

(2) School of Life and Environmental Sciences
Interdisciplinary Program in Life and Environmental Sciences

School of Life and Environmental Sciences

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG00112	Technical English IS	2	1.5	2	SprABC	Wed5	2B507, 2B508	DeMar Taylor, Mayuri Yamaguchi	This course aims to help students develop abilities necessary for science communication in English.	Lectures are conducted in English.
EG00122	Technical English IF	2	1.5	2	FallABC	Wed5	2B507, 2B508	DeMar Taylor, Mayuri Yamaguchi	This course aims to help students develop abilities necessary for science communication in English.	Lectures are conducted in English.
EG00212	Technical English IIS	2	1.5	3	SprABC	Wed4	2B507, 2B508	DeMar Taylor, Louis John Irving, Mayuri Yamaguchi	This course aims to help students develop abilities necessary for science communication in English.	Lectures are conducted in English.
EG00222	Technical English IIF	2	1.5	3	FallABC	Wed4	2B507, 2B508	DeMar Taylor, Louis John Irving, Mayuri Yamaguchi	This course aims to help students develop abilities necessary for science communication in English.	Lectures are conducted in English.
EG02011	Physics	1	1.0	1	FallAB	Thu4	2C407	Mito Kokawa, Marcos Antonio das Neves	Introduction to physics for life and environmental sciences.	Lectures are conducted in English.
EG02021	Mathematics	1	1.0	1	FallAB	Fri5	2D303	Ahamed Tofael	Introduction to mathematics for life and environmental sciences covers application of calculus using applied differentiation and integration, logarithmic and exponential functions, first order differential equations, matrix and probability. This course emphasizes to solve problems related to life and environmental sciences using a wide array of mathematical solutions.	Lectures are conducted in English.
EG02023	Field Studies in Life and Environmental Sciences	3	1.0	1	Sum Vac	Intensive		DeMar Taylor, Louis John Irving, Seung Won Kang, Thomas Parkner	A two-day seminar on life in Tsukuba and studying in the International Undergraduate Program in the School of Life and Environmental Sciences.	Lectures are conducted in English.
EG02024	Field Studies in Life and Environmental Sciences	4	1.0	1	Sum Vac	Intensive		DeMar Taylor, Louis John Irving, Seung Won Kang, Akio Yamashita, Shigehiro Fujino	A two-day seminar on life in Tsukuba and studying in the International Undergraduate Program in the School of Life and Environmental Sciences.	Lectures are conducted in English. 9/26-9/27
EG02031	Statistics	1	1.0	2	FallC	Tue/Thu 2	2C102, 2D202-203	Louis John Irving	Introduction to statistics for life and environmental sciences.	Lectures are conducted in English.
EG02041	Advanced Mathematics	1	1.0	2	SprAB	Thu6	2D205	Ahamed Tofael	In this course, students will have a short review of applied calculus and introduces with the advanced mathematics sections like geometrical meaning of differential equations, solution of ordinary and partial differential equations, numerical analysis and Laplace transformation. These advanced mathematical skills will be invaluable to them to interpret the concepts of modeling of real world problems related to life and environmental sciences.	Lectures are conducted in English.
EG02111	Introduction to Biology I	1	1.0	1	FallAB	Fri3	2C102	Louis John Irving, DeMar Taylor	Introduction to biochemistry and cytology.	Lectures are conducted in English.
EG02131	Introduction to Biology III	1	1.0	1	FallAB	Thu2	2B309	Louis John Irving	Animal Physiology / Evolution	Lectures are conducted in English.
EG02141	Introduction to Biology IV	1	1.0	1	FallC	Thu4 Fri3	2C102	Louis John Irving, Katsuo Furukubo-Tokunaga	Introduction to Genetics and Heredity	Lectures are conducted in English.
EG02151	Introduction to Biology V	1	2.0	2	SprAB	Wed3 Fri4	2C410	Louis John Irving	Diversity of Life	Lectures are conducted in English.

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EG02211	Chemistry I	1	1.0	1	Fall A	Tue/Fri 6	2D206	Seung Won Kang	Introduction to general chemistry for life and environmental sciences.	Lectures are conducted in English.
EG02221	Chemistry II	1	1.0	1	Fall B	Tue/Fri 6	2D206	Seung Won Kang	Introduction to general chemistry for life and environmental sciences.	Lectures are conducted in English.
EG02231	Chemistry III	1	1.0	1	Fall C	Tue4 Thu5	2D303	Seung Won Kang	Introduction to general chemistry for life and environmental sciences.	Lectures are conducted in English.
EG03012	Paper Preparation and Presentation	2	1.0	4	Fall C	by appointment		DeMar Taylor	Preparation and help in writing the graduation thesis which is required towards the end of your fourth year. Also, preparation for the presentation of your results during the Presentation Meeting of all the graduation theses.	For students who started graduate research in spring semester Lectures are conducted in English.
EG03022	Paper Preparation and Presentation	2	1.0	4	SprAB	by appointment		DeMar Taylor	Preparation and help in writing the graduation thesis which is required towards the end of your fourth year. Also, preparation for the presentation of your results during the Presentation Meeting of all the graduation theses.	For students who started graduate research in fall semester Lectures are conducted in English.

College of Biological Sciences

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG10013	Basic Biological Sciences, Laboratory	3	1.0	2	SprC	Intensive	2D413	Takeshi Nakayama, Louis John Irving, Takeo Hama, Yuko Oomori, Kazuo Watanabe, Michiyuki Ono, Ayumi Minoda, Katsuo Furukubo-Tokunaga, Ken Honjo, Shinichi Miyamura, Kentaro Nakano, Kazuichi Sakamoto	This course aims to train the ability of the observation and the experimental technique on the various biological phenomena	Lectures are conducted in English. 7/10-7/14
EG11412	English Communication for Biology I	2	1.0	2	Fall AB	Wed3	2D307	Matthew Christopher Wood	This course prepares students to communicate science both within their discipline and with a wider audience. Through active class discussions and practical assignments, students will develop understanding and practical skills in basic communication theory, and written and oral communication.	for Students of Biology Identical to EB13312. Lectures are conducted in English.
EG11422	English Communication for Biology II	2	1.0	3	SprAB	Wed2	2C403	Matthew Christopher Wood	This course prepares students to communicate science both within their discipline and with a wider audience. Through active class discussions and practical assignments, students will consider the relationship between science and society, and how science is communicated with the public.	for Students in Biology Identical to EB13322. Lectures are conducted in English.
EG11432	English Communication for Biology III	2	1.0	3	Fall AB	Wed2	2C403	Matthew Christopher Wood	This course prepares students to communicate science both within their discipline and with a wider audience. Through active class discussion and practical assignments, students will discover how new and alternative media are providing greater opportunities for researchers to communicate their science.	for Students in Biology Identical to EB13332. Lectures are conducted in English.
EG11442	English Communication for Biology I	2	1.0	2	Fall AB	Wed3	2C102	Maria Luisa Gomez Calanag	This course prepares students to communicate science both within their discipline and with a wider audience. Through active class discussions and practical assignments, students will develop understanding and practical skills in basic communication theory, and written and oral communication.	For students of College of Biological Sciences. Lectures are conducted in English.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG11452	English Communication for Biology II	2	1.0	3	SprAB	Wed2	2C101	Maria Luisa Gomez Calanag	This course prepares students to communicate science both within their discipline and with a wider audience. Through active class discussions and practical assignments, students will consider the relationship between science and society, and how science is communicated with the public.	For students of College of Biological Sciences. Lectures are conducted in English.
EG11462	English Communication for Biology III	2	1.0	3	FallIAB	Wed2	2C101	Maria Luisa Gomez Calanag	This course prepares students to communicate science both within their discipline and with a wider audience. Through active class discussion and practical assignments, students will discover how new and alternative media are providing greater opportunities for researchers to communicate their science.	For students of College of Biological Sciences. Lectures are conducted in English.
EG11882	Biology Seminar	2	1.0	3	SprAB	by appointment		Dean and others	Under the instruction of their supervisor, students read papers on topics related to their graduation research and write a mini-review.	for Students in Biology Lectures are conducted in English.
EG11892	Biology Seminar	2	1.0	3	FallI, Spr Vac	by appointment		Dean and others	Under the instruction of their supervisor, students read papers on topics related to their graduation research and write a mini-review.	for Students in Biology Lectures are conducted in English.
EG11912	Research Seminar I	2	1.0	4	SprAB	by appointment		Dean and others	Topics in biology will be discussed with laboratory members and supervisor.	
EG11922	Research Seminar II	2	1.0	4	SprC, FallIA	by appointment		Dean and others	Topics in biology will be discussed with laboratory members and supervisor.	
EG11932	Research Seminar III	2	1.0	4	FallIBC	by appointment		Dean and others	Topics in biology will be discussed with laboratory members and supervisor.	
EG11968	Graduation Research	8	6.0	3, 4	Annual	by request		Dean and others	Each student engages in research work in laboratory on specific theme under supervisor.	
EG11978	Graduation Research I	8	3.0	4	Fall Semester	by request		Dean and others	指導教員の指導のもとに、テーマを設定して研究を進めることを通して、自ら問題を解決する基礎的な能力を修得させる。	
EG11988	Graduation Research II	8	3.0	4	SprABC	by request		Dean and others	指導教員の指導のもとに、テーマを設定して研究を進めることを通して、卒業研究Iで修得した能力を深化させる。	
EG20014	Programming I	4	1.0	2, 3	FallIAB	Thu1	2D202	Yukihiko Tokunaga (Toquenaga)	In this lecture, students learn programing techniques for manipulating a variety of data. They will also learn simulation techniques with individual-based models. The programming language used is Ruby.	Identical to EB60014. Lectures are conducted in English. JTP
EG20211	Plant Taxonomy I	1	1.0	2, 3	SprAB	Fri2	2C404	Ken-ichiro Ishida	Diversity, classification, morphology, ultrastructure, life history and phylogeny of non-green algae - glaucophytes, rhodophytes, cryptophytes, chlorarachniophytes, euglenophytes, dinoflagellates, haptophytes, and stramenopiles.	Identical to EB50211. Lectures are conducted in English. JTP
EG21011	Marine Biogeochemistry I	1	1.0	2, 3	SprC	Intensive	2B411	Masao Ishii, Masahiro Suzumura	This lecture will focus on the physical, chemical and biological environments in ocean with special reference to carbonate system and eutrophication.	Identical to EB51011. Lectures are conducted in English. 7/5-7/6 JTP
EG22011	Genome Biology I	1	1.0	2, 3	SprAB	Tue1	2B412	hidekazu kuwayama	Lectures will cover basic knowledge on the structure and function of the genome, as well as technologies for DNA and genome analyses.	Identical to EB62011. Lectures are conducted in English. JTP

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG22911	Marine Biology I	1	1.0	2, 3	SprAB	Wed3	2B508	Kazuo Inaba, Sylvain Leonard Georges Agostini	Lecture will give you several topics on physical, chemical and biological properties of ocean to understand the physiology, reproduction, development, biodiversity and ecology of marine invertebrates and fish. This class will especially focus on the following aspects of marine life: life cycle, locomotion, sensory reception, biomineralization, biogeochemical distribution, photosynthesis, respiration, calcification, nitrogen fixation and the impact of climate change. We will give examples of marine organisms under planktonic and benthic conditions and coral reef. The history and present situation of marine biology research will be also included.	Identical to EB72911. Lectures are conducted in English. JTP
EG23131	Biotechnology Literacy	1	1.0	2, 3	FallC	Intensive	2B508	Kazuo Watanabe, Akira Kikuchi, Michiyuki Ono, Taichi Oguchi	Topics covering ethical, legal and social issues in life & environmental sciences.	Identical to EB83161. Lectures are conducted in English. JTP CDP G-course EB83131修得者の履修は認めない。
EG24111	Plant Physiology I	1	1.0	2, 3	SprAB	Fri1	2B411	Shinobu Satoh, Jun Furukawa, Kenji Miura, Louis John Irving	In this lecture, the relationship between various physiological phenomena and the environmental factors in the life history of higher plant will be overviewed for the understanding from the viewpoint at whole plant to cell levels with adding the latest molecular biological findings.	Identical to EB74111. Lectures are conducted in English. JTP
EG24211	Metabolic and Physiological Chemistry I	1	1.0	2, 3	SprAB	Thu1	2C310	Iwane Suzuki	The main topics for this course will be photosynthetic energy conversion, primary and secondary carbon metabolism including C3, C4 and CAM metabolisms, photorespiration, and mitochondrial respiration.	Identical to EB74211. Lectures are conducted in English. JTP
EG29103	Laboratory and Field Studies in Land Biology	3	1.5	2	Spr Vac	Intensive	Sugadaira	Ryuichiro Machida, Kensuke Yahata, Leanne Kay FAULKES	A five-day residential course held at the Sugadaira Montane Research Center. The aim of this course, through animal tracking, bird watching, collecting insects, is to provide genuine experience of the qualities of nature and wild animals in snowy areas.	Identical to EB09103. Lectures are conducted in English. 3/5-3/9 JTP
EG30153	Animal Systematics, Laboratory II	3	1.5	2, 3	SprB	Mon4-6 Tue4, 5 by appointment	2B403	Hiroshi Wada, Yoshiaki Morino	In this course you learn about comparative anatomy of echinoderms (sea urchin, starfish and sea cucumber), molluscs (bivalves, gastropods, and cephalopods), and chordates (lamprey, amphioxus and ascidians). You also observe embryogenesis for some species, and learn evolution of larval forms.	Identical to EB50153. Lectures are conducted in English.
EG30221	Plant Taxonomy II	1	1.0	2, 3	FallIAB	Fri2	2C101	Ken-ichiro Ishida, Takeshi Nakayama	Diversity, classification, morphology, ultrastructure, life history and phylogeny of green plants, including chlorophytes and land plants.	Identical to EB50221. Lectures are conducted in English. JTP
EG30263	Plant Systematics, Laboratory II	3	1.5	2, 3	SprB	Thu4-6 Fri4, 5 by appointment	2D417	Ken-ichiro Ishida, Takeshi Nakayama	Collecting, observing, identifying and culturing unicellular freshwater protists (algae and protozoa). Students will use light and electron microscopes and a few basic molecular techniques.	Prerequisite: Introduction to Biology I-IV, Plant Taxonomy I. Identical to EB50263. Lectures are conducted in English.
EG31021	Marine Biogeochemistry II	1	1.0	2, 3	FallIA	Intensive	2B412	Takeo Hama, Shigeki Wada, Yuko Oomori	This lecture will focus on the biogeochemical cycle of carbon with special reference to the production, transformation and decomposition of organic matter in ocean.	Identical to EB51021. Lectures are conducted in English. 10/14-10/15 JTP
EG32031	Genome Biology III	1	1.0	2, 3	SprAB	Wed2	2C107	Yuji Inagaki	Lectures will focus on the structure and evolution of genomes, including molecular phylogeny and comparative genomics.	Identical to EB62031. Lectures are conducted in English. JTP

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG32131	Chemical Ecology	1	1.0	2, 3	Fall/AB	Fri4	2C107	Yooichi Kainoh, Shigeru Matsuyama, Keiko Yamaji, Seiichi Furukawa, Natsuko Kinoshita	This lecture introduces chemical aspects of relationships between individual insects, animals, plants and microorganisms of the same (pheromone) or different (allelochemicals) species.	Identical to EB82131. Lectures are conducted in English. JTP
EG32921	Marine Biology II	1	1.0	2, 3	Fall/AB	Wed3	2B508	Kazuo Inaba, Yasunori Sakakura, Shunsuke Yaguchi, Kogiku Shiba, Hiroaki Nakano, Shigeki Wada, Koetsu Kon, Takeo Horie, Sylvain Leonard Georges Agostini	Lecture will provide several topics on marine organisms, including fertilization, cilia and flagella, gene-manipulation, development, self-non-self recognition, evolution, animal behavior, population ecology and marine environment. The teaching staff of Shimoda Marine Research Center will tell you about recent progress of their own research.	Identical to EB72921. Lectures are conducted in English. JTP
EG33111	Plant Biotechnology I	1	1.0	2, 3	Spr/C	Intensive	2B507	Kazuo Watanabe, Akira Kikuchi, Michiyuki Ono	Lectures will cover topics on plant biotechnology including control of flowering time, circadian rhythms, photoperiodic responses, organ size and responses to environmental stresses.	Identical to EB83141. Lectures are conducted in English. JTP Who has credit of EB83111 is ineligible.
EG34021	Biometry II	1	1.0	2, 3	Fall/AB	Fri3	2D202	Yukihiko Tokunaga (Toquenaga)	This lecture introduces the dark side of statistics. Starting with randomization techniques, students learn relationships among different domains of statistical ideas: parametric, nonparametric, null hypothesis significance testing, information-theoretic methods, and the Bayesian methods.	Identical to EB64021. Lectures are conducted in English. JTP
EG34111	Theoretical Ecology	1	1.0	2, 3	Spr/AB	Thu1	2D202	Yukihiko Tokunaga (Toquenaga)	This course illustrates theoretical aspects of ecology with examples of laboratory experiments to connect mathematical expressions with ecological phenomena in nature.	Identical to EB64111. Lectures are conducted in English. JTP
EG34131	Plant Physiology II	1	1.0	2, 3	Fall/AB	Fri1	2B411	Hiroaki Iwai, Takuya Suzuki	This lecture introduces several important topics for your further understanding of plant physiology, which includes recent advances in the research of vegetative and reproductive development, and symbiosis with microorganisms in higher plants.	Identical to EB74131. Lectures are conducted in English. JTP
EG34163	Plant Physiology, Laboratory	3	1.5	2, 3	Fall/A	Mon4-6 Tue4, 5 by appointment	2D413	Hiroaki Iwai, Shinobu Satoh, Jun Furukawa, Louis John Irving	This course aims to provide an understanding of the roles of hormones, proteins, polysaccharides and genes in plant development and functions. It also covers basic laboratory skills for plant physiology and molecular biology.	Including recombinant DNA experiments. Prerequisite: Introduction to Biology I-IV, Plant Physiology I, Training session for the registration of the students engaged in recombinant DNA experiments. Identical to EB74163.
EG34221	Metabolic and Physiological Chemistry II	1	1.0	2, 3	Fall/AB	Thu1	2C310	Iwane Suzuki, Louis John Irving	Nitrogen metabolism, sulfur metabolism, metabolic regulatory mechanisms and the function of trace metals in cellular metabolism are main topics. The main topics for this course will be acclimation process of cellular and energy metabolisms response to the changes in intracellular and extracellular environments. It will be discussed about response and regulations of gene expression, enzymatic reaction, transport and signal transduction system.	Identical to EB74221. Lectures are conducted in English. JTP Who has credit of EB74231 or EG34231 is ineligible.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG34273	Metabolic and Physiological Chemistry, Laboratory	3	1.5	2, 3	FallIA	Thu4-6 Fri4, 5 by appointment	2D410	Iwane Suzuki, Ayumi Minoda, Hiroya Araie	Experimental measurements of gas metabolism in photosynthesis, photorespiration and respiration, and glycolate metabolism by microalgae. Mechanisms for acclimation to CO ₂ stress, N-limitation and P-limitation at molecular level in microalgae. Analysis of the function of selenium in marine coccolithophorids using radioactive Se-125.	Prerequisite: Introduction to Biology I-IV, Metabolic and Physiological Chemistry I. Identical to EB74273.
EG35031	Molecular Developmental Genetics	1	1.0	2, 3	FallIAB	Fri3	2B208	Katsuo Furukubo-Tokunaga	Study of the mechanism of development is one of the most fascinating areas in current biology. This lecture focuses on the genetic programs that are conserved from fly to human beyond apparent morphological diversity. It also introduces fundamental aspects of nervous system development including network and synaptic plasticity that are essential to higher brain functions such as memory.	Identical to EB72131. Lectures are conducted in English. JTP
EG35131	Molecular Biology III	1	1.0	2, 3	FallIAB	Thu3	2B412	Tomoki Chiba	Proteins are in a dynamic state, which is regulated by protein synthesis and degradation pathways. Each protein is degraded in a degree of selectivity, and its regulation is essential for the cell homeostasis and viability. In this class, we will learn the latest findings on the molecular mechanism of selective protein degradation and its physiological importance.	Identical to EB71131. Lectures are conducted in English. JTP
EG35153	Molecular Biology, Laboratory	3	1.5	2, 3	SprB	Mon4-6 Tue4, 5 by appointment	2D413	Kazuichi Sakamoto, Tomoki Chiba, Fuminori Tsuruta, 伴 佐藤	Feeding RNAi法による線虫の遺伝子発現阻害実験, マウス胎児を使用した発現解析実験、細胞におけるストレス応答など分子細胞生物学の実験手法を習得する。	Identical to EB71153. Lectures are conducted in English.
EG36013	Laboratory and Field Studies in Marine Biology	3	1.5	2, 3	Spr Vac	Intensive	Shimoda	Shunsuke Yaguchi, Hiroaki Nakano, Shigeki Wada, Sylvain Leonard Georges Agostini	This course aims to understand biodiversity through the collection of coastal and planktonic marine organisms and observation of their body plan and development.	Identical to EB16013. Lectures are conducted in English. 3/12-3/16 Prerequisite: Introduction to Biology I-IV, Marine Biology I.
EG38131	Vertebrate Evolution	1	1.0	2, 3	FallIAB	Tue3	2D306	Louis John Irving	This course looks at the major transitions during vertebrate evolution, particularly focussing on the transition between water and land, and the adaptations which facilitated that transition. The diversification of animal life on land, and the subsequent return of some groups to water will be studied. This course will have a strong evolutionary biology focus.	Identical to EB08131. Lectures are conducted in English. JTP
EG39101	Protistology	1	1.0	2, 3	FallIC	Fri2, 3	2C310	Ken-ichiro Ishida, Yosuke Degawa, Osamu Numata, Hidekazu Kuwayama, Shinichi Miyamura	Topics in protistology. Cellular evolution, cell biology, sex and reproduction, phylogeny and ecology of protists will be the subjects of this lecture.	Identical to EB59101. Lectures are conducted in English. JTP
EG39201	Overview of Algal Biomass	1	1.0	2 - 4	SprC	Intensive	2B411	Iwane Suzuki, Takeshi Nakayama, Yoshida Masaki	Biofuels, especially using algae and protists, phylogenetic diversity and physiology of algae and protists, and a research trend of algal biofuels will be the subjects of this lecture.	Identical to EB79101. Lectures are conducted in English. JTP

College of Agro-Biological Resource Sciences

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG41012	Research Seminar I	2	1.5	4	SprABC	by request		Dean and others	Topics in agro-biological resource sciences will be discussed with laboratory members and supervisor.	Lectures are conducted in English.
EG41022	Research Seminar II	2	1.5	4	FallIABC	by request		Dean and others	Topics in agro-biological resource sciences will be discussed with laboratory members and supervisor.	Lectures are conducted in English.

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EG41078	Graduation Research I	8	3.0	4	SprABC	by request		Dean and others	Each student engages in research work in laboratory on specific theme under supervisor.	Lectures are conducted in English. Students allowed to graduate in March are supposed to register for Graduation Research I and then II in order.
EG41088	Graduation Research II	8	3.0	4	FallABC	by request		Dean and others	Each student engages in research work in laboratory on specific theme under supervisor.	Lectures are conducted in English. Students allowed to graduate in August are supposed to register for Graduation Research II and then I in order.
EG50011	World Food and Agriculture	1	1.0	1	FallAB	Fri2	2C102	Seung Won Kang	This course introduces crop plants, domestic animals and their production in the world, in relation to economic and environmental issues.	Lectures are conducted in English.
EG50013	Agricultural Internship Abroad I	3	2.0	2, 3	Annual	by appointment		Dean and others, Nakao Nomura	Field study program in foreign countries under 3 objectives: 1) To learn overview on agriculture and related industries 2) To discuss current issues related agriculture through seminars with local students 3) Field survey of the agricultural sites in the local areas	(インターンシップ) 国外 Identical to EC41013. Lectures are conducted in English. CDP
EG50023	Agricultural Internship Abroad III	3	2.0	2, 3	Annual	by appointment		Dean and others, Nakao Nomura	Field study program in European countries under 3 objectives: 1) To learn overview on agriculture and related industries 2) To discuss current issues related agriculture through seminars with local students 3) Field survey of the agricultural sites in the local areas	Lectures are conducted in English. Identical to EC41133. CDP
EG50031	Cell Structure and Function	1	1.0	2, 3	FallAB	Fri5	2B309	DeMar Taylor	Lectures and discussions will concentrate on cell structure and function as related to 1) membranes, 2) mitochondria, 3) chloroplasts, 4) intracellular transport, 5) cell communication, 6) cell cycle and 7) cell communities.	Use English Textbook Identical to EC31251. Lectures are conducted in English. JTP
EG50033	Agricultural Internship Abroad IV	3	2.0	2, 3	Annual	by appointment		Dean and others, DeMar Taylor	Field study program in North America under 3 objectives: 1) To learn overview on agriculture and related industries 2) To discuss current issues related agriculture through seminars with local students 3) Field survey of the agricultural sites in the local areas	Lectures are conducted in English. Identical to EC41143. CDP
EG50041	Biochemistry	1	2.0	2, 3	SprAB	Thu4, 5	2C407	Beiwen Ying	Advanced biochemistry covers a wide area including molecular cell biology, molecular genetics, biotechnology, metabolism, and relates all current biological sciences. This course provides an introduction to biochemistry for the undergraduates.	Lectures are conducted in English.
EG50051	Economics	1	2.0	2, 3	SprAB	Mon5, 6	2G305	Satoshi Tachibana, Shusuke Matsushita	This class aims to provide an understanding of the roles of firms, households, and government and the structure and performance of national economies and of the policies.	Lectures are conducted in English.
EG50091	Disease Vector Biology	1	1.0	3	SprAB	Fri1	2D206	DeMar Taylor	Agricultural production of both animals and plants is greatly affected by the transmission of diseases through arthropod vectors. This course will provide a better understanding of arthropod disease vectors and the diseases they transmit.	Identical to EC31261. Lectures are conducted in English.

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EG50163	Fundamental Chemistry Laboratory	3	1.0	2	Fall/AB	Thu4-6		Kosumi Yamada, Hiroaki Daitoku, Kazuyoshi Ogawa, Akihiko Shimada, Akiko Nakagawa-Izumi, Hideyuki Shigemori, Nakao Nomura, Yingnan Yang, Seung Won Kang, Satoko Nonaka, Yoko Nagumo	Chemical substances are existed around and within us everyday and everywhere. We will provide the students inorganic, physicochemical, and organic chemical property of them through the experiments. The students should be able to 1) separate, isolate, and identify chemical substances, 2) learn physicochemical property of them by analytical equipment, 3) know how to use labware and analytical equipment	平成24年度までの「化学実験」(EC12113)を履修済みの者は履修できない。G30学生の受け入れ上限数をおおむね12名とする。10/5は2H101教室に集合すること。Number of G30 students are limited to 12. Venue for orientation of G30 on 5th Oct.: TBA Identical to EC12163. 10/12, 10/19, 10/26, 11/2, 11/9, 11/16
EG60041	Animal Production	1	1.0	3, 4	Spr/AB	Thu3	2D307	Atsushi Tajima	Animal production and grain production are two of the most important human inventions. In the present lecture, basic concepts of domestic animals production, i.e. animal husbandry, animal reproduction and animal nutrition will be covered.	Same as EC31081 Lectures are conducted in English.
EG60051	Biotechnology in Domestic Animals	1	1.0	3, 4	Fall/AB	Tue4	2C403	Atsushi Tajima	The aim of the course is to provide basic information on the current status of biotechnology in domestic animals.	Open in an odd number year. Lectures are conducted in English.
EG60061	Animals and Animal Products in Human Life	1	1.0	3, 4					This course aims to provide an understanding on the basic principles of human-animal relationship. Topics on how animal and animal products contribute to the human life will be discussed.	Open in an even number year. Lectures are conducted in English.
EG60071	Food Functionality	1	1.0	3, 4	Fall/C	Tue5, 6	2G407	Hiroko Isoda, Myra Orlina Villareal	Lectures will cover the topics in advanced food functionality including anti cancer, anti allergy, anti stress, anti obesity, neuronal regulation, melanogenesis regulation and the bioavailability of functional food factors.	Same as EC31391 Lectures are conducted in English.
EG60081	Food and Nutritional Chemistry	1	2.0	3, 4	Fall/AB	Fri5, 6	2D305	Hitoshi Miyazaki, Nobuharu Fujii	The aim of this course is to understand the mechanisms of the digestion and absorption of food, the regulation of homeostasis of carbohydrates, lipids, and proteins, and several diseases induced by overnutrition.	Same as EC32241 Lectures are conducted in English.
EG60091	Applied Microbiology	1	1.0	3, 4	Fall/C	Mon3, 4	2D304	Naoki Takaya, Toshiaki Nakajima-Kambe	Lectures will cover the topics in applied microbiology including genetic engineering, cell-cell communication, biodegradation, and bioremediation.	Same as EC32121 Lectures are conducted in English.
EG60101	Soil Science	1	2.0	3, 4	Fall/AB	Intensive		Maki Asano	Fundamental aspects of soils with regard to their genesis, physicochemical properties, management and the related environmental issues will be lectured, and the discussion on some selected topics will be treated as more advanced understanding of present status of soils in the changing world.	Same as EC32161 Lectures are conducted in English.
EG60111	Environmental Ecological Engineering	1	1.0	3	Fall/AB	Wed3	2C403	Nakao Nomura	Lecture covers eco-engineering technologies to restore deteriorated environments including following major existing issues: 1) Rehabilitation of enclosed water bodies in terms of water and sediment quality improvement, 2) Biomass energy as a renewable energy and its effect on reduction of greenhouse gas emission, 3) Impact of aquacultural industries on coastal environment including mangrove forest.	横断領域科目「環境」 Identical to EC32111. Lectures are conducted in English.
EG60121	Food Process Engineering	1	1.0	3, 4	Spr/AB	Wed3	2G305	Marcos Antonio das Neves, Mito Kokawa	This course introduces basic principles of fluid flow, heat transfer, and mass transfer phenomena, along with the application of these principles to the unit operations most commonly used in food processing, such as thermal processing, cooling, freezing, centrifugation, filtration, drying, size reduction and emulsification.	Same as EC42021 Lectures are conducted in English.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG60131	Food Safety and Security	1	1.0	3, 4	Fall/AB	Fri/4	2D205	Ahamed Tofael	Lectures will cover the topics of food safety management and standard, safety issues related to the food supply chain, traceability and recall on global food markets, and safety perspectives of food preservation methods. Furthermore, food security models, assessments and index will be discussed along with the global scenario of food security and climate change. The impacts of climate of change to crop production, vulnerability and coping strategy in different dimensions of food security will be introduced in this course.	Lectures are conducted in English.
EG60161	Environmental Colloid Engineering	1	1.0	3, 4	Spr/C	Intensive	2C107	Yasuhisa Adachi	Applications of colloid and interface science to environmental issue and its basis are given. Focus will be placed on the flocculation which is important to control water quality.	Class is held in Seino-B201. It is recommended to take EG60421 together with this subject due to complementarity. EG60491 will also be helpful to understand this subject. Lectures are conducted in English. 7/24, 7/25
EG60191	Biomass Conversion	1	2.0	3, 4	Spr/AB	Intensive	2C403	Yingnan Yang	This course is designed to help you develop and understanding of the complex processes of biomass conversion. Lectures and discussions will focus on biomass sources, biomass conversion technology and process.	Limited to G30 students. 10:00~18:00. Lectures are conducted in English. 5/13, 5/20, 6/10, 6/17
EG60201	International Agricultural and Forestry Policies	1	2.0	3, 4	Spr/C	Intensive		Yasuo Watanabe, Yuichiro Hirano, 英樹 萩原, 真康 浅井	Lectures will cover the topics in policies for agriculture, food, forestry, and environmental management related to agriculture and forestry in the world.	Identical to EC34081. Lectures are conducted in English.
EG60211	Econometrics	1	1.0	2, 3	Fall/C	Mon/5, 6	2G103	Hisato Shuto, Ujiie Kiyokazu	This class aims to provide an understanding of the basic econometrics such as formulation of econometric model, estimation and testing of models with observed data.	Lectures are conducted in English.
EG60222	Seminar in Agrobiological and Forestry	2	2.0	3, 4					This seminar focuses on Agrobiological or Environmental sciences, aiming at providing the latest achievement of these science fields. A student studies the method of accessing suitable information, and also will be requested to reflect them for own research through a seminar.	Lectures are conducted in English. Not open in 2017.
EG60232	Seminar in Applied Biological Chemistry	2	2.0	3, 4	Spr/AB	Fri/5, 6	2D403	Nakao Nomura	The purpose of the course is to introduce and discuss the applied life sciences related to biochemistry of plant molecules, molecular and developmental biology, biology for gene regulations, ecological molecular microbiology, biomimetic chemistry, bioreaction engineering.	Open in an odd number year. Lectures are conducted in English.
EG60252	Seminar in Agricultural Economics and Sociology	2	2.0	3, 4	Annual	Intensive		Hisato Shuto	This course aims to introduce the present issues of agricultural and forestry economics, and discuss the roles of rural society, farm management and forestry planning.	Students who are supervised by faculties in the sociology-economics course are eligible to enroll. Lectures are conducted in English.
EG60272	Seminar in Quantitative Food Economics	2	2.0	2, 3	Fall/AB	Thu/3, 4	2D402, 2D204	Hisato Shuto	Exercises in estimation of food production and consumption based on economic theories, and discussions are performed to analyze the factors controlling supply and demand of foods.	Lectures are conducted in English.
EG60282	Seminar in International Agrobiological Resource Sciences	2	2.0	3, 4	Fall/AB	Intensive	生農 G503	Yingnan Yang	This course aims to provide information for resource plants and animals, methods and examples of field survey, and effective use for agriculture and industry.	13:30-21:30 Limited to G30 students. Lectures are conducted in English. 10/20, 10/27, 11/10, 11/17

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG60293	Internship Program for International Agricultural Organization	3	2.0	3, 4	Fall/AB	Intensive		Nakao Nomura	Students will make research activities in the field of interests under the guidance of scientists at international agricultural research centers.	Limitation on the number of registered students Lectures are conducted in English.
EG60361	Microbiology	1	1.0	2, 3	Fall/C	Thu3, 4	2G205	Akira Nakamura, Nobuhiko Nomura, Shinichi Andrew Utada	This lecture will introduce you basic microbiology including: 1. Diversity of microorganisms 2. Cell-structures 3. Metabolisms 4. Genetics 5. Their use in our life	Lectures are conducted in English.
EG60401	Economics of Resource and Environment	1	2.0	3, 4	Spr/AB	Thu3, 4	2D402	Hisato Shuto, Satoshi Tachibana	Lectures will cover the topics in agricultural economy and resource and environment including forest.	Lectures are conducted in English.
EG60411	Biomaterial Science	1	1.0	3, 4	Fall/AB	Tue2	2G205	Toshiharu Enomae, Akiko Nakagawa-Izumi	Fundamentals and applications of paper science and papermaking engineering will be given and they cover chemical structures of polysaccharides constituting fibers, pulping methods for extracting fibers from wood, papermaking technology such as beating, forming, calendaring and coating, and geometrical, mechanical, optical, water-related properties of paper as well as latest research topics.	Lectures are conducted in English.
EG60421	Soil and Water Bio-Engineering	1	1.0	3, 4	Spr/C	Intensive	2C107	Yasuhisa Adachi	Engineering aspect of soil and water will be given on the basis of the knowledge of colloid and interface science. Emphasis will be placed on the solid-liquid separation technology by membrane and flocculation. A topic of application of microbiology, such as activated sludge method will be included.	It is recommended to take EG60161 together with this subject due to complementarity. EG60491 will also be helpful to understand this subject. Lectures are conducted in English. 7/26, 7/27
EG60431	Special Seminar IV	1	2.0	1 - 3	Annual	by request		Dean and others, Nakao Nomura	Seminar on the Special research related with agri-biological resource sciences for each individual student.	JTP Identical to EC00041. Lectures are conducted in English.
EG60441	Polymer and Organic Chemistry I	1	1.0	2, 3	Spr/AB	Tue1	2G103	Mikio Kajiyama	Most organic materials are classified into the polymer with a high molecular weight. This class is designed to help you develop an understanding of the chemical nature of the polymers based on the organic chemistry. In the "Polymer and Organic Chemistry I", the basic organic chemistry, e.g. radical, electrophilic and nucleophilic reactions and the conformations of the isomers will be discussed.	生物資源学類開講「高分子科学」及び平成24年度までの「Polymer Chemistry」を履修済みのものは履修できない。Credited auditors are NOT accepted. Lectures are conducted in English. Credited auditors are NOT accepted. Students MUST attend 「Chemistry III」 first.
EG60443	Special Seminar V	3	2.0	1 - 3	Annual	by request		Dean and others, Nakao Nomura	Field practice on the special research related with agro-biological resource sciences for each individual student.	JTP Identical to EC00053. Lectures are conducted in English.
EG60451	Polymer and Organic Chemistry II	1	1.0	2, 3	Fall/AB	Tue1	2D305	Mikio Kajiyama	Most organic materials are classified into the polymer with a high molecular weight. This class is designed to help you develop an understanding of the chemical nature of the polymers based on the organic chemistry. In the "Polymer and Organic Chemistry II", the reactions for the functional groups, the synthetic pathways and the intermolecular interactions will be discussed.	生物資源学類開講「高分子科学」及び平成24年度までの「Polymer Chemistry」を履修済みのものは履修できない。Students MUST attend 「Polymer and Organic Chemistry I」 first. Lectures are conducted in English. Students MUST attend 「Polymer and Organic Chemistry I」 first.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG60463	Internship in Environmental Engineering	3	2.0	3	SprC, FallABC	by appointment		Motoyoshi Kobayashi and the faculty of the course of Environmental Engineering	Students experience practical training at a work site in the field related to the course of environmental engineering (food, agricultural machinery, bio-fuel, soil, water, etc.), e.g., a research institute, an office of governmental ministry, NPO, a farm, or a food factory.	same as EC33313. The students should attend a briefing session that will be held in Spring A. This course is basically for students in environmental engineering program. Lectures are conducted in English.
EG60473	Environmental and Colloid Engineering Laboratory	3	1.5	2, 3	SprABC	Intensive		Motoyoshi Kobayashi	Students learn the fundamental and applications of colloidal and environmental engineering through the experiments.	It is desirable for participants to take "Introduction of Colloid and Interface Science" or "Environmental Colloid Engineering" beforehand or at the same time. Students need to make a contact with the instructor (kobayashi.moto.fp@u.tsukuba.ac.jp) before registration. (9:00-17:00) Lectures are conducted in English. 4/15, 4/22, 5/13, 5/27, 6/10, 6/24
EG60491	Elementary Applied Thermodynamics	1	1.0	2, 3	SprAB	Tue4	2D306	Yasuhisa Adachi	Thermodynamics is one of most fundamental subject when biological and environmental issues are treated. In this lecture, the elementary thermodynamics will be explained with an orientation toward an application in life and environmental science. Lecture will start the concept of equilibrium system with an example of Brownian motion. It will be followed by the first and the second law of thermodynamics. Thermodynamic function, the concept of Gibbs free energy, chemical potential. Many example will be cited from the field of Colloid and Interface Science. Those, who want to join the lecture of environmental colloid engineering are strongly recommended to join this lecture.	Lectures are conducted in English.
EG60503	Fundamental Environmental Engineering Laboratory	3	2.0	3	SprAB SprC	Fri4-6 Intensive	2D110-1	Ryozo Noguchi, Yutaka Kitamura, Motoo Utsumi, Eiichi Obataya, Hiroshi Ohi, Akiko Nakagawa-Izumi, Mikio Kajiyama, Yasuhisa Adachi, Taiichi Ito, Mitsutoshi Nakajima, Norifumi Hotta, Takuma Genkawa, Motoyoshi Kobayashi, Marcos Antonio das Neves, Zhen Ya Zhang, Yingnan Yang, Atsushi Ishii, Toshiharu Enomae, Takeshi Mizunoya, Zhongfang Lei, Yuji Yamashita, Keisuke Sakata	This course aims to provide basic concepts of environmental engineering necessary to analyze various phenomena present in environments, biomass, or bioresources.	平成22年度以前の「計測工学実験 (EG23113)」に相当。Identical to EC23123.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG60511	Practical Plant Biotechnology	1	1.0	3, 4	SprAB	Thu5	2D303	Hiroshi Ezura, Tohru Ariizumi, Satoko Nonaka	Plant cell, tissue and organ cultures for crop improvement will be introduced as conventional biotechnologies. Production and evaluation of genetically modified (GM) crops as well as the current status of GM crops will be introduced.	same as EC31231 and EG60021. A G30-student who had taken EG60021 is not allowed. Lectures are conducted in English.
EG60521	Green chemistry in ASEAN Countries	1	1.0	2, 3	FallIAB	Mon4	2D306	Gwen Manero Anuevo	This course will introduce the concept of "Green Chemistry" and its applicability to the current situation of Crop and Aquaculture Production in ASEAN countries.	Lectures are conducted in English.
EG60531	Molecular Genetics of Plant Development	1	2.0	3, 4	SprAB	Tue5, 6	2D303	Haniyeh Bidadi	Concepts in plant development are compared with those in animal development and complex processes, such as flowering and photomorphogenesis are presented as pathways of gene action regulated by positional and environmental cues. Emphasis is placed on organ formation and examples are drawn particularly from model plants with well-studied genetic systems like Arabidopsis and maize.	Lectures are conducted in English.
EG60541	Conservation and utilization of agrobiodiversity	1	2.0	3, 4	FallIIC	Intensive	2C107	Kazuo Watanabe, Makoto Kawase	Explains about domestic, regional and international activities of gene banks and related organizations which are involved in research and conservation of plant genetic resources for food and agriculture. Current international instruments (CBD, ITPGRFA, etc.) and relevant negotiations on the above-mentioned activities are also introduced.	Lectures are conducted in English. 1/10, 1/18, 1/19, 1/25
EG60551	Water Resources Management Engineering	1	1.0	3, 4	SprABC	Intensive		Atsushi Ishii	This lecture aims to provide a fundamental understandings of water resources by giving introductory hydraulics and hydrology, natures of river flow, water use in various sectors with a special focus on irrigation, water resources development and management, hydrologic statistics, as well as institutional system for water.	Lectures are conducted in English.

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Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG70013	Laboratory Work in Basic Geoscience	3	1.0	1	FallIAB	Tue4, 5	1D109	Shigehiro Fujino, Sachiko Agematsu, Tsutomu Yamanaka, Hiroshi Tanaka, Atsushi Ikeda, Keisuke Matsui, Akio Yamashita, Ryo Anma, Kei Ikehata, Atsushi Kyono, Masanori Kurosawa, Kosei Komuro, Teruyuki Maruoka	Relevant tools and methods to study Earth's environment are the main topic of this lecture. Students are asked to participate in and carry out hand-on exercise in various geoscientific analyses.	Lectures are conducted in English.
EG70021	Introduction to Geoenvironmental Science	1	1.0	1	FallIAB	Thu1	2C403	Tsuyoshi Hattanji, Takehiro Morimoto, Yuichi Onda, Hiroshi Tanaka, Michiaki Sugita, Norikazu Matsuoka, Masaaki Kureha, 弘亮 加藤	Earth's environment is the main topic of this lecture. Emphasis is on the geoscientific aspects and features in the atmosphere, hydrosphere, topography, and human society among others are discussed.	Lectures are conducted in English.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG70031	Introduction to Earth Evolution Science	1	1.5	1	FallABC	Wed5	2C407	Yoji Arakawa, Kohtaro Ujiie, Yuji Yagi, Katsuo Sashida, Ken-ichiro Hisada, Yoshihito Kamata, Toshiaki Tsunogae, Atsushi Kyono, Kenichiro Hayashi, Shigehiro Fujino	This lecture introduces 4.6 billion years evolution of the earth, mainly focusing on the evolution of solid earth, and the birth and evolution of life.	Students, who attended EG70011, are not permitted. Lectures are conducted in English.
EG80032	Freshman Seminar in Geoscience I	2	1.0	1	FallIAB	Fri6	1E401, 1E402	Akio Yamashita, Shigehiro Fujino	Recent topics and future subjects on geoscience are discussed through short excursion, reading of related books, etc.	For G30 geoscience students. Identical to EE11512. CDP
EG80042	Freshman Seminar in Geoscience II	2	0.5	1	FallIC	Fri6	1E401, 1E402	Akio Yamashita, Shigehiro Fujino	Recent topics and future subjects on geoscience are discussed through short excursion, reading of related books, etc.	For G30 geoscience students. Identical to EE11532. CDP
EG90211	Natural Hazards	1	1.0	2, 3	FallIAB	Fri1	2D304	Norikazu Matsuoka, Yuji Yagi, Shigehiro Fujino, Kei Ikehata, Tsuyoshi Hattanji, Yuichi Onda, Maki Tsujimura, Tomohiro Sekiguchi, Atsushi Ikeda	This lecture overviews various natural hazards and their triggers, reviews historical and recent hazards and explores future prediction and mitigation against possible hazards.	Open in an odd number year. Lectures are conducted in English. G-course
EG91011	Lecture on Geographical Information Systems	1	1.0	2, 3					This course introduces fundamentals of Geographical Information Systems and its application to geography.	Open in an even number year. Lectures are conducted in English.
EG91051	Geomorphology	1	1.0	2, 3	SprAB	Thu1		Thomas Parkner	This course provides an introduction to geomorphology – the study of earth's landforms and the processes which produce and modify them.	Prerequisite: Introduction to Geoenvironmental Science, Laboratory Work in Basic Geoscience. Or permission by teacher. Priority for G30 students. Non-G30 students by permission of instructor. Up to 20 students. Lectures are conducted in English.
EG91091	Environmental Hydrology	1	1.5	2, 3	SprABC	Wed6	2D304	Maki Tsujimura, Tsutomu Yamanaka, Michiaki Sugita, Jun Asanuma, Atushi Kawachi, Yu Tabayashi	Basics on the hydrologic cycle are introduced. In addition, hydrologic aspects on environmental problems and ecology are discussed.	Open in an odd number year. Lectures are conducted in English.
EG91101	Meteorology & Climatology	1	1.5	2, 3					Elementary course about the general circulation of the atmosphere and the energy budget, mechanism of climate and climate change, weather forecasting and precipitation, interactions of the atmospheric environment and human activities.	Students, who attended EG91031, are not permitted. Open in an even number year. Lectures are conducted in English.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG91121	Geomorphological Landscapes of the World	1	1.0	2, 3	Fall/AB	Thu1		Thomas Parkner	Geomorphological landscapes are fascinating facets of our planet shaped by different processes acting over times scales from days to millions of years. In this seminar-like class students present assigned book chapters, followed by discussion.	Prerequisite: Geomorphology. Or permission by teacher. Priority for G30 students. Up to 20 students. Open in an odd number year. Lectures are conducted in English.
EG91141	Human and Regional Geography	1	1.5	2, 3	Fall/ABC	Thu4	2D304	Kenichi Matsui, Yuji Murayama, Keisuke Matsui, Jun Tsutsumi	This course introduces subjects and fundamentals of the human and regional geography by presenting actual examples of Japan and other regions of the world. Following the introduction of basic concepts of human geography, features of various regions will be explained from viewpoints of rural, urban, commercial, political, religious, recreational and ethnic geographies.	Students, who attended EG80011, are not permitted. Lectures are conducted in English.
EG91151	GIS in geomorphology	1	1.0	2, 3					GIS (Geographical Information Systems) are used for storage, retrieval, mapping and analysis of geographic data. This lecture gives an overview on GIS and its application in geomorphology. Application includes visualization of topography, detection and analysis of topographic change, and quantitative morphometric analysis.	Offered in even number years. Lectures are conducted in English. Not open in 2017.
EG91161	Process Geomorphology	1	1.0	2, 3	Spr/AB	Fri4		Atsushi Ikeda, Tomohiro Sekiguchi, Tsuyoshi Hattanji	This lecture focuses on physical processes that create and maintain landforms. Glacial, periglacial, fluvial and coastal processes, and weathering as well as mass movements are mainly discussed.	Students, who attended EG91131, are not permitted. Prerequisite: Introduction to Geoenvironmental Science, Laboratory Work in Basic Geoscience. Or permission by teacher. Priority for G30 students. Up to 20 students. Offered in odd number years. Open in an odd number year. Lectures are conducted in English.
EG91171	Basic Analysis of Environmental Dynamics	1	1.5	2, 3					This lecture provides basic knowledge for analyzing environmental dynamics. In addition, the present state of environmental problems and its analysis methods are discussed.	Offered in even number years. Lectures are conducted in English. Not open in 2017.
EG91181	Soil Erosion	1	1.0	2, 3					This lecture covers the processes of soil erosion and their environmental controls. Control and prevention measures are also introduced.	Students, who attended EG91041, are not permitted. Priority for G30 students. Non-G30 students by permission of instructor. Up to 20 students. Identical to EG91111 (Soil Erosion and Land Management) until 2014. Lectures are conducted in English. Not open in 2017. 平成27年度までの土壌侵食(EG91111)を履修済のものは履修できない。2018年度より隔年開講。

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG91203	Field Work in Geoenvironmental Science I	3	1.5	2, 3					The goal of this course is to provide experience and background in a variety of field methods used by researchers in geoenvironmental sciences. The course will focus on hands-on field techniques for data gathering (observation, measurement, and others), mapping, and data analysis.	Prerequisite: EG70013, EG70021 and EG91091. Or permission by teachers. 平成28年以降入学者用。Open Every 3 years since 2016. Lectures are conducted in English. Offered in 2019. Open every 3 years since 2016. Lectures are conducted in English.
EG91213	Field Work in Geoenvironmental Science II	3	1.5	2, 3					The goal of this course is to provide experience and background in a variety of field methods used by researchers in geoenvironmental sciences. The course will focus on hands-on field techniques for data gathering (observation, measurement, and others), mapping, and data analysis.	Permission by teachers. Only for those entered after 2016. Offered in 2019. Lectures are conducted in English. Not open in 2017.
EG91223	Field Work in Geoenvironmental Science III	3	1.5	2, 3	Annual	Intensive		Keisuke Matsui	The goal of this course is to provide experience and background in a variety of field methods used by researchers in geoenvironmental sciences. The course will focus on hands-on field techniques for data gathering (observation, measurement, and others), mapping, and data analysis.	Permission by teachers. 平成28年以降入学者用。Offered in 2017. Open every 3 years since 2017. Lectures are conducted in English.
EG91233	Field Work in Geoenvironmental Science IV	3	1.5	-	Annual	Intensive		Thomas Parkner	The goal of this course is to provide experience and background in a variety of field methods used by researchers in geoenvironmental sciences. The course will focus on hands-on field techniques for data gathering (observation, measurement, and others), mapping, and data analysis.	Prerequisite: Geomorphology. Priority for G30 students. Non-G30 students by permission of instructor. Up to 10 students. Open every 3 years since 2017. Lectures are conducted in English. 平成28年以降入学者用。
EG91243	Field Work in Geoenvironmental Science V	3	1.5	2, 3	Annual	Intensive			The goal of this course is to provide experience and background in a variety of field methods used by researchers in geoenvironmental sciences. The course will focus on hands-on field techniques for data gathering (observation, measurement, and others), mapping, and data analysis.	Permission by teachers. 平成30年より3年おきに開講。平成28年以降入学者用。Offered in 2018. Lectures are conducted in English.
EG91253	Field Work in Geoenvironmental Science VI	3	1.5	2, 3	Annual	Intensive			The goal of this course is to provide experience and background in a variety of field methods used by researchers in geoenvironmental sciences. The course will focus on hands-on field techniques for data gathering (observation, measurement, and others), mapping, and data analysis.	Permission by teachers. 平成30年より3年おきに開講。平成28年以降入学者用。Offered in 2018. Lectures are conducted in English.
EG92011	Mineralogy & Petrology	1	1.0	2, 3					This lecture provides basic knowledge for various minerals and rocks in the earth's surface and interior. Main purposes are to learn classification, basic principles and processes of the formations of the minerals and rocks (mainly igneous and metamorphic rocks) in the earth.	Open in an even number year. Lectures are conducted in English.
EG92021	Inorganic Geochemistry	1	1.0	2, 3	SprAB	Tue2	2D206	Kenichiro Hayashi, Teruyuki Maruoka, Kosei Komuro	This lecture provides basic principles and quantitative methods of geochemistry in order to gain a better understanding of Earth's surface phenomena.	Open in an odd number year. Lectures are conducted in English.
EG92031	Paleontology & Stratigraphy	1	1.0	2, 3					This lecture provides basic knowledge for sedimentology and paleontology and historical geology. Main purposes are to learn interrelationship between life and environment of geological time.	Open in an even number year. Lectures are conducted in English.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG92041	Applied Structural Geology	1	1.0	2, 3	Fall/AB	Tue4	2D303	Yuji Yagi, Kohtaro Ujiie	Structural geology with emphasis on its application side is the main topics of this lecture.	Open in an odd number year. Lectures are conducted in English.
EG92093	Field Work in Earth Evolution Science E	3	1.5	2, 3	Annual	Intensive			In this field course students acquire basic field methods on geological science such as field description and mapping.	Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Or permission by teachers. 平成30年より4年おきに開講。平成28年以降入学者用。Lectures are conducted in English.
EG92101	Quaternary Environmental Change	1	1.0	3, 4					This lecture focuses on the interaction between climate change and changes in ice sheets, sea level and other landscapes through the Quaternary. Recent changes in surface processes are also introduced.	For G30 students. Prerequisite: Geomorphology, Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science. Open in an even number year. Identical to EE22421. Lectures are conducted in English. Open in an even number year. Identical to EE22421. Lectures are conducted in English.
EG92103	Field Work in Earth Evolution Science F	3	1.5	2, 3	Annual	Intensive				Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Or permission by teachers. 平成31年より4年おきに開講。平成28年以降入学者用。Lectures are conducted in English.
EG92113	Field Work in Earth Evolution Science G	3	1.5	2, 3	Annual	Intensive		Thomas Parkner, Ken-ichiro Hisada	In this field course students acquire basic field methods in stratigraphy and geomorphology.	Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Permission by teachers. Lectures are conducted in English.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG90111	Topics on Earth Evolution Science A	1	1.0	2 - 4	Annual	Intensive			This course presents several Geoscience topics, with a special focus on the "Physics of the Earth". We will explore together how the Earth was formed and how it "works": what are the mechanisms that drive the movement of tectonic plates, why do earthquakes and volcanic eruptions occur and so on. The lectures provide, in particular, some basic knowledge in "Seismology" (or "Earthquake Science") and introduce some current research topics in this field.	Open in an odd number year. Lectures are conducted in English.
EG90121	Topics on Earth Evolution Science B	1	1.0	2 - 4					This course introduces knowledge and recent developments on specific topic(s) in Earth Evolution Science.	Open in an even number year. Lectures are conducted in English.
EG90131	Topics on Geoenvironmental Science A	1	1.0	2 - 4	Annual	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Geoenvironmental Science.	Open in an odd number year. Lectures are conducted in English.
EG90141	Topics on Geoenvironmental Science B	1	1.0	2 - 4					This course introduces knowledge and recent developments on specific topic(s) in Geoenvironmental Science.	Open in an even number year. Lectures are conducted in English.
EG90151	Topics on Geoscience A	1	1.0	3, 4	SprAB	Intensive		Thomas Parkner	Students get in contact with the scientific community by attending the Japan Geoscience Union Meeting 2017. After the conference students assess the value of the event.	Lectures are conducted in English. 5/20-5/25 For geoscience students.
EG90161	Topics on Geoscience B	1	1.0	3, 4	FallC	Intensive		Yuji Yagi, Tatsuhiko Hara	This class gives overview on structure of earth, seismic wave, seismicity, rupture process, subduction, strong ground motion, and tsunami.	Offered in 2017. 2nd to 6th period. Lectures are conducted in English.
EG90171	Topics on Geoscience C	1	1.0	2 - 4	Annual	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Geoscience.	Offered in 2019. Priority for G30 students. Non-G30 students by permission of instructor. Up to 20 students. Lectures are conducted in English.
EG90181	Topics on Geoscience D	1	1.0	2 - 4	Annual	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Geoscience.	Offered in 2018. Priority for G30 students. Non-G30 students by permission of instructor. Up to 20 students. Lectures are conducted in English.
EG90191	Topics on Geoscience E	1	1.0	2 - 4	Annual	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Geoscience.	Offered in 2020. Priority for G30 students. Non-G30 students by permission of instructor. Up to 20 students. Lectures are conducted in English.
EG90303	Internship Program in Geoscience	3	2.0	2 - 4	Annual	by appointment		Kosei Komuro, Hiroyuki Kusaka	Students gain work experience through on-the-job training at a non-university organization such as companies, research institutions, or a nonprofit organizations. The placement is from 5 days to 2 weeks. An agreement between the employer and our college needs to be obtained before starting work. The employer is requested to submit an evaluation of the student after the training.	For G30 Geoscience students. Lectures are conducted in English. GDP

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG92053	Field Work in Earth Evolution Science A	3	2.0	2, 3					In this field course students acquire basic field methods on geological science such as field description and mapping.	Students, who attended EG92013, are not permitted. Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Or permission by teachers. Open in an even number year. Lectures are conducted in English.
EG92063	Field Work in Earth Evolution Science B	3	2.0	2, 3	Annual	Intensive		Yoshihito Kamata, Shigehiro Fujino	In this field course students acquire basic field methods on geological science such as field description and mapping.	Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Or permission by teachers. Open in an odd number year. Lectures are conducted in English.
EG92073	Field Work in Earth Evolution Science C	3	1.5	2, 3					In this field course students acquire basic field methods on geological science such as field description and mapping.	Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Or permission by teachers. Open in an even number year. Lectures are conducted in English.
EG92083	Field Work in Earth Evolution Science D	3	1.5	2, 3	Annual	Intensive		Yoji Arakawa, Kei Ikehata, Toshiaki Tsunogae	In this field course students acquire basic field methods on geological science such as field description and mapping.	Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Or permission by teachers. Open in an odd number year. Lectures are conducted in English.
EG71002	Seminar on Geoscience A	2	1.5	3	SprC	by appointment		Keisuke Matsui, Kosei Komuro	This class provides an overview on all laboratories of the College of Geoscience. Topics on all geoscience disciplines are discussed with members of each laboratory. Students identify 3-4 laboratories of their main interest.	For geoscience students who start their Seminar on Geoscience in spring. Lectures are conducted in English.
EG71012	Seminar on Geoscience B	2	1.5	3	Fall/ABC	by appointment		Keisuke Matsui, Kosei Komuro	In this class further information and discussion is provided on the laboratories identified by students in Seminar of Geoscience A. At the end of this class the laboratory for Graduation Research is identified.	For geoscience students who started their Seminar on Geoscience A in spring. Lectures are conducted in English.

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG71022	Seminar on Geoscience A	2	1.5	3	Fall C	by appointment		Keisuke Matsui, Kosei Komuro	This class provides an overview on all laboratories of the College of Geoscience. Topics on all geoscience disciplines are discussed with members of each laboratory. Students identify 3-4 laboratories of their main interest.	For geoscience students who start their Seminar on Geoscience in fall. Lectures are conducted in English.
EG71032	Seminar on Geoscience B	2	1.5	3	Spr ABC	by appointment		Keisuke Matsui, Kosei Komuro	In this class further information and discussion is provided on the laboratories identified by students in Seminar of Geoscience A. At the end of this class the laboratory for Graduation Research is identified.	For geoscience students who started their Seminar on Geoscience A in fall. Lectures are conducted in English.
EG71102	Research Seminar A	2	1.5	4	Spr ABC	by appointment		Dean and others	Topics on geoscience are discussed with members of a laboratory.	For geoscience students who start their Research Seminar in spring. Lectures are conducted in English.
EG71112	Research Seminar B	2	1.5	4	Fall ABC	by appointment		Dean and others	Topics on geoscience are discussed with members of a laboratory.	For geoscience students who started their Research Seminar A in spring. Lectures are conducted in English.
EG71122	Research Seminar A	2	1.5	4	Fall ABC	by appointment		Dean and others	Topics on geoscience are discussed with members of a laboratory.	For geoscience students who start their Research Seminar in fall. Lectures are conducted in English.
EG71152	Research Seminar B	2	1.5	4	Spr AB	by appointment		Dean and others	Topics on geoscience are discussed with members of a laboratory.	For geoscience students who started their Research Seminar A in fall. Lectures are conducted in English.
EG79018	Graduation Research A	8	3.0	4	Spr ABC	by appointment		Dean and others	Students undertake research in a laboratory where they become familiar with the most advanced research environments and practices.	For geoscience students who start their graduation research in spring. Lectures are conducted in English.
EG79028	Graduation Research B	8	3.0	4	Fall ABC	by appointment		Dean and others	Students undertake research in a laboratory where they become familiar with the most advanced research environments and practices.	For geoscience students who started their graduation research in spring. Lectures are conducted in English.
EG79038	Graduation Research A	8	3.0	4	Fall ABC	by appointment		Dean and others	Students undertake research in a laboratory where they become familiar with the most advanced research environments and practices.	For geoscience students who start their graduation research in fall. Lectures are conducted in English.
EG79068	Graduation Research B	8	3.0	4	Spr AB	by appointment		Dean and others	Students undertake research in a laboratory where they become familiar with the most advanced research environments and practices.	For geoscience students who started their graduation research in fall. Lectures are conducted in English.