FACULTY MEMBERS AND THEIR RESEARCH INTERESTS (Doctoral Program)

EARTH SCIENCES

Baba, Sotaro (Faculty of Education)
Professor, D.Sc., 1998, Osaka City University
Geology, metamorphic petrology
E-mail: baba@cs.u-ryukyu.ac.jp

Hisaki, Yukiharu
Professor, D.Sc., 1996, Tohoku University
Physical oceanography
E-mail: hisaki@cs.u-ryukyu.ac.jp

Matsueda, Mio
Associate Professor, D.Sc., 2008, University of Tsukuba
Predictability of weather and climate, ensemble forecast, numerical weather prediction
E-mail: mio@cs.u-ryukyu.ac.jp

Nakamura, Mamoru
Professor, D.Sc., 1997, Kyoto University
Seismology, seismotectonics, crustal structure in island arc, numerical modeling of tsunami
E-mail: mnaka@cs.u-ryukyu.ac.jp

Shinjo, Ryuichi
Professor, Ph.D., 1992, Tohoku University
Igneous petrology, mineralogy and isotope geochemistry
E-mail: rshinjo@cs.u-ryukyu.ac.jp

CHEMISTRY

Arakaki, Takemitsu
Professor, Ph.D., 1996, Duke University (U.S.A.)
Environmental chemistry, atmospheric chemistry
E-mail: arakakit@cs.u-ryukyu.ac.jp

Arimitsu, Satoru
Associate Professor, Ph.D., 2008, University of Louisville (U.S.A.)
Organic chemistry
E-mail: arimitsu@cs.u-ryukyu.ac.jp

Fujimura, Hiroyuki
Professor, D.Sc., 2002, University of the Ryukyus
Analytical chemistry, chemical oceanography and carbonate chemistry
E-mail: fujimura@cs.u-ryukyu.ac.jp

Suzuka, Toshimasa
Professor, Ph.D., 2003, Kyoto University
Organic chemistry, synthetic chemistry
E-mail: suzuka@cs.u-ryukyu.ac.jp

Teruya, Toshiaki (Faculty of Education)
Professor, D.Sc., 2003, Nagoya University
Natural products chemistry, structure elucidation and evaluation of biological activities of natural products
E-mail: t-teruya@cs.u-ryukyu.ac.jp

Toki, Tomohiro
Associate Professor, D. Sc., 2004, Hokkaido University
Geochemistry, cold seeping mechanism, geochemistry of hydrothermal systems, origin and migration of natural gas, formation processes of gas hydrates
E-mail: toki@cs.u-ryukyu.ac.jp

BIOLOGY

Denda, Tetsuo
Professor, D.Sc., 1996, Kobe University
Vascular plant phylogeny and evolution in the Ryukyus and adjacent areas
E-mail: denda@cs.u-ryukyu.ac.jp

Harii, Saki (Tropical Biosphere Research Center)
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
E-mail: shari@cs.u-ryukyu.ac.jp

Hirose, Euichi
Professor, D.Sc., 1991, University of Tsukuba
Invertebrate biology: biology of tunicates, morphology, body surface, cell function, photosymbiosis
E-mail: eucihi@cs.u-ryukyu.ac.jp

Ikeda, Yuzuru
Professor, D.Fish. Sc., 1993, Hokkaido University
Cephalopod behavior and laboratory culture of cephalopods
E-mail: ikeda@cs.u-ryukyu.ac.jp

Imai, Hideyuki
Professor, D.Fish. Sc., 1999, Tokai University
Population genetics of aquatic animals
E-mail: imai@cs.u-ryukyu.ac.jp

Itoh, Ryuuichi
Associate Professor, D.Sc., 1999, The University of Tokyo
Biology of plant organelles (plastids and mitochondria)
E-mail: ryuitoh@cs.u-ryukyu.ac.jp

Kurihara, Haruko
Professor, D.Sc., 2004, Kyoto University
Biology, marine environmental science, coral reef biology and ecology, climate change, eco-physiology
E-mail: harukoku@cs. u-ryukyu.ac.jp

Morita, Masaya (Tropical Biosphere Research Center)
Associate Professor, Ph.D. 2003, The University of Tokyo
Reproductive biology, evolutionary biology, cell biology
Email: morita@cs.u-ryukyu.ac.jp

Naiki, Akiyo (Tropical Biosphere Research Center)
Associate Professor, Ph.D., 2003, Kyoto University
Plant taxonomy, systematics, plant reproductive ecology
E-mail: naiki@cs.u-ryukyu.ac.jp

Nakamura, Takashi
Associate Professor, Ph.D., 2003, University of the Ryukyus
Biology, ecology and physiology of coral reef organisms, photophysiology of plant-animal symbiosis
E-mail: takasuke@cs. u-ryukyu.ac.jp

Naruse, Tohru (Tropical Biosphere Research Center)
Associate Professor, Ph.D., 2004, University of the Ryukyus
Biology, taxonomy, systematics, biodiversity, crustacean biology
E-mail: naruse@cs.u-ryukyu.ac.jp

Nozawa, Yoko (Tropical Biosphere Research Center)
Professor, Ph.D., 2006, Kyushu University
Marine field ecology, coral reef ecology, synchronized spawning of corals, early life stages of corals, coral demography, coral recovery process, coral-algal-herbivore interaction, marine invertebrates
E-mail: nozaway@cs.u-ryukyu.ac.jp

Otaki, Joji
Professor, Ph.D., 2000, Columbia University in the City of New York
Biology, molecular physiology, color-pattern formation of butterfly wings, cellular regeneration and development, phenotypic plasticity and evolution, protein structure and function, biological impact of Fukushima nuclear accident
E-mail: otaki@cs.u-ryukyu.ac.jp

Reimer, James D
Professor, Ph.D., 2004, Kagoshima University
Biology, marine invertebrate biodiversity, evolution, phylogenetics and phylogenomics, taxonomy, ecology, symbiont diversity and ecology, marine and conservation ecology, eDNA, historical marine ecology
E-mail: jreimer@cs.u-ryukyu.ac.jp

Takahashi, Shunichi (Tropical Biosphere Research Center)
Professor, Ph.D., 2002, University of the Ryukyus
Biology of coral-algal symbiosis, marine physiology
E-mail: tshun@cs.u-ryukyu.ac.jp

Toda, Mamoru (Tropical Biosphere Research Center)
Associate Professor, Ph.D., 2000, Kyoto University
Systematics and biogeography of amphibians and reptiles
E-mail: gekko@cs.u-ryukyu.ac.jp

Tokuda, Gaku (Tropical Biosphere Research Center)
Professor, D.Sc., 1997, The University of Tokyo
Digestive physiology of invertebrates
E-mail: tokuda@cs.u-ryukyu.ac.jp

Tominaga, Atsushi (Faculty of Education)
Professor, Ph.D., 2005, Kyoto University
Animal taxonomy, biodiversity, ecology of amphibians
E-mail: tominaga@cs.u-ryukyu.ac.jp

Yagisawa, Fumi (Research Facility Center, RFC)
Associate Professor, Ph.D., 2006, University of Tokyo
Organelles, molecular biology, and cell biology
E-mail: yagisawa@cs.u-ryukyu.ac.jp

Yamahira, Kazunori (Tropical Biosphere Research Center)
Professor, Ph.D., 1996, Kyushu University
Evolution and ecology of tropical fishes
E-mail: yamahira@cs.u-ryukyu.ac.jp

Yamasaki, Hideo
Professor, D.Sc., 1991, Kyushu University
Biology and biochemistry of active oxygen and nitrogen species
E-mail: yamasaki@cs.u-ryukyu.ac.jp

2025 SUBJECTS (Science)

G-OCEANS (Global-Okinawa Climate change & Ecosystems: Advanced Next-generation Sciences Program)

Table (Article 10) Doctoral Program

Course : Marine and Environmental Sciences

FIELD	SUBJECT		Subject Code	SUBJECT	CREDITS	HOURS	YEARS	SEMESTERS	SUBJECT DESCRIPTION
BIOSCIENCE/ ENVIRONMENTAL SCIENCE	REQUIRED	COMMON	ESME25010	Advanced Special Seminar	2	30	1-3	Fall/ Spring	In seminar format. Through the introduction of original academic papers, as well as presentation and discussions related to research activities in science, students learn advanced academic communication, critical thinking, and issue-solving skills.
			ESME25020	Advanced Special Exercise	2	60	1-3	Fall/ Spring	Students learn about basic principles of science, as well as advanced professional knowledge and skills, formulation of advanced research plans, advanced information searching and data analytical skills, organization, and drawing scientifically-based conclusions.
BIOSCIENCE	ELECTIVE	SPECIAL	ESME25240	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.
			ESME25210	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.
			ESME25220	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.
			ESME25140	Plant Molecular Phylogeny	2	30	1-3	Spring	Discussion of current topics in molecular phylogeny and evolution of vascular plants.
			ESME25150	Plant Molecular Biology	2	30	1-3	Fall	Current topics in molecular genetics, genome science, genetic engineering, and bioimaging techniques, mainly focusing on plants.
			ESME25120	Oxygen Biology	2	30	1-3	Fall	Comprehensive review on biochemistry and biology of reactive oxygen (ROS) and nitrogen species (RNS).
			ESME25130	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.
			ESME25160	Developmental Physiology	2	30	1-3	Spring	Molecular and cellular aspects of mammalian and insect developmental systems.
			ESME25360	Species Biology	2	30	1-3	Fall	Discussion and presentation about the definition, identification and characteristics of ″species″.
			ESME25370	Evolutionary Biology of Tropical Organisms	2	30	1-3	Fall	Discussion about evolutionary mechanisms that create biodiversity in the tropics.
			ESME25180	Organelles and Cell Physiology	2	30	1-3	Spring	Topics in physiological aspects of organella dynamics and function. Focuses on organelle-related diseases, aging, and cell differentiation.
			ESME25190	Vertebrate Systematics and Evolutionary Biology	2	30	1-3	Fall	Discussion and presentation about evolution and divergence processes in vertebrates.
			ESME25390	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.
			ESME25170	Evolutionary Anthropology	2	30	1-3	Spring	Review of evolutionary histories of human: genetics, extant primates, fossils, culture, and society.
			ESME25380	Ecology of Tropical Coasts	2	30	1-3	Fall	Review on current topics of tropical coastal ecology, particularly coral reefs and discussion on environmental issues.
			ESME25350	Advanced Seminar of Reproductive Biology	2	30	1-3	Fall	Seminar and laboratory work on reproductive biology.
			ESME25460	Biodiversity Study	2	30	1-3	Spring	The term biodiversity refers to a concept that indicates diversities related to living organisms on earth. This class will debate about selected biodiversity-related research and reviews.
			ESME25320	Advanced Marine Environmental Biology	2	30	1-3	Fall	Review, presentation and discussion of current topics related to marine environment including climate change effects on marine organisms and ecosystems.
			ESME25400	Plant Reproductive Ecology	2	30	1-3	Fall	Review on recent progress of plant reproductive biology, including the basics of gender expression, pollination and phenology.
			ESME25470	Global Change Biology	2	30	1-3	Spring	Introduction of current topics about the response of corals to global warming.
			ESME25490	Advanced Methodology for Field Ecology	2	30	1-3	Fall	Students will learn statistical sampling techniques to detect patterns in biological communities in the field. The primary audience will be those who already have experience of field surveys.

2025 SUBJECTS (Science)

G-OCEANS (Global-Okinawa Climate change & Ecosystems: Advanced Next-generation Sciences Program)

Table (Article 10) Doctoral Program

Course : Marine and Environmental Sciences

FIELD	SUBJECT		Subject Code	SUBJECT	CREDITS	HOURS	YEARS	SEMESTERS	SUBJECT DESCRIPTION
			ESME25250	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.
			ESME25270	Advanced Ecology of Coral Reef Organisms	2	30	1-3	Fall	Review, presentation and discussion about coral reef organisms and related research fields.
			ESME21020	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.
			ESME23010	Carbonate Geochemistry	2	30	1-3	Spring	This course deals with carbonates in lithosphere and hydrosphere, especially natural mechanism of CO_2 absorption from atmosphere in the global carbon cycles and its role in coral reefs.
			ESME25330	Advanced Asymmetric Organic Reaction	2	30	1-3	Fall	This lecture will be about synthetic strategies for asymmetric organic reactions including catalysis.
			ESME25110	Advanced Marine Environmental Chemistry	2	30	1-3	Fall & Spring	Chemical processes in marine environments.
			ESME25300	Spectrometric Analysis of Organic Compounds	2	30	1-3	Fall	Spectroscopic methods for structure analysis such as mass spectrometry, nuclear magnetic resonance spectroscopy and infrared spectroscopy.
			ESME25070	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.
			ESME25510	Advanced Numerical Weather Prediction	2	30	1-3	Fall	Acquire knowledge of numerical weather prediction and its applications through series of lectures and seminars.
			ESME25040	Igneous Petrology and Geochemistry	2	30	1-3	Fall & Spring	Reviews and discussion about trace elements and isotopic composition of environmental Earth materials.
			ESME25050	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.
			ESME25060	Crustal Evolution	2	30	1-3	Fall	This lecture unit introduces the recent results of the crustal evolution process from the point of view of petrologenesis of metamorphic rock and its geochronology.
			ESME25230	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.
		COMMON	ESME25480	International Field Course	2	30	1-3	Spring	Field and laboratory work at field stations to learn techniques of marine and environmental sciences related to G-OCEANS program.
			ESME25500	Advanced Cross-Disciplinary Seminar	2	30	1-3	Fall	Students will learn how to plan, organize, manage, open, and run a small conference.
			ESME25420	Special Lecture A	2	30	1-3	Intensive	Course on marine and environmental sciences.
			ESME25430	Special Lecture B	2	30	1-3	Intensive	Course on marine and environmental sciences.
			ESME25440	Special Lecture C	2	30	1-3	Intensive	Course on marine and environmental sciences.
			ESME25450	Special Lecture D	2	30	1-3	Intensive	Course on marine and environmental sciences.

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.