

部局	英語の程度	科目の専門性	授業科目名	class	担当教員	Teacher	COURSE DESCRIPTION
地域デザイン科学部	英語と日本語半々で実施する科目	大学院	既存建築物分析学特論A・B	Advanced Analysis on Existing Buildings A Advanced Analysis on Existing Buildings B	藤本郷史	FUJIMOTO, Satoshi	This course explores principles, procedures, inspection methods and up-to-date topics on the management of existing buildings. The topics includes, but not limited to, deterioration phenomena, resource flow and stocks, information transfer, mitigation of environmental impacts and demolition of buildings. Students are expected to understand the basics of building material and construction.
地域デザイン科学部	英語開講科目	学部	建築設計特論A・B	Advanced Architectural Design A Advanced Architectural Design B	安森亮雄	YASUMORI, Akio	This course explores architectural theories and design methods by architects and critics from the 20th century. We will read crucial and up-to-date articles and manifests on modern and contemporary architecture and urbanism in turn, and discuss them to develop students' own strategies toward contemporary architecture. Students are required to have understood the basic history of modern architecture.
地域デザイン科学部	英語と日本語半々で実施する科目	大学院	海外プロジェクト特論	Advanced international project management	山岡 暁	YAMAOKA, Satoshi	This course provides comprehensive project management knowledge required to establish infrastructure and learn to apply the knowledge to actual projects. Introduce examples of overseas projects so that you can understand comprehensive project management and apply it. The first half will focus on project management knowledge using examples to deepen understanding. The latter half will be discussed within the group based on the project case study.
地域デザイン科学部	英語と日本語半々で実施する科目	大学院	耐震工学特論	Advanced Earthquake Engineering	藤倉修一	FUJITA, Syuichi	The course provides the fundamental and advance concepts, principles and application of earthquake engineering in design of structures, especially bridge structures. The course covers the seismic analysis of structures, earthquake resistant design of structures.
地域デザイン科学部	英語と日本語半々で実施する科目	大学院	岩盤力学特論	Advanced course for rock mechanics and rock engineering	清木隆文	SEIKI, Takafumi	This course is a lecture for understanding the basic concept for rock mechanics and for its application introducing the examples of construction and maintenance for rock structure. For example, it will introduce the difference among rocks and rock mass with the view point of base rocks and geological discontinuities in mechanical and hydraulic state.
地域デザイン科学部	英語と日本語半々で実施する科目	大学院	河川工学特論	Advanced River Engineering	池田裕一	IKEDA, Yuichi	This course provides fundamentals of river hydraulics. The first half will show the framework of fluid mechanics in river flow, namely, the governing equations of river flow and turbulence structure in open channel flow. The latter half will deal with movable bed hydraulics, that is, sediment transport and river morphology. The effect of vegetation on river flow and topography will be also discussed in the last part.
地域デザイン科学部	英語と日本語半々で実施する科目	大学院	都市交通特論	Advanced Course on Urban Transportation	大森宣暁	OHMORI, Nobuaki	This course provides basic and advanced knowledge and techniques of urban transportation planning, especially focusing on sustainable transportation and new mobility technologies such as autonomous vehicles and MaaS (mobility as a service). Lectures including exercises about the following specific topics, (1) human activity-travel behavior, (2) travel surveys, (3) accessible cities and transportation, and (4) land use and transportation planning, will be given.
地域デザイン科学部	英語と日本語半々で実施する科目	学部	コミュニティデザイン演習	Seminar in Community Design	安高真弓 原田 淳 石井大一郎 三田妃路佳 中川 敦 中島宗皓 中村祐司 大森玲子 阪田和哉 白石智子 鈴木富之 高橋俊守 塚本 順 若園雄志郎	ATAKA Mayumi, HARADA Jun, ISHII Daiichiro, MITA Hiroka, NAKAGAWA Atsushi, NAKAJIMA So'ko', NAKAMURA Yuji, OHMORI Reiko, SAKATA Kazuya, SHIRAIISHI Satoko, SUZUKI Tomiyuki, TAKAHASHI Toshimori, TSUKAMOTO Jun, WAKAZONO Yushiro	This course provides the various academic disciplines on community design in regional society. The students can choose from the disciplines of Economic Policy, Cultural Management, Local Autonomy, Rural Management, Landscape Ecology, Dietary Habits and Science, Community Management, Public Management, Public Policy, Adult and Community Education, Welfare Sociology, Psychology, Geography of Tourism, and so on.

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地域デザイン科学部	英語と日本語半々で実施する科目	学部	会話分析入門	An Introduction to Conversation Analysis	中川 敦	NAKAGAWA, Atsushi	Ordinary conversation is primordial and most common phenomenon in this society. It has some structures that make our world possible: such as a turn taking system for talk, repair organization to deal with troubles of speaking, hearing and understanding, sequence organization to make conversation coherent, etc. Without these structures, our society would be completely different, or indeed impossible. Conversation Analysis(CA), which was founded by Harvey Sacks, Emanuel Schegloff and Gail Jefferson in 1960's, has elucidated these structures and the way in which we use them in ordinary life. CA has also made it clear that how these structures are applied in institutional settings such as medical, court, politics, media, education, business, etc. We will understand the basic ideas of CA, get a sense of the analysis of conversational data and, most importantly, grasp the spirit of this discipline.
国際学部	英語開講科目	基盤教育	Linguistic Typology and Language Communication	Linguistic Typology and Language Communication	吉田 一彦	YOSHIDA, Kazuhiko	In this course we will conduct classroom activities to discover various formal aspects of human languages, diversity of communication, relations between language and culture and so on, with interests in our own ways of communication in mother tongues/dialects as well as classmates' different ways. For this purpose we will grasp observed phenomena by utilizing methods and findings in language science.
国際学部	英語開講科目	基盤教育	Japanese Communication Arts	Japanese Communication Arts	戚 傑	Qi Jie	In this course, we will explore various aspects of Japanese Communication Arts. This course will introduce different communication styles, which are crucial for successfully functioning in Japanese society. Japanese has a set of discourse styles, or registers that can seem complex to newcomers. We will look at the styles of speech used in personal versus public situations, by men and by women, by old people and young people, in a way that will help clarify the differences and offer you a window into Japanese culture. In addition to presenting the different styles, the class will help you situate them in terms of Japanese history, society, culture and education.
国際学部	英語開講科目	基盤教育	Foreign Language Learning and Communication	Foreign Language Learning and Communication	湯澤 伸夫	YUZAWA, Nobuo	In this course, we will explore language learning, focusing on the English language, and communication with written and visual materials. We will also develop output skills through writing and speaking.
国際学部	英語開講科目	学部	多文化共生基礎A	Comparative Study of Culture	アミン ガデミ	GHADIMI AMIN	One way to think about "culture" is as a category. All around the world, different groups of people have developed varying ways of ascribing meaning to life, and these variegated approaches to collective being coexist and compete in a multicultural world; we ourselves, as students, can define and examine these discrete cultures comparatively. But we can also think of culture as a problem: people in the present and the past have themselves grappled with what it means to live in a world of diversity, and we can study how they have understood and used "culture" as an idea and practice. In this course, we take the latter approach. Instead of imposing our own comparative framework from outside, we will try to enter the comparative frameworks that people themselves have historically developed, and we will assess and evaluate those frameworks.
国際学部	英語開講科目	学部	English for Current Events	English for Current Events	出羽 尚	IZUHA, Takashi	Students are provided with reading and listening activities to develop their skills to make use of English newspaper articles and English news programs for their future study.
国際学部	英語開講科目	学部	Presentation and Discussion	Presentation and Discussion	湯澤 伸夫	YUZAWA, Nobuo	In this course, we will develop academic communication skills in English through presentations and discussions by making use of specified themes on language and culture.
国際学部	英語開講科目	学部	Directed English Reading	Directed English Reading	米山 正文	YONEYAMA, Masafumi	This is an intermediate English reading course. The materials to be used include expository and narrative writings.
国際学部	英語開講科目	学部	Introduction to Latin American Studies	Introduction to Latin American Studies	スエヨシ アナ	SUEYOSHI, Ana	This course will provide the students with a general overview of Latin American and Caribbean countries.
国際学部	英語開講科目	学部	Latin American Politics and Society	Latin American Politics and Society	スエヨシ アナ	SUEYOSHI, Ana	This course will span from the New World discovery, the Spanish conquest, through colonial, independence and early republican periods, and their impact on current Latin America.
国際学部	英語開講科目	学部	Japan's International Relations	Japan's International Relations	清水奈名子	SHIMIZU, Nanako	The aim of this course is to study Japan's international relations with English texts and materials. By analyzing Japan's foreign policies through foreign language, it is expected that students will enhance their abilities to understand the role and position of Japan in today's world.

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国際学部	英語開講科目	学部	Cultures of the English-Speaking World	Cultures of the English-Speaking World	出羽 尚	IZUHA, Takashi	Mainly using the discipline of art history, this course will explore a wide variety of art works in the English-speaking world including not only Britain but also countries in Asia from the 18th to the 21st centuries.
国際学部	英語開講科目	学部	Linguistic Typology and Language Communication	Linguistic Typology and Language Communication	吉田一彦	YOSHIDA, Kazuhiko	In this course we will conduct classroom activities to discover various formal aspects of human languages, diversity of communication, relations between language and culture and so on, with interests in our own ways of communication in mother tongues/dialects as well as classmates' different ways. For this purpose we will grasp observed phenomena by utilizing methods and findings in language science.
国際学部	英語開講科目	学部	Phonetics and Phonology	Phonetics and Phonology	湯澤伸夫	YUZAWA, Nobuo	The purpose of this course is to understand segments and prosody of spoken language phonetically and phonologically, focusing on English, to pronounce them accurately, and to transcribe them with symbols. In addition to English, we will also learn some features of spoken German, French, Chinese, and Korean.
国際学部	英語開講科目	学部	Intercultural Education	Intercultural Education	立花有希	TACHIBANA, Yuki	This course examines various theories and practices of intercultural/multicultural education, with a focus on the concepts like bilingualism, heterogeneity, citizenship, social cohesion and so on.
国際学部	英語開講科目	学部	Globalization and Society	Globalization and Society	湯本浩之	YUMOTO, Hiroyuki	In this course, we learn and discuss about what "globalization" is and what have been going on in this global society. This course introduces some basic ideas of "globalization" and "global issues" in local and global communities. Also, through some groupworks and workshops, some participatory learning skills of global education will be introduced so that we can understand those global issues and take actions for our common future.
国際学部	英語開講科目	学部	International Political Economics	International Political Economics	兒島建彦	KOJIMA, Takehiko	The course introduces students to some major topics in IPE, such as globalization, free trade, inequality, and the decline of US power. It does so by critically examining major theoretical approaches and concepts.
国際学部	英語開講科目	学部	Disaster Studies	Disaster Studies	飯塚明子	IIZUKA, Akiko	Disaster risk is the consequence of the interaction between a hazard and the characteristics that make people and places vulnerable and exposed. This course introduces basic principles of disaster risk, hazard and vulnerability. In addition, students will learn from various actors who engage in disaster response, rehabilitation and prevention in and out of Japan.
国際学部	英語開講科目	学部	International Communication Seminar	International Communication Seminar	出羽 尚 他	IZUHA, Takashi and others	The program is consist of preparatory sessions and a camp to provide opportunity to practice communication skills worldwide. In order to improve their skills, students have to use English during the preparatory sessions and the camp. After the camp students will make a presentation.
国際学部	英語開講科目	学部	International Career Seminar	International Career Seminar	栗原俊輔	KURIHARA, Shunsuke	"International Career Seminar" is a 3-day workshop to foster the global human resources through discussions and other interactive activities based on the lectures by the global professionals. This program is conducted in English.
国際学部	英語開講科目	学部	Global Management: Asia and Development	Global Management: Asia and Development	栗原俊輔	KURIHARA, Shunsuke	This course provides students with the opportunities for critically reviewing and analyzing the on-going global challenges, beyond borders and across disciplines around the world. Through providing conceptual clarity and concrete case studies, students will be directed to understanding and drawing an overall picture of global issues. Students will also learn about some practical technics and tools for problem analysis, in order to analyze the global issues and seek the real global agenda. Globalization is a relatively new aspect, in association with economic activities, political interventions, social network and many more aspects beyond borders. Therefore, it is also critical to learn and explore about the new actors in the scene such as NGOs and Civil ociety. The course will then finally explore the possible ways and alternatives of solution for global issues, examining the major key actors.
国際学部	英語開講科目	学部	Risk Management/Risk Management	Risk Management/Risk Management	飯塚明子	IIZUKA, Akiko	This course introduces risk management principles with the practical cases in and out of Japan. In general, "risk" is defined as an (exposure to) the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility. This course focus on disaster risk from the third class.
国際学部	英語開講科目	学部	欧米文化社会研究H	Seminar in Latin American Studies	スエヨシ アナ	SUEYOSHI, Ana	It discusses the patterns of economic growth in the Americas settled by European nations, and how these patterns were influenced by differences in endowments and institutions.

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国際学部	英語開講科目	大学院	Global Management	Global Management	栗原俊輔	KURIHARA, Shunsuke	This course provides students with the opportunities for critically reviewing and analyzing the on-going global challenges, beyond borders and across disciplines around the world. Through providing conceptual clarity and concrete case studies, students will be directed to understanding and drawing an overall picture of global issues. Students will also learn about some practical technics and tools for problem analysis, in order to analyze the global issues and seek the real global agenda. Globalization is a relatively new aspect, in association with economic activities, political interventions, social network and many more aspects beyond borders. Therefore, it is also critical to learn and explore about the new actors in the scene such as NGOs and Civil Society. The course will then finally explore the possible ways and alternatives of solution for global issues, examining the major key actors.
国際学部	英語開講科目	大学院	Globalization and Society	Globalization and Society	湯本浩之	YUMOTO, Hiroyuki	In this course, we learn and discuss about what "globalization" is and what have been going on in this global society. This course introduces some basic ideas of "globalization" and "global issues" in local and global communities. Also, through some groupworks and workshops, some participatory learning skills of global education will be introduced so that we can understand those global issues and take actions for our common future.
国際学部	英語開講科目	大学院	Globalization and Project Management I	Globalization and Project Management I	栗原俊輔	KURIHARA, Shunsuke	This course provides students with the basic knowledge and theory of Project Management, from needs assessment to post-project evaluation through project development and implementation. Case studies of monitoring and evaluation are also provided, in order for students to gain hands-on knowledge and techniques.
国際学部	英語開講科目	大学院	Globalization and Project Management II	Globalization and Project Management II	栗原俊輔	KURIHARA, Shunsuke	This course provides students a set of knowledge and skills of leadership and capacity building for maximizing potential of the project staff, from organizational development point of view. In addition, the course intends for students to learn about intercultural communication in the field of the international development as a multi-cultural and multi-lingual workplace.
国際学部	英語開講科目	大学院	ラテンアメリカの経済と社会 I	Economy and Society in Latin America I	スエヨシアナ	SUEYOSHI, Ana	After a decade of neoliberal economic policies in most countries of the region, in the 2000s a trend to implement leftist and populist policies was observed amongst several governments. This pendulum-like movement, from pure free-market strategies to regulatory government intervention, has been one of the most salient characteristics of the region in the last quarter-century, and it serves as a framework to study the effects and multiple responses from domestic and foreign actors. The analysis will also be framed within the recent trends in global political economy. This class is open to graduate students interested in Latin American issues, particularly Latin American politics, economy and society.
国際学部	英語開講科目	大学院	ラテンアメリカの経済と社会 II	Economy and Society in Latin America II	スエヨシアナ	SUEYOSHI, Ana	Having as prerequisite Economy and Society in Latin America I, this class will focus on specific countries where the swing between the left and right have been associated with some endemic issues in the region such as, corruption, weak rule of law and dependent judiciary. The analysis will also be framed within the recent trends in global political economy. This class is open to graduate students interested in Latin American politics, economy and society.
国際学部	英語と日本語半々で実施する科目	基盤教育	Multilingual Communication A	Multilingual Communication A	吉田一彦	YOSHIDA, Kazuhiko	In this course we practice communication in several different languages, which is simply an everyday phenomenon in many places in the world but rare in Japan. In multilingual situations we try to obtain mutual understanding rather than correctness of grammar or pronunciation. We will experience achieving understanding with some good use of our limited knowledge and ability in foreign languages throughout classroom activities.
国際学部	英語と日本語半々で実施する科目	基盤教育	Multilingual Communication B	Multilingual Communication B	吉田一彦	YOSHIDA, Kazuhiko	In this course we practice communication in several different languages, which is simply an everyday phenomenon in many places in the world but rare in Japan. In multilingual situations we try to obtain mutual understanding rather than correctness of grammar or pronunciation. We will experience achieving understanding with some good use of our limited knowledge and ability in foreign languages throughout classroom activities.
教育学部	英語開講科目	新規科目 (留学生がある場合にのみ開講)	Technical and Vocational Education and Training in JAPAN	Technical and Vocational Education and Training in JAPAN	丸山剛史	MARUYAMA, Tsuyoshi	The purpose of this lecture is to explain the curriculum, teaching methods and educational significance of Japanese technical and vocational education and training (TVET). This lecture will focus on corporate in-house training in Japan.
教育学部	英語開講科目	新大学院	Studies for Human Support with Cognitive Psychology	Studies for Human Support with Cognitive Psychology	宮代こずゑ	MIYASHIRO, Kozue	To support someone - these activities are involved and surrounded by the various factors. We must be able to recognize them. In this class we will review the knowledge and theoretical frameworks of cognitive psychology and discuss how we can use them to understand human development. By these activities, we consider how we can support someone and totally <i>what support is</i> .

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教育学部	英語開講科目	学部開講	Contemporary English Seminar	Contemporary English Seminar	山野有紀	YAMANO, Yuki	The purpose of this course is to improve students' English skills through a topic-based and integrated skills approach. Topics vary from local lives to global matters. We especially focus on the issues related to Sustainable Development Goals.
教育学部	英語開講科目	新大学院	Sesminar on Foreing Language Communication	Sesminar on Foreing Language Communication	山野有紀	YAMANO, Yuki	This course aims to develop students' English communication skills for collaboration and coexistence as a global citizen. Students will learn various issues, which help them to invigorate local communitis.
教育学部	英語開講科目	学部開講	Methods of Organizing English Language Education (Special Lecture A)	Methods of Organizing English Language Education (Special Lecture A)	田村岳充	TAMURA, Takamitsu	The aim of this course is to acquire practical abilities regarding the teaching of English. It will provide various opportunities to learn how to conduct English lessons and how to evaluate learners with the use of videos of actual English classes.
教育学部	英語開講科目	新大学院	Citizenship Education II	Citizenship Education II	長谷川万由美	HASEGAWA, Mayumi	Citizenship education is to make students responsible for their future. In this lecture, through reading some basic materials related to the citizenship education, students are expected to understand how the citizenship is defined and how the education has developed in England and Japan.
工学部	英語開講科目	学部	機械材料におけるX線回折	X-ray diffraction techniques for mechanical materials	山本篤史郎	YAMAMOTO, Tokujiro	This lecture introduce the basics of X-ray diffraction to study mechanical materials at first. Then, X-ray diffraction for intermetallics, which are used for heat resistant materials, and analysis of single crystal orientation, which is necessary for studying mechanical properties of materials, are introduced.
工学部	英語開講科目	大学院	光計測	Optical metrology	大谷幸利	OTANI, Yukitoshi	Students will learn optical measurement methods, one of the important techniques for optical technologies. The aim is to acquire the skills, learning through the latest examples from modern industry.
工学部	英語開講科目	大学院	光導波路デバイス	Optical Waveguide Devices	杉原興浩	SUGIHARA, Okihiro	Optical fiber and waveguide are essential components for optical communication. This course includes a demonstration and lecture of optical transmission material, devices, and systems used for optical communication.
工学部	英語開講科目	大学院	レーザープラズマ工学	Laser Plasma Engineering	湯上登	YUGAMI, Noboru	Plasma is one of the four fundamental states of matter and there are numerous electrons and ions. In the plasma, wave phenomena are very important. The waves are generated via electromagnetic interaction and new wave is generated from the waves and the wave is interacted with particles. In this class, we discuss these interesting phenomena.
工学部	英語開講科目	大学院	情報光学	Information Optics	早崎秀夫	HAYASAKI, Yoshio	This course has lectures for the Fourier optics, analog and digital holography, computer-generated holography, optical computing, computational imaging, and their applications.
工学部	英語開講科目	大学院	基礎光学	Fundamental Optics	ネイザンヘイガン	Nathan Hagen	Introduction to the foundations of optical engineering: geometric optics and imaging system design/analysis. The course includes a discussions of optical materials, the properties of lenses, prisms, and mirrors, optical ray tracing, and radiometric calculations.
工学部	英語開講科目	大学院	先端フォトンクス	Advanced Photonics	藤村隆史	FUJIMURA, Ryushi	In this lecture, the students will learn about the basic theory of propagation of light in matter, birefringence, electro-optical effects, nonlinear optics, photorefractive effects, plasmonics, and so on
工学部	英語開講科目	大学院	可視化情報工学	Visualization and Image Processing	二宮 尚	NINOMIYA, Nao	PIV(Particle Image Velocimetry) is a powerful measuring technique of fluid velocity using the displacements in the visualized images and is similar to the technique named "Optical Flow". In this class, flow visualization and many technical and theoretical aspects related to PIV are discussed.
工学部	英語開講科目	大学院	現代社会を見通す：生命と感性の科学	Contemporary Society: Life and Emotion	松田 勝 他	MATSUDA, Masaru and others	Regardless of the discipline, to foster deep insight and broad views by expanding your education in regard to how you dissect communities in the twenty-first century. 1.To learn to think in an interdisciplinary and practical manner. 2.To be a self-motivated personality. 3.To learn how to work in groups and develop good communication skills and flexible views.

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農学部	英語開講科目	大学院	作物生理生態学	Crop Physiology and Ecology	和田義春	WADA, Yoshiharu	Photosynthesis is the source of crop production. Animals including humans must eat plants like rice and potatoes to live. Green plants are the only living things that can make their own food using a function called photosynthesis. Therefore, photosynthesis is the origin of our human life. In this lecture, we review the physiological aspects related to photosynthetic functions from molecular, organ, to population levels and discuss physiological and ecological advancements to improve crop production. 1) Principles of plant (angiosperms) leaf structure and functions as a photosynthetic organ. 2) Differences in photosynthesis and respiration functions among and within species. 3) Carbon fixation from leaves to crop canopies. 4) Feed the expanding human population; Discuss future scopes of physiological and ecological advancements to improve crop production.
農学部	英語開講科目	大学院	園芸作物生理学	Physiology of Horticultural Crops	山根健治	YAMANE, Kenji	Horticultural crops are diverse, including vegetables, fruit trees and flowers. This course is focused to explore the physiology of horticultural crops including environments, plant hormones and gene expressions. Especially, we explore about the flowers which are trading internationally. Also, we are exploring the role of horticulture in the human life and society. The course provides students with the opportunity to express opinions and make a presentation in order to learn proactively.
農学部	英語開講科目	大学院	植物細菌学	Advanced PhytoBacteriology	福井 穰	FUKUI, Ryo	Since many principles on phytobacteriology are based on the early fundamental studies on human diseases caused by infectious bacteria and their pathogens, this course will first focus on infectious human bacterial diseases and their basics. Based on this knowledge, the students will learn the causes and epidemiological aspects of major plant diseases and the physiological dynamics between the pathogens and the hosts. The goal of this course is to understand the pathogenic versus beneficial aspects of the bacteria associated with various crops.
農学部	英語開講科目	大学院	動物行動管理学	Animal Behavior Management	青山真人	AOYAMA, Masato	This is a course based on animal behavior and applied animal behavior. The aim of the course is to understand the nature of livestock and wild animals and propose the appropriate management method for those animals. More specifically, the class teaches the fundamental animal behavior such as transition of animal behavior management, behavioral ecology, and neurobehavior, in the first half. In the second half, the class teaches applied behavior including the theory and examples of livestock management. More specifically, the class teaches about the animal behavior management including behavioral ecology, neurobehavior, animal psychology, livestock management and wildlife management, etc.
農学部	英語開講科目	大学院	生物生産環境情報工学	Environment and Information Engineering of Bioproduction	池口厚男	IKEGUCHI, Atsuo	The purpose of this course is to learn about the environment using ICT in agricultural production site, in particular, in greenhouses and livestock barns, sensing method of biological information, analysis of acquired data, and environmental control method using those items. More specifically, the class teaches greenhouses and livestock barns, environmental factor and sensing technology, sensing of biological information of plants, environmental control of greenhouses, current state of livestock, sensing of biological information of environment of barn and livestock, and environmental control of barns, etc.
農学部	英語開講科目	大学院	スマート農林業	Smart-agri Solutions and Technology	松井正実 他	MATSUI, Masami and others	In the international and in regional agricultural and forestry science, the latest technologies in biotechnology, equipment / chemical analysis, ICT (information and communication technology), IoT (Internet of things), and robotics are introduced. Moreover, the next generation of agriculture and forestry will be discussed for improvement of labor saving and accurate control.
農学部	英語開講科目	大学院	遺伝子情報解析技術論	Techniques for Analyzing Genetic Information	松田 勝	MATSUDA, Masaru	The aim of this course is to acquire basic techniques and knowledge of DNA sequencing, expression analysis of mRNA, functional analysis of proteins, and analysis of interaction among molecules using optical technologies, that are used in the actual research situation. More specifically, the class teaches how to use of DNA databases, traditional method and cutting-edge method of DNA cloning, application of next-generation sequencer, and method for analyzing gene function in vitro, which include analysis using individuals, cells, yeast, and bacteria.

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農学部	英語開講科目	大学院	細胞解析技術論	Techniques for Analyzing Cells	児玉 豊	KODAMA, Yutaka	In agriculture, the research subject covers various species from single-celled organisms such as microorganisms to multicellular organisms such as crops and livestock. Cells are the basic units of organisms, and the techniques for analyzing cells focusing on microscopic observation techniques are essential in order to understand the properties and functions that organisms have. However, the microscope systems that is currently used in modern biology are diversified. For example, different light engineering techniques such as stereomicroscopes, fluorescence microscopes, confocal laser microscopes, electron microscopes, etc. are used, and it differs depending on the experimental contents. Also, the tools used for cell analysis nowadays are evolving so rapidly according to the development of molecular biology. It is, for instance, fluorescent proteins of fluorescent staining material and genetic code. Not only various structures and physiological responses in cells but also biochemical reactions such as protein behavior and interactions of proteins can be visualized (imaging) by using these tools. When new staining materials and fluorescent proteins are developed, new microscope systems are being developed to correspond to them. This course is aimed to teach from the basis of cell analysis to the latest research with providing information of staining materials and fluorescent proteins based on highly versatile microscope systems. In addition to the class, the operation using the actual microscopes is demonstrated.
農学部	英語開講科目	大学院	質量分析装置解析技術論	Techniques for Analyzing Mass Spectra	鈴木智大	SUZUKI, Tomohiro	Analysis using a mass spectroscope has become an essential technique for analyzing biopolymer proteins or low-molecular metabolic products. This course is aimed to learn the identification method of proteins that are biological function regulatory molecules based on genetic information and comprehensive analysis method of metabolic products. More specifically, the class establishes techniques to correspond to a wide range of needs such as ① Basic principle of mass spectroscope, ② Protein identification by information engineering approach using existing protein database, ③ Database creation method using unregistered gene information, ④ Post-translational modification analysis such as sugar chain/phosphorylation, ⑤ MSMS spectrum analysis of low-molecular compounds, ⑥ Quantification methods, etc. Students will be given simple quizzes every time and the seminar for analysis using actual MSMS spectra is conducted.
農学部	英語開講科目	大学院	植物分子保護学	Molecular Plant Protection	西川尚志	NISHIGAWA, Hisashi	The aim of this course is to discuss on the problems and solutions for the control method of diseases caused by plant pathogenic microorganisms such as plant viruses, bacteria, phytoplasma and fungi. In particular, the class provides students with the opportunity to acquire the skills, and research and analysis methods for the effective control of diseases using molecular agronomic techniques such as gene level analyses through the understanding of the biological characteristics and life cycle of these pathogens and interactions with plants.
農学部	英語開講科目	大学院	植物分子遺伝育種学	Plant Molecular Genetics and Breeding	大西孝幸	OHNISHI, Takayuki	Recently, due to negative impact of global environmental changes and the problem of overpopulation, the research to design plants from the molecular level is required for the purpose of stabilization and improvement of productivity. Therefore, the scientific elucidation through the development of new genetic improvement technology and large-scale data analysis and modeling for the relationship between behavior of genes (groups) and phenotypes is conducted, and at the same time the projects for breeding new varieties of plants are required, not only for outdoors but also targeting highly efficient production in indoor facilities that pioneering technologies in information science and engineering fields are incorporated. The purpose of this course is to deepen discussions on development of such technologies and needs from the site as well as on how to integrate those matters, while introducing the latest findings.
農学部	英語開講科目	大学院	分子植物生理学	Molecular Aspects of Plant Physiology	野村崇人 他	NOMURA, Takahito and others	Plants sense the signals inside and outside the cells and show various physiological responses. The class teaches the response and adaptation that plants show to the signals such as light, nutrition, temperature, biological and abiotic stress, etc. from a perspective of molecular level (gene and protein level). The class also explores the functions, dynamics, and action mechanisms of low-molecular organic compounds and elements that demonstrate its effect in minute amounts from the plant growth and physiological responses. The class introduces historical and the latest literature of high importance in the research on plant molecular physiology, as well as the latest research techniques and technology including optical engineering which are essential for the plant molecular biology research in order to acquire advanced knowledge in the molecular agriculture field.
農学部	英語開講科目	大学院	分子進化生態学	Molecular Evolutionary Ecology	宮川一志	MIYAKAWA, Hitoshi	This course is aimed to learn how interactions between the environment and living organisms as well as between living organisms work in the process of an order formed and maintained as a result of evolution from ecology, behavior and development of living organisms, also to understand the theory behind the behavior of living organisms including human in nature. More specifically, the class teaches: what is evolution, natural selection and fitness, mutation, population genetics, speciation, phylogeography, sex selection, evolution of reproductive strategies, interaction between organisms and co-evolution, and evolution at molecular level, etc.

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農学部	英語開講科目	大学院	動物分子生理学	Molecular Physiology in Animal Science	飯郷雅之	IIGO, Masayuki	The purpose of this course is to understand synthesis, control mechanism and action of physiologically active substances such as hormones and neurotransmitters that control physiology and behavior of animals, mainly from molecular biological and pharmacological perspectives. Isolation and determination of structure of useful organic compounds of biological origin and elucidation of the mechanism of action, with the latest research trends including molecular biology and structural biology methods will be presented. In addition, the class includes a practice and a seminar for the presentation of a research proposal and preparation of a research plan in order to improve the skills. This class is conducted in a PBL format. The class also provides students with the opportunity to deepen the understanding of the ethics for a researcher.
農学部	英語開講科目	大学院	動物生殖遺伝学	Genetics and Reproduction in Animal Science	福井えみ子	FUKUI, Emiko	This course consists of animal reproduction and animal genetics. The class is aimed to plan experiments, conduct research, and examine about unresolved life phenomena in animal reproduction and animal genetics using various methods based on the basic knowledge learned in the faculty of genetics, animal reproduction science, reproduction biology, and animal breeding, etc., while introducing and reviewing documents and examples. The class teaches the basic theory and applications and practices of reproductive biology and reproductive engineering. The class also explores the important life phenomena in which the complexity and interactions play an important role in mammalian development, that the maternal pregnancy mechanism and embryo side's post implantation development must be synchronized. In addition, the class examines the genes that control economic traits in livestock while introducing examples for deeper understandings, as well as examines the problems with improvement of livestock breeding and its countermeasure for the future. In addition, students are required to understand the current situation of the problems between human and wildlife and seek solutions.
農学部	英語開講科目	大学院	生理活性物質化学	Chemistry of Physiologically Active Substances	二瓶賢一	NIHEI, Kenichi	Chemistry of Physiologically Active Substances consists of 3 disciplines: revealing the substance structure (structure determination), making substance (chemical synthesis) and examining the physiological activity of substance (bioactivity evaluation). The course is aimed to explore the theory and the latest research results of the above in clear and easy-to-follow ways.
農学部	英語開講科目	大学院	栄養生理化学	Nutritional Physiology and Biochemistry	吉澤史昭, 他	YOSHIZAWA, Fumiaki and others	This course is aimed to learn the latest findings acquired recently about the nutritional functions of foods and food components, which are one of the foundations of research in life chemistry, as well as to learn pioneering technologies used in nutritional function analysis. Based on such knowledge, students are required to simulate an application form for research funds for the purpose of studying a formulation method of an actual research plan, in addition, to search for articles on the latest findings to introduce them followed by a group discussion (15 times in total).
農学部	英語開講科目	大学院	植物機能化学	Plant Functional Chemistry	横田信三 他	YOKOTA, Shinso and others	Understanding of the structure and functions of the main components that make up the plant cell wall and the extract components that exist in the cells is important when using the plant resources such as wood. This class teaches these matters from the basics to the application with examples.
農学部	英語開講科目	大学院	土壌環境物理学A	Environmental Soil Physics A	飯山一平	IYAMA, Ippei	This course is aimed at quantitatively understanding how soils retain and transport energy and materials, and learning the methods to mathematically formulate the soil's functions. For these aims, the class teaches physical dimension, the overview of heat and mass transfer equation, physical property of soils, the concepts of water potentials, soil hydraulic functions and water transport equations, soil gaseous behaviors, soil thermal regimes, etc.
農学部	英語開講科目	大学院	土壌環境物理学B	Environmental Soil Physics B	飯山一平	IYAMA, Ippei	This course is aimed at learning the methods of numerical analyses for reproducing and predicting transport and retention of energy and materials in and via soils. For these aims, the class teaches the topics as follow: variability in physical properties of soil, infiltration of irrigated/precipitated water, redistribution of water in soil profiles, evaporation from bare soil surfaces, solute transport in soils, evapotranspiration and soil-plant-atmosphere continuum, surface boundary conditions affecting transport and retention of energy and material in soils, etc.
農学部	英語開講科目	大学院	農業農村開発と技術協力	Rural development assistance in agriculture	福村一成	FUKUMURA, Kazunari	Overview the rural development assistance in agriculture to developing countries. <ul style="list-style-type: none"> <li>• Characteristics of development assistance to developing countries</li> <li>• Outline of engineering assistance from specific assistance cases by each assistance provider</li> <li>• Specialized engineering field and project management</li> <li>• Project cycle management and plan formulation</li> <li>• Interview with trainees from developing countries in the agriculture field</li> <li>• Trial formulation of project planning (group work)</li> <li>• Presentation on the formulated project</li> </ul>



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農学部	英語開講科目	大学院	アグリビジネス論	Agribusiness	齋藤 潔	SAITO, Kiyoshi	This course is aimed to learn basic knowledge of agribusiness and analyze agricultural management from an agribusiness perspective with acquiring business skills. More specifically, the aim of the class is to learn what agribusiness is, agribusiness in Japan, agribusiness in the United States and European countries, agribusiness perspective, agricultural business model being solved using agribusiness, social business perspective, business other than agriculture, the whole image of agribusiness, etc.
農学部	英語開講科目	大学院	森林生態育林学	Forest Ecology and Silviculture	大久保達弘	OHKUBO, Tatsuhiro	The aim of this lecture is to discuss about issues in silviculture practices in Japan and Asia, and the ecological basis options. The detail topics are as follows. 1. Evaluation of regeneration resilience of forest remnants for restoration of degraded forests comparing with large scale forest dynamics plots in Tropical Rain Forests, Sarawak, Malaysia, Tropical montane forests, Thailand and Temperate deciduous forests, Japan. 2. Regeneration dynamics of initial vegetation in selective logged area of Cypress plantation surrounded by temperate deciduous forests in Japan. 3. Restoration of degraded forest vegetation in lime stone mountains of rock desertification area in Guanxi, China. 4. Restoration of degraded tropical montane forests after shifting cultivation using indigenous knowledge of a mountain tribe in Northern Thailand.