Bioresource Sciences (○)						

ge & understanding			Research Front of Food and AgriLife Science (○)						
	③Basic knowledge of such as chemistry, biology, biochemistry, microbiology, physics, and mathematics required for understanding food science.				Food Biochemistry(◎)	Nutrition(◎)			
					Applied Biophysics(◎)	Food Microbiology(○)			
					Seafood Chemistry and Biochemistry (◎)	Agricultural Products and Food Processing(○)			
					Food Hygiene(◎)	Food Physical Property Science(○)			
	④Expertise regarding methods for identifying the mechanism of function expression in food and food material and for application of the function.				Food Biochemistry(◎)	Nutrition(◎)			
					Applied Biophysics(◎)	Food Function (Functional Food Science)(○)			
						Agricultural Products and Food Processing(○)			
						Bioresource Utilization Science(○)			
						Food Physical Property Science(○)			
					Food Hygiene(◎)	Food Microbiology(○)			

⑤Expertise and ethics of science and technology regarding analysis and evaluation methods for safety of food and food material.				Seafood Chemistry and Biochemistry (◎)	Agricultural Products and Food Processing(○)			
				Food Production Management（◎）	Food Function (Functional Food Science)(○)			
				Food Engineering(◎)				
⑥Expertise regarding production management and distribution of foods				Food Production Management（◎）	Food System(○)			
					Food Information Management(○)			
⑦Expertise regarding food processing technologies and development of useful materials.				Food Engineering(◎)	Bioresource Utilization Science(○)			
				Science and Technology for Food Development(○)	Food Physical Property Science(○)			
				Applied Biophysics(◎)	Training for Marine Food Processing（○）			
					Training for Animal Food Processing（○）			

Abil	①Basic ability in communication, information processing, and physical activities required for acquiring expertise	Foreign Languages (◎)							
		Introcuction to Information and Data Scieces (◎)	Fundamental Data Science (◎)						
		Health and Sports Courses (○)							
		"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 (◎)					
	③Basic techniques and methodologies for handling foods and food materials, ability to understand various phenomena regarding foods from scientific points of view, and capability of organizing the study result in a report				Laboratory Works in Food Engineering(◎)	Laboratory Work in Marine Bioresources Chemistry(◎)			
					Laboratory Work in Food Hygiene(◎)	Laboratory Work in Food Chemistry(◎)			
					Laboratory Work in Applied Biophysics (◎)	Laboratory work in nutritional biochemistry(◎)			
						Field Works of Food Production Management(◎)			

i t i e s & s k i l l s	④Acquisition of techniques for production of foods from marine and animal resources and capability of consideration of practical measures for conversion to safe and highly functional foods				Food Biochemistry(◎)	Nutrition(◎)			
					Seafood Chemistry and Biochemistry (◎)	Laboratory Work in Marine Bioresources Chemistry(◎)			
					Food Hygiene(◎)	Laboratory Work in Food Chemistry(◎)			
					Laboratory Works in Food Engineering(◎)	Laboratory work in nutritional biochemistry(◎)			
					Laboratory Work in Food Hygiene(◎)	Training for Marine Food Processing（〇）			
					Laboratory Work in Applied Biophysics (◎)	Training for Animal Food Processing（〇）			
						Agricultural Products and Food Processing(〇)			
						Bioresource Utilization Science(〇)			
	⑤Capable of organizing and considering own issues to explore in the fields of food science from a social point of view based on experience of such as observation of a food manufacturing scene		Agricultural Production Resources(◎)		Laboratory Works in Food Engineering(◎)	Food System(〇)			
					Laboratory Work in Food Hygiene(◎)	Food factory inspection（〇）			
					Laboratory Work in Applied Biophysics (◎)	Laboratory Work in Food Chemistry(◎)			
					Food Engineering(◎)	Laboratory work in nutritional biochemistry(◎)			
					Science and Technology for Food Development(〇)	Laboratory Work in Marine Bioresources Chemistry(◎)			

						Field Works of Food Production Management(◎)			
						Training for Marine Food Processing（〇）			
						Training for Animal Food Processing（〇）			
	⑥Ability to read and understand technical explanations and basic reading capabilities of scientific English				Reading of Foreign Literature in Food Science(◎)				
Comprehensive capability	①Capability of collecting information of the peripheral disciplines and organizing his/her own idea based on the information, validating the idea based on the information, logically presenting the conclusion orally or in a document, and exchanging opinions with others in the area that studies scientific issues regarding foods and food materials						Graduation Thesis I（◎）	Graduation Thesis II（◎）	Graduation Thesis III（◎）

(Example) Liberal arts subjects | Specialized fundamental subjects | Specialized subjects | Graduation thesis | (◎) Required subjects | (〇) Elective required subjects | (△) Elective subjects

Attachment 5

List of Faculty Members of the Food Science Program

Name of faculty	Name of program and position	Extension number	Laboratory	Mail address
Satoru Ueno	Professor	7934	A106	sueno@hiroshima-u.ac.jp
Kiyoshi Kawai	Professor	4366	A107	kawai@hiroshima-u.ac.jp
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Takuya Suzuki	Professor	7984	A809	takuya@hiroshima-u.ac.jp
Yosuke Chomei	Professor	7960	B216	chomei@hiroshima-u.ac.jp
Tatsuya Nakayama	Professor	7953	A508	t-nakayama@hiroshima-u.ac.jp
Shinichi Nishimura	Professor	7930	A803	nshin@hiroshima-u.ac.jp
Yoshio Hagura	Professor	7938	A108	hagura@hiroshima-u.ac.jp
Kenji Hosono	Professor	7959	B215	kjhosono@hiroshima-u.ac.jp
Noriyuki Yanaka	Professor	7979	A609	yanaka@hiroshima-u.ac.jp
Thanutchaporn Kumrungsee	Associate Professor	7980	A604	kumrung@hiroshima-u.ac.jp
Haruhiko Koizumi	Associate Professor	7935	A105	h-koizumi@hiroshima-u.a.cjp
Makoto Hirayama	Associate Professor	7929	A802	hirayama@hiroshima-u.ac.jp
Yoshinari Yamamoto	Assistant Professor	7932	A808	yamamo59@hiroshima-u.ac.jp
TRAN Anh Duc	Assistant Professor	4382	B202	tranduc@hiroshima-u.ac.jp
Shigenori Suzuki	Visiting Professor			Class : Science and Technology for Food Development
Akinobu Ono	Visiting Professor			Class : Science and Technology for Food Development
Kazuyoshi Matsumura	Visiting Professor			Class : Food Information Management,
Yoko Tsurunaga	Visiting Professor			Class : Agricultural Products and Food Processing

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