For entrants in FY 2020

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

The Molecular d -I fcb□P fb b Program aims to enable students to acquire the basic knowledge, expertise, and skills related to the natural phenomena generated by organic molecule, cell, individual organisms, and population that constitute the foundation of the applied biology to develop human resources who are capable of working as a scientist in such as a company, college, and public organization.□Qeb bc b)□f □ef □ d)□eb□abd bb□ c□ eb □c□ d f b□

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(8) Systematic and hierarchical knowledge and understanding regarding physiology of microorganisms, plants, and animals and functionality of living bodies from the level of molecule and cell to that of the individual organism and ecosystem;

(9) Data collection and analysis capabilities and systematic skills for research in the academic fields regarding molecule, cell, functionality of living bodies, and ecosystem and ability to practically use and apply those fundamental skills; and

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(3) The "specialized subjects" provided in the specialized education in this Program are categorized in "base subjects" in which students study molecular biology regarding organic molecule, cell, individual organism, and population and "advanced subjects"" in which the molecule biology is applied and developed to provide systematic education with continuity. They aim to develop capabilities for understanding natural phenomena from the view point of molecular biology and developing the understanding for practical science. In addition to that, this Program provides subjects of "exercise and practicum" in which Problem-based Learning (PBL) is conducted for identifying and solving problems to allow students to acquire skills and attitudes that he/she can widely use and apply in areas of agricultural science. 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."

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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.

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Available qualification

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

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Type	Subject type			Required No. of credits	Class subjects	No. of credits	Type of course registration	Year in which the subject is taken							
								1st grade		2nd grade		3rd grade		4th grade	
								Springs	Fall	Springs	Fall	Springs	Fall	Springs	Fall
Liberal Arts Education	Peace Science Courses			2		2	Required								
	Basic Courses in University Education	Introductory Seminar for First-Year Students		2	Introductory Seminar for First-Year Students	2	Required								
		Introduction to University Education		2	Introduction to University Education	2	Required								
	Common Subjects	Foreign Languages	English(Note2) Basic English Usage	2	Communication Basic I	1	Required								
					Communication Basic II	1									
			English(Note2) Communication I	2	Communication I A	1	Required								
					Communication I B	1									
			English(Note2) Communication II	2	Communication II A	1	Required								
					Communication II B	1									
			Non-English Foreign Languages (Select one language)	4	Basic Foreign Language I	1	Elective Required								
					Basic Foreign Language II	1									
					Basic Foreign Language III	1									
					Basic Foreign Language IV	1									
		Information, Data Science Courses		2	(Note3)	2	Required								
		Area Courses		9	(Note4)	1 or 2	Elective/ Required								
		Health and Sports Courses		2	(Note5)	1 or 2	Elective Required								
	Foundation Courses			14	Basic Calculus or Elements of Calculus (Note6)	2	Required								
					Organic Chemistry	2									
					Species Biology	2									
					Cell Science	2									
					General Chemistry or Basic Concepts of Chemistry (Note7)	2									
					4 subjects from	1 for	Elective								

			“Experimental Methods and Laboratory Work in Physics I”, “Experimental Methods and Laboratory Work in Physics II”, “Experimental Methods and Laboratory Work in Chemistry I”, “Experimental Methods and Laboratory Work in Chemistry II”, “Experimental Methods and Laboratory Work in Biology I”, “Experimental Methods and Laboratory Work in Biology II”(Note8)	each subject	Required							
	Total	44											

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

Note 2: The credit for "Field Research in the English-speaking World" that is earned through such as a short-term study abroad and that for "Online English Seminar I," "Online English Seminar II," and "Online English Seminar III" that is earned through a self-study, are accepted as the credit for English required for graduation. Achievement in a foreign language skill test and language training might be accepted as a credit. For further information, refer to the description regarding English subjects in the liberal arts education and the item "Credit based on Achievement in Foreign Language Skill Test" in the Students Handbook.
(PP. 30 - 31, Liberal Arts)

Note 3: For the information, Data Science subject, it is required to take the subject "Elements of Information Literacy" that is provided in the first semester in the first year. Only when failing to earn the credit for "Elements of Information Literacy," is it allowed to take the subject "Exercise in Information Literacy" that is provided in the second semester in the first year.

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

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

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

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

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

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

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

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

accepted for graduation.

Note 8: It is required to select two combinations of subjects from the following to earn credits for them: "Experimental Methods and Laboratory Work in Physics I" and "Experimental Methods and Laboratory Work in Physics II"; "Experimental Methods and Laboratory Work in Chemistry I" and "Experimental Methods and Laboratory Work in Chemistry II"; and "Experimental Methods and Laboratory Work in Biology I" and "Experimental Methods and Laboratory Work in Biology II."

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
		24	Introduction to Applied Biological Sciences	2								
			Introduction to Microbiology	2								
			Introduction to Molecular Biochemistry	2								
			Agricultural Production Resources	2								
			Physics for Applied Biological Science	2								
			Ethics of Science and Technology	2								
			Statistics in Biology	2								
			Environmental Sciences for Bioproduction	2								
			Laboratory Work in General Biology I	1								
			Laboratory Work in General Biology II	1								
			Laboratory Work in General Chemistry	1								
			Laboratory Work in General Physics	1								
			Required Subjects: Total 20 credits									

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

Table of Registration Standards(Specialized Subjects)

（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 Subjects	56	Genome Science I	2				○				
			Genome Science II	2				○				
			Bioorganic Chemistry	2				○				
			Chemistry of Natural Organic Compounds	2				○				
			Molecular Cell Biology	2				○				
			Bio-Analytical Science	2				○				
			Reading of Foreign Literature in Molecular Agro-Life Science	2				○				
			Laboratory Work in Molecular Agro-life Science I	1				○				
			Laboratory Work in Molecular Agro-life Science II	1				○				
			Laboratory Work in Molecular Agro-life Science III	1				○				
			Systemic Life Science	2				○				
			Problem Based Learning for Molecular Agro-Life Science I	1					○			
			Problem Based Learning for Molecular Agro-Life Science II	1					○			
			Graduation Thesis I	2						○		
			Graduation Thesis II	2							○	
			Graduation Thesis III	2								○
			Required Subjects: Total 27credits									

Results of study in Food Science Program

Relation between evaluation items and evaluation criteria

		Excellent	Very Good
(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.
(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	Has fundamental knowledge and profound understanding required for acquiring expertise, and is capable of sufficiently explaining this knowledge
(3)			

		Ability to collect information related to peripheral disciplines to complement the knowledge regarding the specialized area and comprehensively consider functions of organic molecule, cell, individual organism, and population from view points related to molecules	Capable of collecting information related to peripheral disciplines to complement the knowledge regarding the specialized area, comprehensively considering functions of organic molecule, cell, individual organism, and population from view points related to molecules, explaining to others, and applying the information.	Capable of collecting information related to peripheral disciplines to complement the knowledge regarding the specialized area, comprehensively considering functions of organic molecule, cell, individual organism, and population from view points related to molecules, and explaining to others.
		Ability to organize own ideas, demonstrate comprehension based on those ideas, logically represent own conclusion orally or in a document, and exchange ideas in areas in which themes regarding functions of organic molecule, cell, individual organism, and population are discussed from view points related to molecules.	Capable of organizing own ideas, demonstrating comprehension based on those ideas, logically representing own conclusion orally or in a document, and exchanging advanced ideas in areas in which themes regarding functions of organic molecule, cell, individual organism, and population are discussed from view points related to molecules.	Capable of organizing own ideas, demonstrating comprehension based on those ideas, logically representing own conclusion orally or in a document, and sufficiently exchanging ideas in areas in which themes regarding functions of organic molecule, cell, individual organism, and population are discussed from view points related to molecules.

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 educatic autonomously and a scientific intelligence based on the ability to collect, analyze and criticize data, but also language skills that allow the student t enhances insight from a broad perspective for the essentials and the background of phenomena, and the linguistic ability and concern for peace whi students to acquire the ability to integrate findings and establish a "knowledge system" that is really useful for problem solving, and to examine phe this integrated knowledge.

Good
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.
Has fundamental knowledge and profound understanding required for acquiring expertise, and is capable of providing basic explanation of this
Has basic ability in all the elements regarding communication, information processing, and physical activities required for acquiring expertise.
Generally has sufficient basic experimentation abilities and skills required for acquiring expertise, and is capable of supporting their execution.
Has intellectual ability and techniques in areas regarding organic molecule, cell, individual organism, and population.
Has a basic ability for reading English texts and capable of understanding technical manuals.

Capable of collecting information related to peripheral disciplines to complement the knowledge regarding the specialized area and comprehensively considering functions of organic molecule, cell, individual organism, and population from view points related to molecules.
Capable of organizing own ideas, demonstrating comprehension based on those ideas, logically representing own conclusion orally or in a document, and exchanging ideas in areas in which themes regarding organic molecule, cell, individual organism, and population are discussed from view points related to molecules.

ɔn. It develops not only a capability for studying o exchange ideas with others in English. Also, it ich are required for a citizen of the world. It enables enomena using a top-down perspective based on

Attachment 3

Relation between evaluation items and class subjects

Subject category	Name of class subject	Number of credits	Required or Electivee	Semester when the class is provided	Evaluation item																		Total of weightings for evaluation items for the subject
					Knowledge & understanding						Ability & skills								Comprehensive capability				
					(1)		(2)		(3)		(1)		(2)		(3)		(4)		(1)		(2)		
					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 - 4th semesters	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 Courses	2	Required	1st semester							100	1											100
Liberal arts education subjects	Area Courses	10	Elective required	1st - 6th semesters	100	1																	100
Liberal arts education subjects	Health and Sports Courses	2	Elective required	1st - 2nd semesters							100	1											100
Liberal arts education subjects	"Basic Calculus" or "Elements of Calculus"	2	Required	1st semester			100	1															100
Liberal arts education subjects	Organic Chemistry	2	Required	2nd semester			100	1															100
Liberal arts education subjects	Species Biology	2	Required	2nd semester			100	1															100
Liberal arts education subjects	Cell Science	2	Required	2nd semester			100	1															100
Liberal arts education subjects	"General Chemistry" or "Basic Concepts of Chemistry"	2	Required	1st semester			100	1															100
Liberal arts education subjects	"Experimental Methods and Laboratory Work in Physics I" and "Experimental Methods and Laboratory Work in Physics II"	2	Elective required	1st - 3rd semesters									100	1									100

Liberal arts education subjects	"Experimental Methods and Laboratory Work in Chemistry I" and "Experimental Methods and Laboratory Work in Chemistry II"	2	Elective required	1st - 3rd semesters									100	1									100
Liberal arts education subjectsLiberal arts education subjects	"Experimental Methods and Laboratory Work in Biology I" and "Experimental Methods and Laboratory Work in Biology II"	2	Elective required	1st - 3rd 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	60	1			40	1													100
Specialized subjects	Agricultural Production Resources	2	Required	2nd semester\			100	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			100	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 Applied Biological Sciences	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	Genome Science I	2	Required	4th semester					100	1													100
Specialized subjects	Genome Science II	2	Required	4th semester					100	1													100
Specialized subjects	Bioorganic Chemistry	2	Required	4th semester					100	1													100

Specialized subjects	Chemistry of natural organic compounds	2	Required	4th semester					100	1													100
Specialized subjects	Molecular Cell Biology	2	Required	4th semester					100	1													100
Specialized subjects	Bio-Analytical Science	2	Required	4th semester					100	1													100
Specialized subjects	Reading of Foreign Literature in Molecular Agro-Life Science	2	Required	4th semester													100	1					100
Specialized subjects	Laboratory Work in Molecular Agro-life Science I	1	Required	4th semester											100	1							100
Specialized subjects	Laboratory Work in Molecular Agro-life Science II	1	Required	4th semester											100	1							100
Specialized subjects	Laboratory Work in Molecular Agro-life Science III	1	Required	4th semester											100	1							100
Specialized subjects	Systemic Life Science	2	Required	4th semester					100	1													100
Specialized subjects	Problem Based Learning for Molecular Agro-Life Science I	1	Required	5th semester											100	1							100
Specialized subjects	Problem Based Learning for Molecular Agro-Life Science II	1	Required	5th semester											100	1							100
Specialized subjects	Graduation Thesis I	2	Required	6th semester																	100	1	100
Specialized subjects	Graduation Thesis II	2	Required	7th semester																	100	1	100
Specialized subjects	Graduation Thesis III	2	Required	8th semester																	100	1	100
Specialized subjects	Cell Technology	2	Elective required	5th semester					100	1													100
Specialized subjects	Reproductive Biology	2	Elective required	5th semester					100	1													100
Specialized subjects	Plant Molecular Biology	2	Elective required	5th semester					100	1													100
Specialized subjects	Food Microbiology	2	Elective required	5th semester					100	1													100
Specialized subjects	Bioresource Utilization Science	2	Elective required	5th semester					100	1													100
Specialized subjects	Nutrition	2	Elective required	5th semester					100	1													100
Specialized subjects	Biofunctional Chemistry	2	Elective required	5th semester					100	1													100
Specialized subjects	Pathology	2	Elective required	5th semester					100	1													100
Specialized subjects	Applied Extremophilic Life Science	2	Elective required	5th semester					100	1													100
Specialized subjects	Animal Breeding and Genetics	2	Elective required	6th semester					100	1													100
Specialized subjects	Food Biochemistry	2	Elective required	6th semester															100	1			100
Specialized subjects	Food Hygiene	2	Elective required	6th semester															100	1			100
Specialized subjects	Aquaculture I	2	Elective required	6th semester															100	1			100

Attachment 4

Curriculum map for Food Science Program

Study achievementStudy achievementStudy 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
Knowledge & understanding	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 (◎)							
		Introduction to University Education (◎)	Research Front of Applied Biological Sciences (○)						
		Peace Science Courses (◎)	Introduction to Molecular Biochemistry(◎)						
		Area Courses subjects (○)							
	②Basic knowledge and understanding required for acquiring expertise	Basic Calculus / Elements of Calculus (◎)	Organic Chemistry (◎)	Environmental Sciences for Bioproduction(◎)			Public Health(○)		
		General Chemistry / Basic Concepts of Chemistry (◎)	Cell Science (◎)	Statistics in Biology (◎)					
		Introduction to Applied Biological Science(◎)	Species Biology (◎)						
		Introduction to Microbiology (◎)	Agricultural Production Resources(◎)	Introduction to Physiology (○)					
			Physics for Applied Biological Science(◎)						
			Ethics of Science and Technology(◎)						
			Seminar in Field Science (○)						

t a n d i n g	③Knowledge and understanding regarding organic molecule, cell, individual organism, and population		Introduction to Molecular Biochemistry(◎)		Genome Science I (◎)	Cell Technology（〇）	Animal Breeding and Genetics（〇）		
					Genome Science II (◎)	Reproductive Biology (〇)			
					Bioorganic Chemistry (◎)	Plant Molecular Biology（〇）			
					Chemistry of natural organic compounds (◎)	Food Microbiology (〇)			
					Molecular Cell Biology (◎)	Bioresource Utilization Science (〇)			
					Bio-Analytical Science (◎)	Nutrition（〇）			
					Systemic Life Science (◎)	Biofunctional Chemistry（〇）			
						Pathology （〇）			
						Applied extremophilic life science（〇）			
A b i l i t i e s &	①Basic ability in communication, information processing, and physical activities required for acquiring expertise	健康スポーツ科目（〇）							
		情報科目（◎）							
		外国語科目（◎，〇）							
	②Basic experimentation abilities and skills required for acquiring expertise	"Experimental Methods and Laboratory Work in Physics I" and "Experimental Methods and Laboratory Work in Physics II" (〇)"Experimental Methods and Laboratory Work in Physics I" and "Experimental		Laboratory Work in General Biology I & II (◎)					
		"Experimental Methods and Laboratory Work in Chemistry I" and "Experimental Methods and Laboratory Work in Chemistry II" (〇)"Experimental Methods and Laboratory Work in Chemistry I" and "Experimental Methods and Laboratory		Laboratory Work in General Chemistry (◎)					

s k i l l s		"Experimental Methods and Laboratory Work in Biology I" and "Experimental		Laboratory Work in General Physics (◎)					
					Laboratory Work in Molecular Agro-life Science I（◎）	Problem Based Learning for Molecular Agro-Life Science I（◎）			
	③Intellectual ability and techniques in study fields regarding organic molecule, cell, individual organism, and population				Laboratory Work in Molecular Agro-life Science II（◎）	Problem Based Learning for Molecular Agro-Life Science II（◎）			

	population				Laboratory Work in Molecular Agro-life Science III（◎）					
	④Ability regarding scientific English that is required as a basis for understanding technical				Reading of Foreign Literature in Molecular Agro-Life					
n s i v e c a	①Ability to collect information related to peripheral disciplines to complement the knowledge regarding the specialized area and comprehensively consider functions of organic molecule, cell, individual organism, and population from view points						Food Biochemistry（〇）			
							Food Hygiene（〇）			
							Aquaculture I（〇）			
	②Ability to organize own ideas, demonstrate						Graduation Thesis I（◎）	Graduation Thesis II（◎）	Graduation Thesis III（◎）	

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

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

Name of faculty	Name of program and position	Extension number	Laboratory	Mail address
[redacted]	Professor			@
	Professor			@
	Professor			@
	Professor			@
				@
	Professor			@
				@
				@
