科目コード (Code)	科目名 (Course title)	Course title (English)
10F439	環境リスク学	Environmental Risk
10A632	都市代謝工学	Urban Metabolism Engineering
10F454	循環型社会システム論	Systems Approach on Sound Material Cycles Society
10F441	水環境工学	Water Quality Control Engineering
10F234	水質衛生工学	Water Sanitary Engineering
10F461	原子力環境工学	Nuclear Environmental Engineering, Adv.
10F446	大気・地球環境工学特論	Atmospheric and Global Environmental Engineering, Adv.
10F400	都市環境工学セミナーA	Seminar on Urban and Environmental Engineering A
10F402	都市環境工学セミナーB	Seminar on Urban and Environmental Engineering B
10A643	環境微生物学特論	Environmental Microbiology, Adv.
10A626	環境衛生学特論	Environmental Health, Adv.
10H424	環境資源循環技術	Environmental-friendly Technology for Sound Material Cycle
10A622	地圏環境工学特論	Geohydro Environment Engineering, Adv.
10X321	環境リスク管理リーダー論	Lecture on Environmental Management Leader
10F456	新環境工学特論I	New Environmental Engineering I, Adv.
10F458	新環境工学特論II	New Environmental Engineering II, Adv.
10F468	環境微量分析演習	Environmental Organic Micropollutants Analysis Lab.
10F470	環境工学先端実験演習	Advanced Enivironmental Engineering Lab.
10F472	環境工学実践セミナー	Seminer on Practical Issues in Urbanand Environmental Enginering
10F449	都市環境工学演習A	Laboratory and Seminar on Urbanand Environmental Engineering A
10F450	都市環境工学演習B	Laboratory and Seminar on Urbanand Environmental Engineering B
10i058	安全衛生工学（11回コース）	Safety and Health Engineering(11 times course)
10i045	実践的科学英語演習Ⅰ	Exercise in Practical Scientific English I
10i049	エンジニアリングプロジェクトマネジメント	Project Management in Engineering
10i059	エンジニアリングプロジェクトマネジメント演習	Exercise on Project Management in Engineering
88G101	研究倫理・研究公正（理工系）	Research Ethics and Integrity(Scienceand Technology)
88G301	大学院生のための英語プレゼンテーション	Presentation for Graduate Students

Numbering code			
Course title <English>	環境リスク学 Environmental Risk	Affiliated department, Job title,Name	Graduate School of Engineering Professor,YONEDA MINORU Graduate School of Engineering Associate Professor,MATSUDA TOMONARI

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Wed.4	Class style	Lecture	Language	English

[Outline and Purpose of the Course]

Paying attention to the environment of children in particular, students themselves study, make presentation, and debate about the environmental risk. Students learn the backgound, the actual situation, and the theory for quantitative risk analysis through practice of investigation and discusion by themselves.

[Course Goals]

To understand or master the necessity of environmental risk analysis, its practical exampls, framework for solving problems concerning to risk evaluation, technical and basic knowledge for environmental risk analysis, and the way of thinking for risk analysis

[Course Schedule and Contents]

Introduction Framework of risk analysis,2times,Introduction of lecture and grading. Framework of risk analysis for children of WHO.

Children and health risk,1time,1) Why children 2) Children are not little adults

Children and environmental change,1time,3) The paediatric environmental and health history 4) Global change and children

Air pollution,1time,5) Outdoor air pollution 6) Indoor air pollution

Lead and pesticide,1time,7) Pesticides 8) Lead

Heavy metal,1time,9) Mercury 10) Other heavy metals

Various risk,1time,11) Noise 12) Water 13) Food safety

Chemicals,1time,14) Children and chemicals 15) Persistent Organic Pollutants

Tobacco and natural toxin,1time,16) Second-hand tobacco smoke 17) Mycotoxins, plants, fungi and derivates

Occupational risk and radiation,1time,18) Injuries 19) Ionizing and non-ionizing radiations 20) Occupational risks

Respiratory diseases and cancer,1time,21) Respiratory diseases 22) Childhood cancer

Innume disorders and neural system,1time,23) Immune disorders 24) Neurobehavioral and neurodevelopmental disorders

Continue to 環境リスク学(2)↓↓↓

環境リスク学(2)

Endocrine system and environmental monitoring,1time,25) Endocrine disorders 26) Bio-monitoring and environmental monitoring

Developmental toxicity and indicators,1time,27) Early developmental and environmental origins of disease 28) Indicators

[Class requirement]

Not necessary in particular.

[Method, Point of view, and Attainment levels of Evaluation]

Grading based on the participation and performance in presentation and discussion.

[Textbook]

Handouts will be supplied.

[Reference books, etc.]

（Reference books）

To be introduced, if necessary.

[Regarding studies out of class (preparation and review)]

Sincerely and fully prepare for the presentation and discussion.

（Others (office hour, etc.)）

The contents may be changed according to the progress of lecture.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	都市代謝工学 Urban Metabolism Engineering	Affiliated department, Job title,Name	Graduate School of Engineering Professor,TAKAOKA MASAKI Graduate School of Engineering Associate Professor,OOSHITA KAZUYUKI Graduate School of Engineering Assistant Professor,TAKASHI FUJIMORI

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Tue.3	Class style	Lecture	Language	Japanese and English

[Outline and Purpose of the Course]

Much energy and resources are consumed to maintain various activities in urban city. As the result, various environmental loads such as exhaust gas, wastewater and waste generate and should be reduced to levels natural environment can accept .To establish sustainable urban metabolism, concept, elements, control, optimization and management of urban metabolism are explained.

[Course Goals]

To understand technological measures by learning about current trend and issue of urban metabolism and related engineering principles.

[Course Schedule and Contents]

Class 1:Introduction
Concept of urban metabolism and its system are explained.

Class 2-10: Elements of urban metabolic system
Planning and selection of urban metabolic system, Transportation & collection, Engineering principles on Recycling, Thermal recovery, Engineering principles on flue gas treatment and Landfill management are explained.

Class 11-12: Hazardous Waste Management
Treatment, disposal and management of hazardous waste are explained.

Class 13-14: Design of sewage treatment system in urban area
Properties and chemical compositions of sewage and sludge. Introduction and developing trend of sewage treatment system. Elemental and heat balance analysis of sedimentation, aeration tank, anaerobic fermentation and incineration.

Class 15:Feedback and summary
Feedback of small tests and summary

[Class requirement]

It is desirable that students have already learned Environmental plant engineering.

Continue to 都市代謝工学(2)↓↓↓

都市代謝工学(2)

[Method, Point of view, and Attainment levels of Evaluation]

Small tests and reports are evaluated.

[Textbook]

Learning materials are delivered in class.

[Reference books, etc.]

（Reference books）

[Regarding studies out of class (preparation and review)]

Review the learning materials used in class.

（Others (office hour, etc.)）

The order of lecture content can be changed. Questions about each class should be given to each faculty member. Questions about overall class should be given to Professor Takaoka.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	循環型社会システム論 Systems Approach on Sound Material Cycles Society	Affiliated department, Job title,Name	Agency for Health, Safety and Environment Professor,SAKAI SHINICHI Agency for Health, Safety and Environment Associate Professor,HIRAI YASUHIRO

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Mon.3	Class style	Lecture	Language	Japanese and English

[Outline and Purpose of the Course]

It has become a major political/ social issue to establish a Sound Material-Cycle Society in order to save the earth resources and energy and to preserve environmental conservation. This course mainly covers the following topics: 1) History, current status, and future prospect of waste issues and establishment of a sound material-cycles society. 2) Basic concepts and current conditions/ challenges of the following items: The Basic Law for Establishing the Material Cycles Society and the Basic Plan for accomplishing it; Containers and Packaging Recycling Law; Home Appliance Recycling Law; End-of-Life Vehicle Recycling Law and others. 3) Basic concept and application of material flow analysis and life cycle assessment; these tools are important to grasp the whole flow of each recycling, resource use, product consumption, recycle and disposal of waste electrical and electronic equipment, for which it is required to take Clean Cycle amp Control concepts in relation to chemical substances. Along with above topics, source origin, behavior, and decomposition of persistent organic pollutants, which should be inevitably linked to the realization of a Sound Material-Cycle Society, will also be discussed in the class.

[Course Goals]

The goal of this class is to help students understand the systems and technologies for establishing a Sound Material Cycles Society; students learn how to think about material flow analysis and life cycle assessment in order to develop deep understanding of the whole system of material flow (i.e., resource use, product consumption, cycles and disposal of waste).

[Course Schedule and Contents]

The Basic Law for Establishing the Material Cycles Society and the Basic Plan for Material Cycles ,1time, Lean the frame work and three indices of this basic plan in detail, and examine recent globally developed ldquo3R Initiativerdquo activities and status of material cycles in Asian countries.
Development of Each Recycling System,3times,Learn the following items separately designated as effective measures under The Basic Law for Establishing the Material Cycles Society: 1) Containers and packaging 2) Home Appliance 3) End-of-Life Vehicle 4) Construction Material 5) Food Material
Each Recycling System and Clean, Cycles amp Control Concepts,3times,Examine application of the following strategic concepts for waste electrical and electronic equipment, end-of-life vehicles, and battery waste. 1) Clean: Avoid the use of hazardous waste and chemical substances. 2) Cycle: Apply cycle concept when use effects are expected but no alternatives are available.
Basic concept and application of material flow and life cycle analyses,5times,Lean about basic concept of Material Flow Analysis (MFA) and Life Cycle Assessment (LCA). Examine food waste recycling using these analyses as a case study.
Environmental Transport Model and Behavior of Persistent Organic Pollutants (POPs),2times,Learn basic concept and application of the model. Examine case studies of global mobility of POPs and behavior of PCB on regional and global scales.
Confirmation of Attainment,1time,Confirm studentsrsquo levels of understanding on the course topics, and make sure of the points of MFA, LCA, and systems and techniques for establishing a sound material-cycle

Continue to 循環型社会システム論(2)↓↓↓

循環型社会システム論(2)

society.

[Class requirement]

Solid Waste Management

[Method, Point of view, and Attainment levels of Evaluation]

Evaluation will be done based on the test scores and learning attitude in class.

[Textbook]

Not specified. Materials and references will be distributed when needed.

[Reference books, etc.]

（Reference books）

Introduced in class when necessary.

[Regarding studies out of class (preparation and review)]

Review on the materials and references distributed. Specified points will be announced in class.

（Others (office hour, etc.)）

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	水環境工学 Water Quality Control Engineering	Affiliated department, Job title,Name	Graduate School of Engineering Professor,TANAKA HIROAKI Graduate School of Engineering Associate Professor,NISHIMURA FUMITAKE

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Fri.2	Class style	Lecture	Language	Japanese

[Outline and Purpose of the Course]

Water resource management from the points of both water quantity and water quality is described, for example, mechanism of water pollution and history, and current conditions of water quality standard, Water quality indexes and their analytical technologies including biological methods and instrumental analytical technique are explained as well. Water and wastewater treatment technologies of physical, chemical and biological process including energy and resource recovery are expound.

[Course Goals]

To understand management methods of water environment and evaluation of water environment condition.

To acquire technologies of water and wastewater treatment enough to apply them from the point of creation of recycling-oriented society.

[Course Schedule and Contents]

・Water pollution its history and Water quality standard(1 time):
Introduction of this class. Basic and major water pollution and their generation mechanism are explained, and the history of water pollution and solution are introduced.

・Water quality indexes and analysis(2 times)
Basic knowledge for Water quality indexes and their analysis including instrumental analysis are explained.

・Water pollution and evaluation(5 times)
Water pollution characteristics in rivers, lakes and sea, and countermeasures are explained. Behaviors of recalcitrant organic compounds and emerging contaminants such as PPCPs(Pharmaceuticals and Personal Care Products) and EDCs(Endocrine-Disrupting Chemicals) are explained, and their impacts on water environment are expounded. Based on the understanding, watershed management is explained.

・Water and wastewater treatment(5 times)
Basic countermeasure against water pollution is to remove the pollutants from the wastewater. Fundamental technologies are introduced categorizing into physical, chemical, and biological processes, and each process is explained in detail. Disinfection and water reuse are also introduced from the points of chemicals management.

・Resource recovery and system(1 time):
Resource recovery is important from the points of both creation of recycling-oriented society and prevention of global warming. Technologies and systems accomplishing energy and resource recovery from wastewater is introduced and explained

・Final examination/ Learning achievement evaluation(1 time):

Continue to 水環境工学(2)↓↓↓

水環境工学(2)

・Feedback(1 time):

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

Evaluation will be based on one written examination.

[Textbook]

Materials for each lecture will be provided.

[Reference books, etc.]

（Reference books）

Introduced during class

[Regarding studies out of class (preparation and review)]

Review with related literature is strongly recommended in order to understand broadly based knowledge and to obtain useful information.

（Others (office hour, etc.)）

*Please visit KULASIS to find out about office hours.

未更新

Numbering code			
Course title <English>	水質衛生工学 Water Sanitary Engineering	Affiliated department, Job title,Name	Graduate School of Engineering Professor,ITOH SADAHIKO Graduate School of Engineering Associate Professor,ECHIGO SHINYA

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Tue.2	Class style	Lecture	Language	English

[Outline and Purpose of the Course]

The ultimate goal of this course is to understand Sanitary Engineering quantitatively. Students will learn methods to quantify chemical and microbial risk in drinking water and realize concept and methods of risk management and control.

[Course Goals]

To quantify chemical and microbial risk in drinking water and to realize methodologies of risk management and control.

[Course Schedule and Contents]

Environmental risk and quantification (1 time)
Introduction and goal of the class. Concept of Sanitation. Environmental risk and quantification. Safety of drinking water and acceptable risk level.

Quantitative microbial risk assessment and management (5 times)
Coexistence and competition between human and microbes. Quantitative microbial risk assessment (QMRA). Comparison of the risk assessment and management methods between chemicals and microbes. Disability adjusted life years (DALYs).

Risk assessment and control of hazardous chemicals (3 times)
Risk assessment of hazardous chemicals. Drinking water quality standards. Derivation of drinking water quality standards. The benchmark dose method.

Perspectives of water treatment technology (5 times)
Development of advanced water treatment processes. Water supply technology and its prospects. Water reuse and health risk. Access to safe drinking water in developing countries and global burden of disease.

Feedback and summary (1 time)
Feedback of assignments and summary.

[Class requirement]

General understanding of water quality and water treatment process

[Method, Point of view, and Attainment levels of Evaluation]

Evaluated by assignments.

Continue to 水質衛生工学(2)↓↓↓

水質衛生工学(2)

[Textbook]

Class handouts

[Reference books, etc.]

（Reference books）

Itoh, S., Echigo, S.: Disinfection By-products in Water, GIHOUDOU SHUPPAN Co., Ltd., 2008 (in Japanese).

（Related URLs）

(Data for assignments will be at http://www.urban.env.kyoto-u.ac.jp)

[Regarding studies out of class (preparation and review)]

Instruction will be given by the professors.

（Others (office hour, etc.)）

*Please visit KULASIS to find out about office hours.

未更新

Numbering code			
Course title <English>	原子力環境工学 Nuclear Environmental Engineering, Adv.	Affiliated department, Job title,Name	Institute for Integrated Radiation and Nuclear Science Associate Professor,FUJIKAWA YOUKO Institute for Integrated Radiation and Nuclear Science Associate Professor,FUKUTANI SATOSHI Institute for Integrated Radiation and Nuclear Science Assistant Professor,IKEGAMI MAIKO Institute for Integrated Radiation and Nuclear Science Assistant Professor,SHIBAHARA YUJI

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Thu.2	Class style	Lecture	Language	Japanese

[Outline and Purpose of the Course]

Various wastes are generated from the use of nuclear energy, one of the key technologies to overcome the global warming, and the associated industrial activity. This course is inended to understand the type and origin of radioactive wastes, as well as the management, treatment, and final disposal of these wastes, from the viewpoint of environmental engineering.

[Course Goals]

By providing the students with the knowledge on various radioactive wastes generated by the use on neclear energy as well as the radiological risk of such wastes, the course will enable the students to consider the future of nuclear industries based on their own judgement.

[Course Schedule and Contents]

Course Introduction ,1time,Course Introduction
Nuclear disaster action program,1time,uclear disaster action program
Nuclear reactors,1time,Nuclear reactors
Treatment of liquid radioactive waste,1time,Treatment of liquid radioactive waste
Treatment of gaseous and solid radioactive waste,1time,Treatment of gaseous and solid radioactive waste
Legislation of radioactive wastes,1time,Legislation of radioactive wastes
Decomissining and clearance,1time,ecomissining and clearance
Radiological risk,1time,The risk of radiation exposure, history of radiation dose limit set by international organizations, and dose limit under different situations are discussed
Fukushima Daiichi Nuclear Power Plant (F1) accident and nuclear disaster prevention,1time,Discuss the relation between the events in F1 and the radiation dose in the environment as well as pollution of environment. The evacuation activity conducted in Fukushima and the related lessons are summarized.
Problems of designated waste,1time,In the aftermath of the F1 accident, municipal solid waste contaminated with radioactive cesium has been produced in 12 Prefectures, some of these wastes were classified as designated wastes (DSW). The concept of DSW is compared with that of conventional radioactive wastes.
Geological disposal of high level radioactive wastes (HLW) and the safety assessment ,1time,Inventory, the method of disposal (critical path and nuclides), philosophy of radiological protection, etc. are discussed.
Behavior of radionuclides in the environment and mathematical modeling of nuclide migration,1time,
Behavior of radionuclides in the geosphere has governing effect on the safety of geological disposal of HLW. The behavior based on the chemical characteristics of each nuclides and mathematical modeling of their behavior are discussed.
Behavior and qualitative/ quantitative analysis of radionuclides in the environment,1time,Behavior and qualitative/ quantitative analysis of radioactive Cs, Co, Sr, I, Se, U, Pu and Ra in the environment, and events

Continue to 原子力環境工学(2)↓↓↓

原子力環境工学(2)

of radioactive pollution of the environment in the past, are introduced.
The risk of radiation and the society,1time,After the F1 accident, the risk of radiation has drawn intense attention from citizens. The risk communication methodology to facilitate the understanding of radiation is discussed.
Discussion with /between students,1time,Discussion on issues such as lifestyle in the contaminated environment (under existing exposure situation), whether residents should return to the contaminated areas, and how to deal with siting problems of final disposal of HLW, etc..

[Class requirement]

Basic knowledge on health physics, chemistry and earth science.

[Method, Point of view, and Attainment levels of Evaluation]

Attendance to the lecture plus report

[Textbook]

Related papers etc. will be distributed in each lecture.

[Reference books, etc.]

（Reference books）

Related literature will be notified in each lecture.

（Related URLs）

(None)

[Regarding studies out of class (preparation and review)]

NOt specified.

（Others (office hour, etc.)）

None

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	大気・地球環境工学特論 Atmospheric and Global Environmental Engineering, Adv.	Affiliated department, Job title,Name	Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRO

Target year		Number of credits	2	Course offered year/period	2019/First semester
Day/period	Wed.2	Class style	Lecture	Language	Japanese and English

[Outline and Purpose of the Course]

The contents of the lecture are as follows. (1) History of Global Warming problem, Radiative forcing, Green house gas emission, Carbon cycle, Mechanism of Climate Change, Mitigation measures, Social and Natural impact of Climate change (2) Mechanism of formation of Photochemical oxidant and Acid rain, Global scale transportation of atmospheric pollutants, Deposition and its impact of air pollutants, control measure of air pollution. Also, students make presentation and discussion on the related papers.

[Course Goals]

By the end of the course, students will be able to understand the mechanisms of climate change and air pollution, and learn to solve the problems by themselves.

[Course Schedule and Contents]

Guidance, IPCC, Observation of a climate change ,1time,
Carbon cycle and response of climate,1time,
Impact of Climate Change,1time,
Climate change mitigation (1),1time,
Climate change mitigation(2),1time,
Climate change mitigation and possible side effects,1time,
Urban air pollution, transboundary transport of air pollution, and international measures,1time,
Literature review presentation,1time,
Literature review presentation(1),1time,
Literature review presentation(2),1time,
Literature review presentation(3),1time,
Literature review presentation(4),1time,
Literature review presentation(5),1time,
Literature review presentation(6),1time,
Achievement test,1time,

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

Points are allocated for the quiz at every lectures, the presentation and discussion, report.

Continue to 大気・地球環境工学特論(2)↓↓↓

大気・地球環境工学特論(2)

[Textbook]

Handout

[Reference books, etc.]

（Reference books）

[Regarding studies out of class (preparation and review)]

The students are required to prepare for the presentation with sufficient time.

（Others (office hour, etc.)）

Please check KULASIS for the information of office hour.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	都市環境工学セミナーA Seminar on Urban and Environmental Engineering A	Affiliated department, Job title,Name	Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRO

Target year		Number of credits	4	Course offered year/period	2019/Intensive, year-round

Day/period	Intensive	Class style	Practical training	Language	Japanese

[Outline and Purpose of the Course]

Provide seminar assignments related to a wide range of problems in each educational field of environmental engineering such as advanced research related to urban environmental engineering, actual problems requiring solutions, examples of advanced activities in real society, and the specialization of each student Deepen discovery and understanding of problems from a field perspective. Acquire individual guidance from the supervisor on the method of research investigation on issues and the method of collecting related information. Students need to give reports and presentations, and discuss with supervisors.

[Course Goals]

To understand the overall picture of the issues related to urban environmental engineering.

[Course Schedule and Contents]

Issue 1 setting (1 time)
Set issue 1 on urban environmental engineering that each student studies.

Survey and progress report (1 time)
Each student conducts survey and research on selected task 1.

1st presentation (1 time)
Each student presents the contents of survey and research on task 1 to the teachers in charge and receives questions and evaluations.

Task 2 setting (1 time)
Set issue 2 on urban environmental engineering that each student studies.

Survey and progress report (1 time)
Each student conducts survey and research on selected task 2.

2nd presentation (1 time)
Each student presents the contents of research and research on problem 2 to the teachers in charge and receives questions and evaluations.

Issue 3 setting (1 time)
Set issue 3 on urban environmental engineering to be studied by each student.

Survey and progress report (1 time)
Each student conducts survey and research on selected task 3.

The 3rd presentation (1 time)

Continue to 都市環境工学セミナーA(2)↓↓↓

都市環境工学セミナーA(2)

Each student presents the contents of research and research on problem 3 to the teachers in charge, and receives questions and evaluations.

Task 4 Setting (1 time)
Set issue 4 on urban environmental engineering that each student studies.

Survey and progress report (1 time)
Each student conducts survey and research on selected task 4.

The 4th presentation (1 time)
Each student presents the contents of survey and research on task 4 to the teachers in charge and receives questions and evaluations.

Issue 5 setting (1 time)
Set issue 5 on urban environmental engineering that each student studies.

Survey and progress report (1 time)
Students conduct research and research on selected subjects 5.

The 5th presentation (1 time)
Each student presents the contents of research and research on task 5 to the teachers in charge and receives questions and evaluations.

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

The results will be evaluated comprehensively.

[Textbook]

Handout will be given accordingly.

[Reference books, etc.]

（Reference books）
Handout will be given accordingly.

[Regarding studies out of class (preparation and review)]

Good preparation and enough review are required.

（Others (office hour, etc.)）

Please check KULASIS for the information of my office hour.

*Please visit KULASIS to find out about office hours.

Continue to 都市環境工学セミナーA(3)↓↓↓

都市環境工学セミナーA(3)

Numbering code			
Course title <English>	都市環境工学セミナーB Seminar on Urban and Environmental Engineering B	Affiliated department, Job title,Name	Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRO

Target year		Number of credits	4	Course offered year/period	2019/Intensive, year-round

Day/period	Intensive	Class style	Practical training	Language	Japanese

[Outline and Purpose of the Course]

Provide seminar assignments related to a wide range of problems in each educational field of environmental engineering such as advanced research related to urban environmental engineering, actual problems requiring solutions, examples of advanced activities in real society, and the specialization of each student Deepen discovery and understanding of problems from a field perspective. Acquire individual guidance from the supervisor on the method of research investigation on issues and the method of collecting related information. Students need to give reports and presentations, and discuss with supervisors.

[Course Goals]

To understand the overall picture of the issues related to urban environmental engineering.

[Course Schedule and Contents]

Issue 1 setting (1 time)
Set issue 1 on urban environmental engineering that each student studies.

Survey and progress report (1 time)
Each student conducts survey and research on selected task 1.

1st presentation (1 time)
Each student presents the contents of survey and research on task 1 to the teachers in charge and receives questions and evaluations.

Task 2 setting (1 time)
Set issue 2 on urban environmental engineering that each student studies.

Survey and progress report (1 time)
Each student conducts survey and research on selected task 2.

2nd presentation (1 time)
Each student presents the contents of research and research on problem 2 to the teachers in charge and receives questions and evaluations.

Issue 3 setting (1 time)
Set issue 3 on urban environmental engineering to be studied by each student.

Survey and progress report (1 time)
Each student conducts survey and research on selected task 3.

The 3rd presentation (1 time)

Continue to 都市環境工学セミナーB(2)↓↓↓

都市環境工学セミナーB(2)

Each student presents the contents of research and research on problem 3 to the teachers in charge, and receives questions and evaluations.

Task 4 Setting (1 time)
Set issue 4 on urban environmental engineering that each student studies.

Survey and progress report (1 time)
Each student conducts survey and research on selected task 4.

The 4th presentation (1 time)
Each student presents the contents of survey and research on task 4 to the teachers in charge and receives questions and evaluations.

Issue 5 setting (1 time)
Set issue 5 on urban environmental engineering that each student studies.

Survey and progress report (1 time)
Students conduct research and research on selected subjects 5.

The 5th presentation (1 time)
Each student presents the contents of research and research on task 5 to the teachers in charge and receives questions and evaluations.

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

The results will be evaluated comprehensively.

[Textbook]

Handout will be given accordingly.

[Reference books, etc.]

（Reference books）
Handout will be given accordingly.

[Regarding studies out of class (preparation and review)]

Good preparation and enough review are required.

（Others (office hour, etc.)）

Please check KULASIS for the information of office hour.

*Please visit KULASIS to find out about office hours.

Continue to 都市環境工学セミナーB(3)↓↓↓

都市環境工学セミナーB(3)

Numbering code			
Course title <English>	環境微生物学特論 Environmental Microbiology, Adv.	Affiliated department, Job title,Name	Graduate School of Engineering Professor,TANAKA HIROAKI Graduate School of Engineering Senior Lecturer,HIDAKA TAIRA Graduate School of Engineering Associate Professor,NISHIMURA FUMITAKE Part-time Lecturer,YAMASHITA NAOYUKI Graduate School of Engineering Program-Specific Assistant Professor,IHARA MASARU

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Mon.1	Class style	Lecture	Language	Japanese

[Outline and Purpose of the Course]

The roles of microorganisms in the environment and the utilization methods of them for environmental purification are explained with state-of-the-art research findings. Besides, literature review and presentation of the reviewing results are certainly required in order to understand latest research findings and application to environmental engineering. The concrete contents are as follows; 1) Fundamental science: classification, cultivation, function, gene and genetic analysis of microorganisms, growth rate and biological reaction kinetics. 2) Application of environmental engineering: analyses with mathematical model and simulation, bio assay and bio sensor, relationship between waterborne disease and microorganisms, relationship between phytoplankton growth and hazardous substances production. Presentation and discussion about literature review by the students are prepared.

[Course Goals]

To understand fundamental knowledge of microbiology, which can support environmental engineering.

To discuss current situation and challenges about application of microorganisms for solution of environmental problem, and study with practice.

[Course Schedule and Contents]

(1) Basic of Environmental Microbiology: [1 time]
Introduction of this course: Objectives, composition, and basic of the environmental microbiology. How to review the latest research results from literature, and presentation.

(2) Classification, Nomenclature, Cultivation, and Function of Microorganisms: [1 time]

(3) Microbial ecosystem structure and Microorganism community analysis by gene information: [2 times]

(4) Metabolism of microorganisms, and material transformation: [2 times]

(5) Mathematical model of microbial activity and numerical analysis by computer: [1 time]

(6) Environmental measurement and evaluation using microorganisms: [1 time]

(7) Waterborne diseases and microorganisms: [1 time]

Continue to 環境微生物学特論(2)↓↓↓

環境微生物学特論(2)

(8) Phytoplankton growth and hazardous substances production: [1 time]

(9) Presentation and Discussion of each research subject: [3 times]

(10) Keynote address by an up-and-coming specialist of microbiology: [1 time]

・Final examination/ Learning achievement evaluation(1 time):

・Feedback(1 time):

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

Evaluation will be based on both one written examination and report & presentation of each research topic.

[Textbook]

Materials for each lecture will be provided.

[Reference books, etc.]

（Reference books）

[Regarding studies out of class (preparation and review)]

Review with related literature is strongly recommended in order to understand broadly based knowledge and to obtain useful information.

（Others (office hour, etc.)）

*Please visit KULASIS to find out about office hours.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	環境衛生学特論 Environmental Health, Adv.	Affiliated department, Job title,Name	Graduate School of Global Environmental Studies Professor,TAKANO HIROHISA

Target year		Number of credits	2	Course offered year/period	2019/First semester
Day/period	Tue.4	Class style	Lecture	Language	Japanese

[Outline and Purpose of the Course]

Environmental factors and genetic factors are responsible for our health and diseases. This seminar has the lecture on the relationships between environmental factors and our health. Also, Students make presentation and discussion on the previous and recent environmental problems, with special emphasis on their relation with health concerns.

[Course Goals]

Students learn about the fundamentals of environmental health and make use of the knowledge for the development of related areas.

[Course Schedule and Contents]

Environment and health,2times,Lecture on the relationships between environmental factors and our health
Seminar on the previous and recent environmental problems,13times,Presentation and discussion on the previous and recent environmental problems, with special emphasis on their relation with health concerns

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

Points are allocated for the activities on the presentation and discussion.

[Textbook]

Not used. To be introduced from time to time in the lecture.

[Reference books, etc.]

（Reference books）

To be introduced during class. To be introduced from time to time in the lecture.

[Regarding studies out of class (preparation and review)]

If knowledge of high school biology is insufficient, it might be considered desirable to review every time. No particular preparations are necessary.

（Others (office hour, etc.)）

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	環境資源循環技術 Environmental-friendly Technology for Sound Material Cycle	Affiliated department, Job title,Name	Graduate School of Engineering Associate Professor,NAKAGAWA HIROYUKI Graduate School of Engineering Professor,TAKAOKA MASAKI Graduate School of Engineering Associate Professor,OOSHITA KAZUYUKI Graduate School of Engineering Associate Professor,MAKI TAISUKE Graduate School of Engineering Associate Professor,NISHIMURA FUMITAKE Graduate School of Engineering Senior Lecturer,HIDAKA TAIRA

Target year		Number of credits	1.5	Course offered year/period	2019/First semester

Day/period	Fri.3	Class style	Lecture	Language	Japanese

[Outline and Purpose of the Course]

We face global warming, resource depletion and ecological destruction etc. It is necessary to establish the environmental-friendly and sustainable society with low carbon emission and sound material cycles. This lecture is aimed at learning principle and fundamental knowledge on environmental sound technologies for biomass and related valuable resource in urban area.

[Course Goals]

Learn the environmental-friendly technology to realize the environmental-friendly and sustainable society with low carbon emission and sound material cycles.

[Course Schedule and Contents]

1st -5th Thermodynamic consideration of the technologies for resource cycle
Exergy, which is based on the combination of the first and the second law of thermodynamics, and the methodology to convert resources and to evaluate resource cycles utilizing exergy analysis is introduced with respect to the concept for resource cycles from the viewpoint of the second law of thermodynamics. “Global warming and carbon cycle”, “renewable resources and energy”, and “processes for the utilization of biomass” are also introduced.

6th-8th Technologies for resource cycle of solid waste
General knowledge, legal structures, applied technologies and analytical methods of solid waste (metal or inorganic resources) are introduced. The technologies of resource recovery in urban metabolic facilities are also introduced.

9th-11th Environmental-friendly Technology related to wastewater treatment
Technologies about material recycle and recovery related to water and wastewater treatment are introduced. Recovery of organic resource from sewage sludge, phosphorus recovery from sewage, and sewage systems which can enhance resources & energy recovery are explained together with their current conditions and challenges.

Continue to 環境資源循環技術(2)↓↓↓

環境資源循環技術(2)

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

Evaluated by the reports for each theme and attendance.

[Textbook]

Not used

[Reference books, etc.]

（Reference books）

Introduced during class

[Regarding studies out of class (preparation and review)]

Pre-homework is not necessary, but review the learning materials to make better reports.

（Others (office hour, etc.)）

This class will be open in 2019. The number of class is 11th and is equivalent to 1.5 credits.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	地圏環境工学特論 Geohydro Environment Engineering, Adv.	Affiliated department, Job title,Name	Graduate School of Engineering Professor,YONEDA MINORU

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Thu.1	Class style	Lecture	Language	Japanese

[Outline and Purpose of the Course]

With the theme of conservation of the geosphere environment and contamination countermeasures, lectures are given on the current situation of surrounding groundwater both in Japan and abroad, sustainable groundwater use from the viewpoint of groundwater quality, various global environmental problems related to the geosphere environment, countermeasures, and so forth. In particular, geostatistics, which is a field of spatial statistics, used as a method of investigating the contamination of soil among other things, will be described in detail from its theoretical foundation to application. Additionally, the programming for analyzing spatial data in geostatistics, and the programming method by Excel VBA through a numerical simulation program related to groundwater pollution using Excel VBA will be explained.

[Course Goals]

Recognizing the importance of groundwater in Japan and abroad, understanding the basics of geostatistics for estimating the spatial distribution of soil and groundwater contamination, and the foundation of numerical simulation on groundwater pollution.

[Course Schedule and Contents]

Current state of domestic and overseas groundwater (1 time)
The usage situation of groundwater in Japan and abroad and its importance will be outlined.

Sustainable groundwater usage method (1 time)
Through examples of degradation of groundwater quality in the Kyoto basin, the method of sustainable groundwater use will be outlined from a qualitative point of view.

Geosphere environment and global environmental issues (1 time)
In particular, the global environmental problems in the geosphere environment will be outlined.

Introduction to VBA (1 time)
In particular, the programming method of Excel VBA that is necessary for numerical calculation in a way that is easy to understand by FORTRAN users will be outlined.

Introduction to geostatistics 1 (1 time)
The analysis procedure of spatial data by geostatistics and the method of data review as the first procedure will be outlined.

Introduction to geostatistics 2 (1 time)
The importance of the variogram as a statistical structure of the field and how to obtain it will be outlined.

Introduction to geostatistics 3 (1 time)
The spatial distribution and the method of kriging to estimate its uncertainty will be outlined.

Continue to 地圏環境工学特論(2)↓↓↓

地圏環境工学特論(2)

Introduction to geostatistics 4 (1 time)
The statistical processing method when there is a lot of data below the detection limit and overranged data will be outlined.

Introduction to geostatistics 5 (1 time)
Cokriging and its simplified method for estimating the spatial distribution using several types of data will be outlined.

Introduction to geostatistics 6 (1 time)
A conditional simulation method as a simulation method considering spatial uncertainty and its usage will be outlined.

Chemistry and simulation of soil and groundwater (1 time)
The fundamentals of chemistry to understand the relation between soil pollution and groundwater contamination, as well as the method to simulate the change of groundwater quality will be outlined.

Introduction to groundwater simulation (4 times)
The basics of numerical simulations on groundwater contamination will be outlined.

[Class requirement]

Basics of linear algebra and probability statistics

[Method, Point of view, and Attainment levels of Evaluation]

Evaluated by the scores of reports. The themes of the reports will be given at some lectures.

[Textbook]

Not used
Handout will be given at each lecture.

[Reference books, etc.]

（Reference books）
Others; to be recommended during class as necessary.

（Related URLs）

http://risk.env.kyoto-u.ac.jp/chiken/index.html

[Regarding studies out of class (preparation and review)]

Completely understand the contents of each handout.

（Others (office hour, etc.)）

In consideration of social conditions and so forth, there are cases where class items and contents may be changed.

Continue to 地圏環境工学特論(3)↓↓↓

地圏環境工学特論(3)

*Please visit KULASIS to find out about office hours.

未更新

Numbering code			
Course title <English>	環境リスク管理リーダー論 Lecture on Environmental Management Leader	Affiliated department, Job title,Name	Graduate School of Engineering Associate Professor,YOKO SHIMADA Graduate School of Engineering Professor,TANAKA HIROAKI

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Thu.5	Class style	Lecture	Language	English

[Outline and Purpose of the Course]

In this class, wersquoll give lectures on theory of risk analysis, risk identification, risk assessment, risk evaluation, and risk reduction and avoidance in the field of urban human security including human health risk and ecological risk. The main purpose of this lecture is to provide students basic viewpoint and knowledge required for environmental leaders who can practically solve environmental issues occurring in developing countries, showing several international environmental projects as practical case works.

[Course Goals]

The main purpose of this lecture is to provide students with the basic viewpoint and knowledge required for environmental leaders able to practically solve environmental issues occurring in developing countries, focusing on several international environmental projects as practical case works.

[Course Schedule and Contents]

Introduction,1time,In this introductory lecture, the current situation and problems of the environment in Asian developing countries are explained, and basic ideas for their improvement measures are given together with fundamental terminologies.
Energy and Environment,1time,
View point and commitment to rural environmental issues,1time,
Disaster Risk Management and Grass-roots International Cooperation,1time,
Environmental Risk Assessment and Risk Communication,1time,
Water, Sanitation and Solid Waste Management for Developing Countries,1time,
Presentations and Discussions,2times,
Japan#039s Lessens on Economy amp Development,1time,
Solid Waste Management,1time,
Ensuring Sustainability in Water Supply and Sewerage Sector,1time,
Water Supply and Human Security,1time,
Impending Issues in Lake Biwa-Yodo River Water Management and the Basin Governance,1time,
Environment amp Sanitary Engineering Research International Session,1time,
Poster Presentation in Environment amp Sanitary Engineering Research Symposium,1time,

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

Participation, Oral and Poster Presentation, and Report

Continue to 環境リスク管理リーダー論(2)↓↓↓

環境リスク管理リーダー論(2)

[Textbook]

[Reference books, etc.]

（Reference books）

[Regarding studies out of class (preparation and review)]

（Others (office hour, etc.)）

To be announced at class about poster presentation in Environment amp Sanitary Engineering Research Symposium.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	新環境工学特論I New Environmental Engineering I, Adv.	Affiliated department, Job title,Name	Graduate School of Engineering Professor,SHIMIZU YOSHIHISA

Target year		Number of credits	2	Course offered year/period	2019/First semester

Day/period	Mon.5	Class style	Lecture	Language	English

[Outline and Purpose of the Course]

This course provides various kinds of engineering issues related to the water environment in English, which cover fundamental knowledge, the latest technologies and regional application examples. These lectures, English presentations by students, and discussions enhance English capability and internationality of students. The course is conducted in simultaneous distance-learning from Kyoto University, or from remote lecture stations in University of Malaya, and Tsinghua University of China. For the distance-learning, a hybrid system is used, which consists of prerecorded lecture VIDEO, VCS (Video conference system) and SS (slide sharing system).

[Course Goals]

Each student is requested to give a short presentation in English in the end of the course. The students will understand the present circumstance of environments in the world, and the students may improve their English skill and international senses through these lectures, presentations, and discussions.

[Course Schedule and Contents]

WGuidance & Self Introduction of Students + Lecture: Wastewater Treatment Plants Case Study in Japan (Fujii)

From Ecotoilets to Ecotowns（Shimizu)

Wastewater Treatment Plant: Case Study in China, Biological Nutrient Removal (BNR) (Prof. Wen, Tsinghua University)

Wastewater Reuse amp Disinfection (Tanaka)

Governance of Water and Wastewater in Malaysia (Prof. Ghufran, University of Malaya) Case Studies of Wastewater Treatment Plants Design & Operation (Prof. Nuruol, University of Malaya)

Treatment Technologies (Practical & Advanced Technology I): Membrane Technology (MT) (Prof. Huang, Tsinghua University)

Anaerobic Biological Treatment Technologies (Prof. Shaliza, University of Malaya)

Advanced Oxidation Processes (Prof. Zhang, Tsinghua University)

Student Presentations /Discussions I (all)

Student Presentations /Discussions II (all)

Continue to 新環境工学特論I(2)↓↓↓

新環境工学特論I(2)

Student Presentations /Discussions III (all)

[Class requirement]

General understanding of water environmental issues

[Method, Point of view, and Attainment levels of Evaluation]

Evaluated by class attendance, Q&A and presentation.

[Textbook]

Class handouts

[Reference books, etc.]

（Reference books）

Introduced in the classes

[Regarding studies out of class (preparation and review)]

The students should study the PPT file used in the lectures. Students also need to enough literature review and related prior to their presentation.

（Others (office hour, etc.)）

PowerPoint slides are main teaching materials in the lectures, and their hard copies are distributed to the students. In addition, a list of technical terms and difficult English words is given to the students with their explanation and Japanese translation.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	新環境工学特論II New Environmental Engineering II, Adv.	Affiliated department, Job title,Name	Graduate School of Engineering Professor,TAKAOKA MASAKI Graduate School of Global Environmental Studies Professor,FUJII SHIGEO Graduate School of Global Environmental Studies Associate Professor,UEDA KAYO Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRO Graduate School of Engineering Associate Professor,OOSHITA KAZUYUKI

Target year		Number of credits	2	Course offered year/period	2019/Second semester

Day/period	Mon.5	Class style	Lecture	Language	English

[Outline and Purpose of the Course]

The course is conducted in simultaneous distance-learning from Kyoto University, or from remote lecture stations in University of Malaya, and Tsinghua University. For the distance-learning, a hybrid system is used, which consists of prerecorded lecture VIDEO, VCS (Video conference system) and SS (slide sharing system). The students are requested to give a short presentation in English in the end of the lecture course. This course may improve students' English skill and international senses through these lectures, presentations, and discussions.
The course provides various kinds of engineering issues related to atmospheric environment, climate change and solid wastes management in English, which cover fundamental knowledge, the latest technologies and regional application examples. These lectures, English presentations by students, and discussions enhance English capability and internationality of students.

[Course Goals]

This lecture expects students to freely discuss environmental issues on air and solid wastes with international researchers and students in English. For this purpose, the course encourages the students to conduct self-study for following up each lecture's contents, and requests them to enhance their capabilities by preparations on issues related to water environment.

[Course Schedule and Contents]

No.1
Global warming and Low carbon society （Prof. Fuimori, Kyoto University）

No.2
Atmospheric diffusion and modeling (Prof. S Wang, Tsinghua University)

No.3
Air Pollution, Its Historical Perspective from Asian Countries (II), Malaysia (Prof. Nasrin Aghamohammadi, University of Malaya)

No.4
Air Pollution, Its Historical Perspective from Asian Countries (III), Japan (Prof. Ueda, Kyoto University)

No.5

Continue to 新環境工学特論II(2)↓↓↓

新環境工学特論II(2)

Student Presentations /Discussions I (all)

No.6
Introduction to Municipal Solid Waste (MSW) Management in Malaysia (Prof. Fauziah Shahuk Hamid, University of Malaya)

No.7
Solid Waste Management, Case Study in China (Prof. Lu　Wenjing, Tsinghua University)

No.8
Solid Waste Management, Case Study in Japan (Prof. Takaoka, Kyoto University)

No.9
Solid Waste Management, Case Study in Malaysia (Prof. Noor Zalina Mahamood, University of Malaya)

No.10
Student Presentations /Discussions II (all

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

Evaluate by class attendance(40%), and presentation and Q&A (60%).

[Textbook]

Not used

[Reference books, etc.]

（Reference books）

Introduced during class
To be announced at the class.

[Regarding studies out of class (preparation and review)]

Preparation homework is not required, but homework is recommended to follow up each lecture's contents.

（Others (office hour, etc.)）

A lecture with 120 minitutes (16:30 - 18:30) is conducted 10 times.
PowerPoint slides are main teaching materials in the lectures, and their hard copies are distributed to the students. In addition, a list of technical terms and difficult English words is given to the students with their explanation and Japanese translation.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	環境微量分析演習 Environmental Organic Micropollutants Analysis Lab.	Affiliated department, Job title,Name	Graduate School of Engineering Professor,SHIMIZU YOSHIHISA Graduate School of Engineering Associate Professor,MATSUDA TOMONARI

Target year		Number of credits	2	Course offered year/period	2019/Intensive, year-round

Day/period	Intensive	Class style	Seminar	Language	Japanese

[Outline and Purpose of the Course]

There is increasing concern about proper risk evaluation and management of hazardous chemicals such as dioxins and endocrine disruptors. To manage this problem, it is necessary to understand analytical methods and toxicity of those hazardous chemicals. In this class, lectures and experiments will be carried out about chromatography, bioassays and mass spectrometry.

[Course Goals]

Understand about principle and practical techniques of chromatography. Understand about principle of several bioassays.

[Course Schedule and Contents]

HPLC -How to separate it-,3times,Learn about principle and practice of HPLC separation. How do you choose columns, solvents and detectors? How to improve peak separation?
Fractionation and Purification by using HPLC,3times,Learn about practical techniques of fractionation and purification using HPLC.
LC/MS/MS,5times,Learn about principle and practice of LC/MS/MS analysis. Understand about 3 different scan modes, full scan, daughter scan and MRM. How to make an analytical method in a refined way for substances of your interest.
Bioassays,4times,Lecture about several bioassays which are used for evaluation of environmental toxicity, and discuss about how to identify toxic compounds in environment by using HPLC in combination with bioassays.

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

It is required to attend all 3 days for lectures and experiments. Attendance and reports are considered for grading.

[Textbook]

Handouts are distributed.

Continue to 環境微量分析演習(2)↓↓↓

環境微量分析演習(2)

[Reference books, etc.]

（Reference books）

Daniel C. Harris:　Quantitative Chemical Analysis ISBN-13: 978-1-4292-3989-9

[Regarding studies out of class (preparation and review)]

We hope active participation of students. It is welcome that patticipants additionally try to analyze the sample their own interest.

（Others (office hour, etc.)）

This intensive course is useful especially for students who usually use or intend to use HPLC and LC/MS/MS for their research.

*Please visit KULASIS to find out about office hours.

未更新

Numbering code			
Course title <English>	環境工学先端実験演習 Advanced Enivironmental Engineering Lab.	Affiliated department, Job title,Name	Graduate School of Engineering Professor,ITOH SADAHIKO Graduate School of Engineering Associate Professor,ECHIGO SHINYA Part-time Lecturer,YASOJIMA MAKOTO

Target year		Number of credits	2	Course offered year/period	2019/Second semester

Day/period	Mon.3,4	Class style	Seminar	Language	Japanese and English

[Outline and Purpose of the Course]

Analytical methods to characterize environmental samples are learnt through practical training including site visit to other research institute or analytical company. Also, integration of environmental information using GIS is also mastered.

[Course Goals]

To promote your own research by learning each research method with wide vision

[Course Schedule and Contents]

Guidance and Safety Education (1 time)
The content of subject and safety education for the following experiment are explained.

Quantitative analysis of elements (2 times)
The principle of multielement analysis is explained and practical training of ICP-AES or ICP-MS machine is conducted.

Qualitative analysis of elements (2 times)
The principle of X-ray based methods is explained and practical training of one or two X-ray based machine is conducted.

Qualitative analysis of organic compounds and bioassay (6 times)
Qualitative analysis of organic compounds such as mass spectrometry, NMR, ESR and IR and bioassay are explained and practical training of GC-MS etc. is conducted.

GIS (2 times)
The way to use GIS is learnt.

Site visit (2 times)
Site visit to research institute or analytical company.

[Class requirement]

None

Continue to 環境工学先端実験演習(2)↓↓↓

環境工学先端実験演習(2)

[Method, Point of view, and Attainment levels of Evaluation]

Attendance at the class　(50%) and report subjects(50%) are evaluated.

[Textbook]

[Reference books, etc.]

（Reference books）

[Regarding studies out of class (preparation and review)]

Instruction will be given by the professors.

（Others (office hour, etc.)）

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	環境工学実践セミナー Seminer on Practical Issues in Urban and Environmental Enginering	Affiliated department, Job title,Name	Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRO

Target year		Number of credits	2	Course offered year/period	2019/Intensive, year-round

Day/period	Intensive	Class style	Seminar	Language	Japanese

[Outline and Purpose of the Course]

Acquire practical knowledge and ability required for researchers and engineers involved in environmental engineering and environmental management. Specifically, participate in seminar series or symposium designated by major, conducted by international organizations, government, local governments, private enterprises, research institutes, NPOs and other practitioners / researchers.

[Course Goals]

To

[Course Schedule and Contents]

Task assignment (1 time)
Select an academic society that will make a research presentation, and set a task.

Research / research (5 times)
Investigate and research on the set issues.

Presentation of research (1 time)
Do research presentations at academic societies etc.

Task assignment (1 time)
Select an academic society that will make a research presentation, and set a task.

Research / research (5 times)
Investigate and research on the set issues.

Presentation of research (1 time)
Do research presentations at academic societies etc.

Report creation (1 time)
We prepare a report that summarizes the contents released at academic societies, etc. and submit.

[Class requirement]

None

Continue to 環境工学実践セミナー(2)↓↓↓

環境工学実践セミナー(2)

[Method, Point of view, and Attainment levels of Evaluation]

Submit a report describing the achievement record (participation in seminars and symposia etc), and credit the unit by comprehensive evaluation by the department head and academic supervisor.

[Textbook]

Not used

[Reference books, etc.]

（Reference books）

Introduced during class

[Regarding studies out of class (preparation and review)]

Follow the instructions of your supervisor.

（Others (office hour, etc.)）

Details will be given at the guidance.
Please check KULASIS for the information of office hour.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	都市環境工学演習A Laboratory and Seminar on Urban and Environmental Engineering A	Affiliated department, Job title,Name	Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRO

Target year		Number of credits	2	Course offered year/period	2019/Intensive, year-round
Day/period	Intensive	Class style	Seminar	Language	Japanese

[Outline and Purpose of the Course]

Participate in internships at international organizations, or national and local governments, public organizations, companies and overseas, overseas training that are carrying out environmental engineering researches, investigations or projects. Submit reports and give presentations. In addition to the planning and programs that teachers arrange, students can go internships applying to the programs of various organizations.

[Course Goals]

To conduct the internship and obtain

[Course Schedule and Contents]

Internship content determination (2 times)
Select internships where each student participates.

Research / Research (10 times)
Through internships, you gain professional knowledge and experience.

Report creation (2 times)
Report on experience gained by internship and submit.

Presentation (1 time)
In response to the teachers in charge, we will announce the content of the report and ask questions and respond.

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

The results will be evaluated comprehensively.

[Textbook]

Not used
Handout will be given accordingly.

[Reference books, etc.]

（Reference books）
Handout will be given accordingly.

[Regarding studies out of class (preparation and review)]

Follow the instructions of your supervisor.

（Others (office hour, etc.)）

Please check KULASIS for the information of office hour.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	都市環境工学演習 B Laboratory and Seminar on Urban and Environmental Engineering B	Affiliated department, Job title,Name	Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRO

Target year		Number of credits	2	Course offered year/period	2019/Intensive, year-round
Day/period	Intensive	Class style	Seminar	Language	Japanese

[Outline and Purpose of the Course]

Participate in internships at international organizations, or national and local governments, public organizations, companies and overseas, overseas training that are carrying out environmental engineering researches, investigations or projects. Submit reports and give presentations. In addition to the planning and programs that teachers arrange, students can go internships applying to the programs of various organizations.

[Course Goals]

To

[Course Schedule and Contents]

Task assignment (1 time)
Set up the tasks that each student intends to investigate.

Research / Research (1 time)
Study and study on the tasks that have been set up and prepare presentation materials.

Presentation and question and answer (1 time)
In small classes, research presentation and question and answer are done.

Task assignment (1 time)
Set up the tasks that each student intends to investigate.

Research / Research (1 time)
Study and study on the tasks that have been set up and prepare presentation materials.

Presentation and question and answer (1 time)
In small classes, research presentation and question and answer are done.

Task assignment (1 time)
Set up the tasks that each student intends to investigate.

Research / Research (1 time)
Study and study on the tasks that have been set up and prepare presentation materials.

Presentation and question and answer (1 time)
In small classes, research presentation and question and answer are done.

Task assignment (1 time)
Set up the tasks that each student intends to investigate.

Continue to 都市環境工学演習 B(2)↓↓↓

都市環境工学演習Ｂ(2)

Research / Research (1 time)
Study and study on the tasks that have been set up and prepare presentation materials.

Presentation and question and answer (1 time)
In small classes, research presentation and question and answer are done.

Task assignment (1 time)
Set up the tasks that each student intends to investigate.

Research / Research (1 time)
Study and study on the tasks that have been set up and prepare presentation materials.

Presentation and question and answer (1 time)
In small classes, research presentation and question and answer are done.

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

The results will be evaluated comprehensively.

[Textbook]

Handout will be given accordingly.

[Reference books, etc.]

（Reference books）

Handout will be given accordingly.

[Regarding studies out of class (preparation and review)]

Follow the instructions of your supervisor.

（Others (office hour, etc.)）

Please check KULASIS for the information of office hour.

*Please visit KULASIS to find out about office hours.

未更新

Numbering code			
Course title <English>	安全衛生工学（11回コース） Safety and Health Engineering (11 times course)	Affiliated department, Job title,Name	Agency for Health, Safety and Environment Professor,HASHIMOTO SATOSHI Agency for Health, Safety and Environment Associate Professor,MATSUI YASUTO

Target year		Number of credits	1.5	Course offered year/period	2019/First semester

Day/period	Tue.4	Class style	Lecture	Language	Japanese

[Outline and Purpose of the Course]

[Course Goals]

[Course Schedule and Contents]

,1time,
,1time,
,1time,
,1time,
,1time,
,1time,
,1time,
,1time,
,1time,
,1time,
,1time,

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

[Textbook]

[Reference books, etc.]

（Reference books）

[Regarding studies out of class (preparation and review)]

（Others (office hour, etc.)）

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	実践的科学英語演習Ⅰ Exercise in Practical Scientific English I	Affiliated department, Job title,Name	Graduate School of Engineering Senior Lecturer,NISHIKAWA MIKAKO Graduate School of Engineering Senior Lecturer,MATSUMOTO RIYOUSUKE Graduate School of Engineering Senior Lecturer,ASHIDA RIYUUICHI Graduate School of Engineering Senior Lecturer,MAEDA MASAHIRO Graduate School of Engineering Senior Lecturer,YOROZU KAZUAKI Graduate School of Engineering Senior Lecturer,KANEKO KENTAROU

Target year		Number of credits	1	Course offered year/period	2019/First semester
Day/period	Thu.4,5	Class style	Seminar	Language	Japanese and English

[Outline and Purpose of the Course]

This course is open to all master and doctoral engineering students.
It is designed to help students understand how to write a research paper step by step.
In this course, the students will write a short research paper (i.e. Extended Research Abstract for Proceeding. approx. 1000 -1500 words) on a topic drawn from assigned readings.

[Course Goals]

The primary goal of this course is to deepen an understanding of the main features of each part of a scientific paper (IMRaD).
Throughout the course, students will develop the core competencies required for language, grammar, and style to produce a research manuscript in English.

[Course Schedule and Contents]

Unit 1. Course Overview
Introduction to writing scientific research articles

Unit 2. Introduction
Raising awareness of the register of scientific research articles (genre, audience, purpose)

Unit 3. Preparing to Write (1)
Writing a proposal for a research paper, using corpus-based approach (Exercise: Creating own Corpus)

Unit 4. Preparing to Write (2)
Paraphrasing ideas from source texts, using citations and references in formal writing

Unit 5. Writing Processes (1) Abstract
Identifying the moves for an Abstract section by hint expressions

Unit 6. Writing Processes (2) Abstract-continued
Writing an Abstract (Title), Peer Feedback

Unit 7. Writing Processes (3) Introduction

Continue to 実践的科学英語演習Ⅰ(2)↓↓↓

実践的科学英語演習Ⅰ(2)

Identifying the moves for an Introduction section by hint expressions

Unit 8. Writing Processes (4) Introduction-continued
Writing an Introduction section, Peer Feedback

Unit 9. Writing Processes (5) Method
Writing a Method section, Peer Feedback

Unit 10. Writing Processes (6) Results
Writing a Result section, Peer Feedback

Unit 11. Writing Processes (7) Discussions and Conclusion
Writing a Discussion and a Conclusion section

Unit 12. Cover letter to reviewers
Writing a cover letter to reviewers and how to respond to reviewers

Unit 13. Monitoring and Revising (1)
Submitting the paper online to receive feedback from instructors

Unit 14. Monitoring and Revising (2)
Revising a paper based on peer feedback

Unit 15. Submission of the Final Paper

[Class requirement]

Students who intend to join this course must attend the first class.

[Method, Point of view, and Attainment levels of Evaluation]

Evaluation based on 30% participation, 40% reports, 30% final paper *More than twice unexcused absence can result in course failure

[Textbook]

Handout materials will be supplied by the instructor.

[Reference books, etc.]

（Reference books）
Textbooks (for reference)

ALESS (2012). Active English for Science-英語で科学する-レポート、論文、プレゼンテーション. The University of Tokyo Press.

野口ジュディー・深山晶子・岡本真由美.（2007）.『理系英語のライティング』. アルク

Continue to 実践的科学英語演習Ⅰ(3)↓↓↓

実践的科学英語演習Ⅰ(3)

[Regarding studies out of class (preparation and review)]

Students will need to spend a reasonable amount of time to complete their own piece of writing for the course.

（Others (office hour, etc.)）

We may restrict the class size to enhance students' learning.
Students who intend to join the course are required to attend the first-day guidance.

Office Hours: (by appointment) nishikawa.mikako7w@kyoto-u.ac.jp (Ext. 2052)

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	エンジニアリングプロジェクトマネジメント Project Management in Engineering	Affiliated department, Job title,Name	Graduate School of Engineering Senior Lecturer,MATSUMOTO RIYOUSUKE Graduate School of Engineering Senior Lecturer,ASHIDA RIYUUICHI Graduate School of Engineering Senior Lecturer,MAEDA MASAHIRO Graduate School of Engineering Senior Lecturer,YOROZU KAZUAKI Graduate School of Engineering Senior Lecturer,KANEKO KENTAROU Graduate School of Engineering Associate Professor,Juha Lintuluoto

Target year		Number of credits	2	Course offered year/period	2019/First semester
Day/period	Fri.4	Class style	Lecture	Language	English

[Outline and Purpose of the Course]

This course provides a basic knowledge required for the project management in various engineering fields such as process design, plant design, construction, and R&D project. Some lectures are provided by visiting lecturers from industry and public works who have many experiences on actual engineering projects.

[Course Goals]

This course will help students gain a fundamental knowledge of what project management in engineering is. Throughout the course, students will learn various tools applied in project management. Students will also understand the importance of costs and money, risks, leadership, and environmental assessment in managing engineering projects. This course is followed with the course Exercise on Project Management in Engineering in the second semester.

[Course Schedule and Contents]

Week 1, Course guidance
Week 2-3, Introduction to project management
Week 4, Project scheduling
Week 5-7, Tools for project management, cost, and cash flows
Week 8-9, Team organization and administration
Week 10, Negotiation skills/tactics/examples in business marketing
Week 11, Environmental impact assessment
Week 12-13, Risk management
Week 14, Project management for engineering procurement construction business
Week 15, Feedback

[Class requirement]

We may restrict the class size to enhance students' learning.
Students who intend to join the course are required to attend the first class.

Continue to エンジニアリングプロジェクトマネジメント(2)↓↓↓

エンジニアリングプロジェクトマネジメント(2)

[Method, Point of view, and Attainment levels of Evaluation]

Evaluated by class contribution (or level of understanding) at each class (60%) and assignments (40%)

[Textbook]

Course materials will be provided.

[Reference books, etc.]

（Reference books）

Lock, Dennis 『Project Management, 10th edition』 （Gower Publishing Ltd.）ISBN:1409452697
Cleland, David L., and Ireland, Lewis R. 『Project Management: Strategic Design and Implementation, 5th edition』 （McGraw-Hill Professional）ISBN:007147160X
Miller, Roger and Lessard, Donald R. 『The strategic management of large engineering projects, Shaping Institutions, Risks, and Governance』 （The MIT Press）ISBN:9780262526982

（Related URLs）

http://www.glc.t.kyoto-u.ac.jp/grad(The home page of the engineering education research center)

[Regarding studies out of class (preparation and review)]

This course requests students to prepare a class in advance becouse some classes will be done by an interactive style as necessary.

（Others (office hour, etc.)）

We may restrict the class size to enhance students' learning.
Students who intend to join the course are required to attend the first class.

*Please visit KULASIS to find out about office hours.

Numbering code			
Course title <English>	エンジニアリングプロジェクトマネジメント演習 Exercise on Project Management in Engineering	Affiliated department, Job title,Name	Graduate School of Engineering Senior Lecturer,MATSUMOTO RIYOUSUKE Graduate School of Engineering Senior Lecturer,ASHIDA RIYUUICHI Graduate School of Engineering Senior Lecturer,MAEDA MASAHIRO Graduate School of Engineering Senior Lecturer,YOROZU KAZUAKI Graduate School of Engineering Senior Lecturer,KANEKO KENTAROU Graduate School of Engineering Associate Professor,Juha Lintuluoto

Target year		Number of credits	2	Course offered year/period	2019/Second semester
Day/period	Fri.4,5	Class style	Seminar	Language	English

[Outline and Purpose of the Course]

In this course, students will apply the engineering know-how and the skills of management, and group leadership which they learned in the course of Project Management in Engineering to build and carry out a virtual inter-engineering project. This course provides a forum where students' team-plan based on ideas and theories, decision making, and leadership should produce realistic engineering project outcomes. The course consists of intensive group work, presentations, and a few intermediate discussions. A final report will be required.

[Course Goals]

This course prepares engineering students to work with other engineers within a large international engineering project. In particular this course will focus on leadership and management of projects along with applied engineering skills where the students learn various compromises, co-operation, responsibility, and ethics.

[Course Schedule and Contents]

Week 1, Introduction to Exercise on Project Management in Engineering, Lecture on tools for the Project management in engineering, Practice and Project proposal.
Week 2, Group finalizations & Project selections.
Week 3-7, Group work, Project preliminary structures, Task list, WBS, Cost, Gant chart.
Week 8, Mid-term presentation.
Week 9-11, Group work, Leadership structuring, Risk Management, Environmental Impact Assessment.
Week 12, Presentation.
Each project group may freely schedule the group works within given time frame. The course instructors are available if any need is required.
Some lectures will be provided such as Task list, WBS, Cost, Gant chart, Leadership structuring, Risk Management, Environmental Impact Assessment, and more.

Continue to エンジニアリングプロジェクトマネジメント演習(2)↓↓↓

エンジニアリングプロジェクトマネジメント演習(2)

[Class requirement]

Fundamental skills about group leading and communication, scientific presentation.
We may restrict the class size to enhance students' learning.
Students who intend to join the course are required to attend the first class.

[Method, Point of view, and Attainment levels of Evaluation]

Report, presentations, class activity (at least 10 times attendance including mid-term and final presentations).

[Textbook]

Course materials will be provided if necessary.

[Reference books, etc.]

（Reference books）

Will be informed if necessary.

（Related URLs）

http://www.glc.t.kyoto-u.ac.jp/grad(The home page of the engineering education research center)

[Regarding studies out of class (preparation and review)]

Students are requested to prepare for group work, mid-term presentation and finel presentation.

（Others (office hour, etc.)）

We may restrict the class size to enhance students' learning.
Students who intend to join the course are required to attend the first class.

*Please visit KULASIS to find out about office hours.

Numbering code	G-LAS00 80001 LJ20		
Course title <English>	研究倫理・研究公正（理工系） Research Ethics and Integrity(Science and Technology)	Affiliated department, Job title,Name	Institute for Liberal Arts and Sciences Program-Specific Professor,ITO SHINZABUROU Institute for Liberal Arts and Sciences Program-Specific Professor,SATOU TOORU Graduate School of Engineering Professor,KAWAKAMI YOUICHI

Group	Common Graduate Courses	Field(Classification)	Social Responsibility and Profitability

Language	Japanese	Old group		Number of credits	0.5

Hours	7.5	Class style	Lecture	Course offered year/period	2019・ Intensive, First semester

Day/period	Intensive	Target year	Graduate students	Eligible students	For science students

[Outline and Purpose of the Course]

研究をこれから始める大学院生に責任ある行動をする研究者として身につけておくべき心構えを講述する。研究者としての規範を保っていかに研究を進めるか、また研究成果の適切な発表方法など、研究倫理・研究公正についてさまざまな例を示しながら、科学研究における不正行為がいかに健全な科学の発展の妨げになるか、またデータの正しい取扱いや誠実な研究態度、発表の仕方が、自らの立場を守るためにもいかに重要かを講義する。さらに、研究費の適切な使用と知的財産や利益相反について学ぶ。講義に続いてグループワークを行い、与えられた仮想課題を自らの問題として考え、解決方法のディスカッションを行う。

[Course Goals]

第１講～第４講を通じて、研究者としての責任ある行動とは何かを修得する。科学研究における不正行為の事例学習、討論を通じて、誠実な研究活動を遂行する研究者の心得を身につけ、最後に研究倫理・研究公正についてのe-ラーニングコースを受講し、理解度を確認する。

[Course Schedule and Contents)]

第１講　科学研究における心構え－研究者の責任ある行動とは－
１．研究者の責任ある行動とは（学術活動に参加する者としての義務）
２．不正の可能性と対応
３．実験室の安全対策と環境への配慮
４．データの収集と管理－実験データの正しい取扱い方－
５．科学上の間違いと手抜き行為の戒め
６．誠実な研究活動中の間違いとの区別
７．科学研究における不正行為
第２講　研究成果を発表する際の研究倫理公正
１．研究成果の共有
２．論文発表の方法とプロセス
３．科学研究における不正行為（典型的な不正）
４．データの取扱い（データの保存・公開・機密）
５．その他の逸脱行為（好ましくない研究行為）
６．研究不正事件（シェーン捏造事件）
７．不適切な発表方法（オーサーシップ、二重投稿）
第３講　知的財産と研究費の適正使用
１．知的財産の考え方（知的財産の確保と研究発表）
２．研究資金と契約

Continue to 研究倫理・研究公正（理工系）(2)↓↓↓

研究倫理・研究公正（理工系）(2)

３．利益相反（利害の衝突と回避）
４．公的研究費の適切な取扱い
５．研究者・研究機関へのペナルティー
６．事例紹介（ビデオ：分野共通４件）
７．結語
第４講　グループワーク
１．例示された課題についてグループ・ディスカッションと発表
２．日本学術振興会「研究倫理ラーニングコース」の受講と修了証書の提出

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

第１～４講の全てに出席と参加の状況、ならびに学術振興会e-learningの修了証の提出をもって合格を判定する。

[Textbook]

日本学術振興会「科学の健全な発展のために」編集委員会 『科学の健全な発展のために－ 誠実な科学者の心得－』（丸善出版）ISBN:978-4621089149（学術振興会のHP（https://www.jsps.go.jp/j-kousei/data/rinri.pdf）より、テキスト版をダウンロード可能）

[Reference book, etc.]

（Reference book）
米国科学アカデミー 編、池内 了 訳 『科学者をめざす君たちへ―研究者の責任ある行動とは』（化学同人）ISBN:978-4759814286
眞嶋俊造、奥田太郎、河野哲也編著 『人文・社会科学のための研究倫理ガイドブック』（慶応義塾大学出版会）ISBN:978-4766422559
神里彩子、武藤香織編 『医学・生命科学の研究倫理ハンドブック』（東京大学出版会）ISBN:978-4130624138
野島高彦著 『誰も教えてくれなかった実験ノートの書き方』（化学同人）ISBN:978-4759819335
須田桃子著 『捏造の科学者 STAP細胞事件』（文藝春秋）ISBN:978-4163901916

[Regarding studies out of class (preparation and review)]

日本学術振興会「研究倫理ラーニングコース」の受講

[Others (office hour, etc.)]

第１～３講は土曜２，３，４限に行う。第４講はグループワークを中心として講義の翌週または翌々週の土曜１，２または３，４限に実施する。

Numbering code	G-LAS02 80001 SE48		
Course title <English>	大学院生のための英語プレゼンテーション Presentation for Graduate Students	Affiliated department, Job title,Name	Institute for Liberal Arts and Sciences Senior Lecturer,RYLANDER, John William
Group	Common Graduate Courses	Field(Classification)	Language and Communication
Language	English	Old group	Number of credits: 1
Hours: 15	Class style: Seminar	Course offered year/period	2019・ Intensive, First semester
Day/period	Intensive	Target year: Graduate students	Eligible students: For all majors

[Outline and Purpose of the Course]

This course is designed to provide graduate students with an opportunity to develop their ability and confidence when presenting field-specific content to an informed audience. Giving presentations in an academic setting, whether it is in a classroom, laboratory context, or at a conference, has become increasingly necessary for students at the graduate level. Course content extends from how to greet the audience to how to answer audience questions.

[Course Goals]

Students successfully completing this course will be able to do the following:

- Create an appropriate presentation slideshow for a conference or a research laboratory presentation;
- Clearly introduce and provide an overview of the talk through appropriate signposting;
- Properly display visual aids to enhance audience understanding of research data;
- Use posture and movement to engage the audience;
- Use gestures and gaze to emphasize information and connect with the audience;
- Produce a presentation; and
- Answer audience questions.

[Course Schedule and Contents)]

Session 1: Purpose and structure of academic presentations
Session 2: Topic selection and development
Session 3: Information organization: From greetings to goodbyes
Session 4: Creating effective slideshows and displaying research data
Session 5: Body language and gestures
Session 6: Answering audience questions
Session 7: A special focus on data significance
Session 8: Student presentations and instructor feedback

[Class requirement]

This course has a limit set on student enrollment. In the case where many students wish to enroll in class, a lottery system will decide inclusion.

Continue to 大学院生のための英語プレゼンテーション(2)↓↓↓

大学院生のための英語プレゼンテーション(2)

[Method, Point of view, and Attainment levels of Evaluation]

30% Active Participation
30% Slideshow Creation
40% Main and Minor Presentations

[Textbook]

Not used

[Reference book, etc.]

（Reference book）
All course materials will be provided to the students by the teacher.

[Regarding studies out of class (preparation and review)]

Students will be asked to work on several smaller in-class talks and one larger presentation as their primary out-of-class homework assignment.

[Others (office hour, etc.)]