I. Guidance, Subjects, Grading

I - 1. Guidance

(1) Supervisors

For student guidance, one supervisor and two or more co-supervisors are assigned to each student. One of the co-supervisors is from a specialist field different from that of the supervisor. This arrangement helps to provide advice and guidance from an alternative perspective and, after graduation, helps graduates develop the competence to be highly skilled professionals and technologists who possess knowledge and skills which enables them to respond flexibly to a broad range of challenges on a number of fronts, and can participate in interdisciplinary discussions.

(2) Role of Supervisors

Supervisor

- Discuss and set research topics with students
- At the beginning of each semester, design the education research plan with students
- Work with the co-supervisors and guide and evaluate participation in the Kuroshio Seminar and Special Exercise, and dissertation research and writing according to the degree evaluation criteria
- Through this guidance, have the students acquire knowledge and skills whereby they can continuously contribute to research activities and society as highly skilled professionals or technologists after being awarded their degree

Co-supervisor (A): same field as the supervisor or a closely-related field

- Work with the supervisor and provide research guidance related to the dissertation. If the supervisor is not able to provide guidance due to some unforeseen circumstance, co-supervisor (A) will assume responsibility for education research guidance

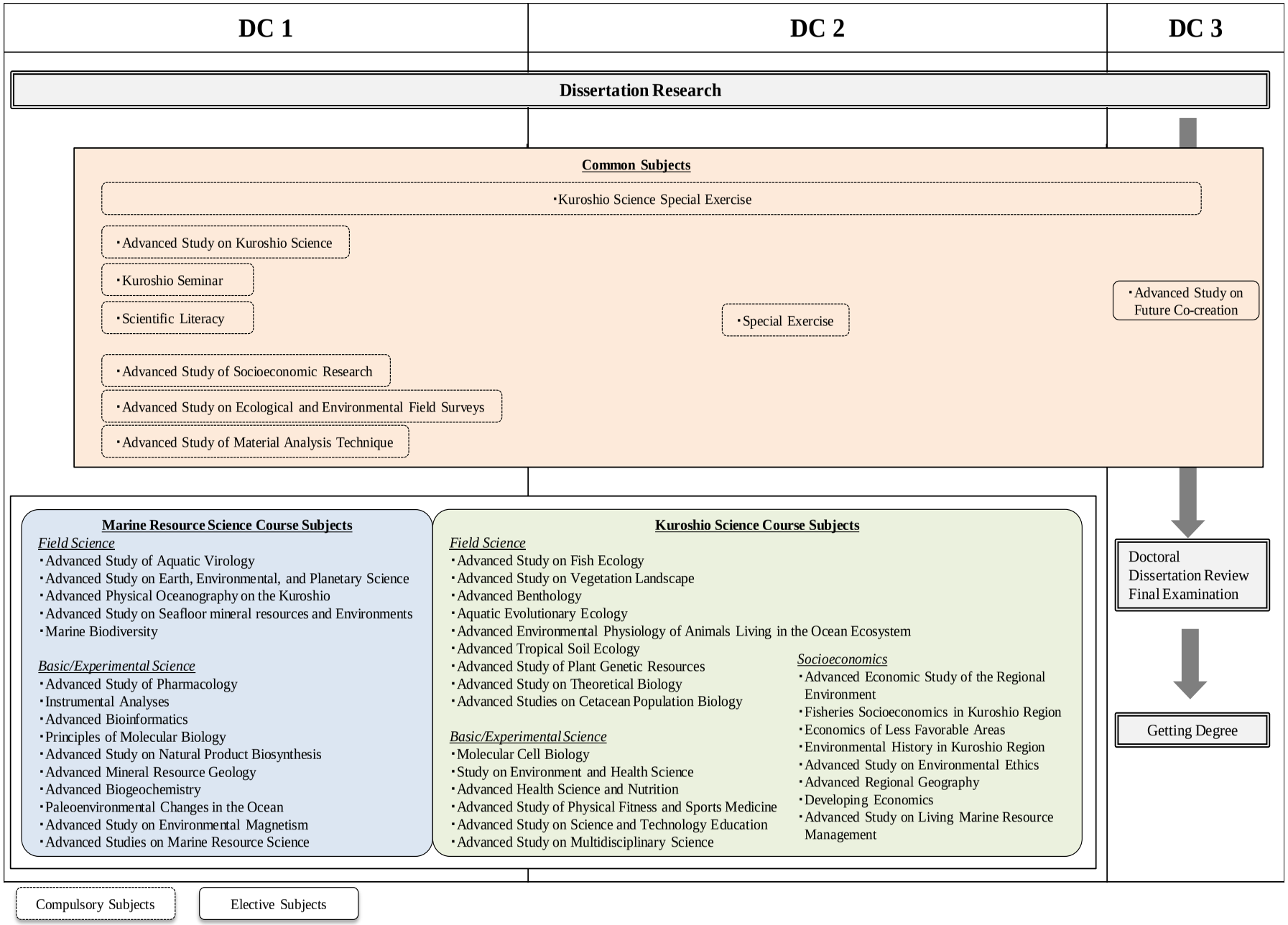
Co-supervisor (B): field different from both supervisor and co-supervisor (A)

- At the end of each semester, obtain a briefing and report from students on their research results and progress, and guide and advise students from the perspective of a different field so they can objectively evaluate their own research progress
- With the supervisor and co-supervisor (A), review the methods and principles of instruction to determine whether they are sufficient to encourage a wider vision in education research and foster enriched learning

I - 2. Subjects

(1) Subjects List

	Code	Title	Instructor	Type	Credit		Year	Semester	Requirement	Remarks	Required for Completion
					Compulsory	Elective					
Common Subjects	19500	Advanced Study on Kuroshio Science	Higa, Kubota, Others	Lecture	1		1	1,2		Omnibus	6 credits
	19600	Kuroshio Seminar	Each Supervisors	Esercise	1		1	1,2			
	19700	Special Exercise	Each Supervisors	Esercise	1		2	1,2			
	19410	Kuroshio Science Special Exercise	Each Supervisors	Esercise	2		1(*)	1,2		(*)Three years full year	
	19401	Scientific Literacy	Gyo ITANI, Hirotaka DOHO, Others	Lecture	1		1	1			
Elective Subjects	19403	Advanced Study of Socioeconomic Research	Teruyuki SHINBO, Mina HORI, Others	Lecture	1		1	1,2	2 subjects are selected depending on belonging course	Omnibus	2 credits
	19404	Advanced Study on Ecological and Environmental Field Surveys	Yohei NAKAMURA, Motoki HIGA, Others	Lecture	1		1	1,2		Omnibus	
	19405	Advanced Study of Material Analysis Technique	Takushi NANBA, Kazuhiko YAMADA, Others	Lecture	1		1	1,2		Omnibus	
	19402	Advanced Study of Future Co-creation	Syun-Ichiro OSHIMA, Others	Lecture		1	3	1,2		Omnibus	
Marine Resource Science Course	19002	Marine Biodiversity	Osamu MIURA	Lecture		2	1	2	Need to earn 4 credits or more from belonging course		6 credits or more
	19041	Principles of Molecular Biology	Maki TERAMOTO	Lecture		2	1	2			
	19042	Instrumental Analyses	Kazuhiko YAMADA	Lecture		2	1	2			
	19044	Advanced Study on Earth, Environmental, and Planetary Science	Yoshiro NISHIO	Lecture		2	1	2			
	19047	Advanced Study on Natural Product Biosynthesis	Dana ULANOVA	Lecture		2	1	2			
	19048	Advanced Study of Pharmacology	Takushi NANBA	Lecture		2	1	1			
	19050	Advanced Mineral Resource Geology	Go-Ichiro URAMOTO	Lecture		2	1	2			
	19051	Advanced Biogeochemistry	Tomoyo OKUMURA	Lecture		2	1	1			
	19052	Advanced Study on Environmental Magnetism								Not Offer this year	
	19057	Paleoenvironmental Changes in the Ocean	Masafumi MURAYAMA	Lecture		2	1	1			
	19096	Advanced Bioinformatics	Tetsuya SAKURAI	Lecture		2	1	2			
	19097	Advanced Study of Aquatic Virology	Keizo NAGASAKI	Lecture		2	1	2			
	19098	Advanced Physical Oceanography on the Kuroshio	Hiroyuki YORITAKA	Lecture		2	1	1			
	19099	Advanced Study on Seafloor mineral resources and Environments					1			Not Offer this year	
	19070	Advanced Studies on Marine Resource Science	Gyo ITANI, Others	Lecture		2	1	1,2		Omnibus	
Kuroshio Science Course	19005	Aquatic Evolutionary Ecology	Masanori HIRAOKA	Lecture		2	1	1			
	19006	Advanced Benthology	Gyo ITANI	Lecture		2	1	2			
	19007	Advanced Study on Living Marine Resource Management	Hiroyuki MATSUDA	Lecture		2	1	2			
	19008	Molecular Cell Biology	Syun-Ichiro OSHIMA	Lecture		2	1	1			
	19012	Advanced Environmental Physiology of Animals Living in the Ocean Ecosystem	Tetsuo HARADA	Lecture		2	1	2			
	19013	Advanced Studies on Cetacean Population Biology	Toshiya KISHIRO	Lecture		2	1	1,2			
	19019	Advanced Tropical Soil Ecology	Sota TANAKA	Lecture		2	1	2			
	19020	Advanced Economic Study of the Regional Environment	Teruyuki SHINBO	Lecture		2	1	1			
	19022	Developing Economics	Satoshi KUBOTA, Others	Lecture		2	1	1,2		Omnibus	
	19023	Economics of Less Favorable Areas	Yoshiaki HIGUNI	Lecture		2	1	1			
	19033	Advanced Health Science and Nutrition	Satoshi KUBOTA	Lecture		2	1	1			
	19043	Fisheries Socioeconomics in Kuroshio Region	Mina HORI	Lecture		2	1	1			
	19045	Advanced Study on Vegetation Landscape	Motoki HIGA	Lecture		2	1	1			
	19053	Environmental History in Kuroshio Region	Shingo AKAIKE	Lecture		2	1	2			
	19054	Advanced Study on Environmental Ethics								Not Offer this year	
	19055	Advanced Regional Geography	Yasukazu SATAKE	Lecture		2	1	1			
	19056	Advanced Study of Physical Fitness and Sports Medicine	Atsumu YUKI	Lecture		2	1	1			
	19060	Advanced Study on Science and Technology Education	Hirotaka DOHO	Lecture		2	1	1			
	19058	Advanced Study on Fish Ecology	Yohei NAKAMURA	Lecture		2	1	2			
	19059	Advanced Study of Plant Genetic Resources	Mitsukazu SAKATA	Lecture		2	1	2			
	19092	Study on Environment and Health Science	Shunji MIZOBUCHI	Lecture		2	1	2			
	19095	Advanced Study on Theoretical Biology	Motomi KATO	Lecture		2	1	2			
	19071	Advanced Study on Multidisciplinary Science	Gyo ITANI, Others	Lecture		2	1	1,2		Omnibus	
									Total		14 credits or more


DC 1
DC 2
DC 3
Dissertation Research
Common Subjects
・Kuroshio Science Special Exercise
・Advanced Study on Kuroshio Science
・Kuroshio Seminar
・Scientific Literacy
・Special Exercise
・Advanced Study on Future Co-creation
・Advanced Study of Socioeconomic Research
・Advanced Study on Ecological and Environmental Field Surveys
・Advanced Study of Material Analysis Technique
Marine Resource Science Course Subjects
Field Science
・Advanced Study of Aquatic Virology
・Advanced Study on Earth, Environmental, and Planetary Science
・Advanced Physical Oceanography on the Kuroshio
・Advanced Study on Seafloor mineral resources and Environments
・Marine Biodiversity
Basic/Experimental Science
・Advanced Study of Pharmacology
・Instrumental Analyses
・Advanced Bioinformatics
・Principles of Molecular Biology
・Advanced Study on Natural Product Biosynthesis
・Advanced Mineral Resource Geology
・Advanced Biogeochemistry
・Paleoenvironmental Changes in the Ocean
・Advanced Study on Environmental Magnetism
・Advanced Studies on Marine Resource Science
Kuroshio Science Course Subjects
Field Science
・Advanced Study on Fish Ecology
・Advanced Study on Vegetation Landscape
・Advanced Benthology
・Aquatic Evolutionary Ecology
・Advanced Environmental Physiology of Animals Living in the Ocean Ecosystem
・Advanced Tropical Soil Ecology
・Advanced Study of Plant Genetic Resources
・Advanced Study on Theoretical Biology
・Advanced Studies on Cetacean Population Biology
Basic/Experimental Science
・Molecular Cell Biology
・Study on Environment and Health Science
・Advanced Health Science and Nutrition
・Advanced Study of Physical Fitness and Sports Medicine
・Advanced Study on Science and Technology Education
・Advanced Study on Multidisciplinary Science
Socioeconomics
・Advanced Economic Study of the Regional Environment
・Fisheries Socioeconomics in Kuroshio Region
・Economics of Less Favorable Areas
・Environmental History in Kuroshio Region
・Advanced Study on Environmental Ethics
・Advanced Regional Geography
・Developing Economics
・Advanced Study on Living Marine Resource Management
Doctoral Dissertation Review Final Examination
Getting Degree
Compulsory Subjects
Elective Subjects

I - 3. Class Overview

(1) Credits Required for Completing the Doctoral Course

<table>
<tr><th colspan="3" rowspan="2">Compulsory subjects</th><th>Elective subjects</th><th rowspan="2">Total required</th></tr>
<tr><th>Required</th></tr>
<tr><td colspan="3">Advanced Study on Kuroshio Science</td><td>1 credit</td><td rowspan="10">6 credits more
(At least 4 credits from affiliation course)</td><td rowspan="10">14 credits or more</td></tr>
<tr><td colspan="3">Kuroshio Seminar</td><td>1 credit</td></tr>
<tr><td colspan="3">Special Exercise</td><td>1 credit</td></tr>
<tr><td colspan="3">Kuroshio Science Special Exercise</td><td>2 credits</td></tr>
<tr><td colspan="3">Scientific Literacy</td><td>1 credit</td></tr>
<tr><td rowspan="4">Select 2 subjects</td><td colspan="2">Advanced Study of Socioeconomic Research</td><td>1 credit</td></tr>
<tr><td colspan="2">Advanced Study on Ecological and Environmental Field Surveys</td><td>1 credit</td></tr>
<tr><td colspan="2">Advanced Study of Material Analysis Technique</td><td>1 credit</td></tr>
<tr><td colspan="3">Subtotal</td><td>8 credits</td></tr>
</table>

(2) Course Common Subjects

1) Compulsory Subjects

Advanced Study on Kuroshio Science (Code: 19500)

The Advanced Study on Kuroshio Science is an omnibus lecture series given by faculty from a number of fields from which students gain broad knowledge and points of view about issues of the Kuroshio Region.

Kuroshio Seminar (Code: 19600)

The Kuroshio Seminar helps students develop presentation and discussion skills through presentations of research during the master's program and dissertation research plans for PhD degree. As well as improving self-expression by trying to get researchers from other fields to understand the content of their own presentations, students enhance their ability to participate in discussions and arguments on research presentations in other fields.

Special Exercise (Code: 19700)

The Special Exercise is the interim presentations of dissertation research. Through presentations and discussion of research progress, students organize their references and bring into focus the direction of research, as well as improve presentation and discussion skills.

Kuroshio Science Special Exercise (Code: 19410)

In order to acquire the manners, methods and skills as a researcher, students will learn a series of thesis creation processes, that is, formulating and presenting research plans, organizing and reporting the progress of study for each semester, and reviewing interim presentations.

Scientific Literacy (Code: 19401)

Learn the ethics and information security, the importance of data analysis using appropriate statistical methods, and the significance of disseminating information to society based on scientific evidence.

2) Elective Compulsory Subjects

Advanced Study of Socioeconomic Research (Code: 19403)

Students will learn the basics of socio-economic science, such as observation of case studies and survey methods of sustainable use of natural and environmental resources by local communities, using the mountainous area in Kochi Prefecture as a subject.

Advanced Study on Ecological and Environmental Field Surveys (Code: 19404)

Acquire basic techniques of field science in the marine and land areas, using the coastal area, farmland and forests of Kochi as fields.

Advanced Study of Material Analysis Techniques (Code: 19405)

Using natural resources and agricultural, forestry and fishery products from Kochi Prefecture as samples, learn the outline of the analysis and analysis process using equipment, and acquire the basics of experimental protocol creation techniques and the basics of experimental science.

3) Elective Subjects

Advanced Study of Future Co-creation (Code: 19402)

This subject is offered as a participatory lecture in cooperation with members of the “Center for Education and Research for Hope-Emergence”. Students will learn the thoughts and needs of society and business and independently explore ways to contribute to the development of local communities and the economy while optimizing the use of resources in the real world and preserving the environment.

(3) Marine Resource Science Course Subjects

These subjects will train advanced professionals in the field of "Marine Resource Science in Kuroshio Region," who will explore the unutilized (micro) biological resources and seafloor mineral and energy resources which extend from the Kuroshio Current coastal area to the deep sea floor, and investigate their origins and functions and how to use them effectively. Furthermore, they will be well-versed in environmental preservation and have knowledge of the law.

Marine Biodiversity by Osamu MIURA (Code: 19002)

There are diverse marine species in Kuroshio region. Molecular genetics is an important tool to elucidate the ecology and evolution of these marine species. In this class, you will read three papers on molecular genetics and answer the questions. Prior knowledge on evolutionary ecology and molecular genetics (master level, at least) is required. Students in my lab or in associated fields are welcome to register. Otherwise, please contact me (miurao@kochi-u.ac.jp) before the registration. The class will be conducted by "ONLINE" using Moodle site.

Principles of Molecular Biology by Maki TERAMOTO (Code: 19041)

For research in molecular biology, we can use various techniques without knowing the underlying principles behind the techniques. In this class, students learn such principles involved in commonly-used techniques as well as in latest techniques. As these techniques, those for gene cloning, gene expression analysis and gene function analysis are included. Each student is required to investigate latest techniques and select at least one from them, and give a presentation(s) on the selected technique(s), explaining the principles, to the rest of the class.

Instrumental Analyses by Kazuhiko YAMADA (Code: 19042)

This lecture introduces the fundamentals and recent applications of instrumental analyses, including nuclear magnetic resonance (NMR), magnetic resonance imaging (MRI), X-ray diffraction, mass spectroscopy, and electron microscope, to organic chemistry, biochemistry, and material sciences. The purpose of this lecture is to understand standard techniques for analyzing various phenomena in science, agriculture, and medical research fields at a molecular level.

Advanced Study on Earth, Environmental, and Planetary Science by Yoshiro NISHIO (Code: 19044)

Nature provides us "resources" and "disaster". In this lecture, Earth, Environmental, and Planetary Science will be explained as essential knowledge to utilize the resources (water, mineral, energy, and etc.) and to reduce the damage from disasters (earthquake, volcanic activity, and etc.) in the Kuroshio Current area.

Advanced study on natural product biosynthesis by Dana ULANOVA (Code: 19047)

Natural products are an important source of clinically useful drugs. Detailed knowledge of how producing organisms synthesize these compounds is essential for improvement of their bioactive properties and also for discovery of new natural products. In this lecture the biosynthetic principles of main natural product groups will be explained with a special focus on products of the marine origin. We will also discuss recent approaches for manipulation of biosynthetic genes to yield new bioactive compounds.

Advanced study of Pharmacology by Takushi NANBA (Code: 19048)

The molecular mechanism of the effect of medicines, such as Aspirin, Penicillin, etc. in the cell level and whole body level will be discussed. The methods of development of new medicine and the leading edge of pharmacological research will also be discussed.

Advanced mineral resource geology by Go-Ichiro URAMOTO (Code: 19050)

Ferromanganese minerals are widely distributed in subseafloor sediments and on the seafloor in oceanic abyssal plains. Assessing their formation and preservation is important for understanding the global marine manganese cycle and associated trace elements. In this lecture, principles of earth surface systems for the formation and preservation of deep-sea ferromanganese minerals will be explained with a special focus on biological evolution and climate changes.

Advanced Biogeochemistry by Tomoyo OKUMURA (Code: 19051)

On a life-filled earth, biological activities and the environment interact on various scales. In this lecture, we will focus on the chemical cycles of carbon, oxygen, sulfur, and nitrogen, etc., learn a wide range of biogeochemical processes throughout the history of the earth, and aim for an integrated understanding of the earth system.

Paleoenvironmental changes in the ocean by Masafumi MURAYAMA (Code: 19057)

This course introduces oceanographic processes active at the Earth's surface and their relationships to most aspects of the Earth's overall environment from the past. The paleoceanographic processes including oceanic circulation, biogeochemical cycles and climate dynamics are examined based on the isotope geochemical evidence.

Advanced Bioinformatics by Tetsuya SAKURAI (Code: 19096)

Bioinformatics is an interdisciplinary research field used for in silico analyses of biological data using mathematical and statistical techniques. In this lecture, I hope to explain an understanding of gene prediction and functional annotation, as well as analyses of genome or transcriptome data from the aspect of mathematics. Moreover, reasonable interpretation methods of such results based on statistical analyses will also be discussed.

Advanced study of Aquatic Virology by Keizo NAGASAKI (Code: 19097)

In any aquatic environments, the most abundant biological entites are “viruses”. In the ocean, the number of virus particles are estimated at 10E30. Hence, researchers’ enthusiastic interest is located in their roles in marine environments. At this class, diversity, function, and ecological roles of aquatic viruses are plainly explained. Discussion on the raison d'être for viruses will be conducted.

Advanced Physical Oceanography on the Kuroshio by Hiroyuki YORITAKA (Code: 19098)

The Kuroshio that is a western boundary current of North Pacific Subtropical Gyre is driven by the wind system of the wide area in the North Pacific. I explain the variation of the Kuroshio, and the impact of the Kuroshio on the coastal ocean condition.

(4) Kuroshio Science Course Subjects

The principal objective of the comprehensive, interdisciplinary Kuroshio Science course is the education through integrating and providing an overall perspective of a number of specialist fields. The course focuses on resources, environment and society, medical health science, food and nursing pertaining to the extensive regions and marine areas (hereinafter, Kuroshio Region) extending from the countries and regions of Southeast Asia to East Asia. Kuroshio Science aspires to promote education and capable people in the following ways:

- To train researchers and educators to possess a high level of expertise in various fields related to coastal ecosystems, including both marine and terrestrial ecosystems, local communities and regional development as well as knowledge of and perspective on different fields
- To train new types of researchers and educators who gain an understanding of the new concept that is Kuroshio Science and possess a broad global perspective
- To provide capable people who lay a foundation based on Kuroshio Science with a broad global perspective, as well as who can play an active part in regional industry and the business community

Aquatic Evolutionary Ecology by Masanori HIRAOKA (Code: 19005)

This lecture introduces the latest phylogenetic and ecological studies for algae being important producers in tidal flat or rocky shore along the seashore. Algae include multifarious taxa which have evolved by symbiosis of photosynthetic bacteria and ameba like organisms. We learn the life diversity from morphology, physiology and life histories in various algal taxa. The discussion about relationships of each alga to environments would lead us to understand fishery and environmental managements more deeply.

Advanced Benthology by Gyo ITANI (Code: 19006)

We will study biodiversity and ecological role of marine benthos. Topics include taxonomy and systematics of marine benthos, adaptation to benthic environment, species interactions, and community ecology of tidal flats.

Advanced Study on Living Marine Resource Management by Hiroyuki MATSUDA (Code: 19007)

I explain ecosystem management, sustainable use, risk assessment, adaptive management, definition of threatened species, fisheries impact assessment, ecological footprint, and mathematical models for these issues. I also explain several case studies, extinction risk and stock recovery plan on southern bluefin tuna, hypotheses of sardine-anchovy-mackerel stock fluctuation.

Molecular Cell Biology by Syun-Ichirou OSHIMA (Code: 19008)

Knowledge about virus-cell interactions has been obtained through studies with various models for virus infection, and contributes to molecular cellbiology. The focus of this subject is the understanding of the mechanisms by which viral gene products manipulate key host cell molecules involved in signal transduction to virus replication and pathogenicity.

Advanced Environmental Physiology of Animals Living in the Ocean Ecosystem by Tetsuo HARADA (Code: 19012)

This advanced course will discuss about how environmental factors, including periodical fluctuations in light and temperature conditions and the activities of animals and plants, affect behavioral and physiological characteristics of animals inhabiting the ocean ecosystem. It will include several biological activities in terrestrial areas and lotic and lentic habitats.

Advanced Studies on Cetacean Population Biology by Toshiya KISHIRO (Code: 19013)

The present lecture proceeds step by step, the first phase giving a general outline of cetacean (whales, dolphins and porpoises) population biology such as their taxonomy, distribution, life history, and stock management, then the second phase focusing on the case studies of specific cetaceans in Kuroshio and its surrounding regions.

Advanced Tropical Soil Ecology by Sota TANAKA (Code: 19019)

Tropical soils, which are a key factor for environmental conservation and sustainable agriculture in the tropics, are discussed from the viewpoint of pedogenetic process, nutrient dynamics, and biological process. The relationship and problems between the life of local people and the conservation and management of soil environment are further discussed.

Advanced Economic Study of the Regional Environment by Teruyuki SHINBO (Code: 19020)

We will study regional environmental problems in the Kuroshio Sphere using economics, theoretically and empirically. We regard approaches from micro economics, public economics, and econometrics as important. In particular, we will take up the following topics: (1) the theory of environmental economics, (2) the economic valuation of environmental and natural resources, (3) environmental policy analyses.

Economics of Less Favored Areas by Yoshiaki IIGUNI (Code: 19023)

The demographic transition in Japan has drastically changed the society. The Changes in agriculture and forestry have been particularly significant. In this class, how the demographic transition has changed the Japanese agriculture is discussed in terms of economic theory and regional characteristics of Japan. Based on the history of Japan, the development of agriculture and forestry around the world is also discussed.

Advanced Health Science and Nutrition by Satoshi KUBOTA (Code: 19033)

Lecture on basic mechanisms of nutrient metabolism, energy exchange, and body formation and public nutrition for keeping and promoting the health of populations.

Fisheries socioeconomics in Kuroshio Region by Mina HORI (Code: 19043)

Towards sustainable fisheries in the Kuroshio region, socioeconomic issues in fisheries such as resource management, fisheries management, fish distribution and tourism in both inland and marine fisheries will be explained using case studies from the region. Considering the world trend in management and conservation, appropriate approach and system for the region will be discussed.

Advance study on Vegetation Landscape by Motoki HIGA (Code: 19045)

Plant species distributions at broader scale are mainly determined by climatic factors, and those at finer scale are affected by other non-climatic factors including topography, geology, and human-activities. This class focuses on distribution and dynamics of vegetation, and changes in the structure of vegetation landscapes caused by human-activities in the Kuroshio area. Finally, effective conservation planning of vegetation landscape under the developing and declining societies are also discussed.

Environmental History in Kuroshio Region by Shingo AKAIKE (Code: 19053)

The Japanese forest rate is about 67% compared to 30% on average of the world. Of all the prefectures in Japan, Kochi has the highest forest rate at 84%. How has this come about? In this lecture, we will clarify this question from historical perspective. Specifically, Students are expected to be able to explain the historical development of “conservation” and “utilization” of the environment in relation to laws, institutions, and technologies. To deepen mutual understanding by discussing between international students.

Advanced Regional Geography by Yasukazu SATAKE (Code: 19055)

In regional geography, regions are considered to be formed by the interaction of nature and humans and to be constantly changing according to this relationship. The purpose of this class is to systematically study the concept of region and its components and to examine the changes in regions based on them. Specifically, we will study the elements that make up a region, such as nature, economy, and transportation, and deepen our understanding of the interaction of these elements, mainly using the example of regions located in the “Kuroshio Region”.

Advanced study of Physical Fitness and Sports Medicine by Atsumu YUKI (Code: 19056)

Physical fitness is an important factor in the prevention of lifestyle-related diseases and nursing care. In this lecture, we will deepen our understanding of the history of research in physical fitness science, the definition of physical fitness, the effects of physical activity, and health problems of children and the older people.

Advanced Study on Science and Technology Education by Hirotaka DOHO (Code: 19060)

In modern society, technology based on science plays an important role in supporting and enriching our lives. In this lecture, we will extract the specific contents of electrical engineering, information science, and manufacturing, and consider the relationship between science and technology and the significance of education that fuses both from the perspective of academic contents and development of teaching materials.

Advanced Study on Fish Ecology by Yohei NAKAMURA (Code: 19058)

In this class, I will explain the factors that determine the distribution patterns of fishes on coral reefs and their surrounding ecosystems. I also explain the current status of fish resource decline and various management problems in these ecosystems.

Advanced Study of Plant Genetic Resources by Mitsukazu SAKATA (Code: 19059)

Effective use of bioactive natural products is important for promoting human health. It has many rich resources including marine biological resources in the Kuroshio region. In this lecture, we will discuss the current situation and problems of the environmental resources, especially plant genetic resources in the Kuroshio region. In addition, we will explain methods for genetic analysis of these resources and introduce specific examples with the latest and applied research.

Study of the Environment and Health Science by Shunji MIZOBUCHI (Code: 19092)

Lectures on study methods, methods of analysis of findings and the interpretation of research on functional materials from Kochi products, such as Citrus junos components and β-glucan from Aureobasidium pullulans.

Advanced Study on Theoretical Biology by Motomi KATO (Code: 19095)

The Kuroshio region includes mountain, river and marine ecosystems. This class focuses on theoretical studies on animal ecology and life science in these ecosystems. It further deals with applied studies on interactions between the ecosystems and ecosystem conservation.

(5) Dissertation Research

Dissertation Research is a related series of studies for writing the dissertation and is conducted under the guidance of the supervisor and co-supervisors. Students acquire advanced knowledge and skills in specialist fields and develop into strong inquisitive researchers. Publication of papers in academic journals and presentations at international conferences are required to have a doctoral dissertation accepted for review. (Refer to the implementation guidelines and additional notes regarding the doctoral dissertation review in “III. Getting Degree”.) In addition, because the doctoral dissertation is reviewed based on the policy governing the conferral of degrees in III-1. (2) and the evaluation criteria in III-1. (3) below, students should read those sections carefully to make sure they understand them fully.

I - 4. Grading, etc

(1) Grading

Course grades are given on a 100-point scale, with a score of 60 or higher being considered a passing grade. The grading standards are shown in the table below. The grading method varies depending on the class, so please check the "Grading Method" in the syllabus.

All registered courses are subject to grading and will be graded unless the student cancels the course registration within the designated period.

Pass/fail	Grade	Points	Criteria
Pass	Outstanding	90 to 100 points	Student judged to have understood and grasped the knowledge, skills, and ideas indicated in the achievement goals, and performed far exceeding the standard level of achievement
	Excellent	80 to 89 points	Student judged to have understood and grasped the knowledge, skills, and ideas indicated in the achievement goals, and performed exceeding the standard level of achievement
	Good	70 to 79 points	Student judged to have understood and grasped the knowledge, skills, and ideas indicated in the achievement goals, to have applied them to the prescribed tasks, and performed at about the standard level of achievement
	Passing	60 to 69 points	Although performance is below the standard level of achievement, student judged to have understood and grasped the knowledge, skills, and ideas indicated in the achievement goals
Fail	Fail	59 points or less	Student judged to have not understood and grasped the knowledge, skills, and ideas indicated in the achievement goals, and is not appropriate for credit acquisition

(2) Grade Appeal System of Kuroshio Integrated Science Program

November 27, 2019
Decision by the Kuroshio Science Program Meeting
Partially Amended on December 7, 2021

Appeal System to grades for course subjects offered in the Kuroshio Science Program will be handled as follows.

1. If a student disagrees with their grade or believes that the grading deviates from the achievement objectives and grading criteria as communicated through information from the syllabus and the classes, the student may file an appeal by filling out the form designated by the Program.

   With regard to filing appeals, the following points, in particular, should be noted.
   No appeals may be made against the achievement objectives and grading criteria set by course instructors.

2. Submit the form to the administrative staff in Kuroshio Science Office (hereinafter, the administrative staff). In principle, the form must be submitted within five (5) days after grades are announced (excluding Saturdays, Sundays, and holidays; the same shall apply hereinafter).

3. If a student raises an objection, an investigation committee consisting of the following three members shall be established.
   Chairperson: Chairperson of the Academic Affairs Committee
   (If the chairperson of the Academic Affairs Committee is the course instructor, the chairperson shall be appointed by the head of the program)
   Committee members: 2 members of the Academic Affairs Committee
   (Note that the committee members shall be teachers other than the course instructor and shall be appointed by the chairperson of the Academic Affairs Committee. If the chairperson of the Academic Affairs Committee is the course instructor, the committee members shall be appointed by the head of the program.)

4. The investigation committee will conduct an investigation, etc. and prepare a written response. After the response is prepared, it will be reported to and confirmed by the head of the department, and the response will be finalized.

5. The content of the written response shall be communicated to the course instructor, and the student shall be notified with the written response. Notification shall be made within seven days of the filing of the objection, in principle.

6. If a grade correction occurs as a result of the response, the course instructor shall immediately submit a grade correction request to the administrative staff.

7. If the objection is related to the completion of the course and cannot be handled based on the above schedule due to the schedule of completion judgment, a separate schedule will be set and the student will be notified.

8. Other matters related to grade appeals will be discussed by the Academic Affairs Committee.