

**GRADUATE SCHOOL OF ENGINEERING AND SCIENCE, UNIVERSITY OF THE RYUKYUS**  
**OKINAWA INTERNATIONAL MARINE SCIENCE PROGRAM**  
**(NON-SCHOLARSHIP)**

**(DOCTORAL PROGRAM)**

**ABOUT THE PROGRAM**

The Okinawa International Marine Science Program is organized in order to offer a better opportunity for graduate study to students from abroad by instructing all courses in the English language.

This is a call for applications to a three year Doctoral Program for the academic years 2019-2021.

Upon enrollment, the candidates are each assigned to an advisor who will direct their thesis research for three years in the designated field of specialization. The degree of Doctor of Science / Philosophy in major of Marine and Environmental Sciences will be awarded in recognition of thesis research and course work including seminars, with a minimum of 12 credit hours.

Before deciding the field and the topic of research, applicants are encouraged and recommended to contact appropriate supervisor(s) appearing in the list of Faculty Members.

**GUIDELINES FOR APPLICATION (Spring 2019)**

**1. Study Areas and Number of International Students for Admission**

A total of about 3 students will be accepted for enrollment under the Okinawa International Marine Science Program, Graduate School of Engineering and Science, University of the Ryukyus.

**2. Qualifications Required for Applicants**

- (1) Prospective applicants are advised to contact a potential thesis advisor at the University of the Ryukyus for consultation on research themes and plans; applicants without an advisor's prior approval may not receive full consideration during the admission screening.
- (2) Academic career: Applicants for the Program leading to a Doctoral Degree should have or be receiving a Master's Degree or an equivalent degree, as of March 31, 2019.
- (3) Health: Applicants should be in good mental and physical health.
- (4) Language proficiency: A good working level of English is required.
- (5) Time limit for arrival in Japan: Applicants should arrive in Japan by April 1, 2019.

**3. Expenses**

- (1) Entrance Examination Fee: 30,000 yen
- (2) Admission Fee: 282,000 yen
- (3) Tuition: A total of 535,800 yen for one year, to be paid in October and April in two divided installments.

**4. Selection and Admission**

Applicants will be examined by the Screening Committee of the Program. Only those who have a solid academic background, research capability and commitment are selected based on their documents. The final decision will be announced to the candidates through the University of the Ryukyus in January 2019.

**5. Enrollment**

Date of enrollment is April 1, 2019.

## 6. Application

Applicants should prepare the following documents to be forwarded to the Graduate School of Engineering and Science, University of the Ryukyus before December 10, 2018 deadline through the head of the universities or the institutions with which the applicants are affiliated. Applicants who presently have no formal affiliation should send the prepared documents through the Dean of the University from which they graduated.

- (1) Application form (Form I-1, I-2, I-3)
- (2) Health certificate in the prescribed form completed by a registered medical doctor within six months of the date of the application (Form II)
- (3) Certificate of Graduation (undergraduate and graduate) or Certified Letter from the Graduate School at which the applicant is currently enrolled, stating the expected graduation date.
- (4) Transcripts of academic record (undergraduate and graduate) issued by the university authorities and their English translation.
- (5) Academic Grade Conversion Sheet (on 3.0 scale)
- (6) Certificate of Citizenship or Proof of Residence in applicant's home country.
- (7) A letter of recommendation (Form III) from the head of the applicant's affiliated institution addressed to the Director of Graduate School of Engineering and Science. Letter(s) of reference from those who know the applicant's research / study capability should be addressed also to the Director of Graduate School of Engineering and Science.
- (8) Photograph (upper front figure without hat, taken within 6 months, passport sized 4.5cm× 3.5cm), name and nationality indicated on the reverse side, and to be fixed on the specified part of the application form. One additional photograph (same as above), name and nationality indicated on the reverse side, should be supplied in an envelope.
- (9) A TOEFL SCORE of 550 (Paper-based Test Score) / 213 (Computer-based Test Score) / 79-80 (Internet-based Test Score) or above for applicants whose instructional language at their home institution is NOT English. You are required to submit an original or certified copy of an OFFICIAL TOEFL Score Report. Certificate indicating the medium of instruction is English issued by the university authorities for applicants whose instructional language at their home institutions is English.
- (10) An abstract of the Master's thesis or project.
- (11) Guarantee (Form IV)
- (12) Entrance Examination Fee of 30,000 yen should be paid by bank transfer before application deadline, December 10, 2018. Refer to the payment information below.

※Transfer fee will be charged separately.

Name of Bank: Bank of the Ryukyus (Bank code No. 0187)

Name of Branch: Ginowan Branch (Branch code No. 512)

SWIFT Code: RYUBJPJZ

Account Number: 428711

Name of Account Holder: KOKURITSUDAIGAKUHOUJIN RYUKYUDAIGAKU

Account Holder's Address: 1 Senbaru, Nishihara, Okinawa 903-0213, Japan

Bank Address: 1-5-3 Ginowan, Okinawa 901-2211, Japan

Bank Phone Number: +81-98-893-2231

\*Please e-mail us to notify when you send a wire transfer.

E-mail: [rggakmu@to.jim.u-ryukyu.ac.jp](mailto:rggakmu@to.jim.u-ryukyu.ac.jp)

\*Please pay any and all applicable bank transfer fees in addition to the examination fee. Ask your bank for details.

### Remarks:

- 1) The above documents of A4 size paper should be typewritten or printed in English on the supplied forms.
- 2) Applications will not be considered if any of the above documents are incomplete, incorrect, or lacking supporting evidence, nor will they be considered if they arrive after the deadline.
- 3) The letters of reference and recommendation should indicate the English proficiency of applicants as excellent, good, or fair.

- 4) All the submitted documents will be retained and will not be returned to the applicant.
- 5) The information for documents mentioned in paragraphs (1), (2), (6) and (10) above must be written on the forms provided. Only originals are accepted.
- 6) All documents are to be prepared in English. For those who cannot prepare in English, a separate English translation should be attached.

## **7. Application Deadline**

December 10, 2018

## **8. Other Notes**

- (1) Successful applicants are expected to study and understand the geography, climate, customs and habits of Okinawa as well as the general features and conditions of the University of the Ryukyus. It must be noted that English is not normally spoken among the majority of people in Okinawa.
- (2) Student Dormitory may be available for accommodation at reasonable cost, if there are vacancies.
- (3) The areas of research conducted by the faculties, and curricula of the Program are outlined in the following section.
- (4) Accepted students are recommended to be well acquainted with the Japanese language, culture, and customs. Knowledge of the Japanese language is necessary in daily life.
- (5) Applicants who will receive the Master's Degree from the Special Non-Scholarship Master's Program in Marine Sciences, Graduate School of Engineering and Science, University of the Ryukyus as of March 31, 2019 can apply for the Non-Scholarship Doctoral Program, Graduate School of Engineering and Science, University of the Ryukyus.

## **Correspondence**

Applications must be sent by registered air mail by the head of the affiliated institution or employing body on behalf of the applicant.

All the correspondence related to this application should be addressed to:

Academic Affairs Unit (Faculty of Science)  
Graduate School of Engineering and Science  
University of the Ryukyus  
1 Senbaru  
Nishihara, Okinawa 903-0213  
Japan

E-mail: [rggakmu@to.jim.u-ryukyu.ac.jp](mailto:rggakmu@to.jim.u-ryukyu.ac.jp)  
Phone: +81-98-895-8595

## FACULTY MEMBERS AND THEIR RESEARCH INTERESTS

### EARTH SCIENCES

#### **Fujita, Kazuhiko**

Professor, D.Sc., 1999, Tohoku University

Marine micropaleontology and coral-reef geosciences, paleoenvironmental analysis of quaternary reef deposits; ecology and paleoecology of large benthic foraminifers

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#### **Furukawa, Masahide**

Professor, Ph.D., 1990, Kobe University

Tectonics of the back-arc basin and radiation science of the earth's environment

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#### **Hisaki, Yukiharu**

Professor, D.Sc., 1996, Tohoku University

Physical oceanography

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#### **Ito, Kosuke**

Associate Professor, Ph.D., 2011, Kyoto University

Numerical weather prediction, high-impact weather events such as tropical cyclones and local heavy rainfall, data assimilation, atmosphere-ocean coupled system, geophysical fluid dynamics

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#### **Matsumoto, Takeshi**

Professor, D.Sc., 1984, The University of Tokyo

Marine geophysics

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#### **Nakamura, Mamoru**

Professor, D.Sc., 1997, Kyoto University

Seismology, seismotectonics, crustal structure in island arc, numerical modeling of tsunami

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#### **Shinjo, Ryuichi**

Professor, Ph.D., 1992, Tohoku University

Igneous petrology, mineralogy and isotope geochemistry

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#### **Yamada, Hiroyuki**

Associate Professor, Ph.D., 2000, Hokkaido University

Tropical meteorology, mesoscale meteorology, observations and numerical simulations of precipitation processes associated with disturbances and tropical cyclones

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### CHEMISTRY

#### **Asato, Eiji**

Professor, D.Sc., 1989, Kyushu University

Inorganic chemistry, coordination chemistry

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**Arakaki, Takemitsu**

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Environmental chemistry, atmospheric chemistry  
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**Tanaka, Junichi**

Professor, Ph.D., 1990, Osaka University  
Marine natural products chemistry  
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**Ueda, Katsuhiko**

Professor, D.Sc., 1984, Nagoya University  
Natural products chemistry  
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**BIOLOGY****Denda, Tetsuo**

Professor, D.Sc., 1996, Kobe University  
Vascular plant phylogeny and evolution in the Ryukyus and adjacent areas  
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**Harai, Saki** (Tropical Biosphere Research Center)

Associate Professor, D.Sc., 2001, The University of Tokyo  
Biology and ecology of marine invertebrates in coral reefs, with special focus on the reproductive biology and symbiosis of reef-building corals  
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**Hirose, Euichi**

Professor, D.Sc., 1991, University of Tsukuba  
Biology, biology of tunicates: morphology, phylogeny, cell functions, photosymbiosis  
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**Ikeda, Yuzuru**

Professor, D.Fish. Sc., 1993, Hokkaido University  
Cephalopod behavior and laboratory culture of cephalopods  
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**Imai, Hideyuki**

Associate Professor, D.Fish. Sc., 1999, Tokai University  
Population genetics of aquatic animals  
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**Itoh, Ryuichi**

Associate Professor, D.Sc., 1999, The University of Tokyo  
Biology of plant organelles (plastids and mitochondria)  
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**Izawa, Masako**

Professor, D.Sc., 1984, Kyushu University  
Ecology, ecology of terrestrial mammals: social systems, habitat use, insular populations, conservation  
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**Kubota, Yasuhiro**

Professor, D.Sc., 1996, Tokyo Metropolitan University

Community ecology

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**Matsumoto, Akiko** (Faculty of Tourism Sciences and Industrial Management)

Professor, D.Sc., 1998, Kyoto University

Biological anthropology

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**Naiki, Akiyo** (Tropical Biosphere Research Center)

Associate Professor, Ph.D., 2003, Kyoto University

Plant taxonomy, systematics, plant reproductive ecology

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**Nakamura, Takashi**

Associate Professor, Ph.D., 2003, University of the Ryukyus

Biology, ecology and physiology of coral reef organisms. Photophysiology of plant-animal symbiosis

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**Naruse, Tohru** (Tropical Biosphere Research Center)

Associate Professor, Ph.D., 2004, University of the Ryukyus

Biology, taxonomy, systematics, biodiversity, crustacean biology

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**Otaki, Joji**

Associate Professor, Ph.D., 2000, Columbia University

Color-pattern formation of butterfly wings, mammalian olfactory system, cellular regeneration and development, protein structure and function

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**Reimer, James D**

Associate Professor, Ph.D., 2004, Kagoshima University

Biology, marine invertebrate biodiversity, evolution, phylogenetics, taxonomy, ecology, symbiont diversity and ecology

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**Sakai, Kazuhiko** (Tropical Biosphere Research Center)

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Ecology and conservation biology of reef corals

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**Suda, Shoichiro**

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Microalgal morphology, taxonomy and phylogeny

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**Tachihara, Katsunori**

Professor, D.Agr., 1988, Kyushu University

Life history of fishes in the Ryukyu Archipelago

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**Takemura, Akihiro**

Professor, D. Fish Sc., 1989, Hokkaido University  
Environmental biology of fishes  
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**Toda, Mamoru** (Tropical Biosphere Research Center)

Associate Professor, Ph.D.2000, Kyoto University  
Systematics and biogeography of amphibians and reptiles  
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**Tokuda, Gaku** (Tropical Biosphere Research Center)

Professor, D.Sc., 1997, The University of Tokyo  
Digestive physiology of invertebrates  
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**Yagisawa, Fumi** (Center for Research Advancement and Collaboration, CRAC)

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Organelles, molecular biology, and cell biology  
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**Yamahira, Kazunori** (Tropical Biosphere Research Center)

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Evolution and ecology of tropical fishes  
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**Yamasaki, Hideo**

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Biology and biochemistry of active oxygen and nitrogen species  
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**Yamashiro, Hideyuki** (Tropical Biosphere Research Center)

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Marine biology, coral and coral-associated animals, coral disease, calcification  
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**Yokota, Masatsugu**

Professor, D.Sc., 1988, Hiroshima University  
Taxonomy and cytogenetics of vascular plants of the Ryukyus  
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FIELD			SUBJECT	CREDITS	HOURS	YEARS	SEMESTERS	SUBJECT DESCRIPTION	
	REQUIRED	COMMON	Advanced Special Seminar	2	30	1-3	Fall/ Spring	Present and discuss research information such as original academic papers, as well as research plans and findings, in a seminar format.	All faculty members
			Advanced Special Exercise	2	60	1-3	Fall/ Spring	For each individual research objective and phase, provide direct instruction and guidance concerning research methods and development.	All faculty members
BIOSCIENCE	ELECTIVE	SPECIAL	Fish and Shellfish Molecular Population Genetics	2	30	1-3	Fall	Genetic species identification of fish and shellfish, existence of cryptic species, exploration of genetic markers for stock identification, study method for aquatic organisms will be presented and discussed. How to write dissertation will be instructed.	Imai, H.
			Cephalopod Behavior	2	30	1-3	Fall	Various aspects of behavioral characteristics in cephalopods. These include learning, memory, sociality, and reproductive behavior in octopus, squid and cuttlefish. This class tries to learn how intelligent these creatures (cephalopods) are.	Ikeda, Y.
			Reproductive Physiology	2	30	1-3	Spring	Physiological and behavioral mechanisms of reproductive events in low vertebrates. Special attention is paid to endocrine regulation of respective function.	Takemura, A.
			Advanced Marine Ecology	2	30	1-3	Fall	Reviews and discussions of recent topics in ecology of coral reef organisms with emphasis on responses of the organisms to climate change.	Sakai, K.
			Coral Disease	2	30	1-3	Spring	Overview of coral diseases/syndromes for conservation of future coral reefs	Yamashiro, H.
			Freshwater Biology	2	30	1-3	Spring	Life historical characteristics of freshwater fishes (primary freshwater fish, amphidromous fish, catadromous fish) in the Ryukyu Archipelago	Tachihara, K.
			Plant Taxonomy and Biogeography	2	30	1-3	Fall	Topics on taxonomy, speciation, biogeography, morphological evolution and adaptation of vascular plants of Japan with special reference to the Ryukyus	Yokota, M.
			Plant Molecular Phylogeny	2	30	1-3	Spring	Discussion of current topics in molecular phylogeny and evolution of vascular plants	Denda, T.
			Plant Molecular Biology	2	30	1-3	Fall	Current topics in molecular genetics, genome science, genetic engineering, and bioimaging techniques, mainly focusing on plants	Itoh, R.
			Oxygen Biology	2	30	1-3	Fall	Comprehensive review on biochemistry and biology of reactive oxygen (ROS) and nitrogen species (RNS)	Yamasaki, H.
			Microscopic Structures of Body Surfaces and Their Functions	2	30	1-3	Fall	Microscopic structures of the body surface of marine invertebrates and the approaches to reveal their properties and functions	Hirose, E.
			Developmental Physiology	2	30	1-3	Spring	Molecular and cellular aspects of mammalian and insect developmental systems.	Otaki, J.
			Species Biology	2	30	1-3	Fall	Discussion and presentation about the definition, identification and characteristics of "species".	Toda, M.
			Evolutionary Biology of Tropical Organisms	2	30	1-3	Fall	Discussion about evolutionary mechanisms that create biodiversity in the tropics.	Yamahira, K.
			Advanced Lecture in Plant Reproductive Morphology	2	30	1-3	Fall	Structure and function of reproductive organs in tropical and subtropical plants are discussed. Pollination mechanisms are also subjects for discussion.	Takaso, T.
Organelles and Cell Physiology	2	30	1-3	Fall	Topics in physiological aspects of organella dynamics and function. Focuses on organelle-related diseases, aging, and cell differentiation.	Yagisawa, F.			



FIELD			SUBJECT	CREDITS	HOURS	YEARS	SEMESTERS	SUBJECT DESCRIPTION	
BIOSCIENCE	ELECTIVE	SPECIAL	Vertebrate Systematics and Evolutionary Biology	2	30	1-3	Fall	Discussion and presentation about evolution and divergent process in vertebrates.	Tominaga, A.
			Molecular Enzymology of Plant Degradation	2	30	1-3	Fall	Reviews on the recent advances on molecular machinery and classifications of enzymes involved in biodegradation of plant cell walls.	Tokuda, G.
			Evolutionary Anthropology	2	30	1-3	Spring	Review of evolutionary histories of human: genetics, extant primates, fossils, culture, and society.	Matsumoto, A.
			Ecology of Tropical Coasts	2	30	1-3	Spring	Review on current topics of tropical coastal ecology, including coral reefs and discussion on environmental issues.	Harii, S.
			Advanced Seminar of Reproductive Biology	2	30	1-3	Fall	Seminar and laboratory work on reproductive biology.	Morita, M.
			Zoological Nomenclature	2	30	1-3	Spring	Learning how to address problems related to zoological nomenclature through discussion on actual cases.	Naruse, T.
ENVIRONMENTAL SCIENCE		SPECIAL	Advanced Island Biology	2	30	1-3	Spring	Topics relating to island biogeography	Izawa, M.
			Applied Phycology	2	30	1-3	Fall	Discussion and presentation about recent and advanced phycological studies especially in applied phycology.	Suda, S.
			Advanced Ecology	2	30	1-3	Fall	Review of current topics on the maintenance and origin of biodiversity patterns based on taxonomic, functional and phylogenetic properties.	Kubota, Y.
			Advanced Ecology of Coral Reef Organisms	2	30	1-3	Fall	Review, presentation and discussion about coral reef organisms and related research fields.	Nakamura, T.
			Advanced Environmental Chemistry	2	30	1-3	Spring	This course provides an overview of chemical reactions occurring in aquatic environment. In particular, this course deals with photochemical reactions caused by sunlight.	Arakaki, T.
			Carbonate Geochemistry	2	30	1-3	Spring	This course deals with carbonates in lithosphere and hydrosphere, especially natural mechanism of CO <sub>2</sub> absorption from atmosphere in the global carbon cycles and its role in coral reefs.	Fujimura, H.
			Advanced Marine Geophysics	2	30	1-3	Fall & Spring	Reviewing the recent studies on marine geophysics, regional tectonics and geodynamics, discussion about the reviewed studies.	Matsumoto, T.
			Advanced Ocean Wave Remote Sensing	2	30	1-3	Fall & Spring	Physics of ocean surface waves, principle of ocean wave remote sensing and application of ocean wave remote sensing to physical oceanography.	Hisaki, Y.
			Tropical Meteorology	2	30	1-3	Fall	This course provides fundamental knowledge of about tropical atmosphere, including energy balance, atmospheric structure and circulation, tropical cyclone, and intraseasonal variability.	Yamada, H.
			Advanced data assimilation	2	30	1-3	Fall	Data assimilation synthesizes the results of mathematical model with observations. In this lecture, Kalman filter, 4D-Var and particle filter are explained through lecture and exercise.	Itoh, K.
			Environmental Tectonics	2	30	1-3	Fall & Spring	Basics and application on the environmental changes related to crustal movement, weathering process, material circulation, sea-level change, etc..	Furukawa, M.
			Igneous Petrology and Geochemistry	2	30	1-3	Fall & Spring	Reviews and discussion about trace elements and isotopic composition of environmental Earth materials.	Shinjo, R.
Geodynamics	2	30	1-3	Fall	This course deals with mechanics of deformation of the crust and mantle. Geological areas of application include earthquakes and tsunamis, tectonic plate flexure, and upper mantle flow and deformation.	Nakamura, M.			

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ENVIRONMENTAL SCIENCE	ELECTIVE	SPECIAL	Coral-reef Biogeoscience	2	30	1-3	Fall	A seminar to study topics and terms on multidisciplinary research on biogeosciences related to coral reefs in the present and past.	Fujita, K.
			Crustal Evolution	2	30	1-3	Fall	This unit of study provides an introduction to crustal evolution process from the point of views of petrogenesis of metamorphic rock and its geochronology.	Baba, S.
			Advanced Biodiversity of Marine Invertebrates	2	30	1-3	Spring	Discussion of marine biodiversity, historical and modern problems in its estimation, and varying concepts of species and methodologies to detect and count them.	Reimer, J.D.
			Advanced Atmospheric and Hydrospheric Sciences	2	30	1-3	Fall & Spring	This course provides an overview of atmospheric chemistry and hydrological science.	Uemura, R.
			Advanced Marine Environmental Chemistry	2	30	1-3	Fall & Spring	Chemical processes in marine environments.	Toki, T.
CHEMISTRY		SPECIAL	Chemistry of Bioactive Marine Natural Products	2	30	1-3	Spring	Advanced chemistry (separation, structure, reaction, and synthesis) of bioactive substances such as toxins, and their bioactivity and application.	Ueda, K.
			Organic Structural Spectroscopy	2	30	1-3	Spring	Spectroscopic methods to analyze the structures of organic molecules will be reviewed.	Tanaka, J.
			Special Lecture A - D	2	30	1-3	Intensive	Course on marine and environmental sciences.	Members of marine and environmental sciences
		COMMON	International Field Exercise	2	30	1-3	Spring	Field course with foreign universities.	Members of biology field
			FUNDAMENTAL	Essential Research Skills and Ethics in Science	1	15	1-3	Spring	Ethical foundations of scientific practices to skills of scientific presentation.

## Requirements for course completion:

Students must obtain a total of 12 or more credits including 2 credits from Advanced Special Seminar and 2 credits from Advanced Special Exercise. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and Doctoral dissertation.