

## (2) School of 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		DeMar Taylor, Clive Stuart Langham	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, Clive Stuart Langham	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		DeMar Taylor, Louis John Irving, Clive Stuart Langham	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, Clive Stuart Langham	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	Marcos Antonio das Neves, Mito Kokawa	Introduction to physics for life and environmental sciences. Basic areas of mechanics, thermodynamics, and waves will be covered.	Lectures are conducted in English.
EG02021	Mathematics	1	1.0	1	FallAB	Fri5	2G205	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. 本年度開講中止
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. 9/18-9/19
EG02031	Statistics	1	1.0	2	FallC	Tue2 Fri1	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		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.
EG02211	Chemistry I	1	1.0	1	FallA	Tue/Fri6	2D303	Seung Won Kang	Introduction to general chemistry for life and environmental sciences.	Lectures are conducted in English.
EG02221	Chemistry II	1	1.0	1	FallB	Tue/Fri6	2D303	Seung Won Kang	Introduction to general chemistry for life and environmental sciences.	Lectures are conducted in English.
EG02231	Chemistry III	1	1.0	1	FallC	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	FallC	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.

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EG10013	Basic Biological Sciences, Laboratory	3	1.0	2	Annual	by appointment	2D413, 2B301	生物学類長	This course aims to train the ability of the observation and the experimental technique on the various biological phenomena	Limited to G30 students. Introduction to Biology I-V are prerequisite for non-Bio students. Lectures are conducted in English. 学研災に加入していること。 Will be registered by the office.
EG10212	Technical English IIS	2	1.5	3	Annual	by appointment		生物学類長	This course aims to help students develop abilities necessary for science communication in English.	For students of College of Biological Sciences. Lectures are conducted in English. 留学等特別な事情があると認められた者が受講する場合に限り開講する。 Will be registered by the office.
EG10222	Technical English IIF	2	1.5	3	Annual	by appointment		生物学類長	This course aims to help students develop abilities necessary for science communication in English.	For students of College of Biological Sciences. Lectures are conducted in English. 留学等特別な事情があると認められた者が受講する場合に限り開講する。 Will be registered by the office.
EG11442	English Communication for Biology I	2	1.0	2	Annual	by appointment		生物学類長	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. 留学等特別な事情があると認められた者が受講する場合に限り開講する。 Will be registered by the office.
EG11452	English Communication for Biology II	2	1.0	3	Annual	by appointment		生物学類長	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. 留学等特別な事情があると認められた者が受講する場合に限り開講する。 Will be registered by the office.
EG11462	English Communication for Biology III	2	1.0	3	Annual	by appointment		生物学類長	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. 留学等特別な事情があると認められた者が受講する場合に限り開講する。 Will be registered by the office.
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	FallC, 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.	

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EG11922	Research Seminar II	2	1.0	4	SprC, FallA	by appointment		Dean and others	Topics in biology will be discussed with laboratory members and supervisor.	
EG11932	Research Seminar III	2	1.0	4	FallBC	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。	

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.	For students who start a graduation research from Spring Semester. Lectures are conducted in English.
EG41022	Research Seminar II	2	1.5	4	FallABC	by request		Dean and others	Topics in agro-biological resource sciences will be discussed with laboratory members and supervisor.	For students who passed EG41012 or EG41032. Lectures are conducted in English.
EG41032	Research Seminar I	2	1.5	4	FallABC	by request		Dean and others	Topics in agro-biological resource sciences will be discussed with laboratory members and supervisor.	For Students who start a graduation research from Fall Semester. Lectures are conducted in English.
EG41042	Research Seminar II	2	1.5	4	SprABC	by request		Dean and others	Topics in agro-biological resource sciences will be discussed with laboratory members and supervisor.	For students who passed EG41012 or EG41032. Lectures are conducted in English.
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. For students who start the graduation research from Spring Semester. Required a special permission by the Dean of the college of Agro-Biological Resource Sciences.
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. For students who passed EG41098 or EG41078. Required a special permission by the Dean of the college of Agro-Biological Resource Sciences.
EG41098	Graduation Research I	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. For Students who start the graduation research from Fall Semester.
EG41108	Graduation Research II	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. 14条対応 For students who passed EG41098 or EG41078.
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.

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EG50013	Agricultural Internship Abroad I	3	2.0	2, 3	Annual	by appointment		Nakao Nomura, Dean and others	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 履修登録は事務で行う。
EG50023	Agricultural Internship Abroad III	3	2.0	2, 3	Annual	by appointment		Nakao Nomura, Dean and others	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	(インターンシップ) 国外。 Identical to EC41133. Lectures are conducted in English. CDP 履修登録は事務で行う。
EG50031	Cell Structure and Function	1	1.0	2, 3	Fall AB	Fri 5	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, Nakao Nomura	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	ユタ州立・スノー大学における短期研修。 Identical to EC41143. CDP 履修登録は事務で行う。
EG50041	Biochemistry	1	2.0	2, 3	Spr AB	Thu 4, 5		Keiji Kimura, Miyako Kusano, Daisuke Hagiwara, Yuko Shimada, Hiromi Yanagisawa	Advanced biochemistry covers a wide area including molecular cell biology, molecular genetics, biotechnology, metabolism, and relates all current biological sciences. In this year, experts of three major classes of the organisms (microorganisms, plants, animals) give lectures from the professional points of view. This course provides an introduction to biochemistry for the undergraduates who are able to learn basic to applied knowledge of life and environmental sciences.	Lectures are conducted in English.
EG50091	Disease Vector Biology	1	1.0	3	Fall AB	Fri 1	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.
EG50163	Fundamental Chemistry Laboratory	3	1.0	2	Fall AB	Fri 4-6	2B301 2B303 2B401	Kosumi Yamada, Hideyuki Shigemori, Shin-ichi Kashiwabara, Junji Ishida, Kazuyoshi Ogawa, Akiko Nakagawa-Izumi, Nakao Nomura, Yingnan Yang, Yoko Nagumo, 俊介 榎尾	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。初回ガイダンスについては、シラバスを参照のこと。Date and venue for orientation of G30: TBA; Number of G30 students are limited to 12. Identical to EC12163. 10/2-12/4
EG50193	Fundamental Biology Laboratory	3	1.0	2	Fall BC	Fri 4-6	2B301 2B303 2B401	Koji Nomura, Seiichi Furukawa, Yasuhiro Ishiga, Ning Wang, Satoko Nonaka, Hitoshi Miyazaki, Hiroaki Daitoku, Daisuke Hagiwara, Hidehiro Hirakawa, Norio Takeshita, Shigeru Matsuyama, Yutaka Yawata	生物学の各分野から、生物資源学類に必要な観察・実験の項目を選んで実施し、生命現象の基本について理解させる。	Class enrollment onto TWINS should be done by the end of September. Identical to EC12173. 12/11-2/12

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EG60041	Animal Production	1	1.0	3, 4	SprAB	Thu3		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					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	FallAB	Thu2	2B309	Yuji Miyaguchi	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	FallC	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.
EG60101	Soil Science	1	2.0	3, 4	FallB	Intensive	2G304	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. Lectures are Conducted in English
EG60111	Environmental Ecological Engineering	1	1.0	3	FallAB	Wed3	2C410	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 green house 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	SprAB	Wed3		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.
EG60161	Environmental Colloid Engineering	1	1.0	3, 4	FallB	Thu2, 3	2G204	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.	Lectures are conducted in English.
EG60191	Biomass Conversion	1	2.0	3, 4	SprAB-Sum Vac	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. Open in an even number year. Lectures are conducted in English.
EG60222	Seminar in Agrobiological and Forestry	2	2.0	3, 4	Sum Vac	Intensive		Ryo Ohsawa	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.
EG60232	Seminar in Applied Biological Chemistry	2	2.0	3, 4					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	by appointment		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 Course of Agriculture and Forestry Social Sciences are eligible to enroll. Lectures are conducted in English.
EG60272	Seminar in Quantitative Food Economics	2	2.0	2, 3	FallAB	Thu5, 6	2D204, 2G205	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.

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EG60282	Seminar in International Agrobiological Resource Sciences	2	2.0	3, 4	FallAB	Intensive	2L503	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. Open in an even number year. Lectures are conducted in English.
EG60361	Microbiology	1	1.0	2, 3	FallC	Thu3, 4	2G205	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	SprAB	Thu3, 4		Hisato Shuto, Satoshi Tachibana	Lectures will cover the topics in agricultural economy and resource and environment including forest.	Open in an even number year. Lectures are conducted in English.
EG60411	Biomaterial Science	1	1.0	3, 4	FallAB	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	FallA	Intensive		Wenfeng Tan, 貴彦 中村	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 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. 10/8, 15, 22, 29
EG60453	Environmental and Colloid Engineering Laboratory	3	1.0	3, 4	FallABC	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) Students who had taken EG60473 is not allowed. Lectures are conducted in English. 11/7, 14, 12/5, 19, 1/9
EG60491	Elementary Applied Thermodynamics	1	1.0	2, 3	SprAB	Mon4		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.
EG60511	Practical Plant Biotechnology	1	1.0	3, 4	SprAB	Thu5		Chiaki Matsukura, Hiroshi Ezura, Tohru Ariizumi	Plant cell, tissue and organ cultures for crop improvement will be introduced as conventional biotechnologies. The current status of genetically modified (GM) crops and the genome editing technology will be introduced.	same as EC31231 and EG60021. A G30-student who had taken EG60021 is not allowed. Lectures are conducted in English.

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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.
EG60561	Water Environmental Management Technology	1	1.0	3	SprC	Intensive		Nakao Nomura	Lecture covers ecological technologies to restore water environments in enclosed water bodies with deteriorated sediment and water quality. Lecture also covers a case study of Lake Kasumigaura Water Renovation Project where several research studies was performed to rehabilitate water environment in large scale.	横断領域科目「環境」. 特別聴講学生(CiCプロジェクト参加学生を含む)のみ履修可. Cross-disciplinary subjects 「Environment」. Limited to Exchange Student (Tokubetsu Chokogakusei) including CiC Project. Lectures are conducted in English.
EG60571	Introduction to Industrial Ecology	1	1.0	3	SprAB	Tue2		Helmut Friedrich Yabar Mostacero	One of the biggest challenges our societies face is how to decouple economic growth from environmental pressure within the limits of the earth's carrying capacity. The highly inefficient use of natural resources from extraction to final disposal produces wastes and releases to air, water and soil. This course addresses the mechanisms and tools necessary to overcome this challenge through the introduction to Industrial Ecology (IE). Industrial ecology focuses on promoting industrial activities similar to processes in nature. This is achieved by optimizing energy and material resource use while minimizing and/or avoiding waste and pollution release. The course will outline the tools to achieve this goal including resource use optimization through the 3R Initiative proposed by Japan, Life Cycle Assessment, and Material Flow Analysis. The course will also address the technical and management aspects of the concept including Environmental Management Systems, Cleaner Production and Design for Environment. At the end of the course the student will develop analytical skills and learn the tools necessary to design and implement solutions to the current production and consumption patterns.	Lectures are conducted in English.
EG60581	Animal Cell Culture Technology	1	1.0	3	SprAB	Fri3		Nakao Nomura	Lectures cover basic knowledge about animal cell culture(cell cycle, growth factors, extra-cellular matrixes, cancer cells) as well as application of cultured animal cells(hybrid artificial organ, production of monoclonal antibodies, alternative for experimental animals). Lectures also provides basic information about biotechnological approached for setting up animal cell bioreactors.	Identical to EC32071.
EG60591	Food and Nutritional Chemistry I	1	1.0	3, 4	FallAB	Fri5	2C410	Hitoshi Miyazaki	The aims of this course are to understand i) structure-function relationship of gastrointestinal tract, ii) functions of food constituents such as carbohydrates, lipids, proteins, and vitamins, iii) mechanisms of their digestion and absorption, iv) relation of lifestyle-related disease with nutrition intake, and v) relation of exercise with nutrition intake.	Same as EC32241 G30 Students who had received credits from EG60081 are not allowed. Open in an even number year. Lectures are conducted in English.
EG60601	Food and Nutritional Chemistry II	1	1.0	3, 4					The aims of this course are to understand i) physiological functions of nutrients such as carbohydrates, lipids, and proteins, ii) regulation of their metabolism, iii) relation of metabolic syndrome with exercise, overnutrition, and biological clock.	Same as EC32241 G30 Students who had received credits from EG60081 are not allowed. Open in an odd number year. Lectures are conducted in English.

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EG60611	International Agricultural and Forestry Policies I	1	1.0	3, 4	SprC	Intensive		英樹 萩原, 真康 浅井, 久人 首藤	Lectures will cover the topics in policies for agriculture, food, forestry, and environmental management related to agriculture and forestry in the world.	630 students who had received credits from EG60201 are not allowed. Open in an even number year. Identical to EC34281. Lectures are conducted in English. 実務経験教員
EG60621	International Agricultural and Forestry Policies II	1	1.0	3, 4					Lectures will cover the topics in policies for agriculture, food, forestry, and environmental management related to agriculture and forestry in the world.	630 students who had received credits from EG60201 are not allowed. Open in an odd number year. Identical to EC34381. Lectures are conducted in English.
EG60641	Precision Agriculture Technology	1	1.0	2, 3	SprAB	Fri5		Ahamed Tofael	Lectures will cover the topics of precision agricultural technology. Recent advancements in the agricultural field of automation, satellite remote sensing, and GIS. The Bigdata analytics, IoT in agriculture and machine learning systems are used in medium to large scale of agricultural production. The outdoor agricultural mechanization to indoor plant growth monitoring and machinery utilization are the core subjects of this course. Through this course students will get exposure of large satellite remote sensing systems for agriculture, UAV-based crop monitoring and IoT advancements in agriculture.	Lectures are conducted in English.
EG60651	Organic Chemistry	1	3.0	2	Annual	Tue1	2C107	Mikio Kajiyama	Basic structure and reactions of organic compounds are explained on the electronic theory.	Lectures are conducted in English.
EG60663	Fundamental Environmental Engineering Laboratory	3	1.0	2	Sum Vac	Intensive	2D110-1	Ryozo Noguchi, Motoyoshi Kobayashi, Marcos Antonio das Neves, Takeshi Mizunoya, Helmut Friedrich Yabar Mostacero, Motosumi Utsumi, Zhongfang Lei, Hiroshi Ohi, Akiko Nakagawa-Izumi, Toshiharu Enomae, Mikio Kajiyama, Yasuhisa Adachi, Atsushi Ishii, Zhen Ya Zhang, Yingnan Yang	水, 土, 圃場, 森林, 大気などの生産環境やバイオマス, 食品などの生物資源を対象として, これらの特性を明らかにする諸理論, 試験, 計測, 解析のための基礎的手法を理解・習得する。また実験を通じて, 環境工学的なアプローチや科学技術研究における問題の発見とその解決のための実践的能力を養成する。  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 (EC23113)」に相当。 EC23113またはEC23123を履修済みの者は履修できない。 Identical to EC23133.

College of Geoscience

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				Atsushi Ikeda, Shigehiro Fujino, Akio Yamashita, Kohei Tanaka, Tsutomu Yamanaka, Hiroshi Tanaka, Kei Ikehata, Atsushi Kyono, Masanori Kurosawa, Teruyuki Maruoka, Chiaki Akiyama	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.



Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
EG70021	Introduction to Geoenvironmental Science	1	1.0	1	FallAB	Fri2		Masaaki Kureha, Tsuyoshi Hattanji, Takehiro Morimoto, Hiroshi Tanaka, Michiaki Sugita, Norikazu Matsuoka, Hiroaki Kato	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.
EG70031	Introduction to Earth Evolution Science	1	1.5	1	FallABC	Wed5		Yoji Arakawa, Kohtaro Ujiie, Yuji Yagi, Yoshihito Kamata, Toshiaki Tsunogae, Atsushi Kyono, Shigehiro Fujino, Teruyuki Maruoka	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	FallAB	Fri6		Mio Matsueda, kaoru suguhara	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	FallC	Fri6		Mio Matsueda, kaoru suguhara	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	FallAB	Fri1			This lecture overviews various natural hazards and their triggers, reviews historical and recent hazards and explores future prediction and mitigation against possible hazards.	Offered in odd number years. Lectures are conducted in English. G-course
EG91011	Lecture on Geographical Information Systems	1	1.0	2, 3	FallAB	Thu1		Takehiro Morimoto, Akio Yamashita, Chiaki Akiyama	This course introduces fundamentals of Geographical Information Systems and its application to geography.	Offered in even number years. 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 degree students of the School of Life and Environmental Sciences. Others by permission of the instructor. Up to 20 students. Lectures are conducted in English.
EG91101	Meteorology & Climatology	1	1.5	2, 3	SprABC	Wed1		Hiroshi Tanaka, Mio Matsueda, Yoichi Kamae, Mariko Harada	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.	Offered in even number years. Students, who attended EG91031, are not permitted. Lectures are conducted in English.
EG91121	Geomorphological Landscapes of the World	1	1.0	2, 3	FallAB	Thu1		Thomas Parkner	Geomorphological landscapes are fascinating facets of our planet shaped by different processes acting over times scales from seconds to millions of years. In this seminar-like class students present on individual landscapes, followed by discussion.	Prerequisite: EG91051 Geomorphology. Offered in odd number years. 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
EG91141	Human and Regional Geography	1	1.5	2, 3	Fall IABC	Thu4		Kenichi Matsui, Keisuke Matsui, Jun Tsutsumi, Tomoko Kubo	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	Fall IAB	Fri4		Thomas Parkner	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.	Prerequisite: EG91051 Geomorphology. Offered in even number years. Lectures are conducted in English.
EG91161	Process Geomorphology	1	1.0	2, 3	SprAB	Fri4			This lecture focuses on physical processes that create and maintain landforms. Tectonic, glacial, fluvial and coastal processes, and weathering as well as mass movements are mainly discussed.	Offered in odd number years. Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science. Or permission by teacher. Priority for Geoscience English program students. Students, who attended EG91131, are not permitted. Lectures are conducted in English.
EG91171	Basic Analysis of Environmental Dynamics	1	1.5	2, 3	SprABC	Tue5		Yuichi Onda, Bunkei Matsushita, Hiroaki Kato, Junko Takahashi	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.
EG91181	Soil Erosion	1	1.0	2, 3	SprAB	Fri4		Thomas Parkner	This lecture covers the processes of soil erosion and their environmental drivers. Control and prevention measures are also introduced.	Offered in even number years. Prerequisite: Introduction to Geoenvironmental Science, Laboratory Work in Basic Geoscience. Or permission by instructor. Students, who attended EG91041, are not permitted. Identical to EG91111 (Soil Erosion and Land Management) until 2014. Up to 20 students. Lectures are conducted in English. 平成26年度までの土壌侵食 (EG91111) を履修済のものは履修できない。
EG91203	Field Work in Geoenvironmental Science I	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.	Prerequisite: EG70013, EG70021 and EG91091. Permission by teachers. Only for those entered after 2016. 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
EG91213	Field Work in Geoenvironmental Science II	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. Only for those entered after 2016. Lecture are conducted in English. Limited undergraduate students who have earned credits of Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Lectures are conducted in English.
EG91223	Field Work in Geoenvironmental Science III	3	1.5	2, 3	Annual	Intensive		Keisuke Matsui, Chiaki Akiyama, Tomoko Kubo	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.	Offered in 2020. Permission by teachers. Only for those entered after 2016. Lectures are conducted in English.
EG91233	Field Work in Geoenvironmental Science IV	3	1.5	2, 3	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.	Offered in 2020. Prerequisite: EG91051 Geomorphology. Priority for degree students of the School of Life and Environmental Sciences. Others by permission of the instructor. Limited to several students. 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.	Offered in 2021. Prerequisite: Human and Regional Geography. Permission by teachers. Only for those entered after 2016. Lectures are conducted both in English and Japanese. 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.	Offered in 2021. Permission by teachers. Only for those entered after 2016. Lectures are conducted in English.
EG92011	Mineralogy & Petrology	1	1.0	2, 3	Fall/AB	Wed3		Yoji Arakawa, Toshiaki Tsunogae, Masanori Kurosawa, Atsushi Kyono, Kei Ikehata	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.	Offered in even number years. Lectures are conducted in English.
EG92021	Inorganic Geochemistry	1	1.0	2, 3	Spr/AB	Tue2		Teruyuki Maruoka	This lecture provides basic principles and quantitative methods of geochemistry in order to gain a better understanding of Earth's surface phenomena.	Offered in odd number years. Lectures are conducted in English.
EG92031	Paleontology & Stratigraphy	1	1.0	2, 3	Fall/AB	Tue2		Sachiko Agematsu, Yoshihito Kamata, Shigehiro Fujino, Kohei Tanaka	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.	Offered in even number years. 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	FallAB	Tue4		Yuji Yagi, Kohtaro Ujiie	Structural geology with emphasis on its application side is the main topics of this lecture.	Offered in odd number years. 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.	Offered in 2022. 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	FallAB	Fri1			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.	Offered in even number years. For English program students. Prerequisite: Geomorphology, Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science. Identical to EE22421. Lectures are conducted in English.
EG92103	Field Work in Earth Evolution Science F	3	1.5	2, 3	SprC	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	Sum Vac	Intensive			In this field course students acquire basic field methods in stratigraphy.	Prerequisite: (1) Introduction to Geoenvironmental Science, (2) Introduction to Earth Evolution Science, (3) Laboratory Work in Basic Geoscience. Or permission by instructors. Lecture are conducted in English. Lectures are conducted in English.
EG90111	Topics on Earth Evolution Science A	1	1.0	2 - 4	SprABC, FallA FallBC	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.	Offered in 2021. Lectures are conducted in English.
EG90121	Topics on Earth Evolution Science B	1	1.0	2 - 4	FallC	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Earth Evolution Science.	Offered in 2023. Lectures are conducted in English.
EG90131	Topics on Geoenvironmental Science A	1	1.0	2 - 4	SprC	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Geoenvironmental Science.	Offered in 2022. 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
EG90141	Topics on Geoenvironmental Science B	1	1.0	2 - 4	Annual	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Geoenvironmental Science.	Offered in 2020. Lectures are conducted in English.
EG90151	Topics on Geoscience A	1	1.0	3, 4	SprB	Intensive		Thomas Parkner	Students get in contact with the scientific community by attending the Japan Geoscience Union Meeting 2020.	Lectures are conducted in English. For geoscience students.
EG90161	Topics on Geoscience B	1	1.0	3, 4	FallC	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Geoscience.	Offered in 2021. Priority for Geoscience English program students. Students other than English program by permission of instructor. Up to 20 students. Lectures are conducted in English.
EG90171	Topics on Geoscience C	1	1.0	2 - 4	FallC	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Geoscience.	Priority for Geoscience English program students. Students other than English program by permission of instructor. Up to 20 students. Lectures are conducted in English.
EG90181	Topics on Geoscience D	1	1.0	2 - 4	FallC	Intensive			This course introduces knowledge and recent developments on specific topic(s) in Geoscience.	Offered in 2022. Priority for Geoscience English program students. Students other than English program 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 Geoscience English program students. Students other than English program by permission of instructor. Up to 20 students. Lectures are conducted in English.
EG90303	Internship Program in Geoscience	3	2.0	2 - 4		This course will be conducted in a face-to-face format after the university summer closure.		Hiroyuki Kusaka, Sachiko Agematsu	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 Geoscience English program students. Lectures are conducted in English. CDP
EG92053	Field Work in Earth Evolution Science A	3	2.0	2, 3	Sum Vac	Intensive		Yoshihito Kamata, Shigehiro Fujino	In this field course students acquire basic field methods on geological science such as field description and mapping.	Offered in even number years. 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. 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
EG92063	Field Work in Earth Evolution Science B	3	2.0	2, 3	Spr Vac	Intensive		Yoshihito Kamata, Shigehiro Fujino	In this field course students acquire basic field methods on geological science such as field description and mapping.	Offered in odd number years. Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Or permission by teachers. Lectures are conducted in English.
EG92073	Field Work in Earth Evolution Science C	3	1.5	2, 3	SprC	Intensive			In this field course students acquire basic field methods on geological science such as field description and mapping.	Offered in 2020. Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Or permission by teachers. Lectures are conducted in English.
EG92083	Field Work in Earth Evolution Science D	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.	Offered in 2021. Prerequisite: Introduction to Geoenvironmental Science, Introduction to Earth Evolution Science, Laboratory Work in Basic Geoscience. Or permission by teachers. Lectures are conducted in English.
EG71002	Seminar on Geoscience A	2	1.5	3	SprC	by appointment		Kenichi Matsui, Yuji Yagi	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	FallABC	by appointment		Kenichi Matsui, Yuji Yagi	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.
EG71022	Seminar on Geoscience A	2	1.5	3	FallC	by appointment		Kenichi Matsui, Yuji Yagi	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	SprABC	by appointment		Kenichi Matsui, Yuji Yagi	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	SprABC	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	FallABC	by appointment		Dean and others	Topics on geoscience are discussed with members of a laboratory.	For geoscience students. Prerequisite: Research Seminar A. 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
EG71122	Research Seminar A	2	1.5	4	FallABC	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	SprAB	by appointment		Dean and others	Topics on geoscience are discussed with members of a laboratory.	For geoscience students. Prerequisite: Research Seminar A. Lectures are conducted in English.
EG79018	Graduation Research A	8	3.0	4	SprABC	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	FallABC	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. Prerequisite: Graduation Research A. Lectures are conducted in English.
EG79038	Graduation Research A	8	3.0	4	FallABC	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	SprAB	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. Prerequisite: Graduation Research A. Lectures are conducted in English.