For entrants in FY 2020

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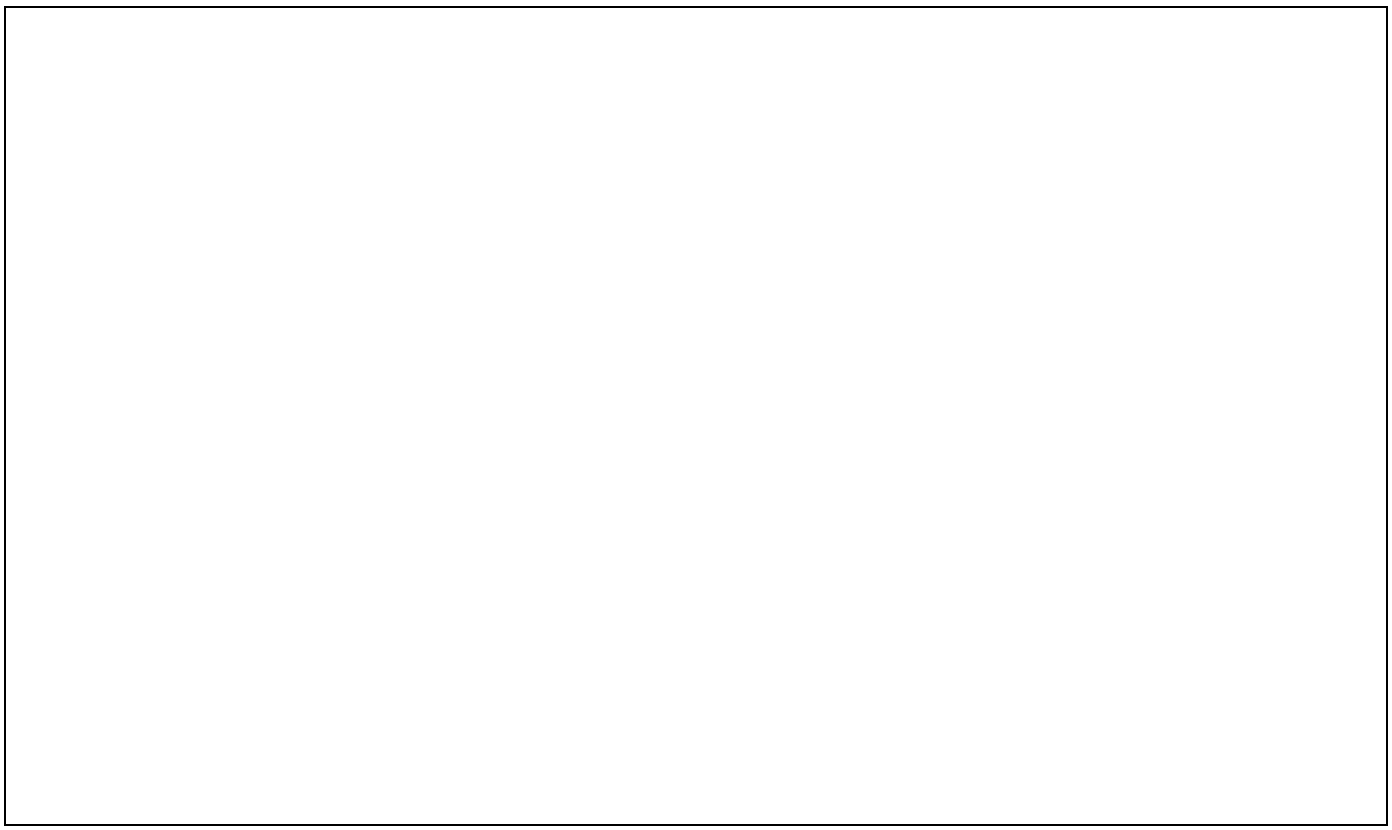


Type	Subject type			Required No. of credits	Class subjects	No. of credits	Type of course registration	Year in which the subject is taken							
								1st grade		2nd grade		3rd grade		4th grade	
								Springs	Fall	Springs	Fall	Springs	Fall	Springs	Fall
Liberal Arts Education	Peace Science Courses			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)

Integrative Hydrospheric 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
			Field Work on Training Vessel	2								
			Reading of Foreign Literature in Hydrospheric Science	2								
			Graduation Thesis I	2								
			Graduation Thesis II	2								
			Graduation Thesis III	2								
			Required Subjects: Total 10credits									
Specialized Subjects	Specialized Subjects	56	Aquaculture I Hydrospheric Zoology I Hydrospheric Ecology I Hydrospheric Environmental Science I Hydrospheric Primary Production I Introduction to Hydrospheric Biodiversity I Laboratory Work in Hydrospheric Biology I Laboratory Work in Hydrospheric Biology II Aquaculture II Hydrospheric Zoology II Hydrospheric Ecology II Hydrospheric Environmental Science II Hydrospheric Primary Production II Introduction to Hydrospheric Biodiversity II Laboratory Work in Hydrospheric Biology III Practical Work in Hydrospheric Field Science I Practical Work in Hydrospheric Field Science II Exercises in Integrative Hydrospheric Science I Exercises in Integrative Hydrospheric Science II Aquatic Biogeochemical Cycles Introduction to International Fishery Fisherish								

			Elective Required Subjects: Take 25 credits from above subjects (Redundant credits over 25 credits move to Elective Subjects)
			Elective Subjects: At least 21 credits must be obtained. Specialized subjects from other Applied Biological Science programs can be included in the elective subjects. Up to 12 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 procession cannot be included in the credits required for graduation.

Attachment 2

Results of study in Integrative Hydrospheric Science Program

Relation between evaluation items and evaluation criteria

Study achievement			Evaluation criteria		
Evaluation items			Excellent	Very Good	Good
Knowledge & understanding	(1)	Ability for comprehensive and cross-disciplinary thinking and knowledge / understanding required to see a phenomenon from a wide bird's eye view to take an 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 wide bird's eye view to take an 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 wide bird's eye view to take an 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 wide bird's eye view to take an action for solving problems regarding the specialized area.
	(2)	Basic knowledge and understanding required for studying the expertise	Has fundamental knowledge and profound understanding required for studying the expertise and is capable of explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge required for studying the expertise and is capable of sufficiently understanding issues in the specialized area and explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge and general understanding required for studying the expertise and is capable of providing basic explanation regarding the knowledge and understandings.
	(3)	Comprehensive understanding on characteristics regarding morphology, ecology, physiology, pathology, biochemistry, and genetics of various hydrosphere organisms	Has fundamental knowledge and profound understanding and is capable of explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge and sufficient understanding and is capable of explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge and general understanding is capable of providing basic explanation regarding the knowledge and understandings.
	(4)	Understanding on economic trend regarding management, breeding, and use of aquatic resources and fishery	Has fundamental knowledge and profound understanding and is capable of explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge and sufficient understanding and is capable of explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge and general understanding is capable of providing basic explanation regarding the knowledge and understandings.
	(5)	Understanding on physiologic, pathologic, biochemical, and genetic mechanisms required for management and breeding of aquatic resources	Has fundamental knowledge and profound understanding and is capable of explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge and sufficient understanding and is capable of explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge and general understanding is capable of providing basic explanation regarding the knowledge and understandings.
	(6)	Understanding on relation between form and ecology of hydrosphere organisms and hydrosphere environment	Has fundamental knowledge and profound understanding and is capable of explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge and sufficient understanding and is capable of explaining the knowledge while associating it with items regarding any other area.	Has fundamental knowledge and general understanding is capable of providing basic explanation regarding the knowledge and understandings.

Abilities & skills	(1)	Basic ability for communication, information processing, and physical activities required for studying the expertise	Has superior ability for all the elements regarding communication, information processing, and physical activities required for studying the expertise.	Has sufficient ability for all the elements regarding communication, information processing, and physical activities required for studying the expertise.	Has basic ability for all the elements regarding communication, information processing, and physical activities required for studying the expertise.
	(2)	Basic experiment abilities and skills required for studying the expertise	Has sufficient basic experiment abilities and skills required for studying the expertise and is capable of autonomously applying it.	Has sufficient basic experiment abilities and skills required for studying the expertise and is capable of applying it according to instruction.	Generally has basic experiment abilities and skills required for studying the expertise and is capable of giving support to execution.
	(3)	Method for analyzing and evaluating various characteristics of hydrosphere organisms and environment	Capable of autonomously analyzing and evaluating characteristics of hydrosphere organisms and hydrosphere environment.	Capable of analyzing and evaluating characteristics of hydrosphere organisms and hydrosphere environment according to instruction.	Capable of substantially analyzing and evaluating characteristics of hydrosphere organisms and hydrosphere environment.
	(4)	Basic skills and analysis methods for breeding and management of hydrosphere organisms	Has sufficiently acquired basic skills and analysis methods for breeding and management of hydrosphere organisms and is capable of autonomously applying the skills and methods.	Has acquired basic skills and analysis methods for breeding and management of hydrosphere organisms and is capable of applying the skills and methods according to instruction.	Has substantially acquired basic skills and analysis methods for breeding and management of hydrosphere organisms and is capable of assisting the breeding and management
	(5)	Method for analyzing and evaluating roles of fishery for human lives and the impact of it on hydrosphere environment	Capable of autonomously analyzing and evaluating roles of fishery for human lives and the impact of it on hydrosphere environment.	Capable of analyzing and evaluating roles of fishery for human lives and the impact of it on hydrosphere environment according to instruction.	Capable of substantially analyzing and evaluating roles of fishery for human lives and the impact of it on hydrosphere environment.
	(6)	Ability for reading and communication in English regarding hydrosphere organisms	Has very advanced ability for reading English texts, is capable of understanding technical manuals, and has acquired sufficient and profound capability for international communication.	Has advanced ability for reading English texts, is capable of understanding technical manuals for some extent, and has acquired sufficient and profound capability for international communication.	Has ability for reading English texts, is capable of partly understanding technical manuals, and has acquired sufficient and profound capability for international communication.

capabilinsive	(1)	Ability to identify issues that he/she should pursue for a specific phenomenon related to hydrosphere organisms, organize his/her own opinion, logically publish them orally and/or in writing, and discuss the topic	Has advanced capabilities regarding elements of comprehensive ability and skills for such as identification of targeted issues, information processing, statistical analysis, and responsive communication.	Has capabilities regarding elements of comprehensive ability and skills for such as identification of targeted issues, information processing, statistical analysis, and responsive communication.	Has basic capabilities regarding elements of comprehensive ability and skills for such as identification of targeted issues, information processing, statistical organization, and responsive communication.

Role of liberal arts education in this program

The liberal arts education in this program aims to build both the language skills and the academic foundation required for th e 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 ski lls 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 pr oblem solving, and to examine phenomena using a top-down perspective based on this integrated knowledge.

Attachment 3

Relation between evaluation items and class subjects

Subject category	Name of class subject	Number of credits	Required or Electivee	Semester when the class is provided	Evaluation item																										Total of weightings for evaluation items for the subject
					Knowledge & understanding												Ability & skills												Comprehensive capability			
					(1)		(2)		(3)		(4)		(5)		(6)		(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		
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 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			100	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			50	1												50	1												100
Specialized subjects	Laboratory Work in General Biology II	1	Required	3rd semester			50	1												50	1												100
Specialized subjects	Laboratory Work in General Chemistry	1	Required	3rd semester			50	1												50	1												100
Specialized subjects	Laboratory Work in General Physics	1	Required	3rd semester			50	1												50	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	Aquaculture I	2	Elective required	4th semester					50	1	25	1	25	1																			100
Specialized subjects	Hydrospheric Zoology I	2	Elective required	4th semester					50	1			50	1																			100
Specialized subjects	Hydrospheric Ecology I	2	Elective required	4th semester					50	1					50	1																	100
Specialized subjects	Hydrospheric Environmental Science I	2	Elective required	4th semester					50	1			25	1	25	1																	100
Specialized subjects	Hydrospheric Primary Production I	2	Elective required	4th semester					50	1					50	1																	100

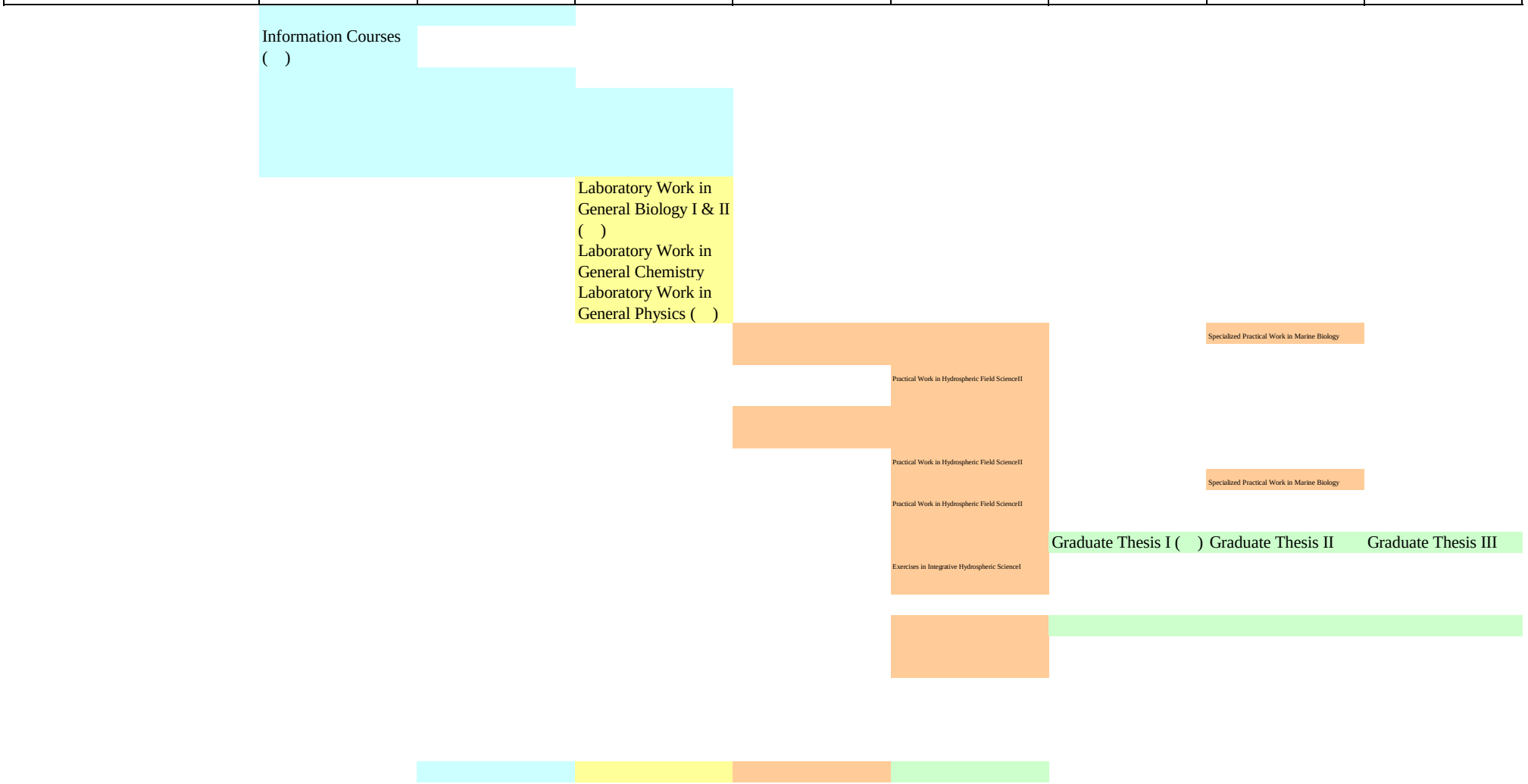
Specialized subjects	Introduction to Hydrospheric Biodiversity I	2	Elective required	4th semester							50	1			50	1																	100
Specialized subjects	Laboratory Work in Hydrospheric Biology I	1	Elective required	4th semester																	50	1	50	1									100
Specialized subjects	Laboratory Work in Hydrospheric Biology	1	Elective required	4th semester																	50	1	50	1									100
Specialized subjects	Aquaculture II	2	Elective required	5th semester					50	1	25	1	25	1																			100
Specialized subjects	Hydrospheric Zoology II	2	Elective required	5th semester					50	1			50	1																			100
Specialized subjects	Hydrospheric Ecology II	2	Elective required	5th semester					50	1					50	1																	100
Specialized subjects	Hydrospheric Environmental Science II	2	Elective required	5th semester					50	1			25	1	25	1																	100
Specialized subjects	Hydrospheric Primary Production II	2	Elective required	5th semester					50	1					50	1																	100
Specialized subjects	Introduction to Hydrospheric Biodiversity II	2	Elective required	5th semester							50	1			50	1																	100
Specialized subjects	Laboratory Work in Hydrospheric Biology III	1	Elective required	5th semester																	50	1	50	1									100
Specialized subjects	Practical Work in Hydrospheric Field Science I	1	Elective required	5th semester																	50	1	25	1	25	1							100
Specialized subjects	Practical Work in Hydrospheric Field Science II	1	Elective required	5th semester																	50	1	25	1	25	1							100
Specialized subjects	Exercises in Integrative Hydrospheric Science I	1	Elective required	5th semester																							20	1	80	1			100
Specialized subjects	Exercises in Integrative Hydrospheric Science II	1	Elective required	5th semester																							20	1	80	1			100
Specialized subjects	Aquatic Biogeochemical Cycles	1	Elective required	5th semester									50	1	50	1																	100
Specialized subjects	Introduction to International Fishery	1	Elective required	5th semester							100	1																					100
Specialized subjects	Fisheries Socioeconomics	1	Elective required	5th semester							100	1																					100
Specialized subjects	Specialized Practical Work in Marine Biology	1	Elective required	7th semester																	50	1			50	1							100
Specialized subjects	Field Work on Training Vessel	2	Required	5th semester																	50	1			50	1							100
Specialized subjects	Reading of Foreign Literature in Hydrospheric Science	2	Required	5th semester																							80	1	20	1			100
Specialized subjects	Graduation Thesis I	2	Required	6th semester																							20	1	80	1			100
Specialized subjects	Graduation Thesis II	2	Required	7th semester																							20	1	80	1			100
Specialized subjects	Graduation Thesis III	2	Required	8th semester																							20	1	80	1			100

Curriculum map for Integrated Hydrospheric Science Program

Study achievementStudy achievementStudy achievement Evaluation items		1st year		2nd year		3rd year		4th year	
		1st semester	2nd semester	3rd semester	4th semester	5th semester	6th semester	7th semester	8th semester
dingKnowledge & understandingKnowledge & understanding	Knowledge and understanding required to see a phenomenon from a broad, top-down perspective and for action based on comprehensive and cross-disciplinary thinking	Peace Science Courses ( )							
		Seminar for developing							
		Introduction to University Education ( )							
		Area Courses subjects ( )							
	Basic knowledge and understandings 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 ( )						
			Species Biology ( )	Laboratory Work in General Biology I & II ( )					
		"Experimental Methods and Laboratory Work in Physics I" and "Experimental Methods and Laboratory Work in Physics II" ( )"Experimental Methods and Laboratory Work in Physics I" and "Experimental Methods and Laboratory Work in Physics II" ( )		Laboratory Work in General Chemistry ( )					
		I" and "Experimental Methods and Laboratory Work in Chemistry II" ( )"Experimental Methods and Laboratory Work in Chemistry I" and "Experimental Methods and Laboratory Work in Chemistry II" ( )		Laboratory Work in General Physics ( )					
		"Experimental Methods and Laboratory Work in Biology I" and "Experimental Methods and Laboratory Work in Biology II" ( )"Experimental Methods and Laboratory Work in Biology I" and "Experimental Methods and Laboratory Work in Biology II" ( )		Introduction to Physiology ( )					
		Introduction to Applied Biological	Agricultural Production	Statistics in Biology ( )					
		Introduction to Microbiology ( )	Physics for Applied Biological Science( )						

Study achievementStudy achievementStudy achievement Evaluation items	1st year		2nd year		3rd year		4th year	
	1st semester	2nd semester	3rd semester	4th semester	5th semester	6th semester	7th semester	8th semester
		Ethics of Science and Technology( ) Seminar in Field Science ( ) Introduction to Molecular Biochemistry( ) Research Front of Applied Biological Sciences ( )						

Study achievementStudy achievementStudy achievement Evaluation items	1st year		2nd year		3rd year		4th year	
	1st semester	2nd semester	3rd semester	4th semester	5th semester	6th semester	7th semester	8th semester



List of Faculty Members of the

Name of faculty	Name of program and position	Extension number	Laboratory	Mail address