Course List (Master's Program in Environmental Sciences)

Interdisciplinary Foundation Courses_Graduate School of Science and Technology (学術院共通専門基盤科目)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AH0316	Introduction to Environmental Sciences	1	2.0	1	FallAB	Wed1,2	C103 Nat. Sci.	環境科学学位プログラム担当教員	This course introduces the core issues globally in environmental sciences and approaches relating to hydrology, biology, ecosystem science, analytical chemistry, climate system science, urban engineering, environmental engineering, social science, and environmental health. Through this course, students can learn the fundamentals and applications of environmental sciences from multi-perspectives on difference scales. It aims to foster students from both global/local and high- /low-angle views.	0AH0316 and 0AND001 must be taken at the same time. The lecture will be conducted in English. In-person class or on-line. Lecture is conducted in English. face-to-face. Online(Asynchronous). Online(Synchronous)

Degree Programs' Common Courses_Degree Programs in Life and Earth Sciences (研究群共通科目)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AN0401	Hydrological Environment	1	1.0	1, 2	SprAB	Fri3	B107 Nat. Sci.	Tsujimura Maki	環境における水の特性,役割,意義を,水に関わる環境問題を例としながら,理解を深め,水を通して総合的に環境をみる重要さを習得する.各種の水環境問題の概要を理解するだけでなく,そのバックグラウンドとなる基礎的知識の理解にも重点をおく.	対面ーオンライン（同時双方向）併用（ハイブリッド方式）により実施予定。授業は録画し、オンデマンドにより視聴できるようにもする。対面授業の実施場所は、理科系棟B棟107教室の予定（manabaで通知）。 face-to-face. Online(Asynchronous). Online(Synchronous)
0AN0403	Utilization and Recycling of Bio-resources	1	2.0	1, 2	FallAB	Fri1,2	B107 Nat. Sci.	Lei Zhongfang,Utsumi Motoo,Yuan Tian	The main purpose of this course is to help the students understand the followings: (1)Basic concepts in bioresource utilization and recycling; (2)Fundamentals of design for waste/wastewater utilization and recycling; and (3)Major technologies used for bioresource utilization and recycling. In addition, case studies, especially those relating to waste/wastewater treatment and biogasification projects are also included.	Lectures taught in English in person or online. Identical to 0AQT039. Lecture is conducted in English. face-to-face
0AN0405	Simulation of Environmental Policy	1	2.0	1, 2	SprAB	Tue3,4	C103 Nat. Sci.	Mizunoya Takeshi	The purpose of this course is to provide the economic and mathematical knowledge necessary to comprehensively evaluate environmental policies. Students will study microeconomics, macroeconomics, welfare economics, and their applications. In particular, students will learn how to evaluate the impact of public investment and macroeconomic policies on both the economy and the environment and how to make policy decisions.	0AQT031と同一。英語で授業。対面或いはオンライン(オンデマンド)で実施する。（manabaで通知） Identical to 0AQT031. Lecture is conducted in English. face-to-face. Online(Asynchronous)

Specialized foundation courses_Environmental Science Related Courses (専門基礎科目_環境科学関連科目)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AND001	Exercises in Environmental Sciences	2	1.0	1	FallAB	Wed3	C103 Nat. Sci.	環境科学学位プログラム担当教員	This course aims to enhance the effectiveness of hands-on knowledge acquisition activities in "Field & Laboratory Practices in Environmental Sciences". Students are expected to master basic research skills, information ethics, group discussion/presentation, and data collection methodologies such as plant identification and waste management.	01AD112 and 0AQT003 must be taken at the same time. The lecture will be conducted in English. In-person class or on-line. Identical to 0AQT003. Lecture is conducted in English. face-to-face. Online(Asynchronous). Online(Synchronous)

Specialized courses_Environmental Science Related Courses_Compulsory (専門科目_環境科学関連科目_必修)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AND301	Lab Seminar in Environmental Sciences 1S	2	2.0	1	SprABC	by appointment		環境科学学位プログラム担当教員	Students in this course read introductory academic papers on various environmental science fields and discuss the contents.	Language depends on each lab seminar.
0AND302	Lab Seminar in Environmental Sciences 1F	2	2.0	1	FallABC	by appointment		環境科学学位プログラム担当教員	Students in this course read introductory academic papers on various environmental science fields and discuss the contents.	Language depends on each lab seminar.
0AND303	Lab Seminar in Environmental Sciences 2S	2	2.0	2	SprABC	by appointment		環境科学学位プログラム担当教員	Students in this course read academic papers on various environmental science fields and discuss more deeply solutions to actual problems.	Language depends on each lab seminar.
0AND304	Lab Seminar in Environmental Sciences 2F	2	2.0	2	FallABC	by appointment		環境科学学位プログラム担当教員	Students in this course read academic papers on various environmental science fields and discuss more deeply solutions to actual problems.	Language depends on each lab seminar.
0AND311	Thesis Seminar in Environmental Sciences 1S	2	2.0	1	SprABC	by request		環境科学学位プログラム担当教員	In this course, students receive basic instructions for writing master's thesis and presentations. Students also acquire basic skills and knowledge for experiments, surveys, and analytical methods in each study area of the environmental sciences.	Language depends on each lab seminar.
0AND312	Thesis Seminar in Environmental Sciences 1F	2	2.0	1	FallABC	by request		環境科学学位プログラム担当教員	In this course, students receive basic instructions for writing master's thesis and presentations. Students also acquire basic skills and knowledge for experiments, surveys, and analytical methods in each study area of the environmental sciences.	Language depends on each lab seminar.
0AND313	Thesis Seminar in Environmental Sciences 2S	2	3.0	2	SprABC	by request		環境科学学位プログラム担当教員	In this course, students receive advanced instructions for writing master's thesis and presentations. Students also acquire advanced skills and knowledge for experiments, surveys, and analytical methods in each study area of the environmental sciences.	Language depends on each lab seminar.
0AND314	Thesis Seminar in Environmental Sciences 2F	2	3.0	2	FallABC	by request		環境科学学位プログラム担当教員	In this course, students receive advanced instructions for writing master's thesis and presentations. Students also acquire advanced skills and knowledge for experiments, surveys, and analytical methods in each study area of the environmental sciences.	Language depends on each lab seminar.

Specialized courses_Environmental Science Related Courses_Compulsory elective (専門科目_環境科学関連科目_選択必修)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AL0108	Spatial Information Science	2	2.0	1, 2	SprAB	Thu3,4	3E404	Watanabe Shun	Lectures on space modeling and analysis techniques using information technology, from theory to application, and deepening understanding through concrete computer application (ArcGIS) operations and Python programming.	01CN109と同一 Online(Asynchronous)
0AL5101	Urban and Regional Analysis	1	2.0	1, 2	FallAB	Fri1,2	3A402	Osawa Yoshiaki,Suzuki Tsutomu,Ishii Norimitsu	Acquire the basic knowledge of urban and regional analysis, and techniques for modeling location and density of the constituent elements of cities and regions. After learning the mathematical models of cities and the ethos of research, we will find familiar applications such as the location of industries and facilities, demographics, and traffic congestion in road networks, and clarify the mechanisms of the problems we have discussed and find solutions.	Identical to 01CN204. face-to-face(partially online)
0AL5111	History of Urban Built Environment	1	2.0	1, 2	SprAB	Tue1,2	3B202	Fujikawa Masaki,Matsubara Kosuke	The lecturer will will give the lectures on how the composition of premodern cities have influenced the current urban space ever and what urban developments were added to the original spaces by showing several cases. Students will join short trips to a traditional farm village and a historic castle town. Along attending lectures, students will learn the methods of analyzing historical documents and maps.	Identical to 01CN312. face-to-face(partially online)
0AL5112	Residential Environment Planning	1	2.0	1, 2	SprAB	Mon3,4	3E404	Fujii Sayaka,Yamamoto Sachiko	The lecture will focus on housing environment planning and community revitalization methods based on the utilization of local resources and participation of local residents, mainly in areas where the population is declining and the birthrate is falling and the population is aging rapidly. Through the presentation of case studies and discussions among students, sustainable housing planning methods in a shrinking society will be discussed. The goal of this course is for students to acquire the ability to plan and draft housing environment plans that respond to social and regional issues, from the perspective of both hard (environmental improvement) planning that effectively utilizes existing local stock and soft (process management) planning that utilizes the status of the temple.	Identical to 01CN314. face-to-face(partially online) Based on face-to-face meetings, group work is conducted in groups. Details will be provided at the time of the first lecture.
0ANC371	Environmental Assessment and Prognosis for Nuclear Emergency I	1	1.0	1, 2	SprC	by appointment		Onda Yuichi,Kato Hiroaki,Takahashi Junko	福島原発事故後の対応や影響評価、福島復興事業、原発の廃炉措置に関する研究および現状と課題などを学ぶ。具体的な授業内容は、福島第一原子力発電所事故後の研究機関の取り組み、放射線モニタリングと放射能マップ、高度化する無人モニタリング技術、放射性セシウムの吸脱着メカニズム、福島長期環境動態研究、モデル除染、除染技術と中間貯蔵施設の概要などである。本授業により、知識と理解力および問題解決能力を向上させる。	
0ANC372	Environmental Assessment and Prognosis for Nuclear Emergency II	1	1.0	1, 2	SprC	by appointment		Onda Yuichi,Kato Hiroaki,Takahashi Junko	原子力災害に対する取り組みの現状と課題について、大気、農業、河川・湖沼等への影響と、環境中の極微量放射性核種の測定方法を学ぶ。具体的な授業内容は 平時の環境放射線モニタリング、緊急時の環境放射線モニタリング、農地土壌における放射性セシウムの挙動、放射性セシウムの農業への影響と対策、除染の費用と効果、放射性セシウム含有土壌の減容化技術、河川流域における放射性セシウムの動態、海洋における放射性核種の分布と挙動などである。本授業により、知識と理解力および問題解決能力を向上させる。	

0ANC374	Special Seminar in Nuclear Emergency	1	1.0	1, 2	Annual	by appointment		Onda Yuichi,Kato Hiroaki,Takahashi Junko	海外から講師を招聘し、チェルノブイリ(ウクライナ)、セラフィールド(イギリス)、サベナリバー(アメリカ)などの海外の原子力災害後の環境・生態系影響についての現状と課題やその評価手法に関する最先端の研究を学ぶとともに、IAEAをはじめとした海外における環境放射能モニタリングや緊急時対応および廃炉や放射性廃棄物の処理・処分に関する取り組みを学び、議論する。本セミナーにより、知識と理解力、企画力、問題解決能力、表現力、創造力の向上を図る。	
0AND321	Environmental Science Practicum I	3	1.0	1, 2	Annual	by appointment		uchida tarou	環境科学に関連したインターンシップ、ボランティア、社会体験活動などの活動を30時間以上行う。履修に際し、事前に計画書を作成し、指導教員が確認をする。その後、カリュキュラム委員会に提出し承認を受け活動を行う。実施後は報告書をカリュキュラム委員会に提出する。	
0AND322	Environmental Science Practicum I	3	1.0	1, 2	Annual	by appointment		uchida tarou	Students perform the activities such as internship, a volunteer and the social experience-based activity in conjunction with the environmental science, more than 30 hours. Students make a plan beforehand, and the supervisors confirms it. Students submit the plan to Curriculum Committee to receive approval. After finishing the activities, students submit a report to Curriculum Committee.	Lecture is conducted in English.
0AND323	Environmental Science Practicum II	3	2.0	1, 2	Annual	by appointment		uchida tarou	環境科学に関連したインターンシップ、ボランティア、社会体験活動などの活動を60時間以上行う。履修に際し、事前に計画書を作成し、指導教員が確認をする。その後、カリュキュラム委員会に提出し承認を受け、活動を行う。実施後は報告書をカリュキュラム委員会に提出する。	
0AND324	Environmental Science Practicum II	1	2.0	1, 2	Annual	by appointment		uchida tarou	Students perform the activities such as internship, a volunteer and the social experience-based activity in conjunction with the environmental science, more than 60 hours. Students make a plan beforehand, and their supervisor confirms it. Students submit the plan to Curriculum Committee to receive approval. After finishing the activities, students submit a report to Curriculum Committee.	Lecture is conducted in English.
0AND325	Environmental Science Practicum III	3	4.0	1, 2	Annual	by appointment		uchida tarou	学際的な実務能力を臨地教育によって得るため、現場において120時間以上の実習を行う。履修に際し、事前に計画書を作成し、指導教員が確認をする。その後,カリュキュラム委員会に提出し承認を受け、活動を行う。実施後は報告書を提出し、実習報告会で成果発表を行う。	ガイダンス資料参照のこと。
0AND326	Environmental Science Practicum III	3	4.0	1, 2	Annual	by appointment		uchida tarou	Students perform the activities to acquire interdisciplinary practical skills via the actual place education, more than 120 hours. Students make a plan beforehand, and the supervisors confirm it. Students submit the plan to Curriculum Committee and receive approval. After finishing the activity, students submit a report to Curriculum Committee and have the oral presentation.	See guidance materials. Lecture is conducted in English.
0AND331	Environmental Science Special Lecture I	1	1.0	1, 2					Invited researchers from universities and research institutes in Japan and abroad give students their knowledge on cutting-edge researches in environmental sciences. Students discuss and analyze environmental issues in developing countries, via student presentations. Students can foster international perspectives and communication skills.	Open in even number years. Lecture is conducted in English. Not open in 2023. face-to-face. face-to-face(partially online). Online(partially face-to-face). Online(Asynchronous). Online(Synchronous)
0AND332	Special Topics in Environmental Sciences II	1	1.0	1, 2	Annual	by appointment		Matsui Kenichi,uchida tarou	Invited researchers from universities and research institutes in Japan and abroad give students their knowledge on cutting-edge researches in environmental sciences.Students discuss and analyze environmental issues in developing countries, via student presentations. Stundets can foster international perspectives and communication skills.	Open in odd number years. Lecture is conducted in English. face-to-face. face-to-face(partially online). Online(partially face-to-face). Online(Asynchronous). Online(Synchronous)

0AND341	International Field Appraisal I	3	1.0	1, 2	Annual	by appointment		Yabar Helmut Friedrich,Lei Zhongfang,Matsui Kenichi	This course aims to deepen understanding about the cause,and state of environmental problems in overseas to find a potential countermeasure against them.	Lecture is conducted in English.
0AND342	International Field Appraisal II	3	1.0	1, 2	Annual	by appointment		Yabar Helmut Friedrich,Lei Zhongfang,Matsui Kenichi	This course aims to foster in-depth analytical skills for monitoring and identifying environmental problems in a local and global context by engaging in hand-on activities overseas.	Lecture is conducted in English.
0AND343	Environmental Field Practice	3	1.0	1, 2	Annual	by appointment		Nasahara Kenlo,Hirota Mitsuru,Yokoi Tomoyuki	Professors and students from multiple fields of expertise visit the fields, where environmental problems are occurring. Professors teach students the knowledge, techniques, and analytical methods needed to understand the fields. Students can acquire problem-solving ability, information analysis ability, communication and practical skills by conducting preliminary literature reviews, basic environmental observations in the fields, data analysis and interpretation exercises, and exchanging opinions with relevant stakeholders on various issues related to terrestrial and aquatic ecosystems, water resources, and the aquatic environments.	Lecture is conducted in English. Including field survey
0AND351	Air Pollution	1	1.0	1, 2					都市域から東アジア域までの領域規模の大気汚染について解説する。内容としては、オゾン、粒子状物質などの大気汚染の現状、生成、反応、消滅などの大気中でのプロセス、大気観測の方法、大気モデルについて紹介する。	連係大学院方式以外の学生も受講可能。 Open in even number years. Not open in 2023. face-to-face
0AND352	Transport Processes in the Terrestrial Environments	1	1.0	1, 2					気圏,水圏,地圏における物質の輸送プロセスについて,基礎的な理論とその応用について講述する.	Open in even number years. Not open in 2023.
0AND353	Lecture on Statistical Analysis in Geoenvironmental Sciences	1	1.0	1, 2	SprC	Intensive		Asanuma Jun	地球科学は、時間（1次元）と空間（3次元）の計4次元に展開する情報（データ）を、観測（調査）によって取得し、これを解析することによって、現象の満たす法則を明らかにする。また、得られた法則と、観測（調査）から推定される特性値を用いて、モデルを構築してシミュレーションを行い、将来の予測や過去の推定を行う。これらの一連の作業において、観測（調査）結果やシミュレーション結果から、不確実性を除去して、有用な情報を集約する目的に用いられるのが、統計解析である。本講義では、地球科学において用いられる、応用的な統計手法について議論し、実践する。	7月上旬開講予定 Identical to 0AN0303.
0AND354	Soil and Water Environmental Colloid Science	1	2.0	1, 2	SprAB	Wed1,2	2K201	Adachi Yasuhisa,Ogawa Kazuyoshi	Introductory and fundamental lecture of colloid and interface science is given placing an emphasis on the application to soil and water, and bio and environmental engineering.	Introductory and fundamental lecture of colloid and interface science is given placing an emphasis on the application to soil and water, and bio-environmental engineering. 9:30-16:00 生農B201(Seinou B201). Lecture is conducted in English.
0AND357	Ecological Biochemistry	1	2.0	1, 2	FallAB	Fri5,6	B501 Nat. Sci.	Yamaji Keiko,Sunohara Yukari	Responses of plants to abiotic environmental stresses such as air pollution, soil contamination, low temperatures, high temperatures, saline soils, aridity, etc. and interactions between organisms (plant-plant, plant-microbe, plant-insect) will be taken from an ecochemical perspective.	If online, materials will be posted on manaba. It shall be in a self-study format. Lecture is conducted in English. face-to-face. Online(Asynchronous)
0AND358	Risk Assessment and Management of Chemicals in Environment	1	1.0	1, 2	SprAB	Thu2	B107 Nat. Sci.	Kajiyama Mikio	人間は様々な化学物質を自然界から単離また人工的に創製して利用することで多くの恩恵を受けてきたが,これらの化学物質による環境並びに人体への影響が無視しえない状況になっている.人間及びその環境と天然及び人工化学物質の関わりについて概説し,化学物質の内包する性質をそれらが発現し得るリスクの観点から述べ,リスクの回避法にも言及する.	face-to-face
0AND359	Environmental Sciences for Food and Medicinal Resources	1	1.0	1, 2	FallAB	Mon2		Isoda Hiroko	地球上の様々な食薬資源の機能解析と生息環境に関する研究の現状を解説し,先端的な機能性・持続的管理方法の導入による新たな食薬資源環境研究について論じる.	昼夜制学生について個別に日程を調整する。教室は共同研究棟A309。 Online(Synchronous)

0AND361	Introduction to Water Environment	1	2.0	1, 2	FallAB	Fri3,4	B107 Nat. Sci.	Tsujimura Maki	This class aims to foster ability to understand principles of water resources issues in relation with regional issues based on scientific/ anthropogenic knowledge of hydrological cycle and water governance. The class consists of lectures on basics of hydrology and discussion on textbook of water governance/ policy.	The class is performed in Hybrid (Face to Face and online (synchronized and ondemand)). Identical to 0AQT033. Lecture is conducted in English. face-to-face(partially online). Online(Synchronous)
0AND362	Environmental Soil Science	1	2.0	1, 2	SprC, Sum Vac	Intensive		Tamura Kenji,Asano Maki	Soil is a fundamental part that supports the natural ecosystems. This lecture deal with basic soil concept, basic soil chemistry, soil functions in ecosystems, soil genesis and classification, soil degradation and conservation, and the rerationships between global environmental issues and soil. In this lecture, we will have brainstorming and group discussions on soil issues.	Lecture is conducted in English. Online(Asynchronous)
0AND363	Environmental Analytical Chemistry	1	1.0	1, 2	FallAB	Thu5	C502 Nat.Sci.	Sakaguchi Aya	'Environmental Science' is a field of study that plays an active role in solving environmental issues/problems in terms of science. In these studies, the target environmental conditions will be understood physically, biologically and chemically with appropriate preciseness and accuracy. Through lectures, students can learn analytical chemistry with application to environmental science. The course addresses the sampling of environmental materials, sample preparation, and subsequent chemical analyses using conventional/ advanced methods.	英語で授業。 Lecture is conducted in English. face-to-face
0AND364	Environmental Microbiology	1	2.0	1, 2	FallAB	Tue5,6	C502 Nat.Sci.	Nomura Nobuhiko,Toyofuku Masanori	Microorganisms are an important part of natural environments. Fundamental knowledge on environmental microbiology will be lectured. This lecture deals with the ecological role of microorganisms, the physiological state of microorganisms in the environment, microorganisms in extreme environments and application of microbial functions for conservation of environments.	Lecture is conducted in English. face-to-face
0AND365	Remote Sensing	1	1.0	1, 2	SprAB	Thu5	B107 Nat. Sci.	Nasahara Kenlo	Remote sensing (observation of earth surface from air and space) is a powerful tool for environmental monitoring and assessment. We learn the principles, utility, and potential of this technology. As a basic background of this lecture, students are encouraged to study elementary physics, mathematics, and geography.	English class. Depending on the situation, the class will be on-line. Lecture is conducted in English.
0AND366	Introduction to Waste Management (Solid Waste Management Systems Planning)	1	2.0	1, 2	SprAB	Fri1,2	B107 Nat. Sci.	Yabar Helmut Friedrich	One of the greatest challenges modern societies face is finding ways to increase economic growth while minimizing resource consumption and environmental degradation. The highly inefficient use of natural resources, from their extraction to final disposal, is already damaging the planet because most of the extracted resources end up as waste. This class will introduce the main aspects concerning integrated waste management including current waste treatment technologies, strategies, policies and modeling of waste management systems.	Identical to 0AQT035. Lecture is conducted in English. face-to-face. Online(Synchronous)
0AND367	Solid Waste Management Systems Planning	1	2.0	1, 2	FallAB	Mon3,4	B107 Nat. Sci.	Yabar Helmut Friedrich	In addition to health and safety concerns, the Planning of waste management systems must also be sustainable i.e. environmentally sound, socially acceptable and economically viable. This class introduces the tools necessary to design integral solid waste management systems. The class provides specific modeling based on life-cycle thinking towards planning of waste management systems through scenario design.	Identical to 0AQT037. Lecture is conducted in English. face-to-face. Online(Synchronous)

0AND369	Environmental Psychology	1	1.0	1, 2	FallAB	Tue2	8G504	Kaida Naoko	In this course, students learn thories and practices in decision making in diverse environmental issues ranging from natural resources utlization, pollution control and natural conservation based on economics, psychology and applied behavioral science. Students first learn theoretical backgrounds of environmental decision making and then different cases of environmental decision making at different levels such as individuals and households, groups (i.e., schools, offices), societies (i.e., communities, cities) and policies (i.e., countries, regions, global). Toward the end of the course, students discuss how to encourage pro-environmental behavioral change and decision making.	Identical to 0AQT045. Lecture is conducted in English. Online(Asynchronous)
0AND371	Environmental Field Appraisal	3	1.0	1, 2	Annual	by appointment		Matsui Kenichi	This course invites students to visit some survey sties in Japan in order to develop analytical and assessment skills and heighten knowledge about some selected environmental science related topics.	The details will be shown later. Lecture is conducted in English.
0AND372	Terrestrial Ecology	1	2.0	1, 2	SprAB	Mon1,2	8G504	Hirota Mitsuru,Yokoi Tomoyuki	生物と環境の間の相互作用を扱う生態学は、生物学のみならず今日の環境科学においても中心的概念である。したがって生物学のような基礎的分野に対してだけでなく、様々な応用的分野においても重要性が増しつつある。生態学には、扱う対象やそのスケールに応じて様々な分野があるが、本講義では主に陸域の植物と動物(特に節足動物)、それらの相互作用、さらに、それらの環境に焦点を当てつつ、生態学について知識のない学生にも理解できるように解説していく。また基礎的な知識のみならず最新の研究成果についても随時紹介していく。	
0AND373	Introduction to Ecology	1	2.0	1, 2	SprAB	Mon3,4	B107 Nat. Sci.	Hirota Mitsuru,Yokoi Tomoyuki	Ecology is scientific study of interactions of organisms with one another (biotic environments), and with abiotic environments. As ever-increasing serious environmental issues at local to global scale, ecology is recognized as one of the fundamental science, because we have to learn and well-consider various relevant aspects on organisms and environments. This class will address fundamentals of ecology mainly focused on plants, insects, their relations, and its surrounding environments. Although I'll try to talk students who have little background on ecology and biology, please don't forget to make every effort to understand and to have flexibility to think for oneself.	Lecture is conducted in English.
0AND374	Aquatic Ecology	1	1.0	1, 2	SprAB	Tue2	B501 Nat. Sci.	Oomori Yuko	海洋,湖沼,河川などの水域は地球上に広く分布し,現在の地球環境を成立し維持するために大きな役割を負っている. また,水域に生息する多種多様の生物群集の物質代謝は,水域における多くの物質の存在状態,存在量,変化量などを支配し,さらにこれらの生物群は,物質・エネルギーのやりとりを通して生物の共生系を構成している.本授業では,海洋に生息する生物群の共生系を,物質・エネルギーのやりとりを通して理解すると共に,地球環境との関わりについても考察する.	face-to-face
0AND376	Environmental Law	1	2.0	1, 2	FallABC	Tue3,4	B107 Nat. Sci.	Asaga Hironobu,Mizunoya Takeshi	The purpose of this course is to provide the economic and mathematical knowledge necessary to comprehensively evaluate environmental policies. Students will study microeconomics, macroeconomics, welfare economics, and their applications. In particular, students will learn how to evaluate the impact of public investment and macroeconomic policies on both the economy and the environment and how to make policy decisions.	Face to face or on-line (on demand). Lecture schedule will be shown on manaba as soon as it is determined. Lecture is conducted in English. face-to-face. Online(Asynchronous)

0AND377	Environmental Analysis and Planning	1	2.0	1, 2	FallAB	Mon5,6	C502 Nat.Sci.	Murakami Akinobu,Yamamoto Sachiko	The course will explain the basic scientific knowledge and techniques of urban planning and land use analysis oriented to the realization of appropriate and sustainable environments. The course also aims to cultivate the basic knowledge necessary to discuss urban planning from an environmental perspective. The course will include systematic lectures on the history of urban planning, reading map information, nature and cities, the role of green spaces in the urban environments, and sustainable landscape planning, as well as exercises and discussions.	Lecture is conducted in English. Online(Asynchronous)
0AND378	Applied Environmental Ethics (Introduction to English Presentation and Debate)	1	2.0	1, 2	FallAB	Mon1,2	B107 Nat. Sci.	Matsui Kenichi	This course aims to develop and refine your academic skills that are imperative in analyzing legal, social, and ethical implications of environmental issues. You are asked to actively participate in discussing, presenting, critically reading and writing about these issues so that you will be fully prepared for your internationally competent career as an environmental scientist or leader. Our topics for discussion include (1) environmental leadership/ diplomacy; (2) eco-economy; (3) rights of nature; (4) climate change; (5) LMOs and ELSI; (6) biological diversity and ecological service; (7) global bioethics; (8) cultural diversity and indigenous knowledge; and (9) innovative approaches to environmental ethics. The examination of these wide-ranging topics will not only enrich your knowledge about environmental ethics but also enlarge your academic background as environmental science communicator.	Identical to 0AQT027. Lecture is conducted in English.
0AND401	Environmental Disaster Prevention Policy	1	1.0	1, 2	FallB	Tue5,6	EDIP 203	uchida tarou,Tsujimura Maki,Sakai Yusuke,Akiyama Kazuya,Yamada Taku,神山 嬢子	土砂災害対策を中心とする環境防災にかかわる計画の立案手法について講述する。具体的には、現象の特徴、特徴を踏まえた計画の立案、近年の災害で明らかとなってきた課題、その対応状況について講述する。講義の多くは、実際の土砂災害対策の計画立案手法を策定している国土技術政策総合研究所、土木研究所の研究員から講述する。	他大学からの受講希望が多い場合は遠隔講義室で実施する予定。事前に実施教室を確認すること。 face-to-face
0AND402	Environmental Disaster Prevention Policy	1	1.0	1, 2	FallA	Tue6,7	EDIP 203	uchida tarou,Tsujimura Maki,Tanaka Hideki	土砂災害対策を中心とする環境防災にかかわる政策について講述する。具体的には、法律や制度の変遷、国の役割と地域防災、行政システム、予算制度、事業評価制度等について講述する。加えて、地球温暖化や公共事業の品質確保などの近年の課題への取組状況についても講述する。講義の多くは、国土交通省の土砂災害対策を担当する行政官により行う。	他大学からの受講希望が多い場合は遠隔講義室で実施する予定。事前に実施教室を確認すること。 face-to-face
0AND403	Climate System Study I	1	1.0	1, 2	SprAB	Thu3	C103 Nat. Sci.	Kamae Yoichi	The Earth's climate system represents complex interactions between the atmosphere, ocean and land. This class aims to foster ability to understand general basis on elements of climate system, their interactions, and their variability including El Nino Southern Oscillation and global warming. This course will also introduce 1) conceptual difference between weather forecast and climate projection, and 2) physical mechanisms responsible for anomalous weather and climate events (heavy rainfall, drought, heat wave, etc) occurred in recent years.	Identical to 0AQT042. Lecture is conducted in English.
0ANE322	Vegetation Science	1	1.0	1, 2	FallB	Tue1,2		Kamijo Takashi,Seino Tatsuyuki,Kawada Kiyokazu	Vegetation is a major component of our landscape. In this course, students learn concepts of vegetation science, world vegetation, climatic and edaphical factors on distribution of plant communities, vegetation dynamics and human impacts on vegetation. Tropical rainforests, Japanese forests, deserts and grasslands are focused in this course. Students also learn field practices of vegetation survey.	理科系B107 Identical to 02JZ009. face-to-face

0ANE323	Vegetation Science	1	1.0	1, 2	FallA	Tue1,2		Kamijo Takashi,Seino Tatsuyuki,Kawada Kiyokazu	Vegetation is a major component of our landscape. In this course, students learn concepts of vegetation science, world vegetation, climatic and edaphical factors on distribution of plant communities, vegetation dynamics and human impacts on vegetation. Tropical rainforests, Japanese forests, deserts and grasslands are focused in this course. Students also learn field practices of vegetation survey.	理科系B107 Identical to 02JZ010. face-to-face(partially online)
0ANE329	Environmental Field Work	3	1.0	1, 2	SprABC, FallAB	by appointment		Hirota Mitsuru,Yokoi Tomoyuki,Nasahara Kenlo	In order to understand environmental issues and take effective countermeasures, it is essential to understand the various current conditions of the field, in other words, to read the field. Furthermore, it is essential to understand the current situation not only from one aspect, but from various aspects. In this practical training, instructors from various fields collaborate to acquire knowledge, techniques, and analytical methods for reading and understanding the field through field surveys.	The schedule will be announced as soon as it is decided. face-to-face

Course List: SUSTEP (M)

Specialized foundation courses_Inter-disciplinary Foudation Courses (専門基礎科目_学術院共通専門基盤科目) (SUSTEP)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AH0316	Introduction to Environmental Sciences	1	2.0	1	FallAB	Wed1,2	C103 Nat. Sci.	環境科学学位プログラム担当教員	This course introduces the core issues globally in environmental sciences and approaches relating to hydrology, biology, ecosystem science, analytical chemistry, climate system science, urban engineering, environmental engineering, social science, and environmental health. Through this course, students can learn the fundamentals and applications of environmental sciences from multi-perspectives on difference scales. It aims to foster students from both global/local and high- /low-angle views.	0AH0316 and 0AND001 must be taken at the same time. The lecture will be conducted in English. In-person class or on-line. Lecture is conducted in English. face-to-face. Online(Asynchronous). Online(Synchronous)

Specialized foundation courses_Environmental Science Related Courses (専門基礎科目_環境科学関連科目) (SUSTEP)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AND001	Exercises in Environmental Sciences	2	1.0	1	FallAB	Wed3	C103 Nat. Sci.	環境科学学位プログラム担当教員	This course aims to enhance the effectiveness of hands-on knowledge acquisition activities in "Field & Laboratory Practices in Environmental Sciences". Students are expected to master basic research skills, information ethics, group discussion/presentation, and data collection methodologies such as plant identification and waste management.	01AD112 and 0AQT003 must be taken at the same time. The lecture will be conducted in English. In-person class or on-line. Identical to 0AQT003. Lecture is conducted in English. face-to-face. Online(Asynchronous). Online(Synchronous)

Specialized foundation courses_Degree Programs' Common Courses (専門基礎科目_研究群共通科目) (SUSTEP)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AN0403	Utilization and Recycling of Bio-resources	1	2.0	1, 2	FallAB	Fri1,2	B107 Nat. Sci.	Lei Zhongfang,Utsumi Motoo,Yuan Tian	The main purpose of this course is to help the students understand the followings: (1)Basic concepts in bioresource utilization and recycling; (2)Fundamentals of design for waste/wastewater utilization and recycling; and (3)Major technologies used for bioresource utilization and recycling. In addition, case studies, especially those relating to waste/wastewater treatment and biogasification projects are also included.	Lectures taught in English in person or online. Identical to 0AQT039. Lecture is conducted in English. face-to-face
0AN0405	Simulation of Environmental Policy	1	2.0	1, 2	SprAB	Tue3,4	C103 Nat. Sci.	Mizunoya Takeshi	The purpose of this course is to provide the economic and mathematical knowledge necessary to comprehensively evaluate environmental policies. Students will study microeconomics, macroeconomics, welfare economics, and their applications. In particular, students will learn how to evaluate the impact of public investment and macroeconomic policies on both the economy and the environment and how to make policy decisions.	0AQT031と同一。英語で授業。対面或いはオンライン(オンデマンド)で実施する。（manabaで通知）Identical to 0AQT031. Lecture is conducted in English. face-to-face. Online(Asynchronous)

Specialized courses_Compulsory (SUSTEP)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AND301	Lab Seminar in Environmental Sciences 1S	2	2.0	1	SprABC	by appointment		環境科学学位プログラム担当教員	Students in this course read introductory academic papers on various environmental science fields and discuss the contents.	Language depends on each lab seminar.
0AND302	Lab Seminar in Environmental Sciences 1F	2	2.0	1	FallABC	by appointment		環境科学学位プログラム担当教員	Students in this course read introductory academic papers on various environmental science fields and discuss the contents.	Language depends on each lab seminar.

0AND303	Lab Seminar in Environmental Sciences 2S	2	2.0	2	SprABC	by appointment		環境科学学位プログラム担当教員	Students in this course read academic papers on various environmental science fields and discuss more deeply solutions to actual problems.	Language depends on each lab seminar.
0AND304	Lab Seminar in Environmental Sciences 2F	2	2.0	2	FallABC	by appointment		環境科学学位プログラム担当教員	Students in this course read academic papers on various environmental science fields and discuss more deeply solutions to actual problems.	Language depends on each lab seminar.
0AND311	Thesis Seminar in Environmental Sciences 1S	2	2.0	1	SprABC	by request		環境科学学位プログラム担当教員	In this course, students receive basic instructions for writing master's thesis and presentations. Students also acquire basic skills and knowledge for experiments, surveys, and analytical methods in each study area of the environmental sciences.	Language depends on each lab seminar.
0AND312	Thesis Seminar in Environmental Sciences 1F	2	2.0	1	FallABC	by request		環境科学学位プログラム担当教員	In this course, students receive basic instructions for writing master's thesis and presentations. Students also acquire basic skills and knowledge for experiments, surveys, and analytical methods in each study area of the environmental sciences.	Language depends on each lab seminar.
0AND313	Thesis Seminar in Environmental Sciences 2S	2	3.0	2	SprABC	by request		環境科学学位プログラム担当教員	In this course, students receive advanced instructions for writing master's thesis and presentations. Students also acquire advanced skills and knowledge for experiments, surveys, and analytical methods in each study area of the environmental sciences.	Language depends on each lab seminar.
0AND314	Thesis Seminar in Environmental Sciences 2F	2	3.0	2	FallABC	by request		環境科学学位プログラム担当教員	In this course, students receive advanced instructions for writing master's thesis and presentations. Students also acquire advanced skills and knowledge for experiments, surveys, and analytical methods in each study area of the environmental sciences.	Language depends on each lab seminar.

Specialized courses_Compulsory elective (SUSTEP)

Course Number	Course Name	Instructional Type	Credits	standard registration year	Term	Meeting Days,Period etc.	Classroom	Instructor	Course Overview	Remarks
0AND322	Environmental Science Practicum I	3	1.0	1, 2	Annual	by appointment		uchida tarou	Students perform the activities such as internship, a volunteer and the social experience-based activity in conjunction with the environmental science, more than 30 hours. Students make a plan beforehand, and the supervisors confirms it. Students submit the plan to Curriculum Committee to receive approval. After finishing the activities, students submit a report to Curriculum Committee.	Lecture is conducted in English.
0AND324	Environmental Science Practicum II	1	2.0	1, 2	Annual	by appointment		uchida tarou	Students perform the activities such as internship, a volunteer and the social experience-based activity in conjunction with the environmental science, more than 60 hours. Students make a plan beforehand, and their supervisor confirms it. Students submit the plan to Curriculum Committee to receive approval. After finishing the activities, students submit a report to Curriculum Committee.	Lecture is conducted in English.
0AND326	Environmental Science Practicum III	3	4.0	1, 2	Annual	by appointment		uchida tarou	Students perform the activities to acquire interdisciplinary practical skills via the actual place education, more than 120 hours. Students make a plan beforehand, and the supervisors confirm it. Students submit the plan to Curriculum Committee and receive approval. After finishing the activity, students submit a report to Curriculum Committee and have the oral presentation.	See guidance materials. Lecture is conducted in English.

0AND331	Environmental Science Special Lecture I	1	1.0	1, 2					Invited researchers from universities and research institutes in Japan and abroad give students their knowledge on cutting-edge researches in environmental sciences. Students discuss and analyze environmental issues in developing countries, via student presentations. Students can foster international perspectives and communication skills.	Open in even number years. Lecture is conducted in English. Not open in 2023. face-to-face. face-to-face(partially online). Online(partially face-to-face). Online(Asynchronous). Online(Synchronous)
0AND332	Special Topics in Environmental Sciences II	1	1.0	1, 2	Annual	by appointment		Matsui Kenichi,uchida tarou	Invited researchers from universities and research institutes in Japan and abroad give students their knowledge on cutting-edge researches in environmental sciences.Students discuss and analyze environmental issues in developing countries, via student presentations. Stundets can foster international perspectives and communication skills.	Open in odd number years. Lecture is conducted in English. face-to-face. face-to-face(partially online). Online(partially face-to-face). Online(Asynchronous). Online(Synchronous)
0AND341	International Field Appraisal I	3	1.0	1, 2	Annual	by appointment		Yabar Helmut Friedrich,Lei Zhongfang,Matsui Kenichi	This course aims to deepen understanding about the cause,and state of environmental problems in overseas to find a potential countermeasure against them.	Lecture is conducted in English.
0AND342	International Field Appraisal II	3	1.0	1, 2	Annual	by appointment		Yabar Helmut Friedrich,Lei Zhongfang,Matsui Kenichi	This course aims to foster in-depth analytical skills for monitoring and identifying environmental problems in a local and global context by engaging in hand-on activities overseas.	Lecture is conducted in English.
0AND354	Soil and Water Environmental Colloid Science	1	2.0	1, 2	SprAB	Wed1,2	2K201	Adachi Yasuhisa,Ogawa Kazuyoshi	Introductory and fundamental lecture of colloid and interface science is given placing an emphasis on the application to soil and water, and bio and environmental engineering.	Introductory and fundamental lecture of colloid and interface science is given placing an emphasis on the application to soil and water, and bio-environmental engineering. 9:30-16:00 生農B201(Seinou B201). Lecture is conducted in English.
0AND361	Introduction to Water Environment	1	2.0	1, 2	FallAB	Fri3,4	B107 Nat. Sci.	Tsujimura Maki	This class aims to foster ability to understand principles of water resources issues in relation with regional issues based on scientific/ anthropogenic knowledge of hydrological cycle and water governance. The class consists of lectures on basics of hydrology and discussion on textbook of water governance/ policy.	The class is performed in Hybrid (Face to Face and online (synchronized and ondemand)). Identical to 0AQT033. Lecture is conducted in English. face-to-face(partially online). Online(Synchronous)
0AND362	Environmental Soil Science	1	2.0	1, 2	SprC, Sum Vac	Intensive		Tamura Kenji,Asano Maki	Soil is a fundamental part that supports the natural ecosystems. This lecture deal with basic soil concept, basic soil chemistry, soil functions in ecosystems, soil genesis and classification, soil degradation and conservation, and the rerationships between global environmental issues and soil. In this lecture, we will have brainstorming and group discussions on soil issues.	Lecture is conducted in English. Online(Asynchronous)
0AND364	Environmental Microbiology	1	2.0	1, 2	FallAB	Tue5,6	C502 Nat.Sci.	Nomura Nobuhiko,Toyofuku Masanori	Microorganisms are an important part of natural environments. Fundamental knowledge on environmental microbiology will be lectured. This lecture deals with the ecological role of microorganisms, the physiological state of microorganisms in the environment, microorganisms in extreme environments and application of microbial functions for conservation of environments.	Lecture is conducted in English. face-to-face
0AND365	Remote Sensing	1	1.0	1, 2	SprAB	Thu5	B107 Nat. Sci.	Nasahara Kenlo	Remote sensing (observation of earth surface from air and space) is a powerful tool for environmental monitoring and assessment. We learn the principles, utility, and potential of this technology. As a basic background of this lecture, students are encouraged to study elementary physics, mathematics, and geography.	English class. Depending on the situation, the class will be on-line. Lecture is conducted in English.

0AND366	Introduction to Waste Management (Solid Waste Management Systems Planning)	1	2.0	1, 2	SprAB	Fri1,2	B107 Nat. Sci.	Yabar Helmut Friedrich	One of the greatest challenges modern societies face is finding ways to increase economic growth while minimizing resource consumption and environmental degradation. The highly inefficient use of natural resources, from their extraction to final disposal, is already damaging the planet because most of the extracted resources end up as waste. This class will introduce the main aspects concerning integrated waste management including current waste treatment technologies, strategies, policies and modeling of waste management systems.	Identical to 0AQT035. Lecture is conducted in English. face-to-face. Online(Synchronous)
0AND367	Solid Waste Management Systems Planning	1	2.0	1, 2	FallAB	Mon3,4	B107 Nat. Sci.	Yabar Helmut Friedrich	In addition to health and safety concerns, the Planning of waste management systems must also be sustainable i.e. environmentally sound, socially acceptable and economically viable. This class introduces the tools necessary to design integral solid waste management systems. The class provides specific modeling based on life-cycle thinking towards planning of waste management systems through scenario design.	Identical to 0AQT037. Lecture is conducted in English. face-to-face. Online(Synchronous)
0AND369	Environmental Psychology	1	1.0	1, 2	FallAB	Tue2	8G504	Kaida Naoko	In this course, students learn thories and practices in decision making in diverse environmental issues ranging from natural resources utlization, pollution control and natural conservation based on economics, psychology and applied behavioral science. Students first learn theoretical backgrounds of environmental decision making and then different cases of environmental decision making at different levels such as individuals and households, groups (i.e., schools, offices), societies (i.e., communities, cities) and policies (i.e., countries, regions, global). Toward the end of the course, students discuss how to encourage pro-environmental behavioral change and decision making.	Identical to 0AQT045. Lecture is conducted in English. Online(Asynchronous)
0AND371	Environmental Field Appraisal	3	1.0	1, 2	Annual	by appointment		Matsui Kenichi	This course invites students to visit some survey sties in Japan in order to develop analytical and assessment skills and heighten knowledge about some selected environmental science related topics.	The details will be shown later. Lecture is conducted in English.
0AND373	Introduction to Ecology	1	2.0	1, 2	SprAB	Mon3,4	B107 Nat. Sci.	Hirota Mitsuru,Yokoi Tomoyuki	Ecology is scientific study of interactions of organisms with one another (biotic environments), and with abiotic environments. As ever-increasing serious environmental issues at local to global scale, ecology is recognized as one of the fundamental science, because we have to learn and well-consider various relevant aspects on organisms and environments. This class will address fundamentals of ecology mainly focused on plants, insects, their relations, and its surrounding environments. Although I'll try to talk students who have little background on ecology and biology, please don't forget to make every effort to understand and to have flexibility to think for oneself.	Lecture is conducted in English.
0AND376	Environmental Law	1	2.0	1, 2	FallABC	Tue3,4	B107 Nat. Sci.	Asaga Hironobu,Mizunoya Takeshi	The purpose of this course is to provide the economic and mathematical knowledge necessary to comprehensively evaluate environmental policies. Students will study microeconomics, macroeconomics, welfare economics, and their applications. In particular, students will learn how to evaluate the impact of public investment and macroeconomic policies on both the economy and the environment and how to make policy decisions.	Face to face or on-line (on demand). Lecture schedule will be shown on manaba as soon as it is determined. Lecture is conducted in English. face-to-face. Online(Asynchronous)

0AND377	Environmental Analysis and Planning	1	2.0	1, 2	FallAB	Mon5,6	C502 Nat.Sci.	Murakami Akinobu,Yamamoto Sachiko	The course will explain the basic scientific knowledge and techniques of urban planning and land use analysis oriented to the realization of appropriate and sustainable environments. The course also aims to cultivate the basic knowledge necessary to discuss urban planning from an environmental perspective. The course will include systematic lectures on the history of urban planning, reading map information, nature and cities, the role of green spaces in the urban environments, and sustainable landscape planning, as well as exercises and discussions.	Lecture is conducted in English. Online(Asynchronous)
0AND378	Applied Environmental Ethics (Introduction to English Presentation and Debate)	1	2.0	1, 2	FallAB	Mon1,2	B107 Nat. Sci.	Matsui Kenichi	This course aims to develop and refine your academic skills that are imperative in analyzing legal, social, and ethical implications of environmental issues. You are asked to actively participate in discussing, presenting, critically reading and writing about these issues so that you will be fully prepared for your internationally competent career as an environmental scientist or leader. Our topics for discussion include (1) environmental leadership/ diplomacy; (2) eco-economy; (3) rights of nature; (4) climate change; (5) LMOs and ELSI; (6) biological diversity and ecological service; (7) global bioethics; (8) cultural diversity and indigenous knowledge; and (9) innovative approaches to environmental ethics. The examination of these wide-ranging topics will not only enrich your knowledge about environmental ethics but also enlarge your academic background as environmental science communicator.	Identical to 0AQT027. Lecture is conducted in English.
0AND403	Climate System Study I	1	1.0	1, 2	SprAB	Thu3	C103 Nat. Sci.	Kamae Yoichi	The Earth's climate system represents complex interactions between the atmosphere, ocean and land. This class aims to foster ability to understand general basis on elements of climate system, their interactions, and their variability including El Nino Southern Oscillation and global warming. This course will also introduce 1) conceptual difference between weather forecast and climate projection, and 2) physical mechanisms responsible for anomalous weather and climate events (heavy rainfall, drought, heat wave, etc) occurred in recent years.	Identical to 0AQT042. Lecture is conducted in English.
0ANE323	Vegetation Science	1	1.0	1, 2	FallA	Tue1,2		Kamijo Takashi,Seino Tatsuyuki,Kawada Kiyokazu	Vegetation is a major component of our landscape. In this course, students learn concepts of vegetation science, world vegetation, climatic and edaphical factors on distribution of plant communities, vegetation dynamics and human impacts on vegetation. Tropical rainforests, Japanese forests, deserts and grasslands are focused in this course. Students also learn field practices of vegetation survey.	理科系B107 Identical to 02JZ010. face-to-face(partially online)

大学院共通科目：開設科目一覧 (Graduate General Education Course)

専門基礎科目における大学院共通科目については、当学位プログラムが指定した以下の科目から必ず1単位以上修得すること。

Students must earn at least one credit in the "大学院共通科目 (Graduate General Education Course)" in the specialized foundation courses from courses separately designated by the degree program as shown below.

科目番号 Course Number	科目名	Course Name	単位数
0A00101	応用倫理	Applied Ethics	1.0
0A00102	環境倫理学概論	Introduction to Environmental Ethics	1.0
0A00103	研究倫理	Introduction to Academic Integrity	1.0
0A00104	生命倫理学	Bioethics in Medical Research and Practice	1.0
0A00311	地球規模課題と国際社会: 食料問題	Global Issues and Global Society: Food Security	1.0
0A00312	地球規模課題と国際社会: 海洋環境変動と生命	Global Issues and Global Society: Marine Environmental Change and Life	1.0
0A00313	地球規模課題と国際社会: 社会脳	Global Issues and Global Society: The Social Brain	1.0
0A00314	地球規模課題と国際社会: 感染症・保健医療問題	Global Issues and Global Society: Infection, Health and Medical Issue	1.0
0A00315	地球規模課題と国際社会: 社会問題	Global Issues and Global Society: Social Issues	1.0
0A00316	地球規模課題と国際社会: 環境汚染と健康影響	Global Issues and Global Society: Environmental Pollution and Health Effects	1.0
0A00317	地球規模課題と国際社会: 環境・エネルギー	Global Issues and Global Society: Environment and Energy	1.0
0A00405	魅力ある理科教員になるための生物・地学実験	Introductory Course for Teacher Training and Education of Life and Environmental Sciences	1.0
0A00501	生物多様性と地球環境	Biodiversity and Change of Environment	1.0
0A00502	内部共生と生物進化	Endosymbiosis and Evolution	1.0
0A00503	海洋生物の世界と海洋環境講座	Marine Life and Environment	1.0
0A00504	科学的発見と創造性	Scientific Discoveries and Creativity	1.0
0A00505	自然災害にどう向き合うか	How Should We Face to Natural Disasters?	1.0