Course number U-ENG23 22051 LJ55	工業数学B1(T1・T2)(2)
Course title (and course title in English) 工業数学B1 (T1・T2) Instructor's name, job title, and department of affiliation Graduate School of Global Environmental Studies	[Textbooks] None.
Target year 2nd year students or above Number of credits 2 Year/semesters 2021/Second semester	[References, etc.]
Days and periods Wed.5 Class style Lecture Language distriction Japanese	(Reference books) Useful material is introduded during the lecture.
[Overview and purpose of the course]	[Study outside of class (preparation and review)]
The course introduces theory of complex functions and its applications.	Basic Calculus
[Course objectives]	(Other information (office hours, etc.))
To understand the properties of regular function. To learn Taylor expansion and Laurent expansion. To calculate residues. To learn some applications for engineering.	KULASIS system will be used to contact with registered students.
11 0 0	*Please visit KULASIS to find out about office hours.
[Course schedule and contents] Introduction[2times]:	
Definition of complex numbers, complex plane and review of vector analysis	
Derivative of complex functions, Cauchy-Riemann equations, Concept and properties of regular functions, Cauchy's integral theorem, Cauchy's integral formula, Taylor series and Laurent series, Classification of singularities, Residue theorem, Various complex functions and their properties. Application of theory of complex functions[4times]: Application of residue theorem to calculation of definite integrals, Multivalued functions. Learning achievement test[1time]: Learning achievement test.	
Feedback	
[Course requirements] Basic Calculus (From the university curriculum: Calculus A and B, Advanced Calculus A). [Evaluation methods and policy]	
Term-end examination and attendance.	

	er	U-ENG23	22051 LJ55							
	nd course le in 工業数学B1(T3・T4) Engineering Mathematics B1				nam and	ructor's ne, job ti departn ffiliation	nent	Graduate School of Engineering Associate Professor,SAITOU JIYI		
larget year	2nd year	r students or abo	ve Number	of cred	lits	2	Year	/semesters	2021/Second semester	
Days and periods I	ri.3	Cla	ss style	Lectur	e			Language of instruction	Japanese	
[Overview an	d pur	pose of th	e course]							
The course intro	duces	theory of co	mplex functi	ions and	its a	pplicat	ions.			
[Course obje	ctives]								
							xpansi	on and Laure	nt expansion. To	
calculate residue	s. 101	earn some a	applications 1	for engin	ieeri	ng.				
[Course sche		and conte	nts]							
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integral theorem singularities, res			l formula, Ta	iylor exp	bansi	ion, Lau	irent e	xpansion, typ	es of isolated	
singularities, res	iuuc ui	leorem								
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工業数学B1(T3・T4)(2)

[Textbooks]

Instructed during class None.

[References, etc.]

(Reference books) Introduced during class

[Study outside of class (preparation and review)] A Report is assigned for every class for review.

(Other information (office hours, etc.))

Only T1 and T2 class students can take the class.

Course number U-ENG20 42105 LJ77	工学倫理(2)
Course title (and course title in English) 工学倫理 English) Graduate School of Informatics Professor,KANDA TAKAYUKI Graduate School of Engineering Professor,MATSUBARA ATSUSHI Graduate School of Engineering Professor,SHIRAISHI MASASHI Graduate School of Engineering Professor,SHIRAISHI MASASHI Graduate School of Letters Associate Professor,KODAMA SATOSHI Graduate School of Letters Associate Professor,KODAMA SATOSHI Graduate School of Letters Associate Professor,KODAMA SATOSHI Graduate School of Letters Associate Professor,MATSUSAKA SHUJI Graduate School of Letters Associate Professor,MATSUSAKA SHUJI Graduate School of Engineering Professor,MATSUSAKA SHUJI Graduate School of Engineering Professor,TATSUSAKA SHUJI Graduate School of Engineering Professor,TADA SAYUKI Graduate School of Engineering Professor,TADA TADASHI Graduate School of Engineering Professor,MURA MASAYUKI Graduate School of Engineering Professor,MURA KEN Graduate School of Engineering P	 This lecture focus on various ideas in ethics (utilitarianism, deontology, virtue ethics, professional ethics etc.) which will be useful for thinking about particular ethical problems in engineering ethics. This Lecture will be conducted online by using zom. (5/6) "Engineering Ethics as a Professional Ethics:" This lecture discusses basic ideas of engineering ethics in comparison with other fields of applied ethics. In particular, it discusses the characteristics of engineering ethics as professional ethics and what engineers as professionals are required to do. (5/13) "Ethics for Engineers" Engineers have to go through some ethical issues about research, development, design, manufacturing, and maintenance. In particular, the ethical decisions of engineers need to be considered for society and environment. (5/20) Press Release is an essential process for introducing the research to our society through various medias. In this lecture, issues related to Press Release will be addressed and discussed with several examples including SNS release. Lecture will be conducted by Zoom. (5/27) "Ethics in Water Supply." It is a basic right in a society that a person can receive and use safe water in sufficient quantity. In addition, a person of water supplier and an engineer is discussed. It is given by Zoom. (6/3) "Forensic Analysis" Forensic reports are sometimes requested by the court in order to clarify the charge of incidents. The nylon rope incident, the Wakayama curry poisoning incident, and the pig iron incident are explained as examples. How to write the forensic report is explained in order to avoid the ethical problems. (Zoom& Youtube) (6/10) "Patents and Ethics (Part 1)" This course will teach the students about 1) patent systems which protect inventions and research results and 2) ethical issues in patents. The first class, in preparation for the next subject of patent ethics, introduces Japan's patent system with comparis
Target year 4th year students or above Number of credits 2 Year/semesters 2021/First semester	actual case studies on ethical and legal issues in patents. (6/24) "Urban Planning and Ethics"
Days and periods Thu.3 Class style Lecture Language distriction Japanese	The lecture focuses on the norms regulating the actions of the engineers involved in planning and designing urban areas, as well as on the normative consciousness required to facilitate such planning and design,
[Overview and purpose of the course] Modern ethics based on engineering aspect are becoming essential to present engineers and scientists. Instructors from various faculties give lectures about ethics in their research fields. [Course objectives] The goal of this class is to understand engineering ethics, and to develop the ability to judge by yourself when you encounter ethical issues. [Course schedule and contents] (4/8) The central topic is what is ethics for engineers and what is significance of studying ethics for engineers. (4/15) "General research ethics" Lectures on the concept of writing academic papers with ethics. (4/22)" Ethical Theories for Engineering Ethics" Continue to T学倫理(2)↓↓↓	 demonstrating some examples on urban transport planning. This will be given via Zoom. (7/1) "General research ethics of synthetic chemistry" Lectures on the concept of writing academic papers and patents of synthetic chemisty with ethics. (7/8) Architecture has developed by imitating beautiful buildings, but in recent years there has been an increase in the number of cases where copyright disputes have arisen. In addition, the appearance of architecture often causes landscape controversy because of its influence on the surrounding environment. Issues concerning the ethics and sociality of architecture are discussed while introducing overseas lawsuits and design processes. (7)15) The materials engineer may stand on the side using materials as well as a side supplying materials. Some examples are introduced and, by this lecture, are argued about an ethic found from each situation by materials engineer. Note that this lecture is going to be carried out in ZOOM, but may be changed to the ondemand on account of the speaker. (7)29) "Engineer ethics in mechanical design" Engineer ethics is not a passive and passive thinking that issues the action of simply following existing norms, but a more active and creative thinking to decide and design noe's own actions. It requires the logical thinking and ethical thinking necessary for engineers. This is explained with past cases in mechanical design.
工学倫理(3)	
L 子倫理(3) [Course requirements] None [Evaluation methods and policy] Class participation and reports. [Textbooks] Lecture materials will be distributed. [References, etc.]	Course number U-ENG20 12108 LJ77 Course itile (and course itile English) U-ENG20 12108 LJ77 Course itile (and course itile in English) U-ENG20 12108 LJ77

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[References, etc.] (Reference books)

[Engineering Ethics (Revised Edition)] (CORONA PUBLISHING CO., LTD.) ISBN:978-4-339-07798-

[World of Engineering Ethics (3rd Edition)] (Morikita Publishing Co., Ltd.) ISBN:978-4-627-97303-9

[Study outside of class (preparation and review)]

The assignment of the report will be given for each lesson

(Other information (office hours, etc.))

The class order is subject to change

*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

Category
 A course with practical content delivered by instructors with practical work experience

(2) Details of instructors' practical work experience related to the course

(3) Details of practical classes delivered based on instructors' practical work experience

Graduate School of Engineering Professor,HIKIHARA TAKASHI

Graduate School of Engineering Professor, KAWASE MOTOAKI Graduate School of Inform

Year/semesters 2021/Intensive, First semester

Language of instruction Japanese

rofessor, YAMASHITA NOBUO

and technology. Lectures are for understanding the role that technology is playing in modern society, for reconfirming importance to study engineering and to work as a researcher and engineer in society, and are to be opportunities to consider own future path. Essays are assigned in every lecture to summarize the lecture ontent and opinions of other students. content and opinions of other students. Schedule of the lectures are announced later.

Special lectures, l time, About basic knowledge and attitude as students who start to learn engineering, and the nole of engineering in society. Intensive lectures,6times, A series of lectures offered by special lecturers playing on global stages of science

Continue to 工学序論(2)↓↓↓

1 st year students or above Number of credits 1

Lecture

Engineering is to inquire after truth, to develop useful technologies, and to establish ways how to give back

Then, we offer a series of intensive lectures about how engineering can suggest solutions of current and future problems of our society, the value of technology, and the responsibilities that researchers and engineers

Students learn basic matters such as attitudes and responsibilities they are expected to take as a member of ocial community. They find value in studying engineering and become to consider what they do in future by inderstanding technology can suggest solutions of problems our society is facing, especially problems about

First, we offer special lectures regarding the basic knowledge that students in faculty of engineering are

Class style

Target year

expected to have.

are expected to fulfill.

[Course objectives]

[Course schedule and contents]

safety and security.

Days and periods Intensive

[Overview and purpose of the course]

evelopment results of technology to the society

Course number U-ENG20 32402 SE77
Course title Instructor's
(and course) 工学部国際インターンシップ 1 name, job title, title in Faculty of Engineering International Internship 1 and department Approved
English) of affiliation
Target year Brd year students or above Number of credits 1 Year/semesters 2021/Intensive, year-ro
Days and periods Intensive Class style Seminar Language distriction Japanese and Engl
[Overview and purpose of the course]
Acquisition of international skills with the training of foreign language through the internship programs hosted by the University, the Faculty of Engineering, or the undergraduate school the applicant belongs t
[Course objectives] The acquisition of international skills with the training of foreign language through the to internship prog
hosted by the University is the major expectation to the students.
[Course schedule and contents]
Overseas Internship, Itime, The contents to be acquired should be described in the brochure of each intern program.
Final Presentation, Itime, A presentation by the student is required followed by discussion among particip
[Course requirements]
Described in the application booklet for each internship program. The registrant is requested to have enough
language skills for the participation.
[Evaluation methods and policy] Marit rating is done based on the presentation or reports after each internship program. Each Departmen
responsible to identify if the credit earned by this subject to be included as mandatory ones or not. If the credit is not included in the undergraduate school in which the participant belongs to, the credit is granter
the Global Leadership Education Center as a optional credit. The number of credits, either 1 or 2, will be
determined depending on the contents and the duration of the program that the participant has participate
[Textbooks]
Course number U-ENG20 22403 SJ77
Course title Instructor's Graduate School of Engineerin
Course title (and course title in English)
Course title (and course) title in English) Target year Dud year students or above Number of credits 1
Course title (and course) fittle in English) Target year Days and periods Intensive Class style
Course title (and course title in English)
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Course title (and course) title in English) Jローイル・リーダーシップセミナー1(企業調査研究) Gibal Leadership Seminar 1(Study for methodology in a company) Instructor's name, job title, and department of affiliation Graduate School of Engineerin Senior Lecturer, YOROZU KAZ Graduate School of Engineerin Senior Lecturer, KOMIYAMA YO Target year 2nd year students or above Number of credits 1 Year/semesters 2021/Intensive, year-re Days and periods Intensive Class style Seminar Langup distudint Intensive, year-re The purpose of this course is to study about how worldwide leading company, institute, etc. make propos and find solutions for expanding their own technologies to the international market. Throughout hands-ou- training on their laboratory, students investigate the methodology of team organization, proposal, market prediction and conception ability by group works. After the investigation, students are expected to impro their comprehension and explanation capability. As extended exersice subject of this course, the Global Leadership Seminar II is opened in the second semester. ICourse objectives] The goal of this course is to improve student's comprehension and explanation capability for processes of proposal and expansion on the international market investigating worldwide leading companies by group work.
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Course title (and course) (ittle in English) パローバル・リーダーシップたミナー1(企業調査研究) Global Leadership Seminer 1(Study for methodology in a company) Instructor's name, job title, and department of affiliation Graduate School of Engineerin Senior Lecturer, YOROZU KAZ Graduate School of Engineerin Senior Lecturer, KOMIYAMA YO Target year Ind year students or above Days and periods Intensive Class style Seminar Lappap distinction The purpose of this course is to study about how worldwide leading company, institute, etc. make propos and find solutions for expanding their own technologies to the international market. Throughout hands-oo training on their laboratory, students in vestigate the methodology of team organization, proposal, market prediction and conception ability by group works. After the investigation, students are expected to improv their comprehension and explanation capability. As extended exersive subject of this course, the Global Leadership Seminar II is opened in the second semester. ICourse objectives] The goal of this course is to improve student's comprehension and explanation capability for processes of proposal and expansion on the international market investigating worldwide leading companies by group work. ICourse schedule and contents] Week 1, Guidance Week 2-13, Hands-on training Week 14, Pre-presentation Week 15, Final presentation International
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stigating companies in advance. Analyzing the result from hands-on training. Preparing presentation.	Acquisition of international skills with wth the training of foreign language through the participation to the international internship programs held by the Faculty of Engineering or its subsidiary bodies.
ther information (office hours, etc.)) v to register will be announced later. Students who want to join this course is requested to attend the first	[Course objectives]
S. Students are prohibited to skip hands-on training. Evaluation will be based on presentation.	The acquisition of international and foreign language skills through the participation to international
ase visit KULASIS to find out about office hours.	programs is expected. Detailed objectives of the participation should be identified by each program.
urses delivered by instructors with practical work experience]	[Course schedule and contents] Overseas Internship, 1 time, The contents to be acquired should be described in the brochure of each inter
ategory mnibus course delivered by invited lecturers and guest speakers from different companies, etc.	program. Final Presentation, Itime, A presentation by the student is required followed by discussion among partici
etails of instructors' practical work experience related to the course	
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Details of practical classes delivered based on instructors' practical work experience	Described in the application booklet for each internship program. The registrant is requested to have enclanguage skills for the participation.
	[Evaluation methods and policy] Marit rating is done based on the presentation or reports after each internship program. Each Departme
	responsible to identify if the credit earned by this subject to be included as mandatory ones or not. If the credit is not included in the undergraduate school in which the participant belongs to, the credit is granted as the second
	the Global Leadership Education Center as a optional credit. The number of credits, either 1 or 2, will b determined depending on the contents and the duration of the program that the participant has participant
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ガローバ()・リーダーシップセミナー II (イノベーションとその事業化)(2)	Course nun	iber U-	-ENG23 1	3001 LJ77	7 U-ENG2	23 13001	LJ73	
a goal is made through presentation of the proposal as well as a submitted report. [Textbooks]	Course title (and course ♯ title in In English)	1球工学総計 troduction t		Engineerir	na ng an	structor's ame, job ti nd departn f affiliation	tle, nent Graduate Sc Professor,Y Graduate Sc	hool of Engineering ONEDA MINORU shool of Engineering
Will be indicated as necessary.	Target year	Lat war at a	l	Number	r of credits		Associate Profe	essor,FUJIMORI SHINIČHIRO
[References, etc.]		· ·				2		2021/First semester
(Reference books)	Days and period			s style	Lecture		Language of instructio	Japanese
Will be indicated as necessary.	[Overview a	nd purpos	se of the	course]				
[Study outside of class (preparation and review)]								
Will be indicated as necessary.	[Course ob	ectives]						
(Other information (office hours, etc.))								
Course open period: October to January	[Course scl	nedule and	d conten	ts]				
*It depends on divisions which students belong to whether the earned credits are admitted as credits required for graduation. Please refer to the syllabus of your division.	Guidance,1tin Safety and En	ie,		•				
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Course num	Der U-EN	G23 23003 LJ55							
Course title (and course title in Pro English)		び演習(T1) atistical Analysis and	Exercise	name and e	uctor's e, job tit departm filiation	nent	Professor, TA Graduate School	ool of Energy Science KAYUKI KAMEDA f Global Environmental Studie ofessor,UEDA KAYO	
Target year	2nd year students	or above Number	of credit	ts	2	Year	/semesters	2021/First semester	
Days and periods	Tue.3,4	Class style	Seminar	r			Language of instruction	Japanese	
[Overview and	nd purpose o	of the course]							
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[Course obje	-	cept of probabilit							
of estimation an [Course sch The 1st Class: S	nd verification edule and co Significance of	and using them f ontents] f probability statis	for concre	te in	ferenti	al stat	istics.	nens and the principles	
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The concept of random variabl generating func	probability an es, the probabi ction, and the c	bilistic grasp of un d its basic theore ility distribution f haracteristic func- nation of random	m will be function, t	exp he p be e	lained. robabi xplaine	lity de ed. Mu	nsity function		
The characteris	tics and proper	ility distribution rties of various pr Poisson distribut	robability					ressing real phenomena ill be described.	
Sample distribu explained. In ac sample values,	ition, such as 2 ddition, regard a lecture will b	ing statistical esti	t distribut mations to oncept and	ion, o de d me	F distr rive pr ethod o	ibutio obabil f poin	n, and how to istic propertie t and interval	calculate them will be es of a population from estimation, and the	
		ivariate statistica						alysis of variance that	

The 150 - 140 Classes: Multivatate statistical analysis/regression analysis Based on the theory of probability statistics, multivariate analysis and the method of analysis of variance that are mainly used to analyze survey data will be described. In particular, the probabilistic model and the Continue to 確率統計解析及び演習(TT)(2) ↓ ↓ ↓ 確率統計解析及び演習(T1)(2)

confidence limits by taking the first order regression analysis as an example will be outlined.

<<Semester final examination>>>

The 15th Class: Feedback

[Course requirements] It is desirable that students have taken calculus and linear algebra.

[Evaluation methods and policy]

Grades will be evaluated by including the degree of active participation in lectures and exercises, the results of quizzes and intermediate tests, and so forth in the scores of regular tests. The details will be communicated by the professors at the beginning of the class. A passing score is 60 or more out of 100 points.

[Textbooks]

Kitamura, San Hori, T(eds.): "An Introduction to Probability and Statistics for Engineering.] (Asakura Publishing Co., Ltd.,) ISBN:9784254111132

[References, etc.]

(Reference books) Introduced during class

[Study outside of class (preparation and review)]

It is necessary to review based on lecture materials and to complete the report assignments given during the lecture.

(Other information (office hours, etc.))

It is divided into 4 classes and conducted as parallel lectures. Partial abbreviations or additions may be done depending on the number of classes in the year. Office hours are not set in particular, but questions are accepted during class/practice or at the professor's room (an appointment should be made in advance. The contact method will be communicated by the professors during the first lecture for each class).

				3003 LJ55	U-ENG23 2	umber
ention Research Institute NKAKITA EIICHI ention Research Institute essor,YAMAGUCHI KOSEI	Professor,NA Disaster Preve	ne, job title, department			計解析及び演習(T2) istic and Statistical Analysis ar	
2021/First semester	r/semesters	2 Yea	of credits	Number o	ear students or above	r 2nd y
Japanese	Language of instruction		Seminar	s style	,4 Clas	ods Tue.
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未更新 Course number U-ENG23 23003 LJ55 Course tit 確率統計解析及び演習(T3) name, job title, (and course Disaster Prevention Research Institut title in Probabilistic and Statistical Analysis and Exercis and department of affiliation Professor,HORI TOMOHARU English) 2nd year students or above Number of credits 2 Year/semesters Target year 2021/First semester Days and periods Tue.3,4 Class style anguage of instructi Semina Japanese [Overview and purpose of the course] Understanding the theory and method of probability statistical analysis as a basic method to cope with the uncertainty of natural and social phenomena subject to geotechnology. In particular, the goal is to understand the concept of probability and its basic theorem, master basic probability distribution and its usage, master thinking on statistical estimation tests, and understanding the basic methods of multivariate analysis. The lecture is a parallel lecture divided into four classes. [Course objectives] Getting familiar with the concept of probability and the basic theorem, and understanding various istributions that are widely used in the field of geotechnology and its properties and usage for design, and so forth. Additionally, being able to understand the basic nature of populations and specimens and the principles of estimation and verification and using them for concrete inferential statistics. [Course schedule and contents] The 1st Class: Significance of probability statistical method A lecture will be given on the significance, in terms of engineering, of probability statistics, and the necessity n general engineering will be outlined. The 2nd - 5th Classes: Probabilistic grasp of uncertain phenomena The concept of probability and its basic theorem will be explained. In particular, conditional probability, random variables, the probability distribution function, the probability density function, the moment enerating function, and the characteristic function will be explained. Multidimensional probability stribution and the transformation of random variables will also be discussed. The 6th - 9th Classes: Probability distribution model The characteristics and properties of various probability distributions effective for expressing real phenomena such as binomial distribution, Poisson distribution, normal distribution, and so forth will be described. The 10th - 12th Classes: Sample distribution and statistical estimation/test Sample distribution, such as X^2 distribution, t distribution, F distribution, and how to calculate them will be explained. In addition, regarding statistical estimations to derive probabilistic properties of a population from sample values, a lecture will be given on the concept and method of point and interval estimation, and the tatistical test method to verify the significance of engineering phenomena. The 13th - 14th Classes: Multivariate statistical analysis/regression analysis Based on the theory of probability statistics, multivariate analysis and the method of analysis of variance that are mainly used to analyze survey data will be described. In particular, the probabilistic model and the Continue to 確率統計解析及び演習(T3)(2)↓↓

霍率統計解析及び演習(T2)(2)

nfidence limits by taking the first order regression analysis as an example will be outlined.

<Semester final examination

The 15th Class: Feedback

[Course requirements]

is desirable that students have taken calculus and linear algebra

Evaluation methods and policy]

Grades will be evaluated by including the degree of active participation in lectures and exercises, the results of quizzes and intermediate tests, and so forth in the scores of regular tests. The details will be communicated by the professors at the beginning of the class. A passing score is 60 or more out of 100 points.

[extbooks]

Kitamura, S and Hori, T(eds.): $[\mbox{An Introduction to Probability and Statistics for Engineering}] (Asakura Publishing Co., Ltd.,) ISBN:9784254111132$

[References, etc.]

(Reference books) ntroduced during class

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[Study outside of class (preparation and review)]

It is necessary to review based on lecture materials and to complete the report assignments given during the lecture.

(Other information (office hours, etc.))

It is divided into 4 classes and conducted as parallel lectures. Partial abbreviations or additions may be done depending on the number of classes in the year. Office hours are not set in particular, but questions are accepted during class/practice or at the professor' s room (an appointment should be made in advance. The contact method will be communicated by the professors during the first lecture for each class).

*Please visit KULASIS to find out about office hours.

確率統計解析及び演習(T3)(2)

confidence limits by taking the first order regression analysis as an example will be outlined.

Semester final examination>>

The 15th Class: Feedback

[Course requirements]

It is desirable that students have taken calculus and linear algebra.

[Evaluation methods and policy]

Grades will be evaluated by including the degree of active participation in lectures and exercises, the results of quizzes and intermediate tests, and so forth in the scores of regular tests. The details will be communicated by the professors at the beginning of the class. A passing score is 60 or more out of 100 points.

[Textbooks]

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[References, etc.]

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[Study outside of class (preparation and review)] It is necessary to review based on lecture materials and to complete the report assignments given during the

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(Other information (office hours, etc.))

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<Semester final examination>>>

he 15th Class: Feedback

[Course requirements]

is desirable that students have taken calculus and linear algebra.

[Evaluation methods and policy]

Grades will be evaluated by including the degree of active participation in lectures and exercises, the results of quizzes and intermediate tests, and so forth in the scores of regular tests. The details will be communicated by the professors at the beginning of the class. A passing score is 60 or more out of 100 points.

extbooks]

Kitamura,S and Hori,T(eds.): $[\mbox{\sc An Introduction to Probability and Statistics for Engineering}] (Asakura Publishing Co., Ltd.,) ISBN:9784254111132$

[References, etc.]

(Reference books) ntroduced during class

Study outside of class (preparation and review)]

It is necessary to review based on lecture materials and to complete the report assignments given during the lecture.

(Other information (office hours, etc.))

It is divided into 4 classes and conducted as parallel lectures. Partial abbreviations or additions may be done depending on the number of classes in the year. Office hours are not set in particular, but questions are accepted during class/practice or at the professor's room (an appointment should be made in advance. The contact method will be communicated by the professors during the first lecture for each class).

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None										
[Evaluatio	n meth	ods and	polic	;y]						
[Textbook	s]									
•	-									
[Reference	es, etc.	1			_		_			
Referen		-								
[Study out	side of	f class (r	rena	ration and	d revie	w)1				
Locard Out	Side U	1 01000 (F	nepa	anon an	a 16416	••/1				
(Other inf	ormati	on (offic	e hou	ırs, etc.))						
(Other inf *Please visit					hours.					
					hours.					

										未更新		
Course nu	umber	U-EN	G23 1	3004 SJ10								
		山理及び演 ter Program		2) In Global Engineering of affiliation					Graduate School of Energy Science Associate Professor,HAKAMADA MASATAKA Graduate School of Energy Science Assistant Professor,CHIN YUUSEI			
Target yea	r 1st	Ist year students or above Number of credits 2 Year/semesters							2021/Second semester			
Days and peric	ods Mon.1 Class style Seminar Language disstuction Ja								Japanese			
[Overview	and p	ourpose o	f the	course]								
[Course o	bjectiv	/es]				_						
[Course s	chedu	le and co	ntent	s]								
,1time, ,1time, ,2times, ,2times, ,2times, ,2times, ,1time, [Course re None [Evaluatio	n met	-	polic	:v]								
[Reference (Referen		-										
[Study out	tside o	of class (p	orepa	ration and	d revie	w)]						
(Other inf	format	tion (offic	e hou	ırs, etc.))	_		_					
*Please visit	t KULA	ASIS to find	l out a	bout office	hours.							

未更新	
Course number U-ENG23 13004 SJ10	Course number U-ENG23 13004 SJ10
Course title and course title in English) Instructor's name, Job title, and department of affiliation affiliation associate Professor,SAWAMURA YASUO Graduate School of Engineering Associate Professor,SAWAMURA YASUO Graduate School of Engineering Assistant Professor,TAKAYA SATOSHI	Course title (and course title in English) Computer Programming in Global Engineering 在研究的中心,在中的中的中,中心,在中,在中的中,中心,在中,中心,在中,中心,在中,中,中,中,中,中,中,中,中,中,中,
arget year list year students or above Number of credits 2 Year/semesters 2021/Second semester	Target year Ist year students or above Number of credits 2 Year/semesters 2021/Second semest
Days and periods Mon.4 Class style Seminar Language d'instructor Japanese	Days and periods Thu.4 Class style Seminar Laquage distructor Japanese
Overview and purpose of the course]	[Overview and purpose of the course]
Course objectives]	[Course objectives]
[Course schedule and contents]	[Course schedule and contents]
Itime,	,1time,
2times,	,2times,
2times,	,2times,
2times, 2times,	,2times, .2times,
Atimes,	, times,
Itime,	, Itime,
[Course requirements]	[Course requirements]
None	None
[Evaluation methods and policy]	[Evaluation methods and policy]
[Textbooks]	[Textbooks]
[References, etc.]	[References, etc.]
(Reference books)	(Reference books)
[Study outside of class (preparation and review)]	[Study outside of class (preparation and review)]
(Other information (office hours, etc.))	(Other information (office hours, etc.))
Please visit KULASIS to find out about office hours.	*Please visit KULASIS to find out about office hours.

Course numb	Der U-EN	G23 23	3005 LJ55							
	course in in ish) 地球工学基礎数理(T1) Mathematics for Global Engineering ish)									
arget year	2nd year students	ear students or above Number of credits 2 Year/semesters							2021/First semester	
ays and periods Fri.1 Class style Lecture Laquage distinution Japanese										
[Overview and purpose of the course]										
[Course obje	ctives]									
[Course sch	edule and co	ontent	sl							
7times,										
3times,										
4times,										
1time,										
[Course requ	lirements]									
-										
[Evaluation r	nethods and	l polic	y]							
-										
[Textbooks]										
[Textbooks]										
[Textbooks] Original text										
Original text	etc 1									
Original text [References,	-									
Original text [References, (Reference	-						_			
Original text [References, (Reference	-				_		_			
Iniginal text IReferences, (Reference Not specified.	books)	prepa	ration and	d revie	w)]					
Original text [References, (References, Not specified. [Study outside]	e books) de of class (j			d revie	w)]					
Iniginal text IReferences, (References, (Reference) Not specified. IStudy outside Preview and revenues of the second secon	books) de of class (j	al text		d revie	w)]					
Iniginal text IReferences, (References, (Reference) Not specified. IStudy outside Preview and revenues of the second secon	e books) de of class (j	al text		d revie	w)]					
Iniginal text [References, (References, Not specified. [Study outside Preview and revealed	books) de of class (j	al text		d revie	w)]					

Course nur	nhor	U-FN	G23.2	3005 LJ55						未更新
Course nur	nder	U-EN	0232	2002 L322						
	ind course 地球工学基礎数理(T2) Mathematics for Global Engineering nglish)									
arget year	t year 2nd year students or above Number of credits 2 Year/semesters 2021/First semester									
Days and period	ls Fri.1		Clas	s style	Lecture	e			Language of instruction	Japanese
[Overview a	and pu	urpose o	of the	course]						
[Course ob	jectiv	es]								
[Course sc	hedul	e and co	nten	ts]						
7times,										
3times,										
4times, 1time,										
rume,										
[Course red	quiren	nents]								
[Evaluation	meth	ods and	polie	cy]						
[Textbooks]									
Original text										
[Reference	s, etc.]								
Referen	ce boo	oks)								
Not specified										
[Study outs	side of	f class (j	orepa	ration and	d revie	w)]				
Preview and r	eview	the origin	al text	t						
(Other info	ormati	on (offic	e ho	urs, etc.))						
		(,,						

Course number U-ENG23 23005 LJ55	未更新	Course number U-ENG23 23005 LJ55	未更新
Zourse title and course h地球工学基礎数理(T3) Mathematics for Global Engineering and	nstructor's ame, job title, Associate Professor, TANAKA SHUHEI Adepartment a fifiliation Professor, HIRAI YASUHIRO	Course title (and course title in English)	Instructor's name, job title, and department of affiliation Associate Professor,HARA YOSHITAK Graduate School of Energy Science of affiliation
arget year 2nd year students or above Number of credits ays and periods Fri.1 Class style Lecture Overview and purpose of the course]		Target year Ind year students or above Number of cred Days and periods Fri.1 Class style Lecture [Overview and purpose of the course] -	iits 2 Year/semesters 2021/First semester
Course objectives]		[Course objectives]	
Course schedule and contents]		- [Course schedule and contents]	
7times, 3times, 4times, Itime,		,7times, ,3times, ,4times, ,1time,	
[Course requirements]		[Course requirements] -	
[Evaluation methods and policy]		[Evaluation methods and policy]	
[Textbooks]		[Textbooks]	
Original text		Original text	
[References, etc.] (Reference books) Not specified.		[References, etc.] (Reference books) Not specified.	
[Study outside of class (preparation and review) Preview and review the original text	1	[Study outside of class (preparation and revie Preview and review the original text	w)]
(Other information (office hours, etc.))		(Other information (office hours, etc.))	
*Please visit KULASIS to find out about office hours.		*Please visit KULASIS to find out about office hours.	
Course number U-ENG23 23008 LJ73		構造力学 I 及び演習(2)	
Course title (and course 構造力学 I 及び演習 title in Structural Mechanics I and Exercises au	nstructor's ame, job title, nd department a faffiliation	[Evaluation methods and policy] Grade is given based on the final examination, mid-terr	n examination and reports.
English) of Farget year 2nd year students or above Number of credits		[Textbooks] To be informed by individual lecturer in his/her first le	cture
Days and periods Fri.1,2 Class style Seminar	Language of instruction Japanese	[References, etc.]	
[Overview and purpose of the course] The following topics are covered: external forces exerted stress; strain and displacement/deformation; cross section computation of displacement; buckling of column. Statica	al properties; relationship between stress and strain;	(Reference books) To be announced by individual lecturer in his/her first	lecture
[Course objectives]	iny determinate su detures are to be rocused on.	[Study outside of class (preparation and revie To be announced by individual lecturer in his/her first	/-
To understand the methods for studying structures at stati strain, and the relationship between them; to understand t		(Other information (office hours, etc.))	
[Course schedule and contents]		There are five classes which will be taken in the meant information and consultation hours) of the individual le	
Week 1: Introduction, Properties of forces, Equilibrium o Week 2: Statically determinate and indeterminate structur conditions of structures and reaction forces Week 3: Member forces of statically determinate trusses		*Please visit KULASIS to find out about office hours.	
Week 4: Shear force and bending moment diagrams of str Week 5: Influence lines Week 6: Stress-strain relationships Week 7: Section forces and stresses, Section properties < <learning check="" level="">> Week 8: Combination of stresses and Mohr's circle Week 9: Deformation of cross-section, Stress and strain d</learning>			
Week 10: Deflection of beam (2nd-order differential equa Week 11: Deflection of beam (4th-order differential equa Week 12: Conjugate beam method Week 13: Compatibility equations for statically indetermi Week 14: Buckling of columns < <final exam="">></final>	ation) tion)		
Week 15: Feedback			
[Course requirements] Calculus A and B			

Continue to 構造力学 I 及び演習(2)↓↓↓

f 1 20 液目(2) * * *

Course number U-ENG23 23008 LJ73 Gard course Instructors Index course Instructors Graduate School of Global Environmental Studies Course attraction Target year Ind year students or alway Number of credits 2 Year/semseters 2021/Second semester Days and periods Fri.1.2 Class style Seminar apprediated Japanese [Overview and purpose of the course] Seminar apprediated Japanese [Reference Sec.] (Reference Dooks) To be informed by individual lecturer in his/her first lecture [Study outside of class (preparation and review)] [Course objectives] To understand the methods for studying structures at static equilibrium conditions; to understand stress and strain, and the relationship between them; to understand the buckling phenomenon in columns. [Study outside of class (preparation and review)] (Course schedule and contents) Week 1: Introduction, Properties of forces, Equilibrium of forces Week 3: Share forces of statically determinate structures, Support conditions of structures and reaction forces Week 3: Share force and bending moment diagrams of statically determinate trues.
Image: job UP 小mme, job UP Graduate School of Global Environmental Studies Figlish) Structural Mechanics I and Exercises name, job UP, job School of Global Environmental Studies Figlish Structural Mechanics I and Exercises name, job UP, job School of Global Environmental Studies Figlish Figlish Graduate School of Global Environmental Studies Figlish Seminar angage distudies Job School (Global Environmental Studies Figlish Seminar angage distudies Job School (Global Environmental Studies Figlish Seminar angage distudies Job School (Global Environmental Studies Figlish Seminar angage distudies Job School (Global Environmental Studies Figlish Seminar
Target year pay and year students of along Number Of Cleurts 2 Constructions 2021/Second semester Days and periods Fri.1.2 Class style Seminar Lapage distudents Image distudents
[Overview and purpose of the course] The following topics are covered: external forces exerted on structures; properties of forces; sectional forces; stress; strain and displacement/deformation; cross sectional properties; relationship between stress and strain; computation of displacement/deformation; cross sectional properties; relationship between stress and strain; computation of displacement/deformation; cross sectional properties; relationship between stress and strain; and the relationship between them; to understand the buckling phenomenon in columns. [Course objectives] To understand the methods for studying structures at static equilibrium conditions; to understand stress and strain, and the relationship between them; to understand the buckling phenomenon in columns. [Course oschedule and contents] (Other information (office hours, etc.)) Week 1: Introduction, Properties of forces, Equilibrium of forces Week 2: Statically determinate and indeterminate structures, Support conditions of structures and reaction forces Week 3: Member forces of statically determinate beams Week 4: Shear force and bending moment diagrams of statically determinate beams
The following topics are covered: external forces exerted on structures; properties of forces; sectional forces; stress; strain and displacement/deformation; cross sectional properties; relationship between stress and strain; computation of displacement/deformation; cross sectional properties; relationship between stress and strain; computation of displacement/deformation; cross sectional properties; relationship between stress and strain; computation of displacement/deformation; cross sectional properties; relationship between stress and strain; computation of displacement/deformation; cross sectional properties; relationship between stress and strain; and the relationship between them; to understand the buckling phenomenon in columns. [Course oschedule and contents] Week 1: Introduction, Properties of forces, Equilibrium of forces Week 3: Member forces of structures and reaction forces Week 3: Member forces of statically determinate trusses Week 4: Shear force and bending moment diagrams of statically determinate beams
stress; strain and displacement/deformation; cross sectional properties; relationship between stress and strain; computation of displacement; buckling of column. Statically determinate structures are to be focused on. [Course objectives] To understand the methods for studying structures at static equilibrium conditions; to understand stress and strain, and the relationship between them; to understand the buckling phenomenon in columns. [Course schedule and contents] Week 1: Introduction, Properties of forces, Equilibrium of forces Week 3: Member forces of statically determinate structures, Support conditions of structures and reaction forces Week 4: Shear force and bending moment diagrams of statically determinate beams
[Course objectives] To understand the methods for studying structures at static equilibrium conditions; to understand stress and strain, and the relationship between them; to understand the buckling phenomenon in columns. [Course schedule and contents] Week 1: Introduction, Properties of forces, Equilibrium of forces Week 2: Statically determinate and indeterminate structures, Support conditions of structures and reaction forces Week 3: Member forces of statically determinate trusses Week 4: Shear force and bending moment diagrams of statically determinate beams
To understand the methods for studying structures at static equilibrium conditions; to understand stress and strain, and the relationship between them; to understand the buckling phenomenon in columns. (Other information (office hours, etc.)) There are five classes which will be taken in the meantime by corresponding teacher. Office hour (contact information hours) of the individual lecturer will be given in his/her first lecture. Week 1: Introduction, Properties of forces, Equilibrium of forces Week 2: Statically determinate and indeterminate structures, Support conditions of structures and reaction forces Week 3: Member forces of statically determinate trusses Week 4: Shear force and bending moment diagrams of statically determinate beams
strain, and the relationship between them; to understand the buckling phenomenon in columns. (Other information (office hours, etc.)) Image: Schedule and contents] There are five classes which will be taken in the meantime by corresponding teacher. Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture. Week 1: Introduction, Properties of forces, Equilibrium of forces *Please visit KULASIS to find out about office hours. Week 3: Member forces of statically determinate trusses Week 4: Shear force and bending moment diagrams of statically determinate beams
[Course schedule and contents] information and consultation hours) of the individual lecturer will be given in his/her first lecture. Week 1: Introduction, Properties of forces, Equilibrium of forces information and consultation hours) of the individual lecturer will be given in his/her first lecture. Week 2: Statically determinate and indeterminate structures, Support conditions of structures and reaction forces *Please visit KULASIS to find out about office hours. Week 3: Member forces of statically determinate trusses week 4: Shear force and bending moment diagrams of statically determinate beams
Week 6: Stress-strain relationships Week 7: Section forces and stresses, Section properties <-Learning level check>> Week 8: Combination of stresses and Mohr's circle Week 9: Deformation of cross-section, Stress and strain distribution Week 10: Deflection of beam (2nd-order differential equation) Week 11: Deflection of beam (4th-order differential equation)
Week 12: Conjugate beam method Week 13: Compatibility equations for statically indeterminate structures Week 14: Buckling of columns < <final exam=""> Week 15: Feedback</final>
[Course requirements] Calculus A and B Continue to 構造力学 T 反び演習(2)↓↓↓

Course nu	umber	U-ENG23 2	23008 LJ73						
Course title (and course title in English)		学 I 及び演習 al Mechanics I	and Exerci		Instructor's name, job ti and departm of affiliation	nent	Graduate School of Engineering Professor, YAGI TOMOMI		
Target yea	r 2nd y	ear students or abov	Number	of credi	ts 2	Year	/semesters	2021/Second semester	
Days and perio	ods Fri.1,	2 Clas	s style	Semina	r		Language of instruction	Japanese	
-		rpose of the							
The following topics are covered: external forces exerted on structures; properties of forces; sectional forces; stress; strain and displacement/deformation; cross sectional properties; relationship between stress and strain; computation of displacement; buckling of column. Statically determinate structures are to be focused on.									
[Course o	-	-							
		ethods for stud nship between						inderstand stress and	
suam, and u	ic relatio	iisiiip between	them, to u	idei stand	uie buekii	ing pric	nomenon m e	orumns.	
-		and content, Properties of	-						
Week 4: She Week 5: Infl Week 6: Strr Week 7: Sec < <learning Week 8: Con Week 9: Def Week 10: Do Week 11: Do Week 12: Co</learning 	ear force luence lir ess-strain tion forc level che mbination formation effection onjugate ompatibil uckling o m>> eedback	relationships es and stresses tck>> n of stresses an n of cross-sect of beam (2nd- of beam (2nd- of beam (4th- beam method lity equations f columns	oment diag s, Section pr nd Mohr's ci ion, Stress a order differ order differ	rams of s operties rcle nd strain ential equ	tatically de distributio lation) ation)	n	nate beams		
Calculus A a	and B					,	Continue to 構	造万学 反び演習[2]↓↓↓	

構造力学 | 及び演習(2)

[Evaluation methods and policy] Grade is given based on the final examination, mid-term examination and reports.

[Textbooks]

To be informed by individual lecturer in his/her first lecture

[References, etc.] (Reference books) To be announced by individual lecturer in his/her first lecture

[Study outside of class (preparation and review)]

To be announced by individual lecturer in his/her first lecture.

(Other information (office hours, etc.))

There are five classes which will be taken in the meantime by corresponding teacher. Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture.

Course number U-ENG23 23008 LJ73	構造力学 及び演習 (2)
	tool of Engineering YONO JIYUNJI Grade is given based on the final examination, mid-term examination and reports.
Target year 2nd year students or above Number of credits 2 Year/semesters 2	2021/Second semester To be informed by individual lecturer in his/her first lecture
	Japanese [References, etc.]
[Overview and purpose of the course] The following topics are covered: external forces exerted on structures; properties of force stress; strain and displacement/deformation; cross sectional properties; relationship betwee	ween stress and strain;
computation of displacement; buckling of column. Statically determinate structures are to	[Study outside of class (preparation and review)]
[Course objectives]	To be announced by individual lecturer in his/her first lecture.
To understand the methods for studying structures at static equilibrium conditions; to und strain, and the relationship between them; to understand the buckling phenomenon in colu	
[Course schedule and contents] Week 1: Introduction, Properties of forces, Equilibrium of forces Week 2: Statically determinate and indeterminate structures, Support conditions of structures and reaction forces Week 3: Member forces of statically determinate trusses Week 4: Shear force and bending moment diagrams of statically determinate beams Week 5: Influence lines Week 6: Stress-strain relationships Week 7: Section forces and stresses, Section properties < <learning check="" level="">> Week 8: Deformation of stresses and Mohr's circle Week 10: Deflection of beam (2nd-order differential equation) Week 11: Conjugate beam method Week 13: Compatibility equations for statically indeterminate structures Week 14: Duckling of columns <<-Final exam>> Week 15: Freedback</learning>	There are five classes which will be taken in the meantime by corresponding teacher. Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture. *Please visit KULASIS to find out about office hours.
[Course requirements] Calculus A and B Continue to 構造力	造力学T 反び演習 (2)↓↓↓

	umber	U-EN	G23 2	3008 LJ73							
Course title (and course title in English)	d course 特造力学 I 及び演習 structural Mechanics I and Exercises and department of affiliation Associa									duate School of Engineering ociate Professor,FURUKAWA AIKO	
Target yea	r 2nd y	year students	or above	Number	of cred	its	2	Year	r/semesters	2021/Second semester	
Days and peri	ods Fri.1	,2	Class	s style	Semina	r			Language of instruction	Japanese	
[Overview	and pu	urpose o	of the	course]							
stress; strair	and dis	placement	t/defoi	mation; cro	oss secti	onal	proper	ties; re	lationship bet	orces; sectional forces; tween stress and strain; e to be focused on.	
[Course o	bjectiv	es]									
									onditions; to u enomenon in c	inderstand stress and columns.	
[Course s	chedul	e and co	ntent	sl							
Week 4: Shi Week 5: Inf Week 6: Str Week 7: See < <learning Week 8: Co Week 9: De Week 10: D Week 10: D Week 11: D Week 12: C Week 14: B <<final exa<br="">Week 15: F</final></learning 	luence li ess-strain ction fore level ch mbinatic formatio eflection onjugate ompatibi uckling o m>> eedback	nes n relations ces and str eck>> on of stres n of beam of beam beam me ility equat of column	ships resses, ses an s-section (2nd-o (4th-o ethod tions fo	, Section pr d Mohr's ci on, Stress au order differe rder differe	operties rcle nd strair ential eq ential eq	dis uati uatic	tributio on) on)	n			
Calculus A		nental									

構造力学 | 及び演習(2)

[Evaluation methods and policy] Grade is given based on the final examination, mid-term examination and reports.

[Textbooks]

To be informed by individual lecturer in his/her first lecture

[References, etc.] (Reference books) To be announced by individual lecturer in his/her first lecture

[Study outside of class (preparation and review)]

To be announced by individual lecturer in his/her first lecture.

(Other information (office hours, etc.))

There are five classes which will be taken in the meantime by corresponding teacher. Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture.

Course numbe	r U-EN	G23 2	3010 LJ57					
	力学(T1・1 lamental Me		'S	n	nstructor's ame, job ti nd departn f affiliation	tle, nent		nool of Engineering ofessor,SAITOU JIYUN
arget year	2nd year students	or above	Number	of credit	s 2	Yea	r/semesters	2021/First semester
ays and periods N	lon.2	Clas	s style	Lecture			Language of instruction	Japanese
Overview and	l purpose o	of the	course]					
This class introdu								
application to en-	bodies are r	nainly	introduced			anics		
tudied in special	ized subjects	s are e	xplained.					
[Course objec	tives]							
The goal is to accontribute of the goal is to accontribute of the second	rticle system							
[Course schee	lule and co	onten	ts]					
Fundamental ma Simple harmonic			e and eiger	ivector, V	ector calc	ulus		
Laws of motion, Equation of moti coordinates, line Damped Harmon Work and Energy Work, Conservat	on, Velocity ar momentun ic Oscillator v, 2 times,	n and a , Drive	ingular moi en Harmoni	nentum, c c Oscillat	onservation, Reson	ance		
Non-inertial syst Galilean Transfo Coriolis force ar	mation, mot			oordinate	system			
Multi-particle sy Center of Mass, (omentum, c	oupled os	cillations	and th	eir mode	
Motion of rigid b Degree of freedo Rotation of a rigi	m, statics of	rigid b						
Foundation of an Constraint condit Generalized force	ion, Constra	int for	ce, General	ized coord	linate,			

Confirmation C	achievement, 1 time
	assessment is intended to measure students' knowledge,
	on the subject using quiz and viva-voce.
[Course require	rements]
It is desirable that	t students complete Calculus A, B and linear algebra A, B.
[Evaluation me	ethods and policy]
Evaluation will b	e based on assignments (13 or 14 times, 20~30 points), and an examination (70~80 points).
Students will sub	mit all assignments.
[Textbooks]	
Instructed during	class
[References, e	to 1
-	
(Reference I	
Introduced during	; class
[Study outside	e of class (preparation and review)]
	e of class (preparation and review)] ned for every class for review.
A Report is assign	
A Report is assign (Other inform	ned for every class for review.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.))
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.
A Report is assign (Other inform Only T3 and T4 c	ned for every class for review. ation (office hours, etc.)) class students can take the class.

500.05 m	umbe	U-EN	G23 2	3010 LJ57						
Course title (and course title in English) -般力学(T3・T4) Fundamental Mechanics										
Farget year End year students or above Number of credits 2 Year/semesters 2021/First sem								2021/First semester		
Days and periods Mon.4 Class style Lecture language distruction Japanese							Japanese			
introduced a		ated mechar	nics st	udied in sp	ecialized	1 sul	bjects ar	e expl	ained.	
	lti-pai	uire a systen ticle system ms.								
-		ule and co		ts]						
Fundamenta Vector calcı		nmatics, 1 tir	mee							
. Lotor enfor	ılus		mes,							
Laws of mo Equation of coordinates, driven harm Work and E	tion, 4 motic linea onic c nergy	n, Velocity momentum scillator, res	and ac and a sonanc	angular moi ce, coupled	mentum oscillati	, con	and the	ir moc	les	rmonic oscillator,
Laws of mo Equation of coordinates, driven harm Work and E Work, conso Non-inertial Galilean Tra	tion, 4 motic linea onic c nergy ervativ syste	n, Velocity a momentum scillator, res , 2 times, re force and	and ac and a sonand poten	angular mor ce, coupled tial, conser a rotating o	mentum oscillati vation o	, con ions f me	nservatio and the echanica	ir moc	les	rmonic oscillator,
Laws of mo Equation of coordinates, driven harm Work and E Work, conse Non-inertial Galilean Tra (Coriolis for Multi-partic	tion, ² motic linea onic c nergy ervativ syste ansfor rce an le sys	n, Velocity : r momentum scillator, res , 2 times, re force and ms, 1 time, mation, moti	and ac and a sonand poten ion in force	angular moi ce, coupled tial, conser a rotating c	mentum oscillati vation o	, con ions f me	nservatio and the echanica	ir moc	les	rmonic oscillator,
Laws of mo Equation of coordinates, driven harm Work and E Work, conse Work, conse Non-inertial Galilean Tr (Coriolis for Multi-partic Center of M Motion of ri Degree of fi	tion, 4 motic linea onic c nergy ervativ syste insfor rcce an le sys ass, c gid bo reedor	n, Velocity ; r momentum scillator, res , 2 times, re force and ms, 1 time, mation, moti d centrifugal tems, 1 time.	and ac a and a sonand poten ion in t force , of Mo s, rigid b	angular more ce, coupled tial, conser a rotating c omentum podies, Mor	mentum oscillati vation o coordina nent of i	, consions f me te sy	nservatio and the echanica ystem tia,	ir moc	les	rmonic oscillator,

一般力学(T3・T4)(2)

Confirmation of achievement, 1 time Examination

[Course requirements]

Elementary calculus and linear algebra

[Evaluation methods and policy] Examination: 85%, Weekly assignment: 15%

[Textbooks] Worksheet (in Japanese) is provided via web.

[References, etc.] (Reference books)

(Related URLs)

https://panda.ecs.kyoto-u.ac.jp/

[Study outside of class (preparation and review)] Preparation and reviewing are recommended, although the details are arbitrary.

(Other information (office hours, etc.))

No particular office-hour is set.

Course number	r U-ENG23 23013 LJ73				水理学及び演習(2)
	学及び演習 aulies and Exercises	Instructor's name, job title, and department of affiliation	Professor,GO Graduate Sch Professor,TO Graduate Sch Associate Profes Graduate Sch Associate Profe Graduate School of Associate Profe Disaster Prevo Disaster Prevo	ool of Engineering TOH HITOSHI ool of Management DA KEIICHI ool of Engineering ssor, NDA SHINICHIROU ol of Engineering ssor, SANJIYOU MICHIO folobal Environmental Studies fessor, HARADA ELJI ention Research Institute essor, KAWAIKE KENJI ention Research Institute sor, YONEYAMA NOZOMU	 Intermediate examination: Intermediate examination is carried out. Dimensional Analysis, Similitude [Ex:0.5 times]: Dimensional analysis, pi-theorem and similarity rule are explained and their exercises are implemented. Viscous Flow in Pipes [Lee:2times, Ex:1time]: Energy equation, frictional law, form drag loss, siphon and pipe flow are explained and their exercises are implemented. Open-Channel Flow [Lee:3times, Ex:2times]: Energy equation, momentum equation, open channel equation, specific energy, specific force, hydraulic jump
Target year 2	nd year students or above Number of cre	edits 2 Year/	/semesters	2021/Second semester	and analysis of gradually varied flow are explained and their exercises are implemented.
Days and periods W [Overview and Hydrodynamics b		ure raulic structure is exp	plained syster	Japanese natically in relation to	 Achievement confirmation: Comprehension check of course contents. Feedback
and steady flow re	elated to pipe flow and open channe aulics through exercises are cultivat	el are main topics. Sy			[Course requirements]
[Course object Systematic unders	tives] standing of fundamental hydraulics				Differential and integral calculus, linear algebra etc., standard mathematics of general education course, and Dynamics and electromagnetism etc., standard physics of general education course. Taking the credits for [Fundamental Physics A] and [Fundamental Physics B] is highly recommended before taking this class. Taking the credits for [Advanced Dynamics] is preferable.
-	ule and contents]				[Evaluation methods and policy]
<lecture(lec) 90<="" td=""><td>minutes:1 time, Exercises(Ex) 90mi</td><td>inutes:0.5 times></td><td></td><th></th><td>Based on the results of examinations</td></lecture(lec)>	minutes:1 time, Exercises(Ex) 90mi	inutes:0.5 times>			Based on the results of examinations
	uoyancy, Flotation Stability [Lec: 1 ure, buoyancy force, stability of floa		ned and their	exercises are	[Textbooks] Handout is used in the Lectures and Exercises.
Continuum dynan	id Dynamics [Lec:2times, Ex:1.5 ti nics, control volume method, contin lysis are explained and their exercis	nuum equation, mome	entum equatio	on and one-	[References, etc.] (Reference books)
 Potential Flows Bernoulli's theorem 	[Lec:1time, Ex:0.5 times]: m and two-dimensiional irrotationa	l flow is explained ar	nd their exerc	ises are implemented.	Non (Related URLs)
Deformation stres	nd Turbulence [Lec:2times]: s, Navier Stokes equation, shear str l velocity distribution of turbulent f		and frictional	loss, laminar and	(Non) [Study outside of class (preparation and review)]
	Exercise [Ex:1time]: heck regarding to each term is impl	emented.			Review the lecture contents. Prepare the exercises questions and review them.
		c	ontinue to 水	(理学及び演習(2)↓↓↓	Continue to 永理学及び演習(3)↓↓↓

Lecture is opened along with exercise. How to contact with instructors is announced during lecture and

水理学及び演習(3)

exercise.

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours.

ר ר

Course numb	er U-ENG23	13014 LJ15	U-ENG2	3 13014	LJ90		
	竟衛生学 vironmental Healtl	h	na an	structor's me, job tit d departm affiliation	tle, Pr nent Gra	ofessor,TA aduate School	of Global Environmental S XKANO HIROHISA of Global Environmental S ofessor, UEDA KAY
Target year	2nd year students or abo	ove Number	of credits	2	Year/se	emesters	2021/First semeste
Days and periods 1	Thu.1 Cla	ss style	Lecture		La	inguage of instruction	Japanese
Overview and	d purpose of th	e coursel	1				
[Course object	-						
health, which wi next generation, related fields.	ill serve as the fou	ndation for c	itizens who	are cons	scious of	their respo	ygiene, and public nsibility toward the e to the developmen
health, which win next generation, related fields. ICourse sche Health, illness, i and their relation and health effecte Environmental to from a toxicolog pollutants, etc.). Health effects of explained, focus actual examples. Ecological impact and the impact o examples. Pollution and glu explained, focus	ill serve as the four life, and the Earth dule and conter the shift of the server of the server the server of the server the server of the server server of the server of the server for the server of the server the server of the server of the server the server of the server of the server of the server the server of the server of the server of the server of the server the server of the server of t	ndation for c n , or as highly nts] environment mmental facto lied. s): Lectures v cusing on ph titon, and so ollutants (2 ti ms of pollutants ollutants on al pollutants on al problems (g past cases a	tal factors (rs will be give armaco(tox forth. mes): The I on by chemi (1 time): Tl the ecosyste 1 time): Pol nd the curr	1 time): ' xplained, n on the fice)kinet health effical subst he structu em will b llution ar ent situat	The conception of the concepti	their respo o contribute ept of heal cepts on th fects of env ogenous m nvironmen d air pollut haracteristi ted, while t	th and illness (disea e prevention of illness vironmental factors aterial (environmen tal pollutants will b tion, while taking up cics of the ecosystem taking up actual ental problems will l

	未更新
環境衛生学(2)	Course number U-ENG23 23015 LJ15
[Course requirements] None	Course title (and course title in English) Course title (and course Biology and Chemistry for Environmental Engineers English)
[Evaluation methods and policy]	Associate Hotessel, in A 1500/A Tomorray
in principle, the results will be evaluated based on attendance (about 10%) and a written test (about 90%).	Target year 2nd year students or above Number of credits 2 Year/semesters 2021/Second semester
[Textbooks]	Days and periods Tue.1 Class style Lecture Language distuition Japanese
Others; to be introduced from time to time during the lecture.	[Overview and purpose of the course]
	This course aims to learn basic chemistry and biology essential for environmental science and technology.
[References, etc.]	This course is divided into two parts. The first half is basic water chemistry and analytical chemistry. The
(Reference books)	second half is biology including structure of major biomolecules, central dogma and respiratory system and energy metabolism.
Others; to be introduced from time to time during the lecture.	energy metabolism.
	[Course objectives]
[Study outside of class (preparation and review)]	To learn basic chemistry and biology essential for environmental science and technology.
If knowledge of high school biology is insufficient, it is considered desirable to review every time. No particular preparations are necessary.	[Course schedule and contents]
A A A •	Chemical parameters in the aquatic environment, Itime, pH, concentration, activity and activity coefficient, acid
(Other information (office hours, etc.))	and bases in the aquatic environment
*Please visit KULASIS to find out about office hours.	Acid and base reaction in the aquatic environment,3times,Principle of acid base equilibrium. Logarithmic diagram and proton condition. carbonates in both closed and open systems. Methods to control the aquatic environment,2times,Alkalinity and Acidity. Coagulation, flocculation and
[Courses delivered by instructors with practical work experience]	sedimentation with logarithmic diagram. Midterm examination, Itime, Midterm examination is on 7th time around.
(1) Category	Cell and biomolecules,2times,Structure and function of cellar organelles and biomolecules such as lipids,
A course with practical content delivered by instructors with practical work experience	protein, nucleic acids. The central dogma, 3 times, DNA replication, transcription and translation.
(2) Details of instructors' practical work experience related to the course	respiratory system and energy metabolism,2times,Aerobic respiration and other type of respiratory systems o environmental microorganisms. confirmation of achievement, Itime,confirmation of achievement
(3) Details of practical classes delivered based on instructors' practical work experience	
	[Course requirements]
	None
	[Evaluation methods and policy]
	The grading is based on the score of a midterm examination and a regular examination.

	未更新
環境生物・化学(2)	Course number U-ENG23 33024 LJ73
[Textbooks] Bruce Alberts 『Essential細胞生物学(原書第4版)』(南江堂)ISBN:978-4524261994(It will be used for latter half of this class (biology part).)	Course title (and course title in English) 材料学 Instructor's name, job title, and department of affiliation Graduate School of Management Professor, YAMAMOTO TAKASHI Graduate School of Engineering Assistant Professor, TAKAYA SATOSHI
	Target year Brd year students or above Number of credits 2 Year/semesters 2021/First semester
[References, etc.] (Reference books)	Days and periods Mon.2 Class style Lecture Language of instruction Japanese
Introduced during class	[Overview and purpose of the course]
	Knowledge and techniques to use construction structural materials from micro-structures to macro-structures
[Study outside of class (preparation and review)]	are introduced.
Several reports will be given for preparation and review.	[Course objectives]
	The student will understand the properties, production and testing methods of concrete, steel, composite
(Other information (office hours, etc.))	materials etc. In addition, the student will understand the way of thinking for construction materials.
We appreciate active discussions and questions.	[Course schedule and contents]
*Please visit KULASIS to find out about office hours.	1. Introduction
	Classification of materials, history of construction materials, ethics for civil engineers and current topics are introduced 2. Basic structure Bond between atoms, ideal strength, dislocation, yield, and mechanical properties are introduced. 3. Metallic materials & steel Metallic materials & steel Metallic materials as the furnace, refine, steel, transformation, heat treatment and metallic new materials are introduced. 4. Matellic corrosion & protection Corrosion and corrosion protection of metals are explained. 5. Polymer materials Resin, rubber, fiber, polymer concrete and organic new materials are explained. 6. Cement Types of cements, ehemical composition, chemical compound, hydration, hydration heat and blended cement are introduced. 7. Admixture for concrete Chemical admixture, water-reducing admixture, air-entraining admixture, mineral admixture, pozzolanic reaction, latent hydratulic property and high-range admixture are introduced. 8. Aggregate & mixing water, fresh concrete Aggregate, mixing water and fresh concrete (workability, rheology, consistency, segregation) are explained. 9. Mechanical properties of concrete The water cement ratio, compressive strength, flexural strength, tensile strength and toughness of concrete are introduced. 10. Durability of concrete Durability, alkali-silica-reaction, shrinkage are introduced. 11. Corrosion of reinforcing steel in concrete Corrosion of concrete Corrosion of reinforcing steel in concrete Corrosion of rei

材料学(2)	Course number U-ENG23 33025 LJ73
Aix desig of concrete is explained. 3. High performance concrete and reinforcement High performance concrete and special reinforcement are introduced. 4. Inspection & investigation methods for concrete structures urface hardness, ultrasonic pulse, elastic wave, thermography, half cell potential and polarization resistance	Course title (and course title in English) Concrete Engineering English
are explained.	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second semester
 Feedback Achievement of learning is confirmed and the result is fed back with regard to questions. 	Days and periods Fri.2 Class style Lecture Language distinction Japanese
[Course requirements]	[Overview and purpose of the course]
"Basic Physical Chemistry" in Liberal Arts and General Education Courses.	The basic theory and the design technique of reinforced concrete (RC) and prestressed concrete (PC) structure are explained with the mechanical behavior of the materials introduced in IsquoConstruction
[Evaluation methods and policy]	Materialsrsquo. Be sure and attend the lecture with your text book. Some homework are assigned to enlarge your knowledge
Evaluate considering the scores of final examination and the submitted reports.	
[Textbooks]	[Course objectives]
Toyoaki Miyagawa and Keitetsu Rokugo 『Construction materials』 (Asakura ltd) ISBN:9784254261622 (in Japanese)	Students of this class learn to understand the basic theory and the design technique of reinforced concrete (RC) and prestressed concrete (PC) structure, and calculate the resistance and the response of simple RC/PC member.
	[Course schedule and contents]
[References, etc.] (Reference books) Introduced during class	Fundamental of design,2times,The design method, the safety factor and etc. are explained. Structural materials, Itime,The mechanical behavior of concrete, reinforcing steel and polymer material is explained. Bond behavior and anchorage,2times,The mechanism of bond and anchorage is explained. Flexural and compression behavior,2times,The cracks and deflection of RC member are explained.
(Related URLs)	Shear and torsion behavior,2times, The mechanical behavior and the capacity of RC section subjected to the
http://csd.kuciv.kyoto-u.ac.jp/(Department of Urban Manatement, Structures Management Engineering (Atsushi Hattori)) http://sme.kuciv.kyoto-u.ac.jp/(Department of Civil & Earth Resources Engineering, Structural Materials Engineering (Takashi Yamamoto)) http://sme.kuciv.kyoto-u.ac.jp/(Department of Civil & Earth Resources Engineering, Structural Materials Engineering (Satoshi Takaya)) [Study outside of class (preparation and review)]	flexural moment and/or the normal force are explained. Crack and deflection,2times,The mechanical behavior and the capacity of RC section subjected to the shear force and/or the torsional moment are explained. Verification method of performance over time, Itime,The verification method of performance over time including the corrosion of the reinforcing steel is explained. Others,Itime,The latest research and technique relating to concrete engineering are introduced. Achievement confirmation,Itime,Achievement of learning is confirmed.
1. Preview of today's chapter.	[Course requirements]
2. Review of each mini-quiz based on explanation.	Students of this class had better take 'Structural Mechanics I and Exercises' in 2nd year and 'Construction Materials' in 3rd year.
(Other information (office hours, etc.))	Evaluation methods and policy
Visiting Atsushi Hattori at rm C1-218, Katsura, Takashi Yamamoto at rm C1-456, Katsura and/or Satoshi Takaya at rm C1-454, Katsura are welcome.	[Evaluation methods and policy] Grading is based on the result of a term-end examination with the homework and attendance.
Please visit KULASIS to find out about office hours.	

								未更新
コンクリート工学(2)	Course n	umber	U-ENG23	33030 LJ73				
Textbooks] Kobayashi: Concrete Engineering, Morikita Publishing Co., Ltd., 3,240JPY ISBN:9784627425651 References, etc.] (Reference books) .Inoue, et al.: Zusetu Concrete structures, Gakugei Publishing Co., Ltd., 3,024JPY ISBN:9784761525958	Course title (and course title in English)	水文学基			lr n. ai	nstructor's ame, job t nd departr f affiliatior	Professor Graduate School of Professor itle, Graduate Associate P Disaster F Associate P Graduate	School of Engineering ,TACHIKAWA YASU ⁷ /Adward Integralo Studies ii Huma Surit, ,TAKARA KAORU School of Engineering trofessor,ICHIKAWA YUTA revention Research Insti trofessor,SAYAMA TAKAH School of Engineering cturer,YOROZU KAZU/
Study outside of class (preparation and review)]	Target yea	r 3rd yea	ir students or abov	Number	of credits	s 2	Year/semeste	2021/First semester
. Preview of today's chapter.			01		x .			
. Review of each mini-quiz based on explanation.	Days and peri			s style	Lecture		Language of instr	ution Japanese
(Other information (office hours, etc.))			pose of the	-				cale physical processes
	oceans and i the land sur Hydrology i subsurface f ICourse o The aim of the hydrologica ICourse s The hydrolo is provided. Precipitation the mechanian Interception governing e Groundwate Surface run wave equati kinematic w Solar radiati mechanism	and surface faces as pro- s the study er-related l processes low, and r bjectives he course to phenome checking gic cycle, The role o , l time, Th sm of rada and infiltr quation of r flow, liti r flow, liti r flow, is do off, 3 times, on is deriv ave model on and eno of global v and transp nergy bala	cess, and trans cecipitation, it y of the move disasters, det such as solativer flow are seen as solativer flow are solativer flow are solation and the constant of the solation of the solation of the solation, time, The eco of thydrology te mechanism ar rainfall lobs ration, Itime, The mechanise the revel from the 1 are provideed from the 1 are provide and the revel from the 1 are provide and the solation, 3 time ance at land s spiration is do the spiration is do the spiration is do the solation.	port of vape ene the flow ment of wards velop water r radiation, described. and the basic engineering its] its] Intents of the in the field of precipiti servation are rhe process flow and the anism of gr he continuit sm of rainfa momentum 1. I time,Energt its influence s,The mech urface and t escribed.	or in the ath of water of ter on and resources precipitati c hydrolog backgrour e class is o of civil eng ation is des e described of precipit basic equ oundwater ty and mon all-runoff i equation of yg and wat c on hydrolog	mosphere on and um under the and pressection of the section of the ical procession of the section of the did for ward section of the section of the generation of the secti	e. The vapor chan der the land suffi- land surface and reve the environn transpiration, inf esses to obtain th ter resources devi- d and the concep is described. A numerical rainf erception by trees ipotential infiltra enception by trees quations of water unious slope is ex- ow, and then the driven by solar ra e is introduced. energy cycle thr y layer is introdu Numerical repre	t of the hydrological cyc all prediction model and s is introduced. Then the tion are explained. l equation to represent

水文学基礎(2)	Course number U-ENG23 33032 LJ73
present channel network structure is introduced, then typical flow routing methods are described. tydrological model, ltime, A physically-based hydrological model which consists of various hydrological rocesses is described. Typical lumped hydrological models are also introduced. ociety and hydrology, ltime, How the hydrological sciences are related to the society is described through arious examples.	Course title (and course title in English) 水資源工学 Instructor's Name, job title, and department of affiliation Graduate School of Engineering Professor, TACHIKAWA YASU Disaster Prevention Research Insti Professor, HORI TOMOHARU Graduate School of Engineering Associate Professor, KIM SUNM
Achievement confirmation, 1 time, Quiz, report and the final examination is conducted to measure tudents#039 knowledge, skill and aptitude on the subject.	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second semesters
[Course requirements]	Days and periods Wed.2 Class style Lecture Language distinction Japanese
t is desiarable to study Hydraulics (2nd year) and probability and statistical analysis (2nd year).	[Overview and purpose of the course]
[Evaluation methods and policy] The score is evaluated comprehensively with quiz, report, and the final examination.	Methodology for water resources development, management and conservation is introduced from the engineering viewpoint. Main topics are distribution of water resource on the earth, grasp and prediction of water demand, planning and design of water resources systems, estimation and prediction of river flow, policy and water rights, and operation of reservoirs.
Textbooks]	[Course objectives]
	The goal is to understand the basic theory and methodology for water demand prediction, water resources systems design, river flow estimation, water resources policy and reservoir operation.
[References, etc.]	[Course schedule and contents]
(Reference books)	Water resources systems planning, ltime, Target of water resources engineering. Temporal and spatial distribution of water resources on the earth.
[Study outside of class (preparation and review)]	Development of water resources,2times, Concept and measures of water resources development. Efficiency and limit of water resources developm
(Other information (office hours, etc.))	Design of water resources systems, ltime, Estimation of water demand and design of water resources systems.
Please visit KULASIS to find out about office hours.	Operation and management of water resources systems,2times, Planning and management, off-line and real time operation, optimization of reservoir control.
	Social and legislation system for water resources, ltime, Social and legislation system for water resources, water right, public and private water, management and defect.
	Water resources evaluation (1): Hydrologic predictions, ltime, Hydrologic predictions play an important role for water resources evaluation. The basic role of hydrologic predictions for a river planning and river management are explained.
	Water resources evaluation (2): Hydrologic frequency analysis,4times, The basis of the hydrologic frequency analysis is explained. Hydrologic variables used for the river planni and water resources planning are introduces as probabilistic variables; the concept of non-exceedance and exceedance probability and T-year probabilistic hydrologic variables are explained. Then, the procedure of hydrologic frequency analysis, distribution functions used for the frequency analysis, and estimation methe of parameters of a distribution function is described. Continue to 水資源工学(2)↓↓
水資源工学(2)	大更新 Course number U-ENG23 33040 PJ73
Veter resources evaluation (3): Real-time hydrologic forecasting,2times, Methods for real-time trainfall forecasting and river discharge forecasting are focused.	Course number U-ENG23 33040 PJ73 Graduate School of Engineering Professor,UNO NOBUHIRO Disaster Prevention Research Ins Professor.HATAYAMA MICHIN

Achievement confirmation, I time, Achievement assement is intended to measure students knowledge, skill and aptitude on the subject.

[Course requirements]

It is desirable that students have already learned fundamental hydrology and systems analysis for planning and management.

[Evaluation methods and policy]

Grading is done based on the mark on regular examination with reference to the degree of positive participation to classes and assignments. Minimum passing grade is sixty percent.

[Textbooks]

Not used

[References, etc.]

(Reference books) Introduced during class

[Study outside of class (preparation and review)]

t is necessary to review based on lecture materials and to complete the report assignments given during the lecture.

(Other information (office hours, etc.))

Active participation is expected in the lectures through questions and so forth. The content and number of lectures may change depending on circumstances. In addition, some lecture items may be replaced with special lectures given by researchers and others outside the university on current topics.

										未更新
Course nu	Imber	U-ENO	323 3	3040 PJ73						
Course title (and course title in English)		² 及び実習(ving and Fie		以前入学者 actice)	nan and	tructor's ne, job ti I departn ffiliation	nent	Professor,UI Disaster Prev Professor,HA Graduate Sc Disaster Prev Associate Pr Graduate Sc Graduate Sc Graduate Sc Graduate Sc	hool of Engineering NO NOBUHIRO rention Research Institute TAYAMA MICHINORI hool of Engineering JSAKI JJYUNICHI rention Research Institute ofessor,HIROI KEI hool of Engineering sor,KAWABATA YUICHIRO hool of Engineering fessor,KIMURA YUUSUKE hool of Engineering
Target yea	r 3rd	year students o	r above	Number o	of cred	its	2	Year	/semesters	2021/First semester
Days and perio	ods Fri.	2,3,4	Class	s style	Practic	al tr	aining		Language of instruction	Japanese
[Overview	and p	ourpose o	f the	course]						
	adjusti vill und	ment of the lerstand the	errors	s contamina	ted in th	he m	neasured	l data a		niques, details on the d. In the field practice,
and the law The student	will be of error will ur exercis	e able to den r propagation nderstand the e, the stude	rive th on. ne pur nt wil	e most prol pose of the l acquire th	various e prepa	kino redn	ds of su	rvey.	e	e least square method the attitude to cooperate
[Course s	chedu	le and co	ntent	s]						
survey appli Distance and surveys, are measure the Control survey, one - Leveling, 3ti practice is cc Plane survey introduced. 7 Theory of er Least square	cations 1 angula introdu angles rey,8tin of the r mes,Th onducto v and to The fea rors,2ti metho f the su	and the ad- ar measurer uced. The str using theorem and the str most tradition tradition and tradition and traditi	vance ment,2 udent lolite. vey pl onal co logy o survey topog oncept he cor is intr	d technolog Btimes,Dista will learn h an for the c ontrol surve f leveling a v,4times,Th graphic map c of the erro acept of the	y of the ance and now to s control s cys, is c nd the a e metho p produc rs and t least sq	e sur d ang set th surve ondu adjus odole ced t he la	veys are gular mainstru- ey is int acted. stment of bgy of the through aw of the	e also i easure iment j roduce of the e he plan the su e error d (LSN how to	ntroduced. ment, simple properly, and ed, and the pr errors are intr ne survey and rvey are expl propagation <i>A</i>), popular a o apply the L	duce. In addition, the and fundamental the technique to actice of the traverse oduced, and the l topographic survey is ained. are introduced. pproach to the SM for the practical 及び実習(H26以前入学者)(2)↓↓↓

測量学及び実習(H26以前入学者)(2)

Error adjustment,4times,The methodology to adjust the errors in the traverse survey is introduced, and the student will learn how to obtain the most probable parameters through the exercise. Photogrammetry,2times,The overview of photogrammetry is introduced, and the practice using the instrument is conducted.

GPS survey,3times,The theory of GPS and GPS survey are introduced, and the practice of GPS survey is conducted. Evaluation of understanding,1time,The student will be evaluated for their understanding of the contents

offered by the course.

[Course requirements]

Linear Algebras, Mathematical Statistics

[Evaluation methods and policy]

Evaluate considering the scores of the intermediate and final examinations, and the reports and attendance of the field exercise.

[Textbooks]

Masayuki Tamura and Junichi Susaki, quotSurveyingquot (in Japanese) isbn {} {9784621087480}

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours.

Course nu	umber							未更新
		U-ENG	23 33044 LJ73	U-ENC	323 33044	LJ55	U-ENG23 3	3044 LJ24
Course title (and course title in English)			可論 ement of Social	Systems	Instructor's name, job ti and departn of affiliation	nent	Professor,TA Disaster Prev	vention Research Ins ATANO HIROKAZ vention Research Ins ssor,OONISHI MASAM
Farget year	ar Brd ye	ear students or	above Number	of credi	ts 2	Year	/semesters	2021/First semest
Days and perio	iods Thu. 1	1 C	lass style	Lecture			Language of instruction	Japanese
[Overview	v and pu	urpose of	the course]					
	social de	ecision-mak	cings and risk g				ge issues mere	uding participatory
-		-	nderstand roles	of infrast	ructure pla	nnina	and manager	nent, typical model
			ssues in infrast			ming	and managen	ient, typicai model
[Course so	schedule	e and con	tents]					
3. Multivaria Significance 4. Multivaria Multiple regi 5. Multivaria	iate analy: e of multi iate analy: gression n iate analy: ethods of r iate analy:	ysis (1): Oni ivariate ana ysis (2): Oni model ysis (3): Oni multivariate ysis (4): Oni	llysis, review o ishi ishi e analysis and a	f linear re	gression m		<u>-</u>	

Continue to 社会システム計画論(2)↓↓↓

社会システム計画論(**2**) _ _ _ [Course requirements] mental understanding of probability [Evaluation methods and policy] Evaluation is based on attendance (30%) and the score of final exam (70%). Systems analysis for Infrastructure planning: phenomenal analysis, Morikita pub. (in Japanese) ISBN: 4627427301 [Textbooks] [References, etc.] (Reference books) Introduced during class (Related URLs) (None) [Study outside of class (preparation and review)] Students are requested to review probabilistic models by using textbook such as the one used in the class of Probabilistic and Statistical Analysis and Exercise'. Because the time for review is limited, students are requested to review by themselves as needed basis. (Other information (office hours, etc.)) Office-hours are not specified whereas the ways to make contact with teachers are informed in classes *Please visit KULASIS to find out about office hours [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course (3) Details of practical classes delivered based on instructors' practical work experience

Course title (and course title in English)		・地域計画 h and Regior	al Pla	inning		nan and	tructor's ne, job ti I departr iffiliatior	tle, nent	Associate Profe Graduate Sch	nool of Management essor,OOBA TETSUHARU nool of Engineering ssor,MATSUNAKA RYOUJ
Target yea	r 31	rd year students o	r above	Number o	of cred	its	2	Yea	r/semesters	2021/Second semester
Days and peri	ods Me	on.4	Class	s style	Lecture	e			Language of instruction	Japanese
[Overview	and	purpose o	f the	course]					·	
policy, and	transpo	ortation poli	y wil	l be discuss	sed in de	etail	. In add	ition, l	ectures will a	es planning, land use lso be given on basic l urban economy.
[Course of	bject	ives]								
			urban	planning a	nd to ur	nder	stand th	e struc	ture of urban	problems.
[Course s	ched	ule and co	ntent	sl						
The basic id	eas an		res of	urban plan						anization areas, case examples from
The signific using case e	ance a xampl nd rea	es from Kyc llocation, url	of lan to we	d use plann will explai	n the ba	isic 1	measure	es relat	ting to urban d	tlined. In addition, levelopments, hat are key to historic
Urban mode	els, suc	l Theory (2 t ch as the pop e explained.	ulatio		nigratio	n m	odel, ec	conom	ic cycle/base 1	nodel, land use model,
and so forth		oblems and U	onmer	tal problen	ns, the g					ivironment, and
Environmer Current issu requirement	s for p	lanning fron				seco			e described in	cribed. In particular, as detail.
Environmer Current issu requirement the foundati System and The social b	s for p on of t Finan enefit	lanning from these issues, cial Resource s achieved th	the th es of I rough	eory of exte Urban Plani 1 urban plari	ernal dis ning (2 t nning wi	time ill be	nomies s) e explai	will b ned, w	e described in /hile focusing	

都市・地域計画(2)

described.

Urban Transportation Measures (2 times)

Urban transportation measures will be explained from the viewpoint of urban development. In particular, we will discuss the direction of transportation measures that should be taken into consideration in order for cities to maintain a level of sustainability based on environmental and energy issues.

ary of all Lectures (1 time)

All lectures will be summarized and relevant tasks will be organized. Finally, achievement levels will be confirmed

[Course requirements]

one

[Evaluation methods and policy]

Attendance, reports, and the final examination will be taken into consideration

[Textbooks] Not used

None used.

[References. etc.] (Reference books)

Yoshitsugu Kanemoto 『Urban Economics』 (TOYO KEIZAI INC.) ISBN:9784492813034 (The content is somewhat advanced, but it is recommended as a book that is useful for understanding urban problems.

[Study outside of class (preparation and review)]

Review of each lecture is essential.

(Other information (office hours, etc.))

Questions and comments should be saved for lectures so that other students can benefit. In the event that you ant to ask questions individually, please ask them after the lecture has finished.

*Please visit KULASIS to find out about office hours.

U-ENG23 33046 LJ73 Course number Course title Instructor's Graduate School of Engineering Associate Professor, ONDA SHINICHIROU name, job title, and department of affiliation 河川工学 (and cours title in River Engineering Disaster Prevention Research Institute English) ssociate Professor TAKEMON YASUHIRC 3rd year students or above Number of credits 2 Year/semesters Farget year 2021/Second semester Days and periods Wed.1 Class style Lecture anguage of instruction Japanese [Overview and purpose of the course] This subject deals with a wide range of basic knowledge on rivers required to make an integrated river basic management plan based on natural amp social sciences and engineeringamp technology. The contents included in this subject are described as follows: various view-points in relation to river systems, long term environmental changes of rivers and their factors, river flows and river channel processes, river and lake ecological systems, recent characteristics of flood disasters, integrated river basin planning including flood control, sustainable reservoir management, nature restoration, and sediment transport management. [Course objectives] To learn the basic knowledge to consider river environments from the various points of view such as flood ontrol, natural environment conservation, water utilization based on natural sciences, social sciences and ngineering amp technology. [Course schedule and contents] Various viewpoints on rivers and river basins, Itime, Various viewpoints on rivers and river basins, Vvrious rivers and their landscapes on the Earth, formation processes of river basins, long term environmental changes of rivers and main factors Precipitation, water cycle and run-off phenomena, ltime, Basic knowledge on Meteorology, Water Resources, Statistical Hydrology of precipitation and Rain Fall Run-off Analysis River flow and river channel processes,2times,Basics on unsteady open channel flows and flood flow mulation, sediment transport in alluvial rivers, formation processes of meso-scale and micro scale sand waves, etc. Application of numerical hydraulics to environmental issues, 1 time, Relation between the behavior of an near the bottom of the northern part of Lake Biwa due to the climate changeon the earth, Dam reservoir sedimentation due to sediment run-off from a catchment area, etc tructure and functions of river and lake eco-system, 3 times, (1) Hierarchical structure and class

river ecosystems. Relations between river geomorphology and habitat structure. Classification of river ecosystems, Relations between river geomorphology and habitat structure, Classification of microhabitats and their maintenance mechanisms, Longitudinal distribution of biological communities (2) Function of river ecosystems, Roles of biodiversity, Sustainable conditions of habitats for biological communities, Mass transfer mechanism in rivers, Nutrient spiraling, Impact assessment of river environmen and Physical Habitat Simulation Model (3) Function of lake ecosystems, Classification of natural lakes and ponds by thermal stratification and thermal convection, Relations between lake types and biota (fauna and ments flora), Characteristics of man-made reservoir ecosystems

Integrated river basin planning,3times.(1) River law, Fundamental river management plan, River improvement plan, Procedures to make a flood control planning (2) Flood invasion analysis and Hazard Map,

Excessive floods and comprehensive flood disaster prevention measures, River structures(groines and levees)
Continue to 河川江學(2) ↓↓↓

河川工学(2)

(3) Cost-Benefit Analysis of flood control projects, Evaluation of peoplersquos awareness to river improvement projects by means of CVM and Conjoint Analysis in view of flood control, water utilization and natural environmental conservation Integrated river basin planning, 3times,(1) River environmental improvement plan, Normal discharge, River restoration projects, Environmental assessment, etc. (2) Classification of river structures and their functions, Impact assessment for construction of dam reservoirs and estuary barrages, etc. (3) Comprehensive

anagement of sediment outflow and sediment budgets in river basings, concepts of recent sediment control ams, asset management of dam reservoirs, management of sediment dynamism for integrated river planning

Achievement confirmation(feedback),1time,Achievement of learning is confirmed.

[Course requirements]

Elementary knowledge of Hydraulics, Hydrology and Ecology

[Evaluation methods and policy]

Mainly regular examination. Quiz in a class, attendance and report submission are also considered for grading o some extent.

[Textbooks]

Printed materials on the contents will be circulated in each lecture.

[References, etc.]

(Reference books)

(Related URLs)

(http://www.geocities.jp/kyoto u rivereng/)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Students can contact with instructors by sending e-mail to hosoda.takashi.4w@kyoto-u.ac.jp amp takemon suhiro.5e@kyoto-u.ac.jp

*Please visit KULASIS to find out about office hours.

Course number U-ENG23 33053 LJ14 U-ENG23 33053 LJ73 araduate School of Engineering Course title Professor, Fujiwara Taku 水質学 name, job title, and department of affiliation (and course Fraduate School of Global Environmental Studie Associate Professor, TANAKA SHUHEI Graduate School of Engineering Associate Professor, NISHIMURA FUMITAKE title in Water Quality English) Brd year students or above Number of credits 2 Year/semesters 2021/First semester Farget year Days and periods Mon.2 Class style Lecture inquage of instructi Japanese [Overview and purpose of the course] [Course objectives] [Course schedule and contents] 1time. 2times 4times, 4times, ,3times, l time. [Course requirements] [Evaluation methods and policy] [Textbooks] [References, etc.] (Reference books) [Study outside of class (preparation and review)] (Other information (office hours, etc.))

Please visit KULASIS to find out about office hours.



未更新

Course nu	umbo	• LEE	NG23 3	3054 I 173	LLEN	G23 33054	1 116			,	上水道工学(2)
Course title	上水	道工学 er Supply E			U-LIV	Instructor's name, job t and depart of affiliatio	s title, ment	Professor,IT Graduate School Professor,EC Graduate Sch	nool of Engineering DH SADAHIKO of Global Environmental Studie 'HIGO SHINYA nool of Engineering or,NAKANISHI TOMOHIRG		Achievement of Achievement of
arget yea	r	3rd year student:	s or above	Number	of cred	lits 2	Yea	r/semesters	2021/Second semester	1	It is preferable t Water Quality.
ays and perio	ods N	lon.2	Class	s style	Lectur	e		Language of instruction	Japanese	1	[Evaluation r
Overview	anc	purpose	of the	course]							Grade is evaluat
									of protection of life. rification technologies	1	Breakdown: sur
re targeted	in cl	ass. Class is	conduc	ted throug	h thinki	ng together					[Textbooks]
Course o	hioc	tives									Not used
o understa	nd ba	-							water cycles in the	1	
						-					[References,
verview (1		lule and c	ontent	sj						4 I.L.	(Reference Itoh S., Ohtani
Concept of s	sanita							supply engine	ering as an example of		R., Yamamoto I Itoh S. and Ech
lole of wate	er sup	gement and oply system ver basin ma	in wate	r cycle of	watershe	d is introdu			tection of water source,		(Related U http://www.urb
		er supply sy y system fr			consume	r taps and o	outline	of topics cove	red in the class are		[Study outsid Instruction will
e											(Other infor
Basics of wa	ater p		processe	es are turb					sms of slow and rapid of disinfection		Office hours are
yproducts,	harm	ful compou	nds suc	h as carcii	nogenicit	y, after dis	infecti	on is also state	d in details.		*Please visit KU
Vater qualit rinking wa	ies o ter by	conventior	ter are v nal wate	videly var r purificat	ied. It is ion proc	esses. Adv	anced		needs of consumers for ion processes such as ntroduced.		
here are m re discusse	icrob d. Co		nical ris method	ks in drin ologies to					ined as drinking water I future prospects of		
								Continue to	上水道工学(2)↓↓↓		
										J	

									11241
Course nu	mber	U-ENG23	33055 LJ73	U-EN	G23	33055	LJ16		
(下水道工 Sewerage	学 System Eng	ineering		nan and	tructor's ne, job tit I departm ffiliation	nent	Professor,Fu Graduate Scl Associate Profes Graduate Scl Senior Lectu Graduate Scl	tool of Engineering jiwara Taku tool of Engineering sor,NISHIMURA FUMITAK tool of Engineering rer,HIDAKA TAIRA tool of Engineering ssor,TAKEUCHI HARUK.
Farget year	3rd year	r students or abo	Number (of cred	its	2	Yea	r/semesters	2021/Second semester
Days and period	is Mon.1	Cla	ss style	Lecture	e			Language of instruction	Japanese
[Overview	and pur	pose of the	e course]						
and design &	operation	n of the facil							quality management,
 To acquire To underst design the factorial 	and the ro						syster	n and to be ab	le to explain and
[Course sc	hedule a	and conter	nts]						
creation of de	on sewera sirable w g of sewer	age system a rater environ rage system	nd course gu ment and ma s, relationshi	inageme p among	ent. g the	Type of sewera	sewe ge-lik	rage system, o	rage system for comprehensive basin- ch as Jokaso and
2) Sewage c Lecture on th				oipe, sett	tling	; basin, a	and pu	imping statior	L.
selection proc	e treatment cess, and l	nt type(prim basic flow o	ary treatmen f treatment.	Solid-lie	quid	l separat	ion ar	nd biological p	eatment), their process(activated esign & operational
		nt[2 weeks]:	1	iont rom				trace harmful	
Lecture on th					ratic	on, and s	ystem	configuration	
ozone. Back	ground, tr t and disp e final dis	eatment prin oosal of sewa sposal of the	nciple, design nge sludge[1 sludge and f	n & oper week]: fundame	ental	compo		configuration	organic compounds by 1. Direction of future
Lecture on th ozone. Back (5) Treatmen Lecture on th	ground, tr t and disp e final dis	eatment prin oosal of sewa sposal of the	nciple, design nge sludge[1 sludge and f	n & oper week]: fundame	ental	compo	nent o	t configuration	1.

ר ר

_ _ _ _ _ onfirmation (1 time) f learning is confirmed.

uirements]

to have knowledge of the courses of Biology and Chemistry for Environmental Engineers, and

methods and policy]

ated by reports, a paper test, and attendance. Im of the results of the reports and the paper test (60%), attendance (40%).

etc.]

books) S., Kozuki Y., Nishimura F., Hashimoto O., Higuchi T., Fujiwara T., Yamazaki S., Yamanaka H. 『Intelligible Environmental Engineering』(Rikoh Tosho)ISBN:9784844608318 nigo S 『Disinfection byproducts in water.』(Gihodo)ISBN:9784765534284

RLs)

ban.env.kyoto-u.ac.jp

de of class (preparation and review)]

be given by the professors.

mation (office hours, etc.))

re not set. But, please visit a C-1 232 room if there are any questions.

ULASIS to find out about office hours.

下水道工学(2)

(6)New perspective of sewerage system[1 week]: Special lecture by a specialist such as a public official from Ministry of Land, Infrastructure, Transport and Tourism.

uture perspective, technological trends and expansion, attitudes of governments

(7) Final examination/ Learning achievement evaluation

(8) Feedback

[Course requirements]

Water quality engineering, hydraulics

[Evaluation methods and policy]

evaluation will be based on the written examination

[Textbooks]

津野洋・西田薫 『環境衛生工学』(共立出版)ISBN:4320073878

[References, etc.] (Reference books)

[Study outside of class (preparation and review)]

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

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours.

*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category A course with practical content delivered by instructors with practical work experience

(2) Details of instructors' practical work experience related to the course

(3) Details of practical classes delivered based on instructors' practical work experience

ourse title	mber	U-ENG23 3	3057 LJ15	U-ENG2	23 33057	LJ77		
and course		衛生工学 gical Health En	gineering	na ar	structor's ame, job tit nd departm f affiliation	nent	Professor,YC Graduate Scl	nool of Engineering DNEDA MINORU nool of Engineering fessor,YOKO SHIMAD
arget year	• 3rd y	ear students or above	Number	of credits	2	Year	/semesters	2021/First semester
ys and perio	ds Tue.	2 Class	s style	Lecture			Language of instruction	Japanese
ctures will iation on a atment, ra	be give human l diation j al radio	peings and orgat protection meth activity, and its	of radiatio nisms, the o ods, radiati	exposure de on environ	ose limit, ment mo	radiat	ion shielding,	matter, the effects of radiation sources, g problems related to
sed on the rironment y of think nework o	basic k the chaing about f exposi	nowledge on ra aracteristics of r at setting radiati	adiation ex on exposur ironmental	posure, the e limits. B monitoring	e characte ased on tl g, and env	ristics his bas	of biological ic knowledge	on sources in the livin influences, and the , understanding the n risk assessment
diation an inition, th dition, the eraction o ys, and y dysis, and kind and	d radioa e compo mechan of radia f radiati rays, ch so fortl	tism of nuclear ation, collapsed on and matter (maracteristics of a will be discuss ss of shielding r): The purp e contents, collapse an series, and 3 times): M radiometer sed. Additio	and curren d the emiss so forth wi lechanism s, nuclear onally, lect	t radiatio sion of ra- ill be cov- and chara reactions, ures will	n relat diation ered. cterist collaj be giv	ed issues will a, the stability ics of interactory ose diagrams, en on the shid	agineering, its be outlined. In of atomic nuclei, type ion between α rays, principles of activatio Iding of gamma rays, sssment by ionizing
ation, and		ells, and the sol	id level wil on protecti	l be explai on, exposu	ned. Radi re limit v	ation alue a	effects on the nd risk, the m	of radiation on living human body will be ethod of setting
ological/hu ngs from ssified, an posure lim	d the co	s, the regulated	values by I	aw, metho	us to avoi	d radi		e, and so forth will be
ological/hu ngs from ssified, an oosure lim vered.	d the co it value diation	s, the regulated	time): Rad	iation effe	cts on the	huma	n body will b	e classified and a
blogical/hu ngs from ssified, an bosure lim vered. ethod of ra ture will b easuremen	d the co it value diation e given t metho	s, the regulated management (3 on the unit of e	time): Rad xposure do y and radia	liation effe ses and ma	cts on the	huma it meth	n body will b ods of radiati	e classified and a
ological/hu ings from issified, an posure lim vered. ethod of ra ture will b easuremen	d the co it value diation e given t metho	s, the regulated management (3 on the unit of e d of radioactivit	time): Rad xposure do y and radia	liation effe ses and ma	cts on the	huma It meth ture w	n body will b ods of radiati ill be given of	e classified and a on exposure.

Course title (and course title in English)	初工学 d Waste Management Instructor's and department of affiliation Graduate School of Engine Professor, TAKAOKA MA: Agency for Health, Safety and E Professor, HIRAI YASUHI		KAOKA MASAKI alth, Safety and Environmen				
Farget year Brd y	year students or	above Number	of credit	s 2	Yea	r/semesters	2021/Second semester
Days and periods Mon	i.3 C	lass style	Lecture			Language of instruction	Japanese
he concept of the 30 management system waste. The course al	idents will l use, recyclin Cs (Clean, C is. We will a lso covers (1	earn the hierard ng, bioconvers Cycle, and Cont also introduce s 1) legal systems	chical mea ion, therm trol) as the trategic ca	sures used al convers by relate to use example the definit	l in so sion, a hazar les for ion an	lid waste man nd final dispo dous waste ar controlling m d classificatio	agement, including sal. We will explain nd international nercury and asbestos on of municipal solid
	waste mana						sportation methods for nt, recycling, and final
(1) to learn about the bioconversion, thern	nal conversi	agement hiera ion, and final d	isposal;				on, reuse, recycling,
 to learn about the bioconversion, therm to gain an unders waste, as well as the to acquire basic 1 	nal conversi standing of l 3Cs concep knowledge a	nagement hieran ion, and final d hazardous wast pt; and about MSW ma	isposal; e definitio magement	ns and int	ernation the te	onal legal syst	tems on hazardous
 to learn about the bioconversion, therm to gain an unders waste, as well as the to acquire basic l MSW collection, tra 	nal conversi standing of l 3Cs concep knowledge a insportation	nagement hieran ion, and final d hazardous wast pt; and about MSW ma , treatment, rec tents]	isposal; e definitio magement ycling, and	ns and int plans and d disposal.	ernation the te	conal legal syst	ems on hazardous systems used for
bioconversion, therm (2) to gain an unders waste, as well as the (3) to acquire basic l MSW collection, tra (2) Course schedul 1. Resource Consum 2. Resource consum (Hirai) 3. Definition and cla 4. Collection and tra 5. Hierarchical wast 6. Hierarchical wast 8. Hierarchical wast 9. Hazardous waste	nal conversi standing of l 3 Cs concep knowledge e ansportation. Pption and W ption and W ption and w assification of unsportation e manageme e manageme e manageme	agement hierar ion, and final d hazardous wast pt; and about MSW ma , treatment, rec tents] Waste Generatic aste generation of waste and le of waste and le of waste (Hira, ent (1) Reduce, ent (2) Compos ent (3) Incinera ent (4) Landfill t(1) Definition	isposal; e definitio unagement ycling, and on (1) Mat (2) Flow, gal system i) i) Reuse and tion and e (Hirai) a nd basic	erial Flow stock, and d Recycle d Recycle d Recycle cogas proc nergy recc cs of hazar	, Mate d life s e mana (Hirai luction	crial Industry ispan of durabl agement (Hirai) n (Hirai) (Takaoka)	tems on hazardous systems used for (Hirai) e consumer goods
 to learn about the bioconversion, therm to gain an unders waste, as well as the to acquire basic I MSW collection, tra ICourse schedul Resource Consum Resource consum Befinition and cla Collection and tra Hierarchical wast Hierarchical wast Hierarchical wast Hierarchical wast 	nal conversi standing of 1 3 Cs concept knowledge at insportation. e and con aption and W ption and W usssification of e manageme e manageme e managemere e managemere e managemere e managemere costs and wa managemere.	agement hierar ion, and final d hazardous wast bit; and about MSW ma about MSW ma treatment, rec. tents] Waste Generation aste generation of waste and leg of waste and leg of waste (Hira ent (1) Reduce, ent (2) Compos ent (3) Incinera ent (4) Landfill tt (1) Definition (2) Asbesto uste charging (f of environmer	isposal; e definitio unagement ycling, and on (1) Mat (2) Flow, gal system i) Reuse and tion and e (Hirai) a and basic (Takaoka s (Hirai)	erial Flow stock, and is on wasted d Recycle ciogas proc nergy recc cs of hazar)	ernatio the te d life s e mana (Hirai duction vvery (rial Industry pan of durabl agement (Hirai) (Takaoka) waste (Hirai)	(Hirai) e consumer goods

放射線衛生工学(2)

Regulation value of radiation (1 time): The concept of radiation protection, exposure limit value and risk, the method of setting an exposure limit value, the regulated value by law, methods to avoid radiation exposure, and so forth will be covered.

Movement of radioactivity in the environment (1 time): A lecture will be given on the method of estimating the movement of radioactivity in the environment and exposure assessment.

[Final exam]

Feedback (1 time): Questions on the lectures or exams will be accepted and answered by E-mail.

[Course requirements]

Evaluation methods and policy]

Evaluated by the scores of the final examination (80%) and small tests after each lecture (20%).

[Textbooks]

lot used landout will be given at each lecture.

[References, etc.]

(Reference books)

Study outside of class (preparation and review)] ompletely understand the contents of each handout.

(Other information (office hours, etc.))

Please visit KULASIS to find out about office hours

廃棄物工学(2)

14. Evaluation and management of environmental impact associated with waste treatment (2) LCA (Hirai) <<Final examination>> 15. Feedback

[Course requirements]

None

[Evaluation methods and policy] Evaluating method: examination scores, 60%; report and quizzes, 40%.

valuating method: examination scores, 60%; report and quizze

[Textbooks]

Not specified. Materials and references will be given in class when needed.

[References, etc.]

(Reference books) To be announced in class.

[Study outside of class (preparation and review)]

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

(Other information (office hours, etc.))

Course number U-ENG23 33059 LJ73 U-ENG23 33059 LJ16 U-ENG23 33059 LJ76	環境装置工学(2)
Course title (and course) title in English) Course title (and course) Environmental Plant Engineering English) Course it ite in English) Course it ite in English) Craduate School of Engineering and department of affiliation Craduate School of Engineering Associate Professor,OSHITA KAZUYUKI Graduate School of Engineering Associate Professor,OSHITA KAZUYUKI Graduate School of Engineering Associate Professor,KUSAKABE TAKETOSHI	
Target year Brd year students or above Number of credits 2 Year/semesters 2021/First semester	It is desirable that students have already learned Hydraulics and Exercises
Days and periods Wed.2 Class style Lecture language distructor Japanese	[Evaluation methods and policy]
[Overview and purpose of the course]	Evaluated by the final examination (60 points) and the participation including attendance, midterm examination and quizzes (40 points)
This lecture is aimed at learning principle of environmental plants to conserve the environment. Unit operations such as fluid transportation, separation, thermodynamics, mass transfer, heat transfer and reaction	[Textbooks]
are explained. Also, the principle and design for treatment devices of liquid, gas and solid are shown.	Not used
[Course objectives]	
Understand the role of environmental plant to conserve the environment and common engineering techniques	
for the plants	[References, etc.] (Reference books)
[Course schedule and contents]	平岡正勝、田中幹也著『新版 移動現象論』(朝倉書店)ISBN:9784254250237
Class 1: Introduction to Environmental plant engineering	水科篤郎、桐栄良三編『化学工学概論』(産業図書)ISBN:4782825102
The engineering ethics are introduced based on accidents in the past. Lecture on unit operations and system in environmental plants, and units and important parameters used in	
environmental plant.	[Study outside of class (preparation and review)]
	Lecture materials are delivered in class. Review the class and the materials.
Class 2-3: Separation Lecture ons property of particles such as dust and sludge and separation processes such as thickening,	(Other information (office hours, etc.))
filtration, dust collectors.	The order of lecture content can be changed.
Class 4-5: Chemical reaction	This lecture does not have a specific office hour
Lecture on Reaction pattern and Reactor types such as batch, continuous stirred-tank and plug flow reactors	Questions about each class should be given to Masaki TAKAOKA using E-mail takaoka.masaki.4w@kyoto- u.ac.jp or phone: 075-383-3335.
Class 6-7: Heat transfer	
Lecture on heat transfer such as thermal conduction, convection and radiation and the applications	*Please visit KULASIS to find out about office hours.
Class 8: Midterm examination	[Courses delivered by instructors with practical work experience]
	(1) Category
Class 9-10: Fluid flow processes Lecture on fluid flow processes and the applications such as measurement of air velocity	A course with practical content delivered by instructors with practical work experience
Lecture on fund now processes and the appreations such as measurement of an velocity	(2) Details of instructors' practical work experience related to the course
Class 11-12: Air conditioning and thermodynamics of vapor Lecture on air conditioning and thermodynamics of vapor and usage of steam table and humidity chart	(3) Details of practical classes delivered based on instructors' practical work experience
Class 13-14: Mass transfer Lecture on mass transfer such as gas - liquid equilibrium and the the applications such as gas absorber tower	
Class 15: Checking the degree of learning achievement and making the answers for quizzes, Feed back Continue to 環境接置工学(2) ↓ ↓ ↓	

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Course nu	imber	U-ENO	323 33	3076 LJ72	U-ENC	23 330	76 L	_J77		
							hool of Engineering SUKADA KAZUHIKO			
Farget year	r βrd y	ear students o	or above	Number	of credi	t s 2	Τ	Year	/semesters	2021/Second semester
Days and perio	ds Wed.	.1	Class	style	Lecture				Language of instruction	Japanese
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Physics on T	`ransduc	ers,2times	з,							
Measuremen	t of Fun	damental	Physic	cal Quantit	ies,4time	s,				
Transformat	ion and	Recording	g of Si	gnals,2time	es,					
Statictical Pr	rocessing	g of Data,	2times							
Modern Inst										
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Course title (and course title in English)	江学 tration Techn	nology	1	Instructor's name, job ti and departr of affiliatior	tle, nent	Graduate School of Energy Scienc Associate Professor,KUSUDA HIROM Graduate School of Energy Scienc Assistant Professor,KUSAKA EIS			
arget year	3rd year students	or above Number	of credi	ts 2	Year	/semesters	2021/Second semester		
Days and periods T	hu.1	Class style	Lecture			Language of instruction	Japanese		
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離工学(2)	Course numb	er U-ENG23 33	085 LJ73				
tudy outside of class (preparation and review)]		共経済学 lic Economics		Instructor's name, job title, and departmen of affiliation	Graduate School of Engineering Associate Professor,MATSUSHIMA KAKU Disaster Prevention Research Instit Associate Professor,YOKOMATSU MUNI		
Other information (office hours, etc.))	Target year	3rd year students or above	Number of cred	its 2 Y	ear/semesters	2021/First semester	
e visit KULASIS to find out about office hours.	Days and periods	Thu.2 Class	style Lecture	, – – – –	Language of instruction	Japanese	
		d purpose of the c	-	-		Jupanese	
	explained. At the	at time, the economic ation will be explaine	characteristics of			o deal with it will be benefit analysis as a	
	evaluation of inf	sic concepts of micro rastructure projects dule and contents					
	Consumer behav after describing function, the cor described. Furth Practice on cons Corporate behav production funct knowledge. Nex market structure Practice of comp Market of perfec differences betw efficiency will b Market of imperfer monopolistic ma countermeasures Indicator of ecor consumer surplu described. Text	the preference, utility appensation function, remore, the type and umer behavior (1 tim ior model (2 times): ion, profit maximizat t, the nature and poin and corporate behav any behavior (1 time t competition (1 time een general equilibrir described in detail. feet competition (1 ti rkets and oligopolist will be explained. T nomic valuation (1 ti s, producer surplus, s 7	The consumer bel , utility maximizi he Slutsky equati nature of househo le): A practice of t The behavioral m tion behavior, and tion behavior, and tis of cost and supp ior will be explain): A practice of th um analysis and p Text 4 me): The charactet ic markets, and fai ext 5 me): Various indic social surplus, con mechanism of extet	avior model w ng behavior of on, and the agg lds' welfare ma he above two 1 l odel of a comp- cost minimiza oly functions w ed. Text 3 e above two le perfect compe- artial equilibriu ristics of mark ctors that cause ators necessar upensation vari	vill be described households, the gregate demand casures will be c ectures will be expl tion behavior w vill be described ectures will be ex tition will be ex tition will be ex um analysis, and ets of imperfect e monopolies an y for measuring fance, and equiv types, and the ir	in detail. In particular nature of the demand function will be xplained. Text 2 onducted. ained. First, technolog ill be explained as bas in detail, and the onducted. plained. Additionally, the concept of Paretc competition, such as d regulations as benefits, such as alent variance will be itemalization policy o	
					Continue to	公共経済学(2)↓↓	

	未更新
公共経済学(2)	Course number U-ENG23 43086 EJ73
Public goods (1 time): The nature of public goods and Samuelson conditions will be explained. Text 6 Practice of market and externality (1 time): A practice of the above five lectures will be conducted. Cost-benefit analysis (1 time): Regarding the concept of cost-benefit analysis, the concepts of cost and benefit, as well as the social discount rate and evaluation index will be explained, and the difference with financial analysis and methods for quantifying benefits will be described in detail. Additionally, from the viewpoint of	Course title (and course title in English) 材料実験 Construction Materials, Laboratory Instructor's name, job title, and department of affiliation Graduate School of Management Professor, YAMAMOTO TAKAS Graduate School of Engineering Assistant Professor, TAKAYA SATO Graduate School of Engineering Assistant Professor, JAKAYA SATO
engineer ethics, the state of project evaluation will be discussed. Texts 8 and 9 Feedback (1 time): Confirming the degree of achievement regarding the contents of this lecture"	Target year 4th year students or above Number of credits 2 Year/semesters 2021/First semester
ICourse annuismental	Days and periods Mon.3,4 Class style Experiment Language distruction Japanese
[Course requirements]	[Overview and purpose of the course]
It is desirable that students have taken the course of planning system analysis and practice. [Evaluation methods and policy]	Experiments on the materials for concrete and concrete member are carried out in the main. Properties of concrete materials and member are discussed by using those experimental results. Be sure and attend the laboratory with your experimental text book. The schedule and details of the experiment are announced at the initial lecture. Students of this laboratory class have to attend an initial
Periodical tests, reports, and attendance are comprehensively taken into consideration. (Periodic tests: 70 to 80%; reports and attendance: 20 to 30%)	lecture because they are to be divided into some groups.
PT code on the 1	[Course objectives]
[Textbooks] 石倉智樹・横松宗太 『公共事業評価のための経済学』(コロナ社)ISBN:9784339056402 Hal R. Varian: Intermediate Microeconomics: A Modern Approach, Nineth Edition, W. W. Norton amp	Students of this class practically learn to understand the properties of concrete material and member introduced in 'Construction Materials' and 'Concrete Engineering', and its measurement technique.
Company, 2014 isbn{} {9780393919677}	[Course schedule and contents]
	Introduction, 1 time, The objective and contents of this laboratory are introduced. The fundamentals of the
[References, etc.] (Reference books) 小林潔司『知識社会と都市の発展』(森北出版)ISBN:4627494610 [Study outside of class (preparation and review)]	Cement, Itime, The density, the fineness and the setting time of cement, and the flow of mortar are tested. Aggregate, Itime, The density, the water absorption ratio, the grading, unit mass and surface water ratio of f and coarse aggregate are tested. Mix proportion design of concrete and fresh concrete, Itime, Mix proportion of concrete is designed using the results of Isquocementrsquo and Isquoaggregatersquo. The condition of fresh concrete made by using the designed mix proportion is examined. The test specimens for Isquohardened concretersquo are also cast.
t is advisable to read the corresponding parts of the textbook in advance.	Hardened concrete, 2times, Some destructive and non-destructive tests are performed in the test specimens of in lsquofresh concretersquo.
(Other information (office hours, etc.))	Reinforcing steel bar, I time, The yield strength, the tensile strength and the elongation are obtained in the
(uestions and as forth will be accepted after the class. Questions can also be asked via e-mail to pub@psa2. kuciv.kyoto-u.ac.jp. *Please visit KULASIS to find out about office hours.	reinforcing steel bar for concrete. Design of reinforced concrete (RC) and prestressed concrete (PC) beam,3times,The reinforced concrete (RC and prestressed concrete (PC) beam are designed. Casting of RC and PC beam, 1time,The designed RC and PC beam specimens are cast. Prestressing,1time,The prestress is introduced in PC beam by post tensioning system. Loading test of RC and PC beam,2times,Loading test for RC and PC beam specimens is carried out. The flexural behavior of RC and PC beam is investigated, comparing the experimental loading capacity with the designed one. Achievement confirmation,1time,Achievement of learning is confirmed.

[Course requirements] Members of this class had better take 'Construction Materials' and 'Concrete Engineering' in 3rd year. [Evaluation methods and policy] A report with the experimental results and discussion is assigned in each time. The grading is based on the total point of reports and attendance. [Textbooks] The Society of Materials Science, Japan: Construction Materials Laboratory, 2,200JPY ISBN:9784901381406 [References, etc.] (Reference books) [Study outside of class (preparation and review)] 'Construction Materials' and 'Concrete Engineering' should be reviewed. (Other information (office hours, etc.))	
Members of this class had better take 'Construction Materials' and 'Concrete Engineering' in 3rd year. [Evaluation methods and policy] A report with the experimental results and discussion is assigned in each time. The grading is based on the otal point of reports and attendance. [Textbooks] The Society of Materials Science, Japan: Construction Materials Laboratory, 2,200JPY ISBN:9784901381406 [References, etc.] (Reference books) [Study outside of class (preparation and review)] Construction Materials' and 'Concrete Engineering' should be reviewed. (Oth contraction (office become other))	
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eport with the experimental results and discussion is assigned in each time. The grading is based on the al point of reports and attendance. extbooks] e Society of Materials Science, Japan: Construction Materials Laboratory, 2,200JPY ISBN:9784901381406 eferences, etc.] (Reference books) tudy outside of class (preparation and review)] nstruction Materials' and 'Concrete Engineering' should be reviewed. The print of employee of the former of the lower of the instruction of the print of employee of the instruction of the instruction of the instruction of the print of employee of the instruction of the print of employee of the instruction of the in	
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Construction Materials' and 'Concrete Engineering' should be reviewed. (and course title in Experiments on Hydraulic	Instructor's
	name, job title,
	s and department of affiliation
Target year Srd year students or above N	umber of credits 2 Y
Days and periods Thu.3,4 Class s	tyle Experiment
水理実験(2) 水理実験(3)	

11

未更新

Graduate School of Engineering Professor,GOTOH HITOSHI Graduate School of Engineering Professor,TACHIKAWA YASUTO

Graduate School of Management Professor, TODA KEIICHI Disaster Prevention Research Institut Professor, MORI NOBUHITO Graduate School of Engineering Associate Professor. ICHIKAWA YUTAKA Associate Professor, ONDA SHINCHIROU Graduate School of Engineering Associate Professor, ONDA SHINICHIROU Graduate School of Engineering Associate Professor, SANJIYOU MICHIO Graduate School of Global Environmental Studi Associate Professor, HARADA EIJI Disaster Prevention Research Institute Associate Professor, KAWAIKE KENJI Disaster Prevention Research Institut Associate Professor, SAYAMA TAKAHIRO Disaster Prevention Research Institute Associate Professor, SHIMURA TOMOYA Disaster Prevention Research Institute

Associate Professor, TAKEBAYASHI HIROSHI Disaster Prevention Research Institute

Disaster Prevention Research Institute Associate Professor, TANAKA KENJI Disaster Prevention Research Institute Associate Professor, YAMAGUCHI KOSEI Graduate School of Engineering Senior Lecturer, YOROZU KAZUAKI Graduate School of Engineering Assistant Professor, IKARI HIROYUKI Graduate School of Engineering Assistant Professor, GKAMOTO TAKAAKI Graduate School of Engineering

Assistant Professor, DAANO TO TARAAAT Graduate School of Engineering Assistant Professor, Yuma Shimizu Graduate School of Global Environmental Studies Assistant Professor, TIH中 智大 Academic Center for Computing and Media Studies Assistant Professor, TORIU DAISUKE

Assistant Professor, IOKIO DAISOKE Disaster Prevention Research Institute Assistant Professor, NOHARA DAISUKE Disaster Prevention Research Institute Assistant Professor, MIYASHITA TAKUYA Disaster Prevention Research Institut sistant Professor, Yamanoi Kazuk Year/semesters 2021/Second semester anguage of instruction Japanese Continue to 水理実験(2)↓↓↓

水理実験(3) [References, etc.] (Reference books) uidance of laboratory experiments in hydraulics and measurement instrument Eight experiments are conducted about pipe flow, open-channel flow, waves, flow in porous media, density [Study outside of class (preparation and review)] Understanding hydraylic phenomena through various flows observed in the hydraulic laboratory (Other information (office hours, etc.)) Guidance, Itime, Guidance of hydraulics laboratory and course goals Instruments in hydraulics laboratory, Itime, Introduction of measurement instruments Methods and principles Please visit KULASIS to find out about office hours. Experiments 1 - 4, Stimes,Rotation for eight experiments A to H as mentioned below Guide for writing reports,4times,Guide for writing reports A)Transition from lamiar to turbulent flows, friction law in pipe flows,(1)times,Observation of dye patterns in lamiar and turbulent flows in pipes Understanding Hagen-Poiseuille flow and Prandtl-Karman flow B)Velocity and free-surface profiles in open-channel flows,(1)times,Measurements of free-surface and C)Hydraulic jump in horizontal bed,(1)times,Understanding hydraulic jump Comparison mea: surface variations with theories ured free D)Transmission and deformation behaviors of waves .(1)times, Measurements of wave deformations, wave eight and orbits of water particles Comparison measured data with small amplitude wave theory and reaking-wave formula E)Flow in porous media and underground water ,(1)times,Measurments steady flows in porous media by using pipenet model and Hele-Shaw model F)Density flow,(1)times,Measurement and understanding transport mechanisms in density flows Evaluations of front speed and related friction laws G)Hydraulic force on cylinder ,(1)times,Measurements of pressure distributions on cylinder surface in open-channel flows Observation of Karman vortex behind cylinder H)Sediment transport.(1)times.Measurements and observations of bed load in open-channel flows Presentations of experimental results, 1 time, Presentations for experimental results and related discussions

[Course requirements] Hydraulics and Exercises

[Overview and purpose of the course]

flow, hydrodynamic force, sediment transport

velocity profiles Comparison measured results with theories

[Course schedule and contents]

[Course objectives]

of hydraulic experiments

[Evaluation methods and policy] Attendance : 40 points

Comparison with theories and formulae

Reports and homework : 60 points total : 100 points

[Textbooks]

_____Continue to 水理実験(3) ↓ ↓ ↓

Course number	U-ENG23 4	13089 1 174					未更新
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stability of slope and soil dynamics.

[Course objectives]

The course objective is to provide an understanding of key engineering properties and mechanical behavior of soil materials including consolidation, shear deformation and strength properties, bearing capacity of foundations, stability of slopes and excavations, and dynamic properties of soil.

At the end of the course, students will be able to:

- Understand the principles of strength and deformation behavior of different soils. Understand and apply the fundamentals of soil mechanics and geotechnical compitation methods.
- Understand the soil-structutes interaction.

[Course schedule and contents]

Consolidaton, 2 times, Understand Terzaghi's theory of consolidation, laboratory consolidation test, field consolidation curve, normally consolidated condition and over consolidated condition, and problems on final and time rate of consolidation

es in ground, 1 time, Understand stresses in the ground due to loading, soil strength and pressure distribution below foundation.

Shear deformation and shear strength, 2 times, Understand measurement of shear strength and triaxial compression tests, strength parameters, drained and undrained behavior of clay and sand, and stress path for conventional triaxial test.

Theories of earth pressure, 2 times, Understand the lateral earth pressure in active and passive states, Rankine theory in cohesive and cohesionless soil, Coloumb's wedge theory with condition for critical failure plane, arth pressure on retaining walls of simple configurations.

Midterm exam, 0.5 times

Bearing capasity of foundation, 1.5 times, Understand the definition of bearing capacity, ultimate bearing capacity, net ultimate bearing capacity, net safe bearing capacity and allowable bearing pressure, and derivation of Terzaghi's general bearing capacity equation for continuous footing and basic numerical

餐工学概論<地球>(2)

ilding are explained. Then, the foundamental concept of seismic design is explained. Moreover, basic wledge of the soil and foundations, and wooden structure are also outlined.

firmation of learning attainment, 1 class: This class will summarize the course and confirm learning

ourse requirements]

valuation methods and policy] ddition to the final examination(80 points), an evaluation of normal points(20 points) is also performed

extbooks] used

eferences, etc.]

Reference books

udy outside of class (preparation and review)]

Other information (office hours, etc.)) fice hours] Will be detailed during clas

ease visit KULASIS to find out about office hours.

ourses delivered by instructors with practical work experience] Categor

ourse with practical content delivered by instructors with practical work experience

Details of instructors' practical work experience related to the course

Details of practical classes delivered based on instructors' practical work experience

質力学||及び演習(2)

blems associated with it.

pe stability, 2 times, Understand the failure mechanisms of both infinite and finite slopes and methods of e stability analysis

dynamics, 2 times, Understand the nature of dynamic loads, mechanism of liquefaction and liquefaction imeters, and stress conditions on soil element under earthquake loading.

astructure and ground, 1 time, Understand the recent geoengineering projects and ethical responsibility geoengineers

dback, 1 time, Understand the intentions and correct answers of the questions given in the examination.

[Course requirements]

A required prerequisite is knowledge of soil mechanics. Soil mechanics I and Exercises(31620) would be elpful as a prerequisite.

[Evaluation methods and policy] Grading Policy: Final exam(70%), Midterm exam and assigned homework(30%)

[Textbooks]

Fext book:Fusao Oka,quotSoil Mechanicsquot,Asakura publishing Co., Ltd isbn{} {9784254261448}.

[References, etc.]

(Reference books) anics Exercisesquot, Morikita publishing Co., Ltd isbn{} {4627426607}. sao Oka,quotSoil Mecha

(Related URLs)

(http://geomechanics.kuciv.kyoto-u.ac.jp/lecture.html)

[Study outside of class (preparation and review)]

Review of Soil Mechanics I and Exercises is rec

(Other information (office hours, etc.)) ontact Information will be delivered in their first lecture

Please visit KULASIS to find out about office hours

[Courses delivered by instructors with practical work experience]

(1) Categor A course with practical content delivered by instructors with practical work experience

_____Continue to 土質万学Ⅱ及び演習(3)↓↓↓

力学II及び演習(3)	Course nu	mber	U-ENG23	33111 LJ73				
etails of instructors' practical work experience related to the course			振動学 cs of Soil and	1 Structures	Instructor's name, job t and depart	title, ment	Professor,KI Disaster Prev	nool of Engineering YONO JIYUNJI ention Research Institu
Details of practical classes delivered based on instructors' practical work experience	English)			_	of affiliation	_		ARASHI AKIRA
	Target year			ove Number (of credits 2	Year	/semesters	2021/First semester
	Days and perio			iss style	Lecture		Language of instruction	Japanese
			Irpose of the the fundamentation of the fund		ation of vibration t	theory a	ind elastic wa	ve propagation in civi
	- Vibration p including ma - Treatment	f this cou ohenome mipulati of vibra	urse, students ena, response on of mathen tion problems	to dynamic lo natical formul s for multi-de	red to have a good bads, fundamental ation and calculati gree-of-freedom sy propagate in elastic	princip on /stems a	le of vibratior and elastic me	
	[Course so	chedule	e and conte	nts]				
		enomena	a encountered		(1 week) neering structures.	Impota	nce and engir	neering issues of
	Free vibratio Definition of vibration resp	the natu		ıd damping ra	tio for single degre	ee-of-fr	eedom system	ns. Derivation of free
	Force vibrati Resonance ci characteristic	urves an		onse curves fo	r forced harmonic	vibratio	on. Frequency	/ response
	Principle of v Background				Accelerometers and	d seism	ometers.	
	Response to Evaluation of				cing and earthquak	ce excit	ation. Respon	ise spectra.
	Nonlinear vil Fundamental			ear dynamic r	esponse of structur	es asso	ciated with el	asto-plastic behavior.
		quations			f-freedom systems	s repres	enting free vi	bration. Concept of
						0	Continue to	波動・振動学(2)↓↓

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Natural frequencies and natural modes of vibration (1 week) Relationship between the natural frequencies, normal vibration modes of multi-degree-of-freedom systems _ _ and eigenvalue analysis.

Damped free vibration of MDOF systems (1 week) Vibration of multi-degree-of-freedom systems with damping. Analysis of MDOF systems using damping sing normal vibration modes.

Forced vibration and response to arbitrary input for MDOF systems (1 week) Modal analysis to evaluate the dyanmic response of multi-degree-of-freedom systems for harmonic and arbitrary excitation.

Vibration of continuum (1 week) Vibration of shear beams. Flexural vibration. Wave equation. Solution of shear vibration problem.

Elastic wave (2 weeks) Properties of elastic waves travelling in elastic media and elastic layers. Fundamental concept in deriving solutions of elastic wave propagation problems.

Examination (1 week) Students' achievements in understanding of the course material are evaluated.

Feedback (1 week) A feedback session on the class material and examination problems is carried out.

[Course requirements]

Calculus, Linear algebra, Structural Mechanics I and Exercises, Structural Mechanics II and Exercises

[Evaluation methods and policy]

Based on the performance during the course (including homework) and the results of a final examination. [Textbooks]

Not used; Class hand-outs are distributed when necessary.

[References, etc.] (Reference books)

[Study outside of class (preparation and review)]

There may be a couple of homework assignments throughout the course.

(Other information (office hours, etc.))

Office hours are not specified; Questions to instructors are accepted by appointment

		+ 亜 年	
Course number U-ENG23 33117 LJ73		未更新	連続体の力学(2)
Course title (and course) title in English)	Instructor's Associate Pro name, job title, and department of affiliation Graduate S	chool of Engineering fessor,ONDA SHINICHIROU chool of Engineering IGO YOUSUKE chool of Engineering	[Evaluation methods and policy] Mainly regular examination. Reports and attendance are also considered for grading. [Textbooks]
Target year Brd year students or above Number of crec		2021/First semester	Printed materials on the contents of this subjetc are distributed in class.
Days and periods Tue.3 Class style Lectur	e Language of instructi	Japanese	[References, etc.]
[Overview and purpose of the course]		-	(Reference books)
Continuum Mechanics is a branch of the physical scier continuous media under the influence of external effec The following basic items are explained with exercise formulation of deformation, motion and stress, Conser angular momentum, energy conservation laws), Consti Principle of virtual work and minimum potential energ Method, Applications in Elasticity and Fluid Dynamic	ts. s: Fundamentals of tensor anal vation laws of continuous med itutive laws of elastic body and ty based on the calculus of vari	ysis, Mathematical ia (mass, momentum, Newtonian fluids,	[Study outside of class (preparation and review)]
[Course objectives] Based on the clear understanding of the mathematical laws, students are requested to understand the derivati angular momentum and energy, certainly. Principle of attached inportance as the basis of Finit Element Meth	on of the Equation of motion, C vurtual work and minimum po	Conservation laws of	(Other information (office hours, etc.)) Students can contact with Prof. Hosoda by sending e-mail to hosoda.takashi.4w@kyoto-u.ac.jp (Katsura C1- 3-265). *Please visit KULASIS to find out about office hours.
[Course schedule and contents]			
Elementary knowledge on tensor analysis,2times,Defin over a material volume, Transformation of component Stress, strain and strain rate tensors,2times,Definition of of components of these tensors variables, Invariants und of strain, etc. Mathematical formulation of conservation laws,2times continuous media (mass, momentum, angular moment Constitutive law of solids and fluids,2times,Constitutiv fluids Principles based on the calculus of variations and FEM potential energy based on the calculus of variations, Fi Applications in elasticity and fluid dynamics,4times,A propagation in elastic body, Thermal convection and L Achievement confirmation,1time,Achievement of lear	s of tensors, etc. of stress, strain and strain rate I der coordinates transformation, "Mathematical expression of c um, energy) ve laws of elastic amp visco ela 1,2times,Principle of vurtual w nite Element Method, etc. pplications in Elasticity and Fl orentz Chaos, etc.	ensors, Transformation Compatibility condition onservation laws of stic body and Newton ork and minimum	
[Course requirements]			
Basic understanding on differential and integral calcul	C C	「連続体の「力学(2)↓↓↓	

Course nu	ımber	• U-ENC	323 2	3132 LJ17	U-EN	G23	23132	LJ16		
Course title (and course title in English)	name, job titue, 基礎環境工学 I le in Fundamental Environmental Engineering I fundational School of Engineering I and department							OIN hool of Engineering		
Farget yea	r 21	nd year students o	or above	Number	of cred	its	2	Yea	r/semesters	2021/Second semester
Days and peri	ods Fr	i.4	Class	s style	Lecture	e			Language of instruction	Japanese
environment protection o developmen and health. I organization	tal eng f wate t of so Lectur s. Bas bject	gineering, glo er environmen ociety of mate es are given sic theories a	obal e nt and erial c by sta nd pra	nvironment l water supp cycles and t affs of Envi actice of En	tal probled by and sechnolo ronment ivironme	ems sewa gies tal E enta	and pro age syst of wast Engineer I Engine	otectic ems, r te mar ring C eering	on of atmosph nanagement o nagement, and ourse and spe are provided.	e overview of eric environment, if environmental risk, global environment cialists of other
- (1) Global e Histories an	nviror d mec		lems : lobal	and protect	ntal prol	blen			nment (3 time ow carbon soo	es): ciety, current situation
Framework quality, poll	and fu utions		iter en e and	vironment, marine and	factors their m	of v iech	vater po anisms,	llution	and mechan	ism, change of water otection of water
		of Environme identificatio				tive	risk ass	essme	ent, and risk m	nanagement.
Design of so	ciety		ycles,	, generation					management I wastes and t	(3 times): heir factors, waste
		nment and he of global env			nan heal	lth a	ind cont	rol me	easures for the	em.
		confirmation earning is cor								
								,	Continue to	基礎環境工学Ⅰ(2)↓↓↓

基礎環境工学 | (2)

[Course requirements] one

[Evaluation methods and policy]

Breakdown of grading: paper tests results (60%) and attendance (40%). Short tests are also conducted for grading.

[Textbooks]

Printed materials are distributed in class.

[References, etc.]

(Reference books)

(Reference books) Ministry of the Environment 『Annual Report on the Environment in Japan』 Graduate School of Global Environmental Studies, Kyoto University (ed.) 『Global Environmental Studies, Learning of Way of Thinking from Several Points of View and Ability to Solve Problems, Kyoto University Popular Lecture Series』 (Maruzen) ISBN:9784621088074

[Study outside of class (preparation and review)] To follow guide of the staffs.

(Other information (office hours, etc.))

Contents and the number of lectures are a guide. Question time is prepared at individual lectures. Please confirm the information on the details of office hours via KULASIS.

*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

Category
 An omnibus course delivered by invited lecturers and guest speakers from different companies, etc.

(2) Details of instructors' practical work experience related to the course 4 to 6 visiting lecturers from government agencies, consultants, think tanks, plant manufacturers

(3) Details of practical classes delivered based on instructors' practical work experience Lectures on the role of environmental engineering in society by members of companies and government

		J						1.
Course number U-ENG23 23133 LJ28 U-EN	NG23 23133 LJ77	未更新	Course n	umber	U-ENG23 23134 LJ73			未更新
Course title (and course title in English) Farget year Ind year students or above Number of creat Days and periods Mon.3 Class style Lectur	Instructor's Professor,K name, job title, and department of affiliation Graduate S Associate Pro- dits 2 Year/semesters	theol of Engineering OIKE KATSUAKI shool of Energy Science IABUCHI MAMORU theol of Energy Science ofessor,KUSUDA HIROMU 2021/First semester Japanese	Course title (and course title in English)		テム分析及び演習 sis and Exercise for Planning and Managem	Instructor's name, job title, and department of affiliation	Graduate School of Professor, FUJII SA7 Disaster Prevention I Professor, TATANO Graduate School of Associate Professor, OC Graduate School of Assistant Professor, KAW Graduate School of Assistant Professor, N	FOSHI Research Institute HIROKAZU Management BA TETSUHARU Engineering ABATA YUICHIRO Engineering
[Overview and purpose of the course]		•	Target yea	r 2nd year	students or above Number of cr	edits 2 Ye	ar/semesters 2021/s	Second semester
			Days and per			inar	Language of instruction Japane	se
[Course objectives]			Overview	v and purp	oose of the course]			
			[Course of	bjectives]			
[Course schedule and contents] ,3times,								
,6times, ,5times,			-		and contents] ning and management,6times,			
ltime, ltime,			Linear Prog	ramming,51	times,			
[Course requirements]				ogramming	, PERT,6times,			
None			[Course r					
[Evaluation methods and policy]			None	on method	is and policy]			
			Levaluation	minethot				
[Textbooks]			[Textbool	(s]				
[References, etc.] (Reference books)			[Reference (Reference)	es, etc.] nce books	(a			
					-,			
[Study outside of class (preparation and revie	ew)]		[Study ou	tside of c	lass (preparation and rev	iew)]		
(Other information (office hours, etc.)) Please visit KULASIS to find out about office hours.					I (office hours, etc.)) S to find out about office hour	s.		
Course number U-ENG23 33136 LJ73 Course title (and course hydrodynamics and Hydrodynamics and Hydrodynamics)	Professor, T Instructor's Disaster Pre name, job title, Professor, N and department of affiliation Associate Pre Disaster Pre Disaster Pre	未更新 hool of Management ODA KEIICHI vention Research Institute AKAKITA EIICHI hool of Engineering fessor,SANJIYOU MICHIO vention Research Institute ressor,YAMACUCHI KOSEI	-	on method	is and policy] I final examination			
Farget year Brd year students or above Number of crect	dits 2 Year/semesters	2021/First semester	[Reference	es.etc.1				
Days and periods Tue.2 Class style Lectur [Overview and purpose of the course]	re Language of instructio	Japanese	-	nce books	s)			
Lecture of fundamental theories of fluid dynamics and Basic equations, potential flow theory, boundary layer modelings about fluid motion and heat transfer in atmo	r theory and turbulent flow Intr	oduction of basic	[Study ou	tside of c	lass (preparation and rev	iew)]		
[Course objectives] Learning elementary knowledge of hydraulics and imp	oortant topics of hydrodynamic	s science	(Other in	formation	(office hours, etc.))			
[Course schedule and contents]					S to find out about office hour	s.		
[Course schedule and contents] Open channel flow (1), Itime,Basic equations of non-to- Open channel flow (2), Itime,Non-uniform flow comp Unsteady pipe flow, Itime,Basic equations of unsteady and surge tank Unsteady open-channel flow, Itime,Basic equations of and hydraulic bore Introduction of fluid dynamics (1), Itime,Boundary the Introduction of fluid dynamics (2), Itime,Primer of turk Applied hydraulics (1), Itime,Fundamentals of sedime Applied hydraulics (3), Itime,Fundamentals of sedime Hydrometeorology (3), Itime,Introduction to hydrome Hydrometeorology (3), Itime,Moisture in atmosphere, Hydrometeorology (5), Itime,Atent instability, Land s Achievement confirmation, Itime,Achievement of learn [Course requirements] Hydraulics and Exercises	nutation pipe flow, application to water unsteady open-channel flow, ory and application to hydrauli bulence theory and application allysis nt transport of rivers teorology osophere, Dry-adiabatic process osphere for infinitesimal displa Moist-adiabatic process surface process of atmosphere	hummer phenomenon theories of flood flow c engineering to hydraulic engineering						
	Continue to	, 永理永工学(2)↓↓↓↓						

Course II	umbe	er U-ENG	G23 33	3138 EJ73						
Course title (and course title in English)		「実験及び演 rriments on Soi		nanics and E	xercises	nam and	ructor's 10, job tii departm ffiliation	nent	Professor,KI Disaster Prev Professor,UZ Graduate Scl Associate Profe Graduate School Associate Prof Graduate Scl Assister Prev Associate Prof Graduate Scl Assistant Profe Graduate Scl Assistant Profe Disaster Prev Disaster Prev	tool of Engineering SHIDA KIYOSHI ention Research Institut 2UOKA RYOSUKE tool of Engineering ssor,SAWAMURA YASUC of Global Environmental Studie fessor,TAKAI ATSUSH tool of Engineering GO YOUSUKE ention Research Institut essor,GOTOU HIROYUK tool of Engineering ssor,KIDO RYUNOSUKI tool of Engineering fessor,SAWADA MAI tool of Engineering ssor,MYAZAKI YUSUKI ention Research Institut fessor, EDDA KYOHE
Farget yea	ar 🛛	3rd year students o	or above	Number of	of cred	its	2	Yea	r/semesters	2021/First semester
Days and peri	iods W	Ved.3,4	Class	style	Semina	ar			Language of instruction	Japanese
-		d purpose o		course]						
			to nom	uiro laborat	onyand	in a	itu tastir		thada ta assas	anginaaring
		, which were						ng me	thods to asses	s engineering
properties o	of soil.	, which were	taught	in the soil	mechan	iics (course.	-		
For the state of t	of soil, objec dents ice. to car analy	, which were	taught ling th l mech ret exp	e soil mech anics funda	mechan nanics co amental data.	once exp	pts give	en in tl		s engineering
properties o [Course c To help stuc on experien To be able To collect, To have a f [Course s	of soil objec dents ice. to car analy feeling schec	, which were tives] in understand rry out all soil rze and interp g of engineeri dule and co	ling th ling th l mech ret exp ing pro	e soil mech anics funda perimental o pperties of g	mechan nanics co amental data.	once exp	pts give	en in tl		
ICourse of To help studion experien To be able To collect, To have a f Introduction	of soil, objec dents ice. to car analy feeling schec n and	, which were tives] in understand rry out all soil rze and interp g of engineeri dule and co Orientation, 1 es of soils, 1	ling th ling th l mech ret exp ing pro ntent l time,	e soil mech anics funda perimental o perties of g	mechan nanics co amental data. geomate	once exp erials	pts give eriment	en in tl s.	he Soil Mecha	
properties o [Course c To help stuce on experien To be able To collect, To have a f [Course s introduction Physical pro- Grain size d	of soil, objec dents ice. to car analy feeling schec n and opertion	, which were tives] in understand rry out all soil rze and interp g of engineeri dule and co Orientation, 1 es of soils, 1	taught ling th l mech ret exp ing pro ntent l time, S	in the soil e soil mech anics funda opertimental operties of g s] Structure of	mechan aanics co amental data. geomate	once exp erials	pts give eriment s. eering c	en in tl s.	he Soil Mecha	inics course with hands
properties o [Course c To help stuc on experien To collect, To collect, To have a f [Course s Introduction Physical pre Grain size d Compaction Hydraulic C	of soil, bbjec dents ice. to car analy feeling schec n and ppertialistrib istrib n Test Condu	, which were tives] in understand rry out all soil rry out all soil rry out all soil rry out all soil re and interp g of engineeri dule and co Orientation, es of soils, 1 uution i, 1 time, Labo hetivity Test &	taught ling th l mech ret exp ing pro ntent l time, s time, s pratory & Parti	in the soil e soil mech anics funda perimental a pretries of g s] Structure of compactic cle size dis	mechan aanics co amental data. geomate	once exp erials Fac	pts give eriment s. eering c tors affe	en in til s. lassifi	he Soil Mecha	nics course with hands s, Consistency Limits, seepage, Darcy's law,
properties o [Course c To help stuc on experien To be able To collect, To have a f [Course s Introduction Physical prod Grain size d Compaction Hydraulic C Hydraulic g	of soil. bbjec dents ice. to car analy feeling schec n and pperti- listrib n Test Condu gradien	, which were tives] in understand rry out all soil ze and intery g of engineeri dule and co Orientation, es of soils, 1 ution i, 1 time, Labo activity Test & nt, Determina	taught ling th I mech ret exp ing pro ntent 1 time, \$ time, \$ voratory to parti- tition o	in the soil e soil mech anics funda perimental operties of p s] Structure of a compactic cle size dis f hydraulic	mechan aanics co amental data. geomate conduct conduct	ngine Fac	eering c tors affe t, 1 time y, Partic	en in the state of	he Soil Mecha ication of soil: compaction meability and	nics course with hands s, Consistency Limits, seepage, Darcy's law, of soils

+ 質実験及び演習(2)

Consolidation Test, 1 time, Fundamentals of consolidation, Laboratory tests, Settlement-time relationship

Jnconfined compression test, 1 time, Stress-strain and strength behavior of clays

Direct Shear Test, 1 time, Mohr-Coulomb failure criterion, Laboratory tests for shear strength determination

ounding methods, 0.5 times, N-values of standard penetration test and elastic wave exploration

Centrifuge model test, 0.5 times, Experiments using the similarity law of centrifuge test

Shaking table test, 1 time, Experiments using the shaking table test on dynamic behaviours of soils and foundatio

Computer Exercise and numerical analysis, 2 times, Fundamentals of math and physics for geotechnical engineering

Special Lecture, 1 time, Special lecture on soil mechanics

Exercise, 1 time, Practical application of laboratory testing data

Feedback, 1 time, Summary of experiments on soil mechanics

[Course requirements]

Soil mechanics I and exercises(31620) It is recommended to take soil mechanics II and exercises in parallel.

[Evaluation methods and policy]

Laboratory: Each student is expected to conduct the experiments to gain hands on experience. Attendance: Full attendance to lecture and laboratories is compulsory. Grading policy:Laboratory Report, 100% of the course grade.

[Textbooks]

To be announced in the class.

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)] It is recommended to read testing procedure beforehand.

Continue to 土質実験及び演習(3)↓↓↓

土質実験及び演習(3)

(Other information (office hours, etc.))

ontact information will be announced in the orientation

*Please visit KULASIS to find out about office hours

[Courses delivered by instructors with practical work experience]

(1) Category A course with practical content delivered by instructors with practical work experience

(2) Details of instructors' practical work experience related to the course

(3) Details of practical classes delivered based on instructors' practical work experience

Course number U-ENG23 33139 LJ73 U-ENG23 33139 LJ16 duate School of Global Envi ental Studi Professor,KATSUMI TAKESHI Course title Instructor's Graduate School of Engineering Professor, KOIKE KATSUAKI 基礎環境工学Ⅱ (and course name, job title . title in Fundamental Environmental Engineering II and department of affiliation Graduate School of Engineering Professor,SHIMIZU YOSHIHISA English) Graduate School of Engineering Professor, YONEDA MINORU Brd year students or above Number of credits 2 Year/semesters 2021/First semester Target year Days and periods Tue.1 Class style anguage of instruction Japanese Lecture [Overview and purpose of the course] The focus is on the management of the geosphere environment, and the management system based on environmental standards and so forth; the history and current state of pollution in Japan, pollution nechanisms and the characteristics of soil and groundwater, a model for pollution evaluation, pollution nvestigation methods, and soil rehabilitation technology will be explained. With respect to various kinds of investigation methods, purification and rehabilitation technologies, actual purification and rehabilitation cases will be introduced, and the principle, characteristics, and problems will be explained. Additionally, the movement mechanism of water and materials in bedrock will be explained. [Course objectives] Protecting the soil and groundwater that is closely related to the geosphere environment, especially our li from contamination, and understanding the knowledge that is the basis for thinking rationally and for the our lives. engineering techniques needed for the theory and background management. Understanding how to grasp the current state of the geosphere environment and the basics for predicting the future of pollution, and also developing applied skills for designing a method of managing the geosphere environment on your own. [Course schedule and contents] History of soil pollution and governing equation (2 times): The historical background and current situation of soil and groundwater pollution in Japan will be introduced, and how Japan has responded to these problems, the setting of environmental standard values, the current situation of legal regulation, future issues, and so forth will be introduced. In addition, the governing equation that describes the behavior of pollutants in the oil will be outlined. Movement mechanism of water and materials in the soil and physical measures (3 times); The following contents will be explained: 1. Hydrology and permeability coefficient in the soil (type of soil and permeability coefficient and ermeability of multilayered ground); 2. characteristics and effects of waterproofing material, underground valls, and clay barriers; and 3. hydraulic characteristics of unsaturated soil and capillary barriers. Organic pollution mechanism and measures (3 times): We explain the characteristics of soil and sorption/ desorption reactions, which are important for the bioremediation of soil contaminated with organic matter. Mechanism and countermeasures of inorganic pollution (3 times): The relation with pH and oxidation-reduction potential, the stoichiometric equilibrium theory, the ionization tendency, and so forth which are necessary for understanding the mechanism of inorganic contamination will be explained. ior understanding the nectaanism of non-generative Continue to 基礎環境工学Ⅱ(2)↓↓↓

	未更新
基礎環境工学II(2)	Course number U-ENG23 33140 LJ14 U-ENG23 33140 LJ15
Movement mechanism of substance in underground layers (3 times): As examples of relationship between geoenvironment and society, geological disposal of high level radioactive waste and naturally occurring heavy metal pollution in underground layers will be taken up and their physical, chemical and geological features will be explained.	Course title (and course) title in English) 大気・地球環境工学 Atmospheric and Global Environmental Engineering and department of affiliation Instructor's name, job title, and department of affiliation Graduate School of Engineering
[Final exam]	Target year Brd year students or above Number of credits 2 Year/semesters 2021/First semester
	Days and periods Mon.1 Class style Lecture Language distriction Japanese
Feedback (1 time): Questions on the lectures or exams will be accepted and answered by E-mail.	[Overview and purpose of the course]
[Course requirements]	The history of global environmental issues are lectured with a special focus on climate change,地球環境問 ozone depletion and acid rain. Moreover, the energy consumption and its environmental relationship would
None	be discussed. The governmental and international organization roles are also presented. Finally the air pollution, its mechanism, health impact and abatement technologies are lectured.
[Evaluation methods and policy] Evaluated by the score or the final examination. The score of some reports will be also considered, if some	
are given by lectures.	[Course objectives] To understand the systematic knowledge about global environment and air pollution problem
[Textbooks] Not used	[Course schedule and contents]
Handout will be given at each lecture.	Global environmental change, ltime, Structural change in society and environmental problem changes are discussed. History of global environment and current situation are explained. The sustainable development and environmental efficiency, environmental capacities follow. Climate change, 4times, Why climate change happens, greenhouse gas emissions, their reaction in the
[References, etc.] (Reference books)	environment, climate change perspective and impacts are explained. Finally, climate change mitigations are
Introduced during class	presented. Ozone layer protection and acd rain, Itime,Ozone depletion history, the source substance, ozone layer distribution, ultraviolet effect on health, international ozone layer protection, Montreal protocol effectiveness and Langue executer protection and activity in exchange in the source of the source
[Study outside of class (preparation and review)]	and Japanese countermeasures are explained. Acid rain mechanism, its ecosystem effect, and the mitigation measures for acid rains are presented.
Completely understand the contents of each handout.	Energy and environment,2times,Environmental load associated with energy consumption, indoor pollution, urban air pollutions caused by energy consumption and intervention to the material cycle induced by energy
(Other information (office hours, etc.))	consumptions are lectured. Global environmental protection, l time, International activities for global environmental issues, and Japanese
*Please visit KULASIS to find out about office hours.	policy as well as private sectorsquos role are explained. Air pollution, 1time, Global and Japanese air pollution history is introduced. Then, industrial development and its relationship with air pollutions are discussed.
	Air pollutants and health impact, I time, Individual air pollution species and its chemical characteristics, as well as health impacts are lectured.
	Air pollution law and abatement technology,1time,Environmental standard and emissions regulations for air
	pollutions are explained. Also, abatement technologies are presented Air pollution mechanism, Itime, Diffusion of pollution, reaction, and deposition are discussed with from the
	physical chemistry phenomena. Stability of air and air quality model is also explained Air pollution simulation, ltime, Emissions source data, meteorological data, and air chemical transport model
	simulations are lectured. Confirmation of understanding, Itime, Confirm the understanding
	commation of understanding, rune, commit the understanding
	Continue to 大気・地球環境工学(2)↓↓↓
]
大気・地球環境工学(2)	未更新 Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Graduate School of Engineering Professor,Fujiwara Taku
大気・地球環境工学(2) 	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Graduate School of Engineering Professor, Fujiwara Taku Graduate School of Global Environmental Studies Associate Professor, TANAKA SHUHEI
[Course requirements] none	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Graduate School of Engineering Professor, Fujiwara Taku Graduate School of Global Environmental Studies Associate Professor, TANAKA SHUHEI Graduate School of Engineering
[Course requirements]	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department Graduate School of Engineering Professor, TANAKA SHUHEI Graduate School of Engineering Associate Professor, NISHIMURA FUMITAKE Graduate School of Engineering
[Course requirements] none [Evaluation methods and policy]	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, of affiliation Graduate School of Engineering Professor, Fujiwara Taku Graduate School of Engineering Associate Professor, NSHIMURA FUNTAKE Graduate School of Engineering Course title, Graduate School of Engineering School teture, NAKADA NORIHIDE Graduate School of Engineering
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well.	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUHEI Graduate School of Engineering Associate Professor, NSIMURA FMUITAKE Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Engineering Associate Professor, NSIMURA FMUITAKE Graduate School of Engineering Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Engineering
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Kasociate Professor, TANAKA SHUHEL Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, NAKDA NORIHIDE Graduate School of Engineering Senior Lecturer, MIDAKA TAIRA Graduate School of Engineering Senior Lecturer, MIDAKA TAIRA
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.]	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Gourse title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUHEI Graduate School of Engineering Associate Professor, TANAKA SHUHEI Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, MISHIMURA FAURA Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Enginering Senior Lecturer
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会検定実行委員会編:3R・低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会)	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Kasociate Professor, TANAKA SHUHEL Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, NAKDA NORIHIDE Graduate School of Engineering Senior Lecturer, MIDAKA TAIRA Graduate School of Engineering Senior Lecturer, MIDAKA TAIRA
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会檢定実行委員会編-3R・低炭素社会檢定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)]	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUHEI Graduate School of Engineering Associate Professor, TANAKA SHUHEI Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Engineering Senior Lecturer, HIDAKA Japanese
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会検定実行委員会編:3R・低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Gourse title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUHEI Graduate School of Engineering Associate Professor, TANAKA SHUHEI Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Enginering Senior Lecturer
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会檢定実行委員会編:3R・低炭素社会檢定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.))	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Instructor's name, job title, Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUHEI Graduate School of Engineering Associate Professor, TANAKA FUMITAKE Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARIKA Target year Target year ird year students or above Number of credits 3 Year/semester 2021/First semester Days and periods Mon.3,4,5 Class style Experiment Lawage distuder Japanese [Overview and purpose of the course] U Senior Lecturer, Historia Japanese
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会檢定実行委員会編:3R・低炭素社会檢定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor,Fujiyara Taku Graduate School of Engineering Associate Professor,TANAKA SHUHEI Graduate School of Engineering Senior Lecturer,HIDAKA TAIRA Graduate School of Engineering Assistant Professor,TAKEUCHI HARUKA Japanese Days and periods [Overview and purpose of the course] Experiment Lapuage disturbs [Course objectives] [Course objectives] Image disturbs
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会検定実行委員会編:3R・低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours.	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Instructor's Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor,Tajiyara Taku Graduate School of Engineering Associate Professor,TANAKA SHUHEL Graduate School of Engineering Senior Lecturer,NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer,NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer,NIDAKA TAIRA Graduate School of Engineering Senior Lecturer,TIDAKA TAIRA Graduate School of Engineering Assistant Professor,TAKEUCHI HARUKA Target year Target year 3rd year students or above Number of credits 3 Year/semester 2021/First semester Days and periods Mon.3,4,5 Class style Experiment Laquaged itstudie Japanese [Overview and purpose of the course] U Senior Lecture Professor, TAKEUCHI HARUKA Japanese
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会檢定実行委員会編:3R・低炭素社会檢定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience]	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANKA SHUHEI Graduate School of Engineering Associate Professor, TANKA SHUHEI Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Japanese Days and periods Mon.3,4,5 Class style Experiment Laquage distuder [Course objectives]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会検定実行委員会編:3R・低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours.	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUHEI Graduate School of Engineering Associate Professor, TANAKA SHUHEI Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Japanese Days and periods Mon.3,4,5 Class style Experiment Lamage disture [Course objectives] [Course schedule and contents]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会検定実行委員会編:3R・低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TaNaKA SHUHEI Graduate School of Engineering Associate Professor, TANAKA SHUHEI Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Japanese Days and periods Mon.3,4,5 Class style Experiment Lappaputistude Japanese [Course objectives]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会檢定実行委員会編:3R・低炭素社会檢定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Graduate School of Engineering Professor, TANAKA SHUEL Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Senior Lecturer, NAKAS ANUHEL Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Graduate School of Engineering Senior Lecturer, MEDAKA TAIRA Graduate School of Engineering Senior Lecturer, MEDAKA TAIRA Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Japanese [Overview and purpose of the course] Impaged instudie Japanese [Course objectives] Impaged instudie Japanese [Course schedule and contents] Stimes, Stimes, Stimes, Stimes, Stimes,
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R・低炭素社会檢定実行委員会編:3R・低炭素社会檢定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANKA SHUHEI Graduate School of Engineering Associate Professor, TANKA SHUHTAKE Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Target year Target year trd year students or above Number of credits 3 Year/semesters 2021/First semester Days and periods Mon.3,4,5 Class style Experiment Laquage distinction Japanese [Course objectives] [Course schedule and contents] 5
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R、低炭素社会検定実行委員会編:3R、低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Graduate School of Engineering Professor, Fujiwara Taku Graduate School of Engineering Associate Professor, Fujiwara Taku Graduate School of Engineering Associate Professor, TANAKA SHUHEI Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Japanese Days and periods Mon.3,4,5 Class style Experiment Impaged instudie ICourse objectives]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R、低炭素社会検定実行委員会編:3R、低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Fright 学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUEEL Graduate School of Engineering Senior Lecturer, NAKADA NORHIDE Graduate School of Engineering Senior Lecturer, MAKADA NORHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Target year Target year trd year students or above Number of credits 3 Year/semesters 2021/First semester Days and periods Mon.3,4,5 Class style Experiment Lapuage fisted of Japanese Japanese [Course objectives]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R、低炭素社会検定実行委員会編:3R、低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Graduate School of Engineering Professor, Fujiwara Taku Graduate School of Engineering Associate Professor, Fujiwara Taku Graduate School of Engineering Associate Professor, TANAKA SHUHEI Graduate School of Engineering Senior Lecturer, NAKADA NORIHIDE Graduate School of Engineering Senior Lecturer, HIDAKA TAIRA Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Japanese Days and periods Mon.3,4,5 Class style Experiment Impaged instudie ICourse objectives]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R、低炭素社会検定実行委員会編:3R、低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Fright 学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUEEL Graduate School of Engineering Senior Lecturer, NAKADA NORHIDE Graduate School of Engineering Senior Lecturer, MAKADA NORHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Target year Target year trd year students or above Number of credits 3 Year/semesters 2021/First semester Days and periods Mon.3,4,5 Class style Experiment Lapuage fisted of Japanese Japanese [Course objectives]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R、低炭素社会検定実行委員会編:3R、低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Fright 学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUEEL Graduate School of Engineering Senior Lecturer, NAKADA NORHIDE Graduate School of Engineering Senior Lecturer, MAKADA NORHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Target year Target year trd year students or above Number of credits 3 Year/semesters 2021/First semester Days and periods Mon.3,4,5 Class style Experiment Lapuage fisted of Japanese Japanese [Course objectives]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R、低炭素社会検定実行委員会編:3R、低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Fright 学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUEEL Graduate School of Engineering Senior Lecturer, NAKADA NORHIDE Graduate School of Engineering Senior Lecturer, MAKADA NORHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Target year Target year trd year students or above Number of credits 3 Year/semesters 2021/First semester Days and periods Mon.3,4,5 Class style Experiment Lapuage fisted of Japanese Japanese [Course objectives]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R、低炭素社会検定実行委員会編:3R、低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Fright 学実験1 Environmental Engineering, Laboratory I Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TANAKA SHUEEL Graduate School of Engineering Senior Lecturer, NAKADA NORHIDE Graduate School of Engineering Senior Lecturer, MAKADA NORHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Target year Target year trd year students or above Number of credits 3 Year/semesters 2021/First semester Days and periods Mon.3,4,5 Class style Experiment Lapuage fisted of Japanese Japanese [Course objectives]
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R、低炭素社会検定実行委員会編:3R、低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) 環境工学実験1 English) Instructor's English) Graduate School of Engineering Professor, Fujivara Taku Graduate School of Engineering Asciate Professor, TANAKA S1NUAR HUMITAKE Graduate School of Engineering Saciate Professor, TANAKA S1NUAR HUMITAKE Graduate School of Engineering Saciate Professor, TANAKA S1NUAR Graduate School of Engineering Graduate School of Enginering Graduate School of Enginering Graduate School
[Course requirements] none [Evaluation methods and policy] There to be writing test every class and final exam are evaluated as well. [Textbooks] Distribute handout copy [References, etc.] (Reference books) 3R、低炭素社会検定実行委員会編:3R、低炭素社会検定公式テキスト(ミネルバ書房)公害防止の 技術と法規編集委員会:新・公害防止の技術と法規(大気編)(産業環境管理協会) [Study outside of class (preparation and review)] non (Other information (office hours, etc.)) Explain in the first lecture *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course	Course number U-ENG23 33141 EJ14 U-ENG23 33141 EJ73 Course title (and course title in English) Graduate School of Engineering Professor, TANAKA SHUEEL Graduate School of Engineering Associate Professor, TANAKA SHUEEL Graduate School of Engineering Senior Lecturer, NAKADA NORHIDE Graduate School of Engineering Senior Lecturer, MAKADA NORHIDE Graduate School of Engineering Assistant Professor, TAKEUCHI HARUKA Target year Target year trd year students or above Number of credits 3 Year/semesters 2021/First semester Days and periods [Course objectives] [Course schedule and contents] 5 3 Japanese [Course requirements] [Course requirements] [Course requirements] None

環境工学実験1(2)	Course number U-ENG23 33144 LJ77
[References, etc.] (Reference books)	Graduate School of Engineering Professor,KOIKE KATSUAKI Graduate School of Engineering Professor,TSUKADA KAZUHIKO Graduate School of Engineering Professor,TKUKYAMA EIICHI Graduate School of Energy Science
[Study outside of class (preparation and review)] (Other information (office hours, etc.)) *Please visit KULASIS to find out about office hours.	Course title (and course title in English)
[Courses delivered by instructors with practical work experience]	Associate Professor,KASHIWAYAKOUK Graduate School of Energy Science Professor,HAMA TAKAYUKI
 Category A course with practical content delivered by instructors with practical work experience 	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second semester
(2) Details of instructors' practical work experience related to the course	Days and periods Fri.3 Class style Lecture Language of instruction Japanese [Overview and purpose of the course]
(3) Details of practical classes delivered based on instructors' practical work experience	[Course objectives]
	[#039#039, #039#039]
	[Course schedule and contents]
	,1-2times, ,1-2times, ,1-2times, ,1-2times, ,1-2times, ,1-2times, ,1-2times, ,1-2times,
	[Course requirements]
	None
先端資源エネルギー工学(2) [Evaluation methods and policy]	未更新 Course number U-ENG23 33147 PJ73 U-ENG23 33147 PJ16 U-ENG23 33147 PJ17 Course title (and course 学外実習(土木工学コース) and department Graduate School of Global Environmental Studi Associate Professor. TAK AI ATSUSH
	title in English) Spot Trainning and department of affiliation Associate Professor, TAKAI ATSUSI
[Textbooks] [#039#039, #039#039]	Target year Brd year students or above Number of credits 2 Year/semester 2021/Intensive, Second semester
	Days and periods Intensive Class style Practical training Language disturbed Japanese
[References, etc.] (Reference books) #039#039, #039#039]	[Overview and purpose of the course]
(Related URLs)	[Course objectives]
[#039#039, #039#039])	
[Study outside of class (preparation and review)]	[Course schedule and contents]
(Other information (office hours, etc.)) Please visit KULASIS to find out about office hours.	
	[Course requirements] None
[Courses delivered by instructors with practical work experience] (1) Category	[Evaluation methods and policy]
An omnibus course delivered by invited lecturers and guest speakers from different companies, etc.	
2) Details of instructors' practical work experience related to the course	[Textbooks]
3) Details of practical classes delivered based on instructors' practical work experience	
	[References, etc.] (Reference books)

学外実習(土木工学コース)(2)	Course number U-ENG23 33147 PJ73 U-ENG23 33147 PJ16 U-ENG23 33147 PJ17
[Study outside of class (preparation and review)]	- Course itilie (and course title in English) Spot Trainning Spo
Other information (office hours, etc.))	
lease visit KULASIS to find out about office hours.	Target year Bid year students or above Number of credits 2 Year/semesters 20// Infensive. Second remesters Days and periods Intensive Class style Practical training Lappage distudy Japanese
	[Overview and purpose of the course]
Courses delivered by instructors with practical work experience]) Category	To acquire methodologies of Global Engineering (e.g., structural engineering, hydraulic engineering, geotechnical engineering, planning, and environmental engineering) through their experiences at institut
course that includes off-campus training classes.	(e.g., national and local governments, public corporations, and private companies).
) Details of instructors' practical work experience related to the course	[Course objectives] To improve job consciousness and working knowledge through business experiences related to Global
Details of practical classes delivered based on instructors' practical work experience	Engineering (Civil Engineering and Environmental Engineering). To share experiences of internship among the students at debrief meeting and improve their presentation skills.
	[Course schedule and contents] Internship related to Global Engineering (e.g., structural engineering, hydraulic engineering, geotechnica
	engineering, planning, and environmental engineering): To acquire methodologies of Global Engineering (e.g., mechanical characteristics of structures and methodologies of structural engineering to achieve rational structure design, hydraulics and hydrology ft basics of hydraulic structure design, characteristics of soil and rock and basic methodologies of ground structure design, methodologies of rational infrastructure development, and roles of environmental engineering) through actual applications.
	[Course requirements] A required prerequisite is knowledge of basic subjects (e.g., structural mechanics, hydraulics, soil mecha systems analysis for planning and management, and fundamental environmental engineering).
	[Evaluation methods and policy] Grade is given based on a business diary during the internship, a report about outcome of the internship,
	presentation after the internship.
	[Textbooks] Not used
	No textbook.
	[References, etc.]
^学 外実習(環境工学コース)(2)	未更 Course number U-ENG23 33148 LJ73
Study outside of class (preparation and review)]	Course title (and course title in English) 空間情報学 Instructor's name, job title, and department of affiliation Graduate School of Engineerin Professor,SUSAKI JIYUNICE Disaster Prevention Research In Professor,HATAYAMA MICH
o follow guide of the staffs.	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second ser
(Other information (office hours, etc.)) he contents of internship are dependent on accepting organizations.	Days and periods Thu.2 Class style Lecture Language distriction Japanese
Periods of internship is about one month during summer holidays. Briefing attendance at the beginning of fiscal year is necessary. o confirm information on details of office hours via KULASIS. Please visit KULASIS to find out about office hours.	[Overview and purpose of the course] Techniques to collect, manage and analyze the spatial data and information related to the terrain and environment are introduced. Especially, Geographic Information System (GIS), satellite remote sensing digital photogrammetry are focused on.
	[Course objectives]
	The student will understand the techniques to obtain the spatial data, e.g. remote sensing and photogram and the system to effectively show and analyze such data, e.g. GIS. In addition, the student will underst the relationship between the techniques and the system.
	[Course schedule and contents] Introduction, Itime, The purpose and role of geoinformatics, and the techniques related to geoinformatics introduced. In addition, the student will understand the concept of CIM (Construction Information Mode to share 3D data among different stages, e.g. design, construction and management. The student will also understand the future trend about CIM. GIS, 6times, The student will understand how to represent geographic information and the geographic information system. Digital photogrammetry,2times,The student will understand (1) interior orientation, (2) exterior orientati and (3) colinearity condition. Remote sensing,4(imes,The student will understand (1) visible and reflective infrared remote sensing, (2)
	thermal remote sensing, (3) microwave remote sensing. 3D point cloud data processing, ltime, The concept and techniques to process point cloud data measured light detection and ranging (LiDAR) will be introduced. Evaluation of understanding, ltime, The student will be evaluated for their understanding of the contents offered by the course.
	 thermal remote sensing, (3) microwave remote sensing. 3D point cloud data processing, Itime, The concept and techniques to process point cloud data measured light detection and ranging (LiDAR) will be introduced. Evaluation of understanding, Itime, The student will be evaluated for their understanding of the contents

空間情報学(2) [Evaluation methods and policy] Evaluate considering the scores of intermediate examination (GIS) and final examination (remote sensing and photogrammetry), and the submitted reports. [Textbooks] saki, J. and Hatayama M., quotGeoinformaticsquot Corona Publishing Co., Ltd., isbn{} {9784339056389} [References. etc.] (Reference books) Japan Association on Remote Sensing, quotRemote Sensing Notequot ibid{} {BB01990469}, Kohei Cho, quotSpatial Data Analysis using GISquot isbn{} {9784772231244} [Study outside of class (preparation and review)] (Other information (office hours, etc.)) Please visit KULASIS to find out about office hours.

Course nu	ımbe	ər	U-EN	G23 3	3149 EJ73						
Course title (and course title in English)			• 解析 ramming an		neat on Structural	Mechanics	nar anc	tructor's ne, job ti I departn Iffiliation	tle, nent	Professor, SL Graduate Sci Professor, TAJ Disaster Prev Professor, GA Disaster Prev Professor, SA Graduate Sci Associate Prof Graduate Sci Associate Prof Graduate Sci Associate Prof Graduate Sci Associate Prof Graduate Sci Assistant Pro Graduate Sci Assistant Pro Graduate Sci Assistant Pro Graduate Sci Assistant Pro	of Global Environmental Studies (GIURA KUNITOMO hool of Engineering KAHASHI YOSHIKAZU ention Research Institute ARASHI AKIRA ention Research Institute WADA SUMIO hool of Engineering fressor, KITANE YASUO hool of Engineering fressor, GTOU JIYUN hool of Engineering fessor, CIVURUKAWA AIKO ention Research Institute essor, GOTOU HIROYUKI hool of Engineering fessor, UEMURA KEITA hool of Engineering fessor, OI YOSHINAO hool of Engineering fessor, OI YOSHINAO hool of Engineering
Target yea	r	3rd yea	students	or above	Number o	of cred	its	2	Year	/semesters	2021/Second semester
Days and perio	ods F	ri.4,5		Clas	s style	Semina	ır			Language of instruction	Japanese
[Overview	and	d pur	pose o	of the	course]						
Practical une Exercises an							at h	ave bee	n learn	ed in Structu	re mechanicsIand

To learn the measurement technique on strain, deflection and vibration in experiment, and the fundamentals/ application on computer programming for matrix methods for structural analysis in computational exercise which are needed for understanding the mechanical properties of member and/or structure.

[Course objectives]

To understand the fundamentals of measurement of strain, deflection and vibration To deeply understand theory of structure mechanics by beam experiment

To understand numerical analysis approach of structures by use of matrix methods To deeply and synthetically understand mechanical behaviors and validation methods of structures by comparing the experimental results with those resulted from matrix methods

[Course schedule and contents]

Introduction, 1 time Explanation of the significance and the role of structural experiment and computer analysis Introduction of practical failure structures

Structural Experiment, 6 times Introducing fundamentals of experiment method and measurement technique for structure model, 5 Continue to 構造実験・解析演習(2)↓↓↓

土面鉱

構造実験・解析演習(2) _ _ _ _ _ _ _ _ _ _ experiments (cantilver, frame, metal, vibraition test, concrete) Computer Analysis, 7 times Computation of the global stiffness matrix, boundary condition, solution procedure, calculation of strain, Visualization, Numerical analysis of a simple beam, Numerical analysis of the test cases (flexural deflection of and a frame) Feeback lecture, 1 time Review structural experiments and computer analysis. Confirm the attainment level of learning [Course requirements] Computer Programming in Global Engineering, Structure mechanics I and Exercises, Structure mechanics II and Exercises [Evaluation methods and policy] Grade is given based on attendance and reports. Experiment: 50 points (each experiments 10 points), Computer programming:50 points Evaluation of experiment and computer programming must be over 30 points. [Textbooks] Instructed during class To be distributed in lectures [References, etc.] (Reference books) Introduced during class [Study outside of class (preparation and review)] tudents will review frame analysis (Other information (office hours, etc.)) Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lectur It is desirable to bring your own laptop. *Please visit KULASIS to find out about office hours.

						不定机
Course number	U-ENG23 33	150 LJ73				
	耐風・設計論 Wind Resistance of Structures, and	Related Structural Design Principles	nstructor's ame, job tit nd departm f affiliation	le, ent A	Professor, SU Graduate Scl Professor, TA Graduate Scl Professor, YA Disaster Prev Associate Prof Graduate Scl	of Global Environmental Studies GIURA KUNITOMO nool of Engineering KAHASHI YOSHIKAZU nool of Engineering AGI TOMOMI ention Research Institute essor,GOTOU HIROYUKI nool of Engineering essor,NOGUCHI KYOHEJ
Farget year Brd y	year students or above	Number of credit	s 2	Year/s	semesters	2021/Second semester
Days and periods Fri.3	Class	style Lecture			Language of instruction	Japanese
[Overview and pu	urpose of the c	ourse]				
including dead load, their evaluation, dem serviceability, aesthe	nand performance etics, and environ	e. To design structu				
[Course objective To understand fundation	-					
seismic design.	amentals of earth		nd seismic	respor	ase of struct	ures, seismic load, and
[Course schedule		•				
The concept and sig design process, meel explained. Introduction of load, classification of desig- characteristics of ran Prediction of earthqu earthquake ground m vibration. Equation corder to estimate earth basis of theories of e	nificance of desig- hanical design, m ,3times,Design lo ign loads are expl ndom loads, i.e. ss uake ground moti notion are introdu of motion for the rthquake response elasticity and plas atural wind and ae	gn, objective of des uulti-level decision i ads for civil infrast lained and their qua eismic load and wir ion and earthquake i.cced based on the th single degree of free of structure. Desig ticity. crodynamics of stru	ign, charace naking are uctures ar ntitative ex d load, are esponse of eories of e edom syste n methods ctures,2tim	e introd pressic explai f structu arthqua for infi	s of civil inf sed. Engined luced. The c on is discuss ned. ure,2times,N ike mechani its solution rastructures characterist	haracteristics and ed. Especially statistic Aethods for predicting

未更新 耐震・耐風・設計論(2) Course number U-ENG23 33151 LJ73 Graduate School of Global Environmental Studie Professor,KATSUMI TAKESHI and the resistance of structures, the design methods such as allowable stress method, limit states method with partial safety factors will be discussed in conjunction with reliability analysis. Seismic design, wind resistant design, optimal design, and landscape design,3times,Seismic design, wind Instructor's name, job title, and department of affiliation Course title (and cours 抽盤環墙工学 Graduate School of Engineering Professor, KIMURA MAKOTO Geoenvironmental Engineering title in rch Institu English) Disaster Prevention Rese resistant design, optimal design and landscape design for various structures, including long span bridge sor,UZUOKA RYOSUKE Profe Brd year students or above Number of credits 2 Year/semesters 2021/Second semester [Course requirements] Farget year Probabilistic and Statistical Analysis and Exercises(30030), Dynamics of Soil and Structures(31110), Structural Mechanics I and Exercises(30080), Structural Mechanics II and Exercises(31640), and Fluid Days and periods Tue.2 Class style Lecture inguage of instruction Japanese Mechanics(31650) [Overview and purpose of the course] This course provides the knowledge on geotechnical engineering related to soft ground improvement, natural [Evaluation methods and policy] saster mitigation, and geo-environmental issues. Based on the performance during the course (including homework) and the results of a final examination [Course objectives] [Textbooks] The goal of this course is to understand the geotechnical engineering contributing to disaster prevention and Hand-outs are distributed when necessary. nvironmental issues. [Course schedule and contents] [References, etc.] Soft ground improvement, 4times,(1) Foundations of structures, (2) countermeasures against soft ground, (3) principle of ground improvement, (4) innovative materials including geosynthetics, and (5) road and (Reference books) pavement engineering, are introduced. Environmental Geotechnics,5times,(1) Remediation of contaminated soils and groundwaters, (2) waste containment, and (3) reuse of waste materials in geotechnical applications, are introduced [Study outside of class (preparation and review)] Geo-disaster, 5times, (1) Rainfall-induced geo-disaster, (2) earthquake-induced geo-disaster, (3) mechanism of liquefaction, and (4) prediction and countermeasure of liquefaction, are introduced. Achievement confirmation, Itime, Achievement of learning is confirmed. (Other information (office hours, etc.)) [Course requirements] uotSoil mechanics I and Exercises (31620)quot would be helpful as a prerequisite. Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture [Evaluation methods and policy] *Please visit KULASIS to find out about office hours. Grading will be made based on the final exam and attendances. [Textbooks] Handouts will be provided. [References, etc.] (Reference books) Continue to 地盤環境工学(2)↓↓↓

地盤環境工学(2)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Contact Information: Professor T. Katsumi at katsumi.takeshi.6v@kyoto-u.ac.jp.

*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience] (1) Category A course with practical content delivered by instructors with practical work experience

(2) Details of instructors' practical work experience related to the course

(3) Details of practical classes delivered based on instructors' practical work experience

									未更新
Course numbe	er U-EN	G23 33152	2 LJ73						
	ヨマネジメン Isportation Sy		nageme	ent	nan and	ructor's ne, job tit departm ffiliation	nent	Professor,FU Graduate Sch	nool of Engineering JII SATOSHI nool of Management MADA TADASHI
Target year	3rd year students	or above Nu	mber o	of cred	lits	2	Year	/semesters	2021/Second semester
Days and periods N	1on.3	Class st	yle	Lectur	e			Language of instruction	Japanese
[Overview and This lecture is air			-	les of su	irvei	desigi	n and	operation for	urban traffic and
transportation sys									
[Course object	-								
	desgin and op	peration of	transpo	ortation	plan	ning an	d traff		n the methodologies g. In addition, these
[Course sched				1.1.1					
Outlines of Traff Road Transportat	tion Planning	,2times,	-		ne,				
Survey and Anal Approaches for T	Fravel Manag	ement,2tir	nes,	,					
Survey and Anal Traffic Flow The		Network,3	times,						
Plannig and Desi Traffic Operation		time,							
Feedback,1time,	1,2times,								
[Course requi	rements]								
The students are #039Systems An									Exercises#039 and
[Evaluation m									
Students will be	graded consid	dering both	1 assing	nments	and	term pa	iper.		
[Textbooks]									
Y. Iida and R. Ki	tamura: Traf	fic Engine	ering (v	vritten i	n Ja	panese)	, Ohm	sha, 2008 isbr	n{}{9784274206382}.

Continue to 交通マネジメント工学(2)↓↓↓

交通マネジメント工学(2)

[References, etc.] (Reference books)

[Study outside of class (preparation and review)]

The exercises related to the class are assigned to the students in order to encourage them to review the ontents of class.

(Other information (office hours, etc.))

The way to contact with the professors for Q amp A is provided at the first class of this course

*Please visit KULASIS to find out about office hours.

Course n	umber	U-EN	G23 33	3154 EJ16	U-EN	G23	33154	EJ76	U-ENG23 3	3154 EJ15
Course title (and course title in English)		学実験2 mental Er	ngineer	ing , Labor	ratoryII	nan and	tructor's ne, job ti departn ffiliation	nent	Professor, T./ Graduate Sc Professor, T./ Graduate Sc Professor, Y.G Graduate Sc Associate Prof Associate Prof Agency for He Professor, M Graduate Sc Assistant Professor, M Graduate Sc Assistant Profes Graduate Sc Assistant Profes Graduate Sc	hool of Energy Science KAAYUKI KAMEDA hool of Engineering NKAOKA MASAKI hool of Engineering NNEDA MINORU hool of Engineering sosor,OSHITA KAZUYUK hool of Engineering fessor, YOKO SHIMAD/ alth, Safety and Environmer ATSUI YASUTO hool of Engineering forssor,GOMI RYOUT) hool of Engineering sor,NAKANISHI TOMOHIR hool of Engineering Science
Target yea	r 3rd y	ear students o	or above	Number o	of cred	its	3	Yea	r/semesters	2021/Second semester
Days and peri	ods Tue.	3,4,5	Class	style	Experi	men	t		Language of instruction	Japanese
[Overview	and p	urpose o	of the o	course]						
environmen	t, noise 1	neasurem	ent and	l radiation	measure	emei	nt throu	gh var		nitoring of atmospheric ents. Also, basic re conducted.
[Course o	bjectiv	es]								
Learning ex operations i					ious fac	tors	in the e	nviror	iment and phy	vsical and chemical unit
[Course s	chedul	e and co	ntents	s]						
The outline the first day These classe and analyzin • Lecture o matter (PM)	of 12 ex of class es cover ng air qu n the me	periments the follow ality. asuremen	in this ving cost	course and ntents to le iques of air	d genera arn the r polluta	ıl ini meti ants,	formation hodolog	on for gy for i s nitroj	monitoring at gen oxides (N	onment dents are presented on mospheric environment (Ox) and particulate tion of the amount of

emission in the field.

3rd and 4th Class:Noise measurement

To understand physical and subjective measurement of the sound levels in the environment o understand physical and subjective measurements and the standard standar

環境工学実験2(2)

5th Class: Report writing To write the reports on these experiments

6th to 11th Class: Environmental process experiments

(1) Air flow condition

(2) Flow characteristics of reactors

(2) Flow characteristics of reactors
 (3) The overall heat transfer coefficient of turbulent flow
 (3) Obtaining the overall heat transfer coefficient of turbulent flow

and cold water. (4) Coagulation

To decide optimal dosage of a coagulant to turbid samples by conducting jar-test

(5) Settling Characteristics To understand the settling behavior of suspended particle in water and the design of the horizontal

edimentation tank.

(6) Rapid sand filtration To evaluate the relationship between turbidity removal and water head loss and to observe filter washing rocess

12th and 13th Class: Radiation measurement

 Basic principles of radiation measurement: To understand basic principles of radiation measurement applying interaction between radiation and substances.

To analyze counting rate performance and statistical characteristics of radioactive decay using GM counter.

(2)Measurement of environmental radioactivity

To measure some radiation dose in living spaces using a personal dosemeter. To measure concentrations of natural radioactive nuclides in soils. To master how to investigate pollution points using survey meters.

14th Treatment of Wastewater and Waste Treat the wastewater and waste generated from experiments

15th Report writing and feed back To write the reports on these experiment

[Course requirements]

on

[Evaluation methods and policy]

evaluated by the reports from each experiment and the active participation in each experiment

環境工学実験2(3)

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ [Textbooks]

Fextbook for the experiments is delivered in class.

[References, etc.] (Reference books)

[Study outside of class (preparation and review)] Read thoroughly the textbook and understand procedures of the experiments.

(Other information (office hours, etc.))

The date on report writing 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.

[Courses delivered by instructors with practical work experience]

Category
 Course with practical content delivered by instructors with practical work experience

(2) Details of instructors' practical work experience related to the course

(3) Details of practical classes delivered based on instructors' practical work experience

Course number U-ENG23 33155 LJ71 U-ENG23 33155 LJ77 U-ENG23 33155 LJ58	波動工学(2)
Course title (and course) 批title in Wave Motions for Engineering Wave Motions for Engineering title in Wave Motions for Engineering	understanding of the wave phenomenon progressed through this whole lecture.
English) of affiliation Graduate School of Engineering	[Course requirements]
Assistant Professor, XU Shibo	Vector Analysis, Classical Dynamics, Electromagnetics
Target year 3rd year students or above Number of credits 2 Year/semesters 2021/Second semester	[Evaluation methods and policy]
Days and periods Mon.4 Class style Lecture Language distution Japanese	Although experimental mark is based on fundamental score, attendance to a lesson and report results may be taken into consideration.
[Overview and purpose of the course]	Internation of the State
All the attendance students understand correctly vibration and the wave motion phenomenon which are seen by the nature, and put on the practical skills which are needed by resource engineering. Learn about the	[Textbooks]
wave motion in the elastic body and electromagnetic waves which spreads the underground. This knowledge becomes important for engineers in resource engineering field. Furthermore, in order to understand the micro phenomenon which is needed by oil engineering, the first step about the wave motion of quantum mechanics	Not used
is described. Although the lesson is based on a lecture, an understanding is deepened by studying an exercise	[References, etc.]
problem according to circumstances. [Course objectives] Students will be able to manipulate vibrations and wave motion phenomena freely using mathematical	(Reference books) 有山正孝「振動,波動」 裳華房 isbn{}{9784785321093} Walter Fox Smith, Waves and Oscillations, Oxford University Press isbn{}{9780195393491}
formula. Moreover, the ability to explain vibration and wave motion phenomena is mastered during this class.	[Study outside of class (preparation and review)]
[Course schedule and contents]	Since the lecture will follow what are written in the Syllabus unless otherwise specified, students are requested to prepare for the class beforehand.
Simple harmonic motion and its superposition, I time, The oscillating phenomenon and the wave motion phenomena of appearing in the resource engineering are described focusing on using examples. Furthermore,	(Other information (office hours, etc.))
simple harmonic motion and its superposition are described. Damping oscillation, forced oscillation, and coupled vibration.3times,An attenuation coefficient is defined about the damping oscillation of one degree of freedom, and it finds for an oscillatory wave form. Furthermore, after finding for the resonance curve and phase curve to harmony wave external force and clarifying a frequency response characteristic, vibration is described when two or more vibration systems are interacting mutually. The traverse wave which spreads the string, ltime,A one-dimensional wave equation is drawn taking the case	A part of the lecture could be given in English. Depending on the annual schedule in the academic calendar and of the lecturer, there could be cancellation and supplementary lectures in the semester. Modeled answers will be distributed as a feedback material within the best delay after the final exam. *Please visit KULASIS to find out about office hours.
of a string, and the character of a wave is stated.	[Courses delivered by instructors with practical work experience]
Analytic Mechinics, 2times, The analytic mechanics which is needed when you understand the mathematical principle of a wave motion phenomena is described, and the solution by the Lagrange equation of an oscillating phenomenon is described. Elastic Waves, 2times, About the wave motion which spreads an elastic body, from the equation of motion of an elastic body, a wave equation is drawn and existence of a longitudinal wave and a traverse wave is	(1) Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course
described. Furthermore, the distributed phenomenon is described about a surface wave. Electromagnetic Waves,2times,From Maxwell#039s equation, the wave equation with which an electromagnetism phenomenon follows is drawn, and the solution is described. Diffraction Phnonena,2times,The diffraction phenomena of a wave are described using Kirchhoff#039s integration theorem. Numerical Simulation of Wave Phenomena,1time,The fundamentals of numerical methods are introduced to simulate wave phenomena. Check of Progress, 1 times,Furthermore, the degree of study achievement is checked about whether an	(3) Details of practical classes delivered based on instructors' practical work experience
Continue to 波動工学(2)↓↓↓	

Course num	ber U-EN	G23 3	3156 LJ71					
Course title (and course 熱 title in TI English)	流体工学 nermo-Fluid En	gineee	ering		Instructor's name, job ti and departn of affiliation	tle, nent		nool of Energy Science JIMOTO HITOSHI
arget year	3rd year students	or above	Number	of credi	ts 2	Year	/semesters	2021/Second semester
Days and periods	Fri.2	Class	s style	Lecture			Language of instruction	Japanese
Overview a	nd purpose o	of the	course]					
[Course obj	ectives1							
,								
[Course sch	edule and co	ntent	s]					
3-4times,								
4times,								
4times, 1time,								
ltime,								
ltime.								
· · · ·								
[Course req	uirements]					_		
	uirements]							
	uirements]							
None	uirements] methods and	polic	×y]					
None		polic	>y]					
None		polic	[y]					
None		polic	¥2					
None		polic	[لات					
None		polic	[y]					
[Textbooks]	methods and	polic	[v]					
None [Evaluation [Textbooks] [References	methods and	polic	9y]					
None	methods and	polid	»у]					
None [Evaluation [Textbooks] [References	methods and	polic	₽y]					
In the second se	, etc.] e books)							
In the second se	methods and			d reviev	v)]			
In the second se	, etc.] e books)			d review	×)]			
In the second se	, etc.] e books) de of class (j	orepa	ration and	d review	v)]			
None [Evaluation [Textbooks] [References (Reference [Study outsi (Other infor	methods and , etc.] e books) de of class (j rmation (offic	orepa e hou	ration and urs, etc.))		v)]			
None [Evaluation [Textbooks] [References (Reference [Study outsi (Other infor	, etc.] e books) de of class (j	orepa e hou	ration and urs, etc.))		v)]			

未更新 Course number U-ENG23 33157 EJ77 Graduate School of Energy Science Professor,MABUCHI MAMORU Graduate School of Engineering Associate Professor, NARA YOSHITAKA Graduate School of Energy Science Associate Professor,HAKAMADA MASATAK/ Graduate School of Energy Science Professor,HAMA TAKAYUKI Course title Instructor's (and course name, job title and departmen of affiliation 資源工学材料実験 title in English) Materials testing for mineral science and technology Graduate School of Engineering Assistant Professor.ISHITSUKA KAZUYA Graduate School of Energy Science Assistant Professor, CHIN YUUSEI Target year Brd year students or above Number of credits Year/semesters 2021/Second semester Days and periods Wed.3,4 Class style Experiment Language of instruction Japanese [Overview and purpose of the course] Fundamental experiments and microscopic observation of rock and metal materials are conducted. Through the experiments and microscopic observation, students can learn how to measure mechanical properties of these materials and how to use the equipments to carry out the experiments and observation. [Course objectives] The goal of this course is to master the evaluation method of mechanical properties for both rock and metal aterials and the mineralogical observation method and the metallographic observation method. [Course schedule and contents] Orientation, Itime, The course goals, schedule of this class, and various attention for safety are presented. Material testing and failure criterion of rock, 4.5 times, Overview of the rock material testing, the method to obtain Young#039s modulus, Poisson#039s ratio, uniaxial compressive strength, and tensile strength are explained. First, in this theme, rock specimen is prepared. Second, uniaxial compression test is conducted. During the uniaxial compression test, strain measurement using strain gauges is performed, and the uniaxial compressive strength, Young#039s modulus and Poisson#039s ratio are determined. Third, Brazilian test is conducted and the tensile strength is determined. Finally, the failure criterion of the specimen is determine Tensile test and mechanical properties of sheet metals,4.5times,Overview of the testing for sheet metals is ined explained. A uniaxial tensile test of steel and aluminum alloy sheets is conducted, and then the stress-strain curves and the mechanical properties are evaluated. Metallographic observation and petrographic observation,4.5times,The metallographic observation for metal specimens and the petrographic observation for rock specimens are conducted. At the first step, observation procedures including how to use a microscope are explained. In the metallographic observation, every group makes a specimen and observes the metal crystal. In the petrographic observation, every student observes the thin sections of rocks using a petrographic microscope and learns how to identify minerals and rocks on thin ections. [Course requirements] It is desirable that students take the quotExperimental Basics in Earth Resources and Energy Science, Laboratoryquot offered in the previous semester. It is also desirable to take quotMaterials and Plasticityquot, quotRock Engineeringquot, and quotGeological and Geophysical Survey, Field Excavationquot of the ____ _____Continue to 資源工学材料実験(2)↓↓↓

未更新 資源工学材料実験(2) Course number U-ENG23 33159 LJ28 U-ENG23 33159 LJ77 Undergraduate Course Program of Earth Resources and Energy Engineering that are offered in the same Instructor's name, job title, and department of affiliation Graduate School of Energy Science Professor,MABUCHI MAMORU Graduate School of Energy Science Associate Professor,KUSUDA HIROMU Course title (and course title in 地殼海洋資源論 emester. Earth Resources and Ocean Energy English) [Evaluation methods and policy] Students are divided into several groups. Every student is asked to conduct the experiments and microscopic observation with group members and to make an experimental report individually for every theme. Grading is 4th year students or above Number of credits 2 Year/semesters 2021/First semester Target year made by the attitudes to the experiments and the grade points of every experimental report. The grading Days and periods Mon.1 anguage of instruction Japanese Class style Lecture weights of them are even. [Overview and purpose of the course] [Textbooks] This course does not specify a textbook. Lecture documents may be deribered from teachers in each experimental theme. [Course objectives] [References, etc.] (Reference books) Not specified [Course schedule and contents] ,2times, ,2times, (Related URLs) ,1time, (This course does not have a web site.) ,3times, ,1time, [Study outside of class (preparation and review)] 2times ltime, ,1time, ltime, (Other information (office hours, etc.)) ltime, It is desirable that all students belonging to the Undergraduate Course Program of Earth Resources and .1time. Energy Engineering take this course. Additional information is presented in the first class [Course requirements] *Please visit KULASIS to find out about office hours. lone [Evaluation methods and policy] [Textbooks] [References, etc.] (Reference books) _____Continue to 地腔海洋資源腧(2)↓↓↓

·殻海洋資源論(2)	Co	urse num	ber U-E	NG23 23162 LJ73				未更新
Study outside of class (preparation and review)] Other information (office hours, etc.)) Please visit KULASIS to find out about office hours.		n Sc	ğ力学 I 及 il Mechanics	び演習 I and Exercises	n a	nstructor's ame, job title nd departme f affiliation	Professor,K Graduate Sc Professor,K Graduate Sc Professor,M Disaster Pre Professor,U Graduate Sc Associate Prr Graduate School Associate Prr Graduate School	hool of Engineering IMURA MAKOTO hool of Engineering ISHIDA KIYOSHI hool of Engineering IMURA MAMORU vention Research Institut ZUOKA RYOSUKE hool of Management of Global Environmental Studie ofessor, TAKAI ATSUSH hool of Engineering IGO YOUSUKE
				_	_		Professor,K	of Global Environmental Studie ATSUMI TAKESHI
	Targ	et year	2nd year studen	ts or above Number	of credit	s 2	Year/semesters	2021/Second semester
		and periods		Class style of the course]	Seminar		Language of instructio	Japanese
	the function in the function of the function o	undamenta urse obje undergoi rse objecti	als of shear st ectives] ng this course ve is to provi	rength and deform e, the student gains de a fundamental	ation behaves adequate l understand	viour of dif knowledge ing of mecl	ferent soils. on engineering pr hanical behavior of	
		ding soil c	classification,	compaction, perm	neability, co	onsolidatioi	n, and strength.	
	inclue [Con	urse sch	edule and o	contents]				ion and the
	inclu [Cou Introv funda Soil d	urse sch duction, 0 amentals c classificati	edule and o .5 times, Intro of geotechnica	contents] oductory concepts: al practices in soils action, 3.5 times,	Understand	d the princi l the geolog	iples of soil behav	ior and the ssification system,
	inclu Introd funda Soil d funda Wate	urse sch duction, 0 amentals c classificati amental pr	edule and o .5 times, Intro- of geotechnica ion and comp roperties, effe	contents] oductory concepts: al practices in soils action, 3.5 times, 1 cetive stress, comp	Understand s. Understand action, uns	d the princi I the geolog aturated soi	iples of soil behav gy of soils, soil cla il and frozen soil	
	inclu [Con Intro- funds Soil c funds Wate and f	urse sch duction, 0 amentals o classificati amental pr r flow thr low nets.	edule and o .5 times, Intro- of geotechnica ion and comp roperties, effe	contents] oductory concepts: al practices in soils action, 3.5 times, 1 cetive stress, comp	Understand s. Understand action, uns	d the princi I the geolog aturated soi	iples of soil behav gy of soils, soil cla il and frozen soil	ssification system,
	inclu [Con Intro- funda Soil c funda Wate and f Midte Cons	urse sch duction, 0 umentals c classificat: umental pr r flow thr low nets. erm exam olidation	edule and o .5 times, Intro- of geotechnics ion and comp operties, effe ough soil, 3 ti , 0.5 times, and settlemen	contents] oductory concepts: al practices in soils action, 3.5 times, ctive stress, comp imes, Understand t	Understand action, uns the permea	d the princi I the geolog aturated soi bility and D	iples of soil behav gy of soils, soil ela il and frozen soil Darcy's law, quick	ssification system,
	inclu Introv funda Soil c funda Wate and f Midte Cons total Shear	urse sch duction, 0 amentals c classificati amental pr r flow thr low nets. erm exam olidation a and effect r Strength	edule and c 5 times, Intro f geotechnica ion and comp operties, effe ough soil, 3 ti , 0.5 times, and settlemen ive stress dist of soil, 3 tim	contents] oductory concepts: a practices in soils action, 3.5 times, ctive stress, comp imes, Understand 1 at, 3.5 times, Under tribution in soil.	Understand s. Understand action, uns iche permea rstand Terz ear strength	d the princi I the geolog aturated soi bility and E zaghi's one	iples of soil behav gy of soils, soil cla il and frozen soil Darcy's law, quick dimensional cons	ssification system,

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	未更新
土質力学 及び演習(2)	Course number U-ENG23 33163 LJ73
Feedback, 1 time, Understand the intentions and correct answers of the questions given in the examination.	Course title (and course title in Enolish) は Thr 景観デザイン Urban and Landscape Design Enolish
[Course requirements] The course is designed for students in any major;an earth science background is not required.	English) of affiliation Associate Professor, YAMAGUCHI KET
The course is designed for students in any major; an earth science background is not required.	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second semester
[Evaluation methods and policy]	
Grading Policy:Final exam(70%), Midterm exams and assigned homeworks(30%)	Days and periods Wed.3,4 Class style Lecture Language distinction Japanese
[Textbooks]	[Overview and purpose of the course]
Text book: Fusao Oka, quotSoil Mechanicsquot, Asakura publishing Co., Ltd isbn{} {9784254261448}.	To design the urban facilities, open spaces, landscapes of streets and districts, is to create the place for the people and their activities. It enables to make places in harmony with the environment by making connection of each space of the city, region, and nature. The course aims to consider vision of urban landscape and learn practical skills of design and representation.
[References, etc.]	practical skins of design and representation.
(Reference books) Fusao Oka, quotSoil Mechanics Exercisesquot, Morikita publishing Co., Ltd isbn{} {4627426607}.	[Course objectives] To understand the ways of design of the urban facilities, open spaces, landscapes of streets and districts. To
	acquire basic skills of landscape design. Students are expected to get design-mindsets as civil engineers in th end.
(Related URLs) (http://geomechanics.kuciv.kyoto-u.ac.jp/lecture.html)	
(http://geomechanics.kuciv.kyoto-u.ac.jp/lecture.html)	[Course schedule and contents]
[Study outside of class (preparation and review)]	Guidance:What is urban landscape?,1 time, Definition of landscape, recognition of landscape, visual perception, climate and landscape, living landscape, social system of landscape
It is recommended to read the textbook beforehand.	What is design?,1 time,Landscape Architecture of Urban structures, roads, streets, waterfront, parks, Design
(Other information (office hours, etc.))	methods, spaces and scales, landscape prediction Basic practice,5 times, Techniques of drawings: lines and elements, plans(Paley Park), Perspective drawings,
Mimura, Kishida, Higo and Kimoto: Contact Information will be delivered in their first lecture	sketches
Katsumi and Takai: Visit their office in Yoshida Campus directly	Design practice,5 times,Site survey, Group work (task arrangement and planning), concept making, space design, presentation
*Please visit KULASIS to find out about office hours.	Landscape History, 1 time, Formation of urban and rural villages in Japan and history of civil engineering,
[Courses delivered by instructors with practical work experience]	urban planning and urbanization in modern times Landscape Planning, 1 time, Landscape Conservation, town planning methodology, examples of urban / regio
	revitalization by public space design
A course with practical content delivered by instructors with practical work experience	Feedback,1 time,Achievement of learning is confirmed.
(2) Details of instructors' practical work experience related to the course	[Course requirements]
	None
(3) Details of practical classes delivered based on instructors' practical work experience	[Evaluation methods and policy]
	Total points will be scored in attitude of attendance (30%) and results of design practice and reports (70%).
	()
	Continue to 都市景観デザイン(2)↓↓

都市景観デザイン(2)

[References, etc.] (Reference books)

To be announced

[Study outside of class (preparation and review)]

Office hours are not especially set. Ask any questions by mailing or visiting professors (Kawasaki, rm.202; Yamaguchi, rm.201 at C1-1, Katsura Campus). The theme of design practice could be changed partially.

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours.

[Textbooks] nstructed during class ٦ [

Course title (and course title in English)		学II及び演習(A班) al Mechanics II and Exercises			Instructor's name, job tit and departm of affiliation	nent		nool of Engineering KAHASHI YOSHIKAZ	
Target year	Brd ye	ar students o	r above N	umber	of cred	its 3	Yea	r/semesters	2021/First semester
Days and period	is Mon.	4,5	Class s	style	Semina	r		Language of instruction	Japanese
Principle of v Approaches f Fundamental: Fundamental:	or study s of elas	of statica tic stabili	ally inde ty	terminat	te structu		analys	sis	
To understan to get the stif	d the sta fness m hedule	bility of o atrix of si and co	equilibri mple tru ntents]	um sses			<u>^</u>	ment method	tiglianorsquos
of virtual wor	k (virtu inate an tatically	al displac d indetern indetern of elastic	ement)P ninate,1 ninate str ityBy dis	rinciple time,De ructures, splacem	of comp gree of fi 6times,In ent meth	lementary v reedom and ntroduction od	virtual degre of for	work(virtual = e of indetermine the of indetermine the second sec	virtual workPrinciple force)Reciprocal inacy d displacement stemDeformation of
Solutions to s methodBy eq					Simution	or ngia oo	ay ena	1 0 1	
Static determ Solutions to s methodBy eq Structural sta elastic beam- Basis of matr conditionsAn Structral anal	bility,3t column ix meth alysis o ysis eng	system od of stru f plane tru ineer#03	ıss ∂s ethics	,1time,I	Examples	on structra	l anal	ysis engineer#	uations/displacement 039s ethics related to ity of structural
Static determ Solutions to s methodBy eq Structural sta elastic beam- Basis of matr conditionsAn Structral anal safety of stru analysis	bility,3t column ix meth alysis o ysis eng cture an	system od of stru f plane tru ineer#03 alyses suc	iss 9s ethics 2h as app	,1time,E	Examples scope, p	on structra recision of	l analy analys	ysis engineer#	039s ethics related to ity of structural
Static determ Solutions to s methodBy eq Structural sta elastic beam- Basis of matr conditionsAn Structral anal safety of stru analysis	bility,3t column ix meth alysis o ysis eng cture an of the a	system od of stru f plane tru ineer#03 alyses suo attainmen	iss 9s ethics 2h as app	,1time,E	Examples scope, p	on structra recision of	l analy analys	ysis engineer#	039s ethics related to ity of structural

構造力学II及び演習(A班)(2)	Course number U-ENG23 33164 LJ73
	Course title Instructor's
[Evaluation methods and policy] Grade is given based on the final examination, mid-term examination and reports.	(and course 構造力学II及び演習(B班) name, job title, Disaster Prevention Research Insti
Grade is given based on the minar examination, mid-term examination and reports.	title in Structural Mechanics II and Exercises and department English) Professor, SAWADA SUMIO
[Textbooks]	
To be informed by individual lecturer in charge in his/her first lecture	Target year Brd year students or above Number of credits 3 Year/semesters 2021/First semesters
[References, etc.]	Days and periods Mon.4,5 Class style Seminar Laquage distution Japanese
(Reference books)	[Overview and purpose of the course]
M. Matsumoto, E. Watanabe, H. Shirato, K. Sugiura, A. Igarashi, T. Utsunomiya, Y. Takahashi: Structure mechanics II , Maruzen Ltd. isbn{}{4621046403}	Fundamentals of structural analysis based on energy principle Principle of virtual work and some energy principles for structural analysis Approaches for study of statically indeterminate structures
[Study outside of class (preparation and review)]	Fundamentals of elastic stability Fundamentals of structural analysis by matrix methods
	[Course objectives]
(Other information (office hours, etc.))	To solve structures such as truss and beam by the principle of virtual work/energy principles
There are four classes which will be taken in the meantime by corresponding teacher. Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture.	To solve statically indeterminate structures by force method and displacement method To understand the stability of equilibrium to get the stiffness matrix of simple trusses
*Please visit KULASIS to find out about office hours.	[Course schedule and contents]
	Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class. Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection.
	Intrusion Detection by Signature-Based IDS, Stimes, Learn the mechanism of intrusion detection by signature based IDS by studying open source signature-based IDS and attacks, such as correspondence between alarr issued from IDS and communications, and adding signatures to detect attacks. Intrusion Detection by Machine Learning, 7times, Learn the method of classifying normal and malicious
	traffic by machine learning algorithms and public dataset for benchmarking intrusion detection performance Presentation, I time, Based on the exercise, students presents their methods of intrusion detection using machine learning, and discuss it with other students and instructors.
	[Course requirements]
	calculus A and B, Linear Algebra A and B, Structure mechanics I and Exercises
	[Evaluation methods and policy]
	Grade is given based on the final examination, mid-term examination and reports.

構造力学II及び演習(B班)(2)	
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_ _ _ _ _ _ _ [Textbooks]

To be informed by individual lecturer in charge in his/her first lecture

[References, etc.]

(Reference books) (Notation C. Watanabe, H. Shirato, K. Sugiura, A. Igarashi, T. Utsunomiya, Y. Takahashi: Structure mechanics II, Maruzen Ltd. isbn{} {4621046403}

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

There are four classes which will be taken in the meantime by corresponding teacher. Office hour (contact nformation and consultation hours) of the individual lecturer will be given in his/her first lecture.

Please visit KULASIS to find out about office hours.

未更新 Course number U-ENG23 33164 LJ73 Course titl structor's name, job title, and department of affiliation 構造力学II及び演習(C班) (and course Disaster Prevention Research Institute title in Structural Mechanics II and Exercises Professor,IGARASHI AKIRA English) Brd year students or above Number of credits 3 Year/semesters Target year 2021/First semester Days and periods Mon.4,5 Class style anguage of instructi Japanese Semina [Overview and purpose of the course] undamentals of structural analysis based on energy principle rinciple of virtual work and some energy principles for structural analysis Approaches for study of statically indeterminate structures ndamentals of elastic stability undamentals of structural analysis by matrix methods [Course objectives] To solve structures such as truss and beam by the principle of virtual work/energy principles To solve statically indeterminate structures by force method and displacement method To understand the stability of equilibrium to get the stiffness matrix of simple trusses [Course schedule and contents] Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class. Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by signaturebased IDS by studying open source signature-based IDS and attacks, such as correspondence between alarms issued from IDS and communications, and adding signatures to detect attacks. Intrusion Detection by Machine Learning,7times,Learn the method of classifying normal and malicious traffic by machine learning algorithms and public dataset for benchmarking intrusion detection performance Presentation, I time, Based on the exercise, students presents their methods of intrusion detection machine learning, and discuss it with other students and instructors. [Course requirements] alculus A and B, Linear Algebra A and B, Structure mechanics I and Exercises [Evaluation methods and policy] rade is given based on the final examination, mid-term examination and reports. Continue to 構造力学II及び演習(C班)(2)↓↓↓

構造力学II及び演習(C班)(2)					1/2 1 1-1		
	Course nu	umber	U-ENG	23 33	165 LJ71		_
[Textbooks] Fo be informed by individual lecturer in charge in his/her first lecture		流体丿 Fluid 〕	力学 Mechanics				Instr nam and of at
[References, etc.]	Target yea	r 2	d year students or	abaya	Numbor	oforod	lite
(Reference books) M. Matsumoto, E. Watanabe, H. Shirato, K. Sugiura, A. Igarashi, T. Utsunomiya, Y. Takahashi: Structure nechanics II, Maruzen Ltd. isbn{} {4621046403}	Days and perio	ods Mo	<u> </u>	lass	style	Lecture	
[Study outside of class (preparation and review)]	-						
	[Course o	bjecti	ves]				_
(Other information (office hours, etc.)) There are four classes which will be taken in the meantime by corresponding teacher. Office hour (contact							
nformation and consultation hours) of the individual lecturer will be given in his/her first lecture.	[Course s	chedı	le and cor	tents	5]		
Please visit KULASIS to find out about office hours.	,2times, ,1time,						
	,1time,						
	,7times, ,1time,						
	[Course re	equire	ements]				
			thods and				
	Evaluatio	in mei		Jone	A1		
	[Textbook	s]					
	[Referenc	es. et	c.1				
	Referen						
	[Study ou	tside	of class (p	repar	ation an	d revie	w)]
	(Other int	forma	tion (office	hou	rs, etc.)))	
	*Please visit	t KUL	ASIS to find	out al	out office	e hours.	

Course num	ber	U-ENG23	33173 LJ55	U-ENC	323 33	3173 L	J73				
	dc ourse e in 工業数学B2(土木工学コース) Engineering Mathematics B2				and de	ctor's , job title epartme liation		Disaster Prevention Research Institu Associate Professor,GOTOU HIROYU			
Target year	3rd year	students or abov	Number	of credi	ts 2	·	Year	/semesters	2021/First semester		
Days and periods	Fri.1	Clas	s style	Lecture				Language of instruction	Japanese		
[Overview a	nd purp	ose of the	e course]								
various enginee to engineering	ering pro problem	blems. In a s.							Fourier analysis to form and its application		
[Course obje	ectives]										
	tudents a	nalyze vario							cal and physical ransform, and solve the		
background. St	tudents a tial equa	nalyze vario tions. Ind conter	ous problem	s on the F	Fourie	er series	s and	the Fourier to	ransform, and solve the		
background. St partial differen +Day 1: Introd What is Fourie +Day 2-3: Fouri	tudents a tial equa edule a uction er Analys rier serie	nalyze vario tions. Ind conter sis? How to	ous problem its] apply it? Cl	s on the F	rourie	er series	s and	the Fourier the Fo	ransform, and solve the		
background. St partial differen +Day 1: Introd What is Fourie +Day 2-3: Four A periodic fund series. +Day 4-5: Part	tudents a tial equa edule a uction er Analys rier serie ction wh ial differ partial dif	nalyze varic tions. Ind conten sis? How to s ich is expan rential equat fferential equat	ut s] apply it? Cl ded into an ion I uations (Laj	s on the F	rourie	er series ssary ba of trigo	ackgro	the Fourier the Fo	dge. s is called a Fourier equation, etc.) are		
background. St partial differen +Day 1: Introd What is Fourie +Day 2-3: Four A periodic func series. +Day 4-5: Part Second order p discussed. The +Day 6-8: Con	edule a uction er Analys rier serie ction wh ial differ applicat wergence ehavior o	nalyze varic tions. IND CONTER sis? How to s ich is expan rential equat fferential equat ifferential equat ons of Fourier	nus problem its] apply it? Cl ded into an ion I uations (Lag ier series to series and F	s on the F larify the infinite se blace equa initial-bc	rourie	er series ssary ba of trigo , wave e ury prob	ackgro nome	ound knowled etric function are discussed	dge. s is called a Fourier equation, etc.) are		
background. St partial differen +Day 1: Introd What is Fourie +Day 2-3: Four A periodic fun series. +Day 4-5: Part Second order p discussed. The +Day 6-8: Con Convergence b of the Fourier s +Day 9-10: For	edule a tial equa uction er Analys rier serie ction wh ial differ applicat wergence series. urier trar is of non-	nalyze varie tions. Ind conter sis? How to s ich is expan ential equat ferential eq ions of Fourier of Fourier so hsform	us problem its] apply it? Cl ded into an ion I uations (Lag rier series to series and F eries are dis	s on the F larify the infinite so blace equa initial-bc functional cussed. Fr	neces eries o ation, ounda I spac	er series ssary ba of trigo wave e ury prob ce onal spa	ackgronome equat blems ace (1	ound knowle etric function are discusse (.2) is introdu	dge. s is called a Fourier equation, etc.) are d.		

未更新

Graduate School of Energy Science Professor,FUJIMOTO HITOSHI

Year/semesters 2021/First semester Language of instruction Japanese

Instructor's name, job title, and department of affiliation

Course title (and course title in English)	里化学 rsical Chemist	ry	r	nstructor's name, job ti and departn of affiliation	nent	ool of Energy Science ABUCHI MAMORU			
arget year	3rd year students o	or above Number	of credit	its 2 Year/semesters			2021/First semester		
Days and periods	Wed.3	Class style	Lecture			Language of instruction	Japanese		
[Course obje	ctives]								
[Course sche 2times,	dule and co	ntents]							
4times, 4times, 2times, 2times,									
1time, [Course requ	irementsl								
None									
[Evaluation m	lethods and	ропсуј							
[Textbooks]									
	e4e 1								
[References, (Reference	-								
	books)	preparation an	d review	01					
(Reference	books) le of class (p	preparation an e hours, etc.)))]					

		未更新
工業数学B2(土木工学コース)(2)	Course number U-ENG23 33174 LJ77 U-ENG23 33174 LJ55	
	Course title	
-Day 13: Supplement of Fourier transform	(and course 工業数学B2(資源工学コース) name, job title, Graduate School of Er	igineering
Supplement contents of Fourier transform are lectured, i.e. uncertainty principle, etc.	title in English) Engineering Mathematics B2 and department of affiliation Professor,TSUKADA	KAZUHII
Day 14: Discrete Fourier transform		
biscrete Fourier transform for digital signals is explained.	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Fir	rst semeste
Day 15: Exercise	Days and periods Tue.2 Class style Lecture Language distruction Japanese	
xercise the typical problems about Fourier analysis and partial differential equations.	[Overview and purpose of the course]	
	Fourier transform amp Laplace transform and their application to the solution of differential equ	ations.
Course requirements]		,
alculus, Linear Algebra, Engineering Mathematics B1.	[Course objectives]	
[Evaluation methods and policy]		
ttendance, homeworks, midterm exam, and term-end exam. The details are introduced in the first cl	[Course schedule and contents]	
Textbooks]	Fourier Series and Fourier Transform, Itime,	
lone.	Fourier Transform Appllied to Boundary Value Problem of Differential Equation, 3times,	
	Interporation and Approximation, 3 times, Laplace Transform, 3 times,	
	Solution of Differential Equations by Laplace Transform,4times,	
[References, etc.]	Liniar System and Laplace Transform,2times,	
(Reference books) Useful material is introduded during the lecture.	,1time,	
Seru macharis intoduced during the reduce.		
[Study outside of class (preparation and review)]	[Course requirements]	
Students need to review the lecture for preparation to quiz.	None	
	[Evaluation methods and policy]	
(Other information (office hours, etc.))		
KULASIS		
Please visit KULASIS to find out about office hours.	[Textbooks]	
	[References, etc.]	
	(Reference books)	
	[Study outside of class (preparation and review)]	
	(Other information (office hours, etc.))	
	*Please visit KULASIS to find out about office hours.	

Course title (and course title in English)	-ス)	n	nstructor's ame, job ti nd departr f affiliatior	tle, nent	Professor,KI Graduate Scl	nool of Engineering SHIDA KIYOSHI nool of Engineering sor,PIPATPONGSA, Thirapong	
Target year Brd y	ear students or above	Number	of credit	s 2	Yea	r/semesters	2021/Second semester
Days and periods Tue.	Class	s style	Lecture			Language of instruction	Japanese
[Overview and pu	•	-					
Design and construct mechanical propertie mass are introduced	es of rock and ro	ock fracture	, laborato	ry tests a	nd field	1 measuremen	ck slope, etc.), geology, its of rock and rock
[Course objective	es]						
Understanding of me mechanical and hydr design and construct	a-mechanical p	roperties of	rock disc	ontinuitie			nd fractures, o basic knowledge of
[Course schedule	e and content	ts]					
of rock, experiments results. Also, different be explained. Classification and id hydraulic charactersis crack network. Also, distributed discontin Hydraulics in rocks s underground water the related with it will be Methods of investing such as geological st etc. which are carried of principles of those	s of rock and ro I methods to de nce between roc entification of c ics of discontinu understanding uity planes. and groundwate hat flows throug e explained. tion and testing urvery, load test	bek joint, 3tii termine the ck and rock discontinuit, uity planes a of stereogra- er investigat gh the rockl g of rock ma and boreho sign and con	mes,Unde se charac masses, r y (rock fr such as fa aphic proj ion,2time beds, their asses,4tim ble test of	rstanding teristics a ion-homo acture),2ti ult, joint, ection of s,Method analysis es,Introdu rock mas	to stre nd me geneit imes,E etc. ar notation s of ur metho uction ses, ge	ength and defc thod of interpr y, anisotropy a xplaination of id understandi on used for the iderstanding the ds and environ of ground inv ophysical exp	primation characteristics reting the experimental and scale effects will if mechanical and ng the modelling of ee dimensionaly he behavior of umental problems estigation methods loration, intial stresses,
Application of Rock Foundation, 3 times, E bedrocks such as fou in the mountain regio	e methods, inter Mechnicas in E Explaination of r undation of dam on and represen	Engineering methodolgy is and bridg tative shield	f data mea for Unde and the p es and slo d method	sured and rground C roblems f pes is ma for tunnel	l the p Dpenin for the de. Als	g, Rock Slop, construction oso, methods or	
	e methods, inter Mechnicas in E Explaination of r undation of dam on and represen	Engineering methodolgy is and bridg tative shield	f data mea for Unde and the p es and slo d method	sured and rground C roblems f pes is ma for tunnel	I the p Openin for the de. Als ling at	g, Rock Slop, construction of so, methods of city area are a	Tunneling and of structures on the f construction of tunnels

岩盤工学(土木工学コース)(2)

Confirmation of understanding, I time, Students are examined on the understanding of this subjet through a paper test.

[Course requirements]

None

[Evaluation methods and policy]

Evaluation is decided overall as 35% first examination, 45% final examination and 20% of reports and subjects.

[Textbooks]

Not used

[References, etc.]

(Reference books) Society of Materials Science, Japan: Rock Mechanics isbn{} {4765516288}

[Study outside of class (preparation and review)]

Quizzes are handed out through PandA.

(Other information (office hours, etc.)) Office hour will be explained at the guidence.

1 0

*Please visit KULASIS to find out about office hours.

Course n	umber	U-ENG23 2	3176 LJ77					未更
Course title and course itle in English)		(資源工学コ ineering	ース)		Instructor's name, job ti and departn of affiliation	tle, nent	Professor,HA Graduate Scl	hool of Engineerin AYASHI TAMET hool of Engineerin essor,NARA YOSHI
arget yea	r 3rd year	students or above	Number	of cred	its 2	Yea	r/semesters	2021/Second sen
lys and peri	ods Tue.1	Class	s style	Lecture	, ,		Language of instruction	Japanese
		pose of the	-	1				
etal mater periment,	ials and an students w	observation of ill learn how	of the struct to measure	ure of m the mec	aterials wil	ll be c pertie	arried out. By	cteristics of rocks a completing this metal materials, h on.
	bjectives							
mpressive ell as the a	strength, si bility to ol	and the tensil oserve the stru	e strength o icture of ro	f rocks a cks and i	and to deter metals usin	mine g a m	icroscope, and	no, uniaxial n condition of rock l to be able to eval- oefficient of metal
		and content	-			1	a	C.d. 1d.
		time): An ove on into group		ation wil	ii be given	about	uie purpose o	f the class, the pro
ompression est), the eva arried out. ensile test netallic ma naterial wil	and mecha and mecha terials will l be condu-	ks and the stu Young's mod nical properti be explained.	es of metal Additional	ement b bisson's i lic mater lly, a uni	y strain gau ratio, and d rials (4.5 tin axial tensil	nge, th estruc mes): e test	e tensile test of tive condition The outline of of steel mater	ch group, the uniax of rocks (compress determination wil the test method fo ial/aluminum alloy valuation and analy
ssue obse d the usag prosion of rth is cond icroscope	rvation of 1 ge microsco the specin lucted. As s will be stu	metal and roch opes will be en nen is perform for the observation adied and the	k (4.5 times xplained. R ned by each vation of the observation	egarding group, a structu n of rock	g the observ and the stru re of rocks, is and mine	the p rals b ths wil	of metallic str observation or rinciple and us y means of po l be carried or	re of metals and ro ructures, grinding i f crystal grains and sage of polarizing larized microscope it. 工学資源工学コース)(2
								未更
Course n	umber	U-ENG23 4	3177 LJ73					
Course title (and course itle in English)	- · ·	デザインA ercise for Glo	obal Engine	ering A	Instructor's name, job ti and departm of affiliation	tle, nent	Professor,KA Graduate Scl Professor,TA Graduate Scl Professor,YA Graduate Scl Associate Profe	hool of Engineerin AWASAKI MASA hool of Engineerin KAHASHI YOSHI hool of Engineerin AGI TOMOMI hool of Engineerin essor, YAMAGUCHI er, NAGAHAMA NOBI
						_	Part-time Le	cturer, YAGI HIRO

In this course, the name of which represents the ldquoCivil Engineering Design,rdquo the process and methodology to integrate an engineering aspect and an aesthetic aspect of design of civil engineering facilities will be provided through a design exercise of a footbridge. In this course, structural engineering, material science, and landscape design will be considered to be unified. Before that, planning issues such as a flow plan, pedestrian traffic, width of the walkway etc. will be introduced. Through the design exercise, students acquire a viewpoint of integration contained in designing civil engineering facilities, and find a domain of design that can be done and should be done by civil engineers. Moreover, we will have special lectures by 3 practitioners who are active in the front line.

[Course objectives]

To understand the process and methodology to integrate an engineering aspect and an aesthetic aspect of design of civil engineering facilities through a design exercise of a footbridge. To come in touch with the front line of civil engineering design. Students are expected to get design-mindsets as civil engineers in the end.

[Course schedule and contents]

Outline of Civil engineering design, 1 time, Guidance Outline of Civil engineering design: design and

architecture, idea and image of design, shape and scale, method of design Civil engineering design exercise, 8times, Through a design exercise, students execute a design process: the field survey, arrangement of conditions, planning, creating ideas, structural analysis, detailed study, drawing, model making, and presentation. Then, a mature design is proposed with the consideration of integration of basic knowledge of civil engineering. Front line of civil engineering design,5times,Lectures and design practices by 3 professionals who are

working on the front line of civil engineering design. In addition, we will have a talk session with the lecturers about various topics. Feedback,times,Achievement of learning is confirmed.

Continue to 地球工学デザインA(2)↓↓↓

L学(資源工学コース)(2)

rse requirements]

sirable that students have taken "Basic Experiment on Resource Engineering." It is also desirable to 'Field Practice of Resource Engineering," "Rock Engineering," and "Material and Plasticity" of source Engineering course, which are open at the same time.

luation methods and policy]

iments are conducted for each group, and experiment reports are assigned for each topic. Grading will ed on 50% for efforts towards experiments and 50% for the experiment report.

books]

; prints will be distributed as necessary.

erences, etc.] ference books

dy outside of class (preparation and review)]

quired to attend every class, work on the tasks handed out to each person in charge, and submit reports.

er information (office hours, etc.))

dance is recommended for all third-year students of the Resource Engineering course. Contact details aportant issues will be presented during the overall explanation of the first class.

e visit KULASIS to find out about office hours

rses delivered by instructors with practical work experience]

tegory rse with practical content delivered by instructors with practical work experience

tails of instructors' practical work experience related to the course

tails of practical classes delivered based on instructors' practical work experience

C学デザインA(2)

rse requirements]

esirable to have taken the class of quotUrban and Landscape Designquot. It is expected to have red basic knowledge of quotStructural Mechanicsquot and quotConstruction Materialsquot.

uation methods and policy]

points will be scored in attitude of attendance (40%) and results of design practice and reports (60%).

books] cted during class

erences, etc.]

ference books)

[Study outside of class (preparation and review)] To be anno

(Other information (office hours, etc.))

Office hours are not especially set. Ask any questions by mailing or visiting professors (Kawasaki, rm.202; Yamaguchi, rm.201, C1-1 at Katsura Campus). The theme of design practice could be changed partially.

*Please visit KULASIS to find out about office hours

[Courses delivered by instructors with practical work experience]

(1) Category A course with practical content delivered by instructors with practical work experience

(2) Details of instructors' practical work experience related to the course

(3) Details of practical classes delivered based on instructors' practical work experience

Course number	U-ENG23 4	3178 LJ77					
Course title (and course title in English)			Instructor's name, job title, and department of affiliation			Professor, KC Graduate Sch Professor, PLU Graduate Sch Professor, PLU Graduate Sch Professor, PLU Graduate Sch Associate Profe Graduate Sch Associate Profes Graduate Sch Associate Professor, HA Graduate Sch Associate Professor, HA Graduate Sch Associate Professor, HA Graduate Sch Associate Professor, HA Graduate Sch Assistant Profe Graduate Sch Assistant Profe Graduate Sch Assistant Profe Graduate Sch Assistant Profe Graduate Sch	ool of Engineering NKE KATSUAKI ool of Engineering KUYAMA EIICHI 1000 I of Energy Science BUCHI MAMORU BUCHI MAMORU BUCHI MAMORU 1001 of Energy Science essor,KASHWAYA KOUKI 1001 of Energy Science essor,KUSUDA HIROMU 1001 of Engineering 1001 of Energy Science or,HAKAMADA MASATAKA 1001 of Energy Science 1001 of Energy Science 1001 of Engineering 1001 of Engineering 10
Target year 4th	ear students or above	Number of cro	dits	2	Year	/semesters	2021/First semester
Days and periods Fri.3	,4 Clas	s style Lect	ıre			Language of instruction	Japanese
[Overview and p Two courses (a, b) a In the course (a), the analysis. Lectures of In the course(b), lec [Course objectiv	re opened in par e aim is understa n simulation the tures and exerci es]	allel. nding theories of ory and analysis ses on basic know	are convolution	nducted related	with e to reso	xercises. ources and en	
Course (a): getting s							
Course (a): getting s Course (b): getting b			renerg	57.			

a-3. Interim report, 1 time, Each student explains their own theme, and reports the method and the progress.
 a-4. Simulation exercise, 4 times, Continue simulation analysis for each theme.

a-5. Presentation of final results. 1 time, Summary of the analysis results, and the presentation. Continue to 地球工学デザインB(2)↓↓↓

U-ENG23 33179 LJ73 U-ENG23 33179 LJ16

Instructor's

name, job title

and department of affiliation

地球工学デザインB(2)

1 [

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b-1. Deformation and Strength of Metallic Material, $4\sim 6$ times, Learning deformation behavior and strength characteristics of metallic materials from the dislocation theory, and also basic knowledge on the relationship between macroscopic behavior and factors in deformation. Exercise on fundamental problems related to them b-2. Observation and Analysis of Minerals, 4~6 times, Observations and Analysis of production and dissolution of methane hydrate using microscope. Observation rock minerals, rock texture, micro-cracks. Knowledge of rock minerals.

b-3. Numerical analysis of thermal fluid, 3~5 times, Explanation of finite difference method for estimation of numerical solution of thermal fluid. Programming exercise.

b-4 Confirmation of achievement, 1 time, Confirmation of students knowledge. In the Course (b), Professors in charge of each theme will decide the number of lecture and exercise according to the degree of students' understanding. The total number of them is 15 times.

[Course requirements]

In the course (a), it is desirable to complete the subjects relating Computer Programming and Informatics. In the course (b), it is desirable to complete the next subjects, Physical Chemistry, Materials Testing for mineral science and technology, Materials and Plasticity, and Resources and Energy.

[Evaluation methods and policy]

In the course (a), the half of scores is based on student's presentation with discussion, the rest is from student' s reports. In the course (b), the score is based on student's daily study attitude and reports.

[Textbooks]

It will be shown in the lectures. Printed materials will be also provided.

[References, etc.]

(Reference books)

It will be shown in the lectures

[Study outside of class (preparation and review)]

It will be shown in the lectur

(Other information (office hours, etc.))

Details are explained at the guidance

*Please visit KULASIS to find out about office hours.

地球工学デザインC(2)

Exercise of design (5 times)

To conduct planning and design about certain cities selected by students. That is, hydrologic and capacity parameters of water purification and sewage treatment facilities are calculated based on goals and subjects set by the students. Exercises are proceeded with discussion when some problems happen. Drawing and reports of the results of the series of the works are prepared. Some works may be simplified or cut for time.

Exercise of design (5 times)

To conduct planning and design about certain cities selected by students. That is, hydrologic and capacity rameters of water purification and sewage treatment facilities are calculated based on goals and subjects set the students. Exercises are proceeded with discussion when some problems happen. Drawing and reports of the results of the series of the works are prepared. Some works may be simplified or cut for time.

Prediction of waste emission and its basic design (1 time)

To understand the methodologies of prediction of emissions of industrial waste and estimate values of basic rameters of a certain city targeted

Basic design of a waste incineration facility (2 times) To understand heat and mass balances through combustion calculation and calculate a basic design based on

certain setting conditions. Environmental Impact Assessment (1 time)

Environmental impact assessment is introduced using a construction of a waste incineration facility as a ubject.

[Course requirements]

It is preferable to have knowledge of related courses because their principles and theories are basics in this ourse. But, such knowledge is not requirement to attend the class

[Evaluation methods and policy] Glade is evaluated by reports and presentation

[Textbooks]

Not used

No textbook

Printed materials are distributed in cla

[References, etc.] (Reference books)

[Study outside of class (preparation and review)] Instruction will be given by the professors.

Days and periods Wed.3,4 Class style Lecture arguage of instruction Japanese [Overview and purpose of the course] Exercises about specific issues related to environmental facilities are conducted based on engineering principles learned until a junior year. Basic planning and design of water supply and sewage treatment facilities are exercised in the first half of the course. In the remaining of the course, basic planning and design of waste management and methodologies of environmental impact assessment using a construction of a waste incineration facility as a subject are learned and estimation about them are exercised. [Course objectives] To understand deeply sequence of procedures to gain solutions for substantial problems of environmental facilities through exercises. [Course schedule and contents] Planning and design of environmental facility (1 time) Current status and issues of municipal water supply and wastewater are introduced. Outline of procedures of planning and design of environmental facilities, and their design criteria are stated. Purposes and how to oceed of the exercises in the course are expressed. Basic design of water supply and sewage treatment (1 time) A series of steps of design of water supply and sevage treatment systems (e.g., setting of target area, subjects of design based on characteristics and problems of the area, planning of plot and outline of city, design of water supply and sewage treatment facilities (determinations of areas, types of system, capacity, and location etc.)) are explained. Population prediction and estimation of design of water supply and sewage discharge are exercised.

Basic design of water supply (1 time)

Course number

地球工学デザインC

Design Exercise for Global Engineering C

4th year students or above Number of credits 2

Course title

(and course

Target year

title in English)

Methodologies to determine placement and volume of water supply facilities are expressed. Exercise of a nple case is conducted, and the design of an existing facility is read. An actual water supply facility is also isited.

Basic design of sewerage system (2 times)

Update status of design of sewerage system, and methodologies to determine placement and capacity of wage pipe and treatment facility are explained. Exercises of such determinations using a simple case are onducted -----

Continue to 地球工学デザインC(2)↓↓↓

Graduate School of Engineering Professor,ITOH SADAHIKO Graduate School of Engineering Professor, TAKAOKA MASAKI

Professor,ECHIGO SHINYA Graduate School of Engineering Associate Professor,OOSHITA KAZUYUKI

Graduate School of Engineering Assistant Professor, NAKANISHI TOMOHIRO

2021/First semeste

ental Studi

raduate School of Global Fr

Year/semesters

地球工学デザインC(3)									未更新
世球工学テリイン(3)	Course	numbe	er U-EN	NG23 3.	3180 LJ71	U-ENG23	3 33180 L	J75	
(Other information (office hours, etc.)) he number of class hours may be changed. nformation on office hours is provided at fist time of class.	Course title (and course title in English)	ie 材料	科と塑性 terials and Pl	lasticity		nan and	tructor's ne, job title d departme affiliation	e, Professor,M Graduate Sc	hool of Energy Science ABUCHI MAMORU hool of Energy Science AMA TAKAYUKI
Please visit KULASIS to find out about office hours.	Target ye	ar	3rd year students	s or above	Number	of credits	2	Year/semesters	2021/Second semester
	Days and pe	eriods T	Гue.2	Class	s style	Lecture		Language of instruction	Japanese
	[Overvie	w and	d purpose	of the	course]				
	,1time, ,3times, ,3times, ,4times, ,3times, ,1time, [Course None	scheo	ctives] dule and c irements] nethods and		-				
	[Textboo	oks]							
	[Referen	ices, e	etc.]			_			
	Refer	ence l	books)						
	[Study o	utside	le of class ((prepa	ration an	nd review)]			
	(Other i	inform	nation (offi	ce hou	ırs, etc.)))			
	*Please vis	sit KUI	JLASIS to fir	nd out a	bout offic	e hours.			

Course number U-ENG23 23181 LJ73 Graduate School of Engineering Professor,UNO NOBUHIRO Graduate School of Engineering Professor, GOTOH HITOSHI Course title nstructor's (and course 社会基盤デザイン I name, job title iraduate School of Global Envi -stal Studie Professor,SUGIURA KUNITOMO Graduate School of Engineering Associate Professor,SAWAMURA YASUO title in Design for Infrastructure I and department of affiliation English) Fraduate School of Global Environmental Studie Associate Professor, HARADA EIJI Year/semesters 2021/First semester 2nd year students or above Number of credits 2 Target year Days and periods Thu.2 Class style Lecture arguage of instruction Japanese [Overview and purpose of the course] Civil Engineering is the study which provides the essential technology and knowledge to improve social infrastructures. Various science, technology and knowledge are required in order to realize quotconvenient and comfortable citiesquot, quotsafe countries to live inquot, quoteco-friendly global societyquot and quotsustainable civilization based on resources and energyquot. As an introduction to learn Civil Engineering, this course explains the essence of Civil Engineering from four fields in Civil Engineering (Structural Engineering, Hydraulics and Hydrology, Geotechnical Engineering and Planning and Management). Throughout the lectures and exercises including visiting lecturers, it is expected to learn the essence of Civil Engineering and the ethic of the engineering. [Course objectives] To understand that Civil Engineering is the organization of the technology and knowledge related to social capital improvement, prevention or mitigation of disaster and creation of environment. [Course schedule and contents] Introduction to Civil Engineering,2times,The content of the course is introduced. Then, the study field of Civil Engineering including latest topics and the ethic of Civil Engineers throughout the achievement of redecessors is introduced. Structual Enginnering, 3 times, Civil Engineering is introduced in the viewpoint of Structural Engineering, which includes natural disasters and structural engineering, introduction of new technology and research, the ollaboration with other fields, etc. Hydraulic Engineering,3times,There will be three lectures corresponding to Hydraulic Engineering. These three lectures provide the student with basic knowledge of hydraulics from an engineering perspective corresponding to mitigation/prevention of flood induced disasters in river and coastal areas, towards establishment of safe and sustainable water environments. The fundamentals of hydraulic structure design related to hydrostatic analysis will be explained along with examples related to dams, weirs and floating hodies. Geotechnical Engineering,3times,Civil Engineering is introduced in the view point of geotechnical Engineering, which includes soil mechanics, geo-hazard mitigation, geo-environment, international cooperation, etc. linen, etc. — Continue to 社会基盤デザイン「(2)↓↓↓

社会基盤デザイン | (2)

Planning and Management,3times,Civil Engineering is introduced in the view point of designing and managing social Infrastructure, which includes an asset management of social infrastructure, soft measures for traffic jam, logistic vehicles in urban area, etc. Achievement confirmation, Itime,Achievement of learning is confirmed.

[Course requirements]

No specific prior knowledge is required

[Evaluation methods and policy]

The score is evaluated comprehensively from reports for each lecture (including performance scores in the class) and the final examination. The full score is 100 marks which consists of 50 marks from reports and 50 marks from the final examination.

[Textbooks]

Handouts will be distributed as appropriate.

[References, etc.] (Reference books)

[Study outside of class (preparation and review)] To be notified by instructor during his/her lecture.

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours

[Courses delivered by instructors with practical work experience]

 Category A course with practical content delivered by instructors with practical work experience

(2) Details of instructors' practical work experience related to the course

(3) Details of practical classes delivered based on instructors' practical work experience

未更新	社会基盤デザイン (2)
Course number U-ENG23 33182 LJ73	
Course title Instructor's Graduate School of Global Environmental Studies	
(and course 社会基盤デザインII name, job title, Associate Professor, TAKAI ATSUSHI	[References, etc.]
title in Design for Infrastructure II and department of affiliation KANKEI KYOIN	(Reference books)
Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second semester	[Study outside of class (preparation and review)]
Days and periods Tue.5 Class style Lecture Language distuction Japanese	
[Overview and purpose of the course]	
Civil Engineering is the study which provides the essential technology and knowledge to improve social infrastructures. In this course, the fields of Civil Engineering are explained clearly in terms of how	(Other information (office hours, etc.))
technologies and knowledge, which have been evolved as academic disciplines, have been applied and	*Please visit KULASIS to find out about office hours.
integrated to realize a safe, comfortable and sustainable society. It is expected to learn the essence of Civil	
Engineering, especially on expected roles of civil engineers including engineering ethics. Also, lecturers are invited from outside of school.	
	[Courses delivered by instructors with practical work experience] (1) Category
[Course objectives]	An omnibus course delivered by invited lecturers and guest speakers from different companies, etc.
To understand how technologies and knowledge developed in Civil Engineering can be applied in the field of development of infrastructure, disaster management and mitigation, creation of environment and so on; to	
understand challenges of Civil Engineering and its directions of development, through recent research trends.	(2) Details of instructors' practical work experience related to the course
[Course schedule and contents]	(3) Details of practical classes delivered based on instructors' practical work experience
Expected roles of civil engineers, 2times, Introduction Explanation on roles of civil engineers, active areas for	
them and engineering ethics, introducing the recent examples Application of Civil Engineering to real world,9times,Explanation on how technologies and knowledge	
developed in Civil Engineering can be applied in the field of development of infrastructure, disaster	
management and mitigation, creation of environment Explanation on the relation between Civil Engineering as a discipline and its practical application, and real facts of Civil Engineering as global engineering,	
including recent topics in major business fields of civil engineer, such as civil service, construction,	
electricity, gas, transportation and communications, consulting and so on	
Research trends in Civil Engineering, 3times, Explanation on recent research trends in Civil Engineering, which aims to realize a safe, comfortable and sustainable society. Aim to learn independently status, issues	
and possibility of developing in the specified research field	
Confirmation of the attainment level of learning, 1 time, Confirm the achievements of learning	
[Course requirements]	
None	
[Evaluation methods and policy]	
Grade is given based on the examination (or reports) and attendance to class.	
[Textbooks]	
Distribute printed materials as needed	
「	

Course number U-ENG23 33184 PJ73]			
Course title (and course title in English)	(and course 測量学及) title in Surveying		民習(H27以降入学者) I Field Practice				tructor's ne, job til I departm ffiliation	tle, nent	Professor,UN Disaster Prev Professor,HA Graduate Sch Professor,SU Graduate Sch Assistant Profess Graduate Sch Assistant Profe Graduate Sch	ool of Engineering IO NOBUHIRO ention Research Institute TAYAMA MICHINORI Iool of Engineering SAKI JIYUNICHI Iool of Engineering ssor,KIMURA YUUSUKE Iool of Engineering ssor,KIMURA YUUSUKE Iool of Engineering
Target yea	r 3	rd year students	or above	Number o	of cred	its	3	Year	semesters	2021/First semester
Days and peri	ods Fr	i.2,3,4	Clas	s style	Practic	al tr	aining		Language of instruction	Japanese
 ・観測値へ ・様々な測 ・測量実習 	bject まれ 最小 では	ives] るデータか 二乗法や誤 内容を理解 、事前に計	ら最低差伝が	奞値や標準 番の法則を	適用し	τ.	最確値	iや標準)解する。)られるようになる。 標を達成できる協調
の測量技術	ched ,1回, 動向	ule and co 側量学の目 を紹介する	的、 。	歴史、内容						術の適用事例や最新
測量機器の 基準点測量 ある三角測	設置 ,8回, 量、 回,測	方法(整準、 基準点測量 トラバース 点の標高を	求心 のたる 測量)とセオドう かの測量計 こついて詳	ライトな 画につ 説し、	を用いて野夕	いた角 概説す トにおけ	測量技 るとと る実習	術を体得す さもに、代表 習を実施する	的な基準点測量法で
平板測量と 述べるとと あわせて実 え方を説明	地も習誤す回,	側量,4回,測 、その成果 行う。 に関する基 。 側量データ	物でお	ちる地形図 な概念を説	の特性 明する	、 沮 とと	量と空 ∶もに、	2間の計 誤差化	8識との関連 伝播の法則、	測量の方法について 1性について解説する。 一般算術平均値の考 1方法について演習を
			ラバ- 	- ス測量デ 	ータの 	調整	と法を解			っれたデータを用いた なび実習(H27以降入学者)(2)↓↓↓

測量学及び実習(H27以降入学者)(2)

計算演習を行う。 写真測量,2回写真測量の概要を説明するとともに、実体視、反射実体鏡による航空写真の判読に関 する実習を行う。 GPS測量,3回,GPSの原理ならびにGPSを使った測量技術について講義し、演習を行う。さらに、受 講生の学習到達度を確認する。 学習到達度の確認,1回,本講義の内容に関する到達度を確認(講評)する。

[Course requirements] 船型代数学、数理統計学

[Evaluation methods and policy] 測量学の中間・期末試験を中心に実習レポート、出席状況等を総合的に勘案して行う。

[**Textbooks]** 田村正行・須崎純一『新版 測量学』(丸善)ISBN:9784621087480

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)] 実習では6~7名の学生から構成される班単位で行動することなり、全員が最低一回は班長を務める 班長は計画書や報告書の作成が求められるため、十分な学習が必要である。

(Other information (office hours, etc.)) *Please visit KULASIS to find out about office hours.

Course number U-ENG23 23185 SJ48				Course num	nber U-E	NG23 23185 SJ4	8			
course title and course ttle in inglish) (T1) Scientific English	Instructor's name, job title, and department of affiliation	Part-time Lecturer,Ste Graduate School of En Associate Professor,FUJIMO	gineering		科学英語(地) cientific Engli			Instructor's name, job title and departmen of affiliation	Associate Prof	chool of Engineering essor,FUJIMORI SHINICHI ecturer,Stephen Gill
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Course nu	umber	U-EN	G23 2	3185 SJ48						
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Course number U-ENG23 23185 SJ48	未更新	Course nur	nher U-EN(G23 23185 SJ48	2		未更新
Course title (and course 科学英語(地球)(T2) title in Scientific English and department	ool of Engineering or,FUJIMORI SHINICHIRO urer,Karin L. Swanson	Course title (and course 禾	科学英語(地球) cientific English) (T2)	Instructor's name, job title and departme of affiliation	e, Associate Profe	chool of Engineering essor,FUJIMORI SHINICHI ecturer,Karin L. Swans
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未更新	未更新
Course number U-ENG23 23185 SJ48	Course number U-ENG23 23185 SJ48
Course title (and course Scientific English (T3) Instructor's name, Job title, and department of affiliation Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRO Part-time Lecturer,Karin L. Swanson	Course title (and course title in English) 科学英語(地球)(T4) Instructor's name, job title, and department of affiliation Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRG Part-time Lecturer,Karin L. Swanson
Target year 2nd year students or above Number of credits 1 Year/semesters 2021/Second semester	Target year 2nd year students or above Number of credits 1 Year/semesters 2021/Second semester
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[Course requirements] None	[Course requirements] None
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ndispensable	for designing c	coastal environm	ent.					[Textbo Handout
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Introduction to	coastal engine	eering with focus	sing on beach	deforma	ation			[Refere
Small Amplitu	de wave theor	y[2times]:						Supplem
Characteristics	of small ampl	litude wave theor	ry and its appl	ication a	are ex	plained.		
Wave Statistic	s / Wave Trans	sformation[2time	s].					(Rela
Developing pro	ocess of wind	wave and expres		of irregul	lar wa	ves are expla	ined. Mechanics of	(Non)
wave transform	nation is outlin	ned.						[Ctuchy
Wave Force or	n Coastal Struc	ctures[1time]:						[Study Review t
Several experi	mental formula	ae of wave force	acting on coa	stal strue	ctures	are introduce	d. Problems for	ite view t
stability of rub	ble mound is r	nentioned.						Other
		(Exercise)[1time	e]:					Reexami
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State-of-the-ar	t numerical wa	ave flume and its	applications a	are expla	ained.			
Sediment Hydr	aulics (i.e., bas	sic characteristic	s, calculation	of river-	bed, ł	oed load and s	uspended load, non-	
equilibrium se								

未更新 U-ENG23 33187 LJ58 U-ENG23 33187 LJ10 U-ENG23 33187 LJ77 Course number Graduate School of Engineering Professor,KOIKE KATSUAKI Graduate School of Engineering Professor, MIKADA HITOSHI Course title Instructor's 資源情報解析学 (and course name, job title Graduate School of Engineering Professor,HAYASHI TAMETO Resource information analysis and department of affiliation title in English) Graduate School of Engineering Associate Professor, KASHIWAYA KOUK Graduate School of Engineering Assistant Professor, ISHITSUKA KAZUY Target year 4th year students or above Number of credits Year/semesters 2021/First semester Days and periods Mon.4 Class style Lecture arguage of instruction Japanese [Overview and purpose of the course] In the process of geological survey and exploration related to mineral and energy resources, various information, such as lithofacies and minerals, rock physical properties and chemical composition, mechanical properties, and so forth are obtained in large quantities. Lectures will be given on modeling the spatial distribution of resources from this information and accurately evaluating ore reserves. In addition, the information analysis method necessary for designing and planning resource development by land mining, underground digging, and underwater drilling will be covered. Additionally, the geological properties, such as chemical component concentration and groundwater level in the fluid, and the response from underground regarding the input electromagnetic waves in the electromagnetic wave survey change with time. Lectures will be given on analysis methods for such data that change according to time and space, and understand the application to underground structure and the Earth's crust environment evaluation. The contents are composed of four items: geological information analysis, time series data analysis, spatio-temporal data analysis, and integrated analysis of mechanical data. The purpose of the class is to understand the basics of ese analytical methods and to acquire knowledge that can be applied to the field of resource engineering. [Course objectives] Learning the basics of the geological map creation method required for resource evaluation and the spatial distribution estimation method of geological data, the rock geochemical analysis method and mineral analysis method, the time series data analysis method, and the dynamic data analysis method for resource development. Additionally, being able to understand how they can be applied to the field of resource available to the field of resource development. ngineering. [Course schedule and contents]

Geological information analysis (5 times): Lectures will be given on the quality distribution model by geostatistics, the calculation method of ore reserves, the evaluation method of resource existence by data ntegration using Bayesian statistics, and the geological map creation and interpretation method of geological structure as a basis for resource distribution modeling. In addition, in order to clarify chemical anomalies of rock-forming ore deposits, lectures will be given on the geochemical data analysis method of rocks and Earth crust fluids, the chemical composition analysis method, and the crystal structure of minerals.

Time series data analysis (2 times): Lectures will be given on autoregressive and multivariate regression models, which are representative analysis methods, in order to find inherent regularity from time series data and to enable future prediction.

_____Continue to 資源情報解析学(2)↓↓↓

ent / Coastal Sediment Transport[1time]: ent due to wave deformation and resultant coastal sediment transport are outlined.

torm Surge: Evacuation Planning under Coastal Disasters[1time]: of tsunami and storm surge are explained. Additionally, evacuation process and evacuation troduced.

onfirmation[1time]:

check of course contents

irements1 completed the class of Hydraulics and Exercises is desirable

methods and policy] sults of examinations

d in the lectures as needed

etc.]

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is not provided ouch with instructors is announced in the first lecture.

ULASIS to find out about office hours.

資源情報解析学(2)

Spatio-temporal data analysis (3 times): Lectures will be given on principal component analysis and independent component analysis as unsupervised classification methods of spatio-temporal data. In addition, lectures will be given on analysis methods of spatio-temporal data using geostatistics, and will deepen understanding of how to model and visualize geological and environmental data that varies according to time and space.

Integrated analytics of mechanical data (4 times): Lectures will be given on mechanical problems related to the development of underground resources and undergrave aresources, analysis metalatical property data, the integration method of core data and logging data, the evaluation method of wide stress fields, and a world stress map, to utilize dynamic data to safely and efficiently develop mineral and energy resources. Additionally, many practical examples will be covered.

Feedback (1 time): Supplementary explanation of the items of insufficient understanding regarding the ontent of the above le

[Course requirements]

It is assumed that students have taken the third year courses of Geological Engineering and Rock Engineering and the second year course of Basic Mathematics of Geological Engineering

[Evaluation methods and policy]

Class attendance and the results of reports will be evaluated together.

[Textbooks]

Others; prints will be distributed as appropriate.

[References, etc.] (Reference books)

Introduced during class

[Study outside of class (preparation and review)]

Although preparation is not particularly necessary, students should spend enough time preparing the reports as a review and deepening their understanding.

(Other information (office hours, etc.))

In case of questions, students should come to the office of the professor in charge. After the grade evaluation class for feedback on the content that was insufficiently understood will be conducted

Please visit KULASIS to find out about office hours.

name, job title, and department of affiliation

の力学物性と破壊(2)

Rheology model (Macro rheology model, Microrheology model) Feedback class (Review of the whole class and examination)

rse requirements]

ential calculus, integral calculus and linear algebra are necessary for this course. luation methods and policy]

z or a report problem is given in every class. The grade is evaluated by the sum of scores of the quiz or port and the final exam. The grading weights of them are 30% and 70% respectively.

books] ed

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erences, etc.]

eference books) Zairyo Kyodo Kaiseki-gaku (Uchida Rokakuho Publishing Co., Ltd) ISBN: hiro Togo

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course does not have a web site.)

dy outside of class (preparation and review)] w the lecture materials and note by yourself. In the next lecture, make a qustion about the points that buld not understand well.

er information (office hours, etc.))

onal information is presented in the first class of each teacher.

se visit KULASIS to find out about office hours.

弾性体の力学解析(2)

[Course requirements]

Differential calculus, integral calculus, and linear algebra are necessary for taking this course.

[Evaluation methods and policy]

Several Exercises are presented in the term. Midterm exam and final exam are also presented. Grade is evaluated by the sum of the exercises and the exams with the weight of 30% and 70% respectively.

[Textbooks] Not used

Not specified.

[References, etc.]

(Reference books) igeo Takezono et al. Introduction of Mechanics of elasticity-from basic theory to numerical analysis-(Morikita Publishing Co.) ISBN:9784627666412 (in Japanese)

(Related URLs)

(This course does not have a web site. But some lecture documents may be deribered by the net. The URL to ownload the lecture documents will be announced in the class.)

[Study outside of class (preparation and review)]

It is strongly recommended to solve again the example problems explained in the lecture by yourself.

(Other information (office hours, etc.))

Additional information is presented in the first class of each teacher

*Please visit KULASIS to find out about office hours.

Coordinate transformation of stress, Principal stress
2nd: Maximum shear stress, Mohl s stress circle, Invariant of stress
3rd: Displacement and strain, Coordinate transformation of strain, Invariant of strain, Mohl s strain circle
4th: Relationship between stress and strain, Elastic modulus,
Basic equations of elasticity in rectangular coordinate system,
Elastic basic formula in polar coordinate system
5th: Airy's stress function in rectangular coordinate system,
Two-dimensional elastic problem using Airy's stress function
6th: Various Airy's stress function in rectangular coordinate system
7th: Airy's stress function in polar coordinate system,
Two-dimensional elastic problem using Airy's stress function in polar coordinate system
8th: Two-dimensional elastic problem using Airy's stress function in polar coordinate system
9th: Intermediate examination
10th: Introduction of "Mechanical analysis for elastic bodies based on energy principle",
Basic equations of small displacement problem in elasticity its solution

Course number U-ENG23 33200 LJ77 U-ENG23 33200 LJ71

Brd year students or above Number of credits 4

Lecture

Stress, strain, displacement and basic equations in linear elasticity are first lectured, and then Airy's stress function and its application to solve two dimensional problems in linear elasticity are explained. Moreover,

One objective of this course is to master the basis to solve the boundary value problems in linear elasticity

analytically or numerically. Another one is to obtain the basic knowledge of numerical stress analysis

energy theorems and their application to a numerical stress analysis method are explained

Class style

Ist: Explanation about the contents, schedule and evaluation etc. Outline of class and explanation of syllabus, History of elasticity, Stress,

Fundamental Theory of Elasticity and Stress Analysi

弾性体の力学解析

[Overview and purpose of the course]

Course titl

title in

English)

(and course

Target year

Days and periods Mon.1,2

[Course objectives]

ethods such as FEM and BEM.

[Course schedule and contents]

Energy principle (Principle of virtual work / Complement virtual work, Strain energy function) 12th: Energy principle (Principle of minimum potential energy, Simple example of energy principle)

13th: Approximate solution based on the variational principle of minimum potential energy) (Approximate solution based on the principle of virtual work and principle of minimum potential energy) 14th: Approximate solution based on variational principle

(Introduction to finite element method) 15th: Finite element method for elastic problems, Feedback class

Continue to 弾性体の力学解析(2)↓↓↓

Graduate School of Engineering Professor, TSUKADA KAZUHIKO

Graduate School of Engineering Associate Professor, MURATA SUMIHIKO

Japanese

2021/First semester

Year/semesters

anguage of instructi

Course number U-ENG23 33210 SJ77 U-ENG23 33210 SJ54	未更新 Course number U-ENG23 33220 EJ77
urse title d course e in glish) 数値計算法及び演習 Numerical Methods for Engineering and Exercises and periods Mon.1,2 Class style Linstructor's name, job title, and department of affiliation Linstructor's name, job title, and department of affiliation Craduate School of Engineering Graduate School of Engineering Orderson,FUKUYAMA EIICHI Graduate School of Engineering Orderson,FUKUYAMA TAKAYUKI Seminar Linguaged Instantor Japanese	Course title (and course 世間) (and course (and course) (and course) (有能力) (有) (有) (有) (有) (有) (有) (有) (有) (有) (有
Overview and purpose of the course]	Associate Professor,NARA YOSHIT, Graduate School of Engineering Assistant Professor,ISHITSUKA KAZI Graduate School of Energy Scie Assistant Professor,KUSAKA EI Graduate School of Engineering Assistant Professor,XU Shibo
ourse schedule and contents]	Target year Brd year students or above Number of credits 2 Year/semesters 2021/First semesters
times, times, times,	Days and periods Thu.3,4,5 Class style Experiment Larguage d/instructor Japanese [Overview and purpose of the course]
imes,	[Course objectives]
ne	
valuation methods and policy]	[Course schedule and contents] ,1time, ,2times, ,2times,
extbooks]	,6times, ,1time,
eferences, etc.]	[Course requirements] None
[Reference books)	[Evaluation methods and policy]
	[Textbooks]
Other information (office hours, etc.)) lease visit KULASIS to find out about office hours.	
源工学基礎実験(2)	未更结 Course number U-ENG23 33231 EJ77 U-ENG23 33231 EJ58 U-ENG23 33231 EJ73
References, etc.]	Graduate School of Engineering Professor, KOIKE KATSUAKI Graduate School of Engineering Professor, MIKADA HITOSHI
tudy outside of class (preparation and review)]	Course title (and course title in English) Course title (and course (資源工学フィールド実習 Geological and Geophysical Survey, Field Excursion English) Geological and Geophysical Survey, Field Excursion English) Geological and Geophysical Survey, Field Excursion English) Geological and Geophysical Survey, Field Excursion English) Graduate School of Engineering Associate Professor, TAKEKAWA JUN Graduate School of Engineering Associate Professor, TAKEKAWA JUN Graduate School of Engineering Associate Professor, ISHITSUKA KAZ Graduate School of Engineering Associate Professor, ISHITSUKA KAZ Graduate School of Engineering Associate Professor, ISHITSUKA KAZ
Other information (office hours, etc.)) lease visit KULASIS to find out about office hours.	Assistant Professor,XU Shibo Graduate School of Energy Scie Assistant Professor,CHIN YUU
	Target year Prof year students or above Number of credits 2 Year/semesters 2021/Second seme Days and periods Tue.3,4,5 Class style Experiment Language dristitutor Japanese [Overview and purpose of the course] Experiment Language dristitutor Language dristitutor Language dristitutor
	In the resource engineering, data acquirement and observation in the field are essential skills. For learning these knowledge, two field experiments are conducted; geological and geophysical surveys. [Course objectives]
	Geological Survey Students can understand the relationship between the geology and topography by field observations, and become familiar with the observation of the geological outcrops from the view point of resource geology. addition, they can explain how the topography and geology are deeply related each other, and obtain the b geological information, such as strike, dip, rock type (mineral species) in the field observation (measurem
	Geophysical Survey Students carry out the field training and data analysis of seismic refraction survey and electrical resistivit exploration. In the field training, they learn deployment of geophones for land seismic survey, together warrangement of current/potential electrodes for electrical survey. In addition, they can understand the vibration at seismic source wave and recording method of the seismic wave, together with the transmissio electric current and the measurement of potential. In the data analysis, students can deeply learn the knowledge about the estimated physical quantity from the recorded data, and also understand the imaging method for underground structure.
	[Course schedule and contents] Topographic Analysis (Geology),2times,The topographic analysis method is lectured as a pre-study of geological field trip, then students carry out the analysis by using topographic maps and aerial photos of th excursion destination. Field Excursion I, II (Geology),6times,Students observe the outcrops in the field, and compare the real geological structure with the results done as the exercises. Two excursions on the different locations are conducted.
	Conducted. Presentation_2times,Students make presentations what they learned in the excursion and analysis. Continue to 資源工学フィール下実習(2)

資源工学フィールド実習(2)

Seismic Survey (Geophysics),2.5times,Along the Kamo river side, the seismic refraction survey is conducted. The data acquired is analyzed using the quotstripping methodquot, and used for estimating the subsurface structure based on the seismic wave velocity. Electrical Resistivity Survey (Geophysics),2.5times,Along the Kamo river side, the electrical resistivity

urvey using the Wenner array is conducted. The data acquired is analyzed , then students learn the heoretical basis of this method together with a way for estimation of subsurface resistivity structure.

[Course requirements]

[Evaluation methods and policy]

Evaluation based on reports and presentations. Details will be explained at the beginning of class. [Textbooks]

It will be presented in the lecture

[References, etc.]

(Reference books It will be presented in the lecture

[Study outside of class (preparation and review)] It will be shown in the lecture

(Other information (office hours, etc.))

Please visit KULASIS to find out about office hours.

										未更新
Course n	umber	U-ENG2	23 3	3240 LJ73	U-EN	G23	33240	LJ77	U-ENG23 3	3240 LJ58
Course title (and course title in English)	hd course le in Engineering Geology			Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor,KOIKE KATSUAKI Graduate School of Engineering Professor,HAYASHI TAMETO Graduate School of Engineering Associate Professor,KASHIWAYAKO			
Target yea	r Brd y	ear students or a	ibove	Number	of cred	lits	2	Year	/semesters	2021/First semester
Days and peri	ods Tue.	3 C	lass	s style	Lectur	e			Language of instruction	Japanese
[Overview	and p	urpose of	the	course]						
information properties, a distribution information underground as chemical regarding th will be give application	such as nd so fo of resou analysis digging compon e input e n on ana to under	lithofacies a rth are obtai rces from th method nec g, and under ent concentr electromagno lysis methoo ground struc	and ned is in cessa wate ratio etic ds fo ture	minerals, ru in large qu iformation a ary for desi er drilling v on and grou waves in th or such data e and the Ea	ock phy antities. and accor- gning an vill be c ndwater the electr that ch rth's c	sical Lec urate nd pl over leve oma ange crust	l proper ctures w ely evalu lanning red. Add el in the gnetic v e accord t enviror	ties an ill be g aating resour litiona fluid, vave so ing to ment	d chemical co given on mod ore reserves. ce developme and the respo urvey change time and space evaluation. T	urces, various mposition, mechanical eling the spatial In addition, the ent by land mining, gical properties, such onse from underground with time. Lectures ce, and understand the he contents are tio-temporal data

[Course objectives]

Course number

Learning the basics of the geological map creation method required for resource evaluation and the spatial distribution estimation method of geological data, the rock geochemical analysis method and mineral analysis method, the time series data analysis method, and the dynamic data analysis method for resource development. Additionally, being able to understand how they can be applied to the field of resource engineering.

analysis, and integrated analysis of mechanical data. The purpose of the class is to understand the basics of analytical methods and to acquire knowledge that can be applied to the field of resource engineering.

[Course schedule and contents]

Geological information analysis (5 times): Lectures will be given on the quality distribution model by geostatistics, the calculation method of ore reserves, the evaluation method of resource existence by data Integration using Bayesian statistics, and the geological map creation and interpretation method of geological structure as a basis for resource distribution modeling. In addition, in order to clarify chemical anomalies of rock-forming ore deposits, lectures will be given on the geochemical data analysis method of rocks and Earth crust fluids, the chemical composition analysis method, and the crystal structure of minerals

Time series data analysis (2 times): Lectures will be given on autoregressive and multivariate regression models, which are representative analysis methods, in order to find inherent regularity from time series data and to enable future prediction.

Spatio-temporal data analysis (3 times): Lectures will be given on principal component analysis and independent component analysis as unsupervised classification methods of spatio-temporal data. In addition, lectures will be given on analysis methods of spatio-temporal data using geostatistics, and will deepen Continue to 地質工学(2)↓↓↓

U-ENG23 23250 LJ58 U-ENG23 23250 LJ73 U-ENG23 23250 LJ77

地質工学(2)

understanding of how to model and visualize geological and environmental data that varies according to time and space.

Integrated analytics of mechanical data (4 times): Lectures will be given on mechanical problems related to the development of underground resources and undersea resources, analysis methods of mechanical data and physical property data, the integration method of core data and logging data, the evaluation method of wide energy resources. Additionally, many practical examples will be covered.

Feedback (1 time): Supplementary explanation of the items of insufficient understanding regarding the ontent of the above lectures

[Course requirements]

It is assumed that students have taken the third year courses of Geological Engineering and Rock Engineering and the second year course of Basic Mathematics of Geological Engineering

[Evaluation methods and policy]

Class attendance and the results of reports will be evaluated together.

[Textbooks]

Prints will be distributed as appropriate.

[References, etc.]

(Reference books)

ntroduced during class

[Study outside of class (preparation and review)]

Although preparation is not particularly necessary, students should spend enough time preparing the reports as a review and deepening their understanding.

(Other information (office hours, etc.))

In case of questions, students should come to the office of the professor in charge. After the grade evaluation, a class for feedback on the content that was insufficiently understood will be conducted

*Please visit KULASIS to find out about office hours

Graduate School of Engineering Professor,KOIKE KATSUAKI Course titl nstructor's Graduate School of Engineering Professor, MIKADA HITOSHI 資源工学入門 (and course name, job title . title in Introduction to Earth Resources Engineering and department Graduate School of Engineering Associate Professor,NARA YOSHITAKA English) Graduate School of Engineering Associate Professor, MURATA SUMIHIKO 2nd year students or above Number of credits 2 Year/semesters 2021/Second semester Target year Days and periods Tue.2 Class style Lecture Language of instruction Japanese [Overview and purpose of the course] Through the understanding of natural resources that are integral to the development of our human society, a series of lectures is given to bring the fundamental knowledge in earth resources engineering, i.e., a synthetic research area composed of plural scientific fields such as geology, geophysics, civil engineering, environmental sciences, and the other engineering areas of mechanical, electrical, and material sciences [Course objectives] The acquisition of fundamental knowledge on earth resources engineering and its related engineering fields as synthetic research areas being covered in this academic domain. [Course schedule and contents] General introduction to earth resources problems (1 class) The discussion is on how the earth resource engineering has developed after the industrial revolution chronologically with a special interest in relations with earth sciences such as geology, geophysics, and many other engineering fields. Resources geology (4 classes) Fundamentals of resource geology about generation mechanism and location of deposits in the earth and accumulation mechanism of useful metals such as metals are accumulated. First to report in the contrast and reconstruction in the physical and chemical structures of the earth, geologic and tectonic histories, physics, and chemistry of mineralogy and ores. Next, by classifying deposits by origins into igneous (ortho-magmatic and hydrothermal), sedimentary (chemical deposition, weathering, etc.), and metamorphic deposits, characteristics and generation mechanisms of each deposit type are explained, as wells as a brief introduction of hydrocarbon and coal deposits, typical fossil energy resources. To deepen interests, su a orient introduction of injurcements in the construction of the provide of th Exploration Geophysics (3 classes) Exploration geophysics for the development of hydrocarbon, metallic and mineral deposits are outlined. Fundamentals on exploration seismology, exploration electromagnetics, etrophysics and related fields are covered. The future direction of exploration methodologies is discussed, Rock Mechanics (3 classes) Information and knowledge of the mechanics of rock are essential to ensure the safety of various engineering projects, such as mining engineering, radioactive waste disposal, and carbon capture and storage. To understand the mechanics of rock, the mechanical properties (the deformation, fracturing, and strength) of rock are described. In addition, the influences of the environmental conditions (e.

g., temperature, humidity, and water) on the mechanical properties are described. Petroleum Engineering (3 classes) An overview of oil and natural gas development technology will be introduced, and then the drilling technology, reservoir evaluation technology and production technology for rilling technology, too tect the community of the commu

資源工学入門(2)	
貝/冰工于八门(4)	Course number U-ENG23 33260 LJ77
┡	Course title Instructor's
oil and natural gas are explained. The environmental measures technologies such as CCS (Carbon Capture	(and course 貯留層工学 name, job title, Graduate School of Engineering
and Storage) and CCUS (Carbon Capture Utilization and Storage) are also explained. Confirmation of proficiency level (1 class) The proficiency level throughout the classes is confirmed for	title in Reservoir Engineering and department Associate Professor, MURATA SUMIHIKO
students to deepen their understanding. The answers to the questions used to check the proficiency will be	English) of affiliation
provided.	
provide and the second s	Target year 4th year students or above Number of credits 2 Year/semesters 2021/First semester
[Course requirements]	Target year 4th year students or above Number of credits 2 Year/semesters 2021/First semester
Preferred students are whom has taken quotResources and Energyquot in the first semester of the sophomore	Days and periods Fri.2 Class style Lecture language distinction Japanese
grade.	
	[Overview and purpose of the course]
[Evaluation methods and policy]	Fluid flow in an oil and gas reservoir and geothermal reservoir is explained. Then, the reservoir properties relating to the flow such as porosity, permeability, relative permeability, capirally pressure and so on are
Grading is based on the following shares: 20% for the attendance, reports, etc., and 80% for the final exam.	explained. Reservoir fluids properties and their phase behavior are also explained. Furthermore, drilling and
Shalling is called on the following shalles 20% for the and another reports, ever, and over for the final chain	completion for a oil/gas well, log interpretation method and well test analysis are explained.
[Textbooks]	compretion for a on-gas went tog interpretation include and went tost analysis are explained.
None specified.	[Course objectives]
	The course goals are as follows: 1) to understand the basics of fluid flow in reservoir based on Darcy#039s
	law, 2) to master the properties of reservoir rock and fluids and their evaluation methods, 3) to obtain basic
[References, etc.]	knowledge about oil/gas well drilling and completion methods, 4) to understand the log interpretaion method
(Reference books)	and well test analysis.
Lecturer for each theme may specify supplemental textbooks if necessary.	10 million and a sector (s)
	[Course schedule and contents]
(Related URLs)	1st: Introduction (Explanation about class schedule and grade evaluation), Summary of oil field development,
(None)	Reserves and reserve evaluation methods 2nd: Reservoir rock properties 1 (Porosity and Compressibility)
	3rd: Reservoir rock properties 2 (Wettability and Capillary pressure)
[Study outside of class (preparation and review)]	4th: Reservoir rock properties 3 (Darcy's law, permeability, and effective permeability)
Lecturer for each theme may specify the title of reports in the lecture.	5th: Reservoir rock properties 4 (Relative permeability)
	6th: Exercise for the reservoir rock properties
(Other information (office hours, etc.))	7th: Reservoir fluid properties
After the exam, modeled answers will be distributed through KULASIS with the best delay as a feedback	8th: Drive mechanism and material balance equations
material for each student to review the lecture.	9th: Oil well drilling and completion 10th: Electrical properties of reservoir rock
	11th: Well logging
*Please visit KULASIS to find out about office hours.	12th: Basic equation of fluid flow in a reservoir
	13th: Basic theory of well test analysis
[Courses delivered by instructors with practical work experience]	14th: Exercise of well test analysis
(1) Category	15th: Feedback (Review of this class and examination)
A course with practical content delivered by instructors with practical work experience	
(2) Details of instructors' practical work experience related to the course	[Course requirements]
(2) Details of instructions product work experience related to the course	The knowledge of differential calculus, integral calculus, physical chemistry and exploration geophysics are
	necessary for this course.
(3) Details of practical classes delivered based on instructors' practical work experience	
	Continue to 貯留層工学(2)↓↓↓

貯留層工学(2)	Course r	numbei	r l	U-ENG23	33270 LJ2	24 U-E	NG23 3327	0 LJ73		
[Evaluation methods and policy] The grade will be evaluated by the score of three report works and final examination. Their weight for the grading is 50% each. [Textbooks] Not used Not used Not specified. Materials for the course will be derivered.	Course title (and course title in English)	社会	防災コ al Engi		or Disaster	Reductio	Instructor name, job and depa of affiliati	title, rtment	Professor,K Disaster Pre Professor,T Disaster Pre Professor,H Disaster Pre Professor,Y Disaster Pre	hool of Engineering AWASAKI MASASHI vention Research Institute ATANO HIROKAZU vention Research Institute XTAYAMA MICHINORI vention Research Institute AMORI KATSUYA vention Research Institute
[References, etc.] (Reference books)	Target ye	ar 4	th year st	udents or abo	ove Numbe	er of cre	edits 2	Year	Disaster Pre-	essor,OONISHI MASAMITSU vention Research Institute ssor,YOKOMATSU MUNETA 2021/First semester
L. P. Dake "Fundamentals of Reservoir Engineering, 19th impression.] (Elsevier) ISBN:9780444418302	Days and pe				ss style	Lect			Language of instructio	
(Related URLs)	[Overvie	w and	purp	ose of th	e course]				
(Not specified.)							hodologies, e to natural			ogies and plannings
[Study outside of class (preparation and review)]	[Course	obioc	livoel							
It is recommended to solve the homework problems with reviewing the course materials.	-	-		and social	l impacts c	aused by	various tvi	es of na	tural disaster	so that students can
(Other information (office hours, etc.))										understand various
Office hour will be set from 13:00 to 15:00 on the same day of this class.	concepts, s reducing th						nologies and	l plannin	igs related to	social policies for
	reducing u	ie uann	age uu		ii uisasters.					
*Please visit KULASIS to find out about office hours.	[Course				-					
[Courses delivered by instructors with practical work experience]							saster reduc			nceptual framework of
(1) Category	disaster ris			laturai uis	asters, dan	lages du	e to various	KIIIUS OI	uisastei, co	neeptuar framework of
A course with practical content delivered by instructors with practical work experience	(2) Disaste		ntion .	lonning [2 4 wookal					
(2) Details of instructors' practical work experience related to the course	Based on s	pecifie	d haza	rd events	such as ear	, thquake,	, floods and nd social m			disaster events and
(3) Details of practical classes delivered based on instructors' practical work experience	(3) Disaste	r and ii	nforma	tion [3-4	weeks]					
	During a d	isaster	event,	various ei	nergency r	neasures the infor	must be un mation to a	dertaker ction is c	n including ev liscussed.	vacuation. The role of
	(4) Evaluat	ion of	disaste	r risk [3-4	weeks]					
	(5) Feedba	ak								
	(5) Feedba	CK								
								0	Continue to	社会防災工学(2)↓↓↓

社会防災工学(2)	
11云彻灭土子(2)	Course number U-ENG23 33280 LJ77 U-ENG23 33280 LJ58 U-ENG23 33280 LJ14 Graduate School of Engineering
[Course requirements]	Professor,KOIKE KATSUAKI
None	(and course 物理探查学 name, job title, Professor, MIKADA HITOSHI
[Evaluation methods and policy]	title in Exploration Geophysics and department Graduate School of Engineering Associate Professor, TAKEKAWA JUNICHI
The score is based on the evaluation of multiple report works including mini-reports after the classes.	Graduate School of Engineering Assistant Professor,XU Shibo
[Textbooks]	Target year Brd year students or above Number of credits 2 Year/semesters 2021/First semester
Hand-out materials will be distributed.	
	Days and periods Tue.4 Class style Lecture Language distriction Japanese
[References, etc.]	[Overview and purpose of the course]
(Reference books)	About various subsurface exploration methods, technologies for investigating subsurface natural resources from the surface of the earth, their exploration principles, as well as data acquisition methods will be
	introduced. Along with lectures on basic physicochemical principles of data processing technology and interpretation
[Chudu sutside of along (supporting and surjeut)]	methods, energy
[Study outside of class (preparation and review)] Homework such as writing essays will be given as needed-basis.	 The application to the resource field, environment field, disaster prevention field, ground engineering field, and civil engineering field will also be introduced.
	and tivit engineering netd with also be introduced.
(Other information (office hours, etc.))	[Course objectives]
Office hour is not specified, but students may ask lectures questions by email.	The goal is to understand geophysical exploration methods from the perspectives of electromagnetics, seismology, geochemistry, and rock physics.
*Please visit KULASIS to find out about office hours.	
[Courses delivered by instructors with practical work experience]	[Course schedule and contents]
(1) Category	Geoelectromagnetism and geophysical exploration, 5 times, outlines the basic theory of exploration technology by geoelectromagnetic methods. Geophysical exploration
An omnibus course delivered by invited lecturers and guest speakers from different companies, etc.	Learn the physical basis and measured physical quantities of geoelectromagnetic methods used in the field of By doing so, the goal is to understand its physical significance.
(2) Details of instructors' practical work experience related to the course	Seismology and geophysical exploration, 6 times, outline the basic theory of exploration technology by
	seismological methods. Refraction from the basics of seismology By learning about measured physical quantities from the physical basis of law and reflection method
(3) Details of practical classes delivered based on instructors' practical work experience	exploration,
	The goal is to understand the scientific significance. Geochemical exploration and remote sensing, 3 times, chemical properties of rock minerals forming the crust,
	mantle, and core,
	And a geochemical overview of the basics of geochemical measurements used in the exploration of metal deposits and energy resources.
	After that, the interaction between electromagnetic waves and substances used in remote sensing technology,
	optical sensors, and synthetic apertures. Basics such as data, remote sensing image processing method and topographic analysis, resource exploration,
	environmental monitoring, etc.
	The application to the above will be described. Confirmation of achievement, 1 time, understanding of lecture contents.
	commation of admevement, 1 time, understanding of recture contents.
	Continue to 物理探査学(2)↓↓↓
物理探查学(2)	Course number U-ENG23 33290 SJ15 U-ENG23 33290 SJ14
	Course number U-ENG23 33290 SJ15 U-ENG23 33290 SJ14 Graduate School of Global Environmental Studies
[Course requirements]	Professor,ECHIGO SHINYA
Preferrable students are those who have taken university-level physics, chemistry, and earth science.	Course title (and course) 環境工学解析演習 Instructor's Graduate School of Engineering Assistant Professor,GOMI RYOUTA
Evaluation methods and policy	title in Data Analysis in Environmental Engineering and department Graduate School of Energy Science
[Evaluation methods and policy] Basically, a paper-based exam will be conducted, but each professor in charge may explain the method of	Agency for Health, Safety and Environment
grade evaluation.	Assistant Professor, YANO JUNYA
[Textbooks]	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second semester
Instructed during class	Days and periods Fri.4,5 Class style Seminar Language distution Japanese
· ·	[Overview and purpose of the course]
	環境工学に関連するデータ処理・解析、統計手法等について、手法の基礎の習得、及び実践的な
[References, etc.]	データを用いた演習を通じて、環境工学の応用について理解を深めるともに関連する技術を身に着 ける。また、演習結果を学生間で発表し、それに関して議論することでデータ解析とそれをもとに
(Reference books) Introduced during class	のる。また、領古和未を手工用で光衣し、それに関して飯舗のなことでアーン所有してれたもとに した解釈に関する幅広い視点を身に着けることを目的とする。

[Study outside of class (preparation and review)] N.P.

(Other information (office hours, etc.)) Anytime.

*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]
(1) Category
A course with practical content delivered by instructors with practical work experience

(2) Details of instructors' practical work experience related to the course Mikada: Schlumberger 10 yrs, JAMSTEC 5.5 yrs. Takekawa: Geo-Research Inst. 2.3 yrs.

(3) Details of practical classes delivered based on instructors' practical work experience Lecture on praxis of geophysical exploration used in private sector practice.

Course title (and course title in English)	nd course 周境工学解析演習 Data Analysis in Environmental Engineering			Instructor's name, job title, and department of affiliation			Graduate School of Global Environmental Studies Professor, ECHIGO SHINYA Graduate School of Engineering Assistant Professor, GOMI RYOUTA Graduate School of Energy Science Assistant Professor, YAMAMOTO KOUHEI Agency for Health, Safety and Environment Assistant Professor, YANO JUNYA				
Target yea	r Brd year st	udents or above	Number	of cred	its	2	Year	r/semesters	2021/Second semester		
Days and perio	ods Fri.4,5	Class	style	Semina	ır			Language of instruction	Japanese		
-	and purpo		-								
データを用 ける。また した解釈に前 及び関連す	いた演習を 、演習結果 関する幅広 半部と後半	通じて、現 を学生間で い視点を身 部にわかれ う。後半に	環境工学の 変発表し、 すに着ける し、前半部 は実際の環	応用に それに では デー	つ関目とタ	て理解 て議論る で基礎 に見いて	を なる 前半	めるともに関 ことでデータ 手法やソフト	○習得、及び実践的な 関連する技術を身に着 マ解析とそれをもとに、 、ウェアの技能の講義 と手法を適用し、グル		
る能力を習 - タ間の関		体的には、 機械学習に	様々な種 こよる分類	類のグ	ラフ	を用い			5、及びそれを解釈す 2表現する方法論、デ		
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環境工学解析演習(2)	Course number U-ENG23 13501 LE14 U-ENG23 13501 LE73
Course requirements]	Course title (and course title in English) Introduction to Global Engineering Introduction to Global Engineering (and department of affiliation of affiliation Instructor's name, job title, and department of affiliation Graduate School of Engineering (KANKEI KYOIN Graduate School of Engineering Associate Professor, PPATPONGA, Thira
Evaluation methods and policy]	Associat Holdsol, II AH ONOSA, Hina
【評価方法】 レポートの成績(50%)、発表・討論の成績(20%)、平常点評価(30%) 平常点評価には、出席状況の他に小テストが課される場合がある。 【評価基準】 到達目標について、各演習の内容を理解する観点から A+:すべての観点においてさわめて高い水準で目標を達成している。 A::すべての観点において目標を達成している。 B::すべての観点において目標を達成している。 C::大半の観点において目標を達成している。 D::目標をある程度達成しているが、更なる努力が求められる。	Target year Ist year students or above Number of credits 2 Year/semesters 2021/First semesters Days and periods Wed.4 Class style Lecture Language distinction English [Overview and purpose of the course] This course focuses on improving studentsrsquo understanding about Global Engineering. The course also active the sustainability of human society on a global scale in addition, this course is designed to provide students with a personal and professional downdation for working in professions and roles that utilize knowledge of global engineering.
F :学修の効果が認められず、目標を達成したとは言い難い。	[Course objectives]
[Textbooks] instructed during class	To understand concepts of global engineering. To understand subjects and contents that students should stu at the department of global engineering within 4 years.
なお, 原則として履修者各自がノートパソコンを各回持参することを想定している。難しい場合は, 1 回目の講義時に相談すること。	[Course schedule and contents]
[References, etc.] (Reference books) Introduced during class [Study outside of class (preparation and review)] 配布するプリントの内容を完全に理解するとともに、関連する知識を自分でも得るようにすること。	obligations to the public, clients, employers, and the profession. Lecture,6times,Major roles in solving problems on a global scale from civil, environmental, and resources engineering point of views. Small group seminar,6times,Each small group of participants visits a laboratory associated with global engineering and take a seminar. Students have to choose a theme relating to global engineering as a group project and perform the project under the supervision of a faculty member. Introduction of latest research,2times,Visit laboratories of the global engineering department to widen students#039 knowledge and to deepen their understanding of the role and importance of the global engineering.
(Other information (office hours, etc.))	[Course requirements]
オフィスアワーは特に設けないが、質問や学修上の相談があればメール等で事前連絡の上, 担当教 員のオフィスを訪れること。	No prerequisite is required.
	[Evaluation methods and policy]
*Please visit KULASIS to find out about office hours.	Coursework will be graded based on reports and attendance.
	[Textbooks]
	A textbook is not required. Materials will be delivered by instructors as needed.
	[References, etc.]
	(Reference books)
	Continue to Introduction to Global Engineering(2)

	未更新
Introduction to Global Engineering(2)	Course number U-ENG23 13502 SE73
[Study outside of class (preparation and review)]	Course title (and course title in English) Exercises in Infrastructure Design Instructor's name, job title, and department of affiliation Graduate School of Engineering KANKEI KYOIN Graduate School of Engineering Associate Professor, PIPATPONGSA, Thirapong
	Target year Ist year students or above Number of credits 2 Year/semesters 2021/First semester
(Other information (office hours, etc.))	Days and periods Mon.1, Thu.1 Class style Seminar Language distution English
*Please visit KULASIS to find out about office hours.	[Overview and purpose of the course]
	The purpose of this course is to understand how Civil Engineering relates to our society. In order to do this, this course firstly explains the target area and new topics related to Civil Engineering with some concrete examples. Then, students examine one of the social infrastructure in their countries and make a presentation. After introducing brainstorm and KJ method, which is a methods for structuring problems, students discuss desirable social infrastructure with group members and make a presentation about the results.
	[Course objectives]
	To understand how Civil Engineering relates to and contributes to our society. Furthermore, throughout the exercise, it is expected to enhance the ability of discussion for reaching solutions and the ability of making a presentation of the solutions.
	[Course schedule and contents]
	Guidance, I time, Introduction of this course. Introduction of Civil Engineering, 5 times, To help the exercise, the target area of civil engineering is explained with some concrete examples. Individual exercise, 8 times, Students are asked to pick up one of the social infrastructure in their own countries and to summarize the outline about it. Presentation, 4 times, Each student is asked to make a presentation about the social infrastructure he/she examined. Structuring problems, 2 times, For designing infrastructures appropriately, it is important to reveal problems in the society and find their solutions. For the sake of this, the concept of brainstorm and KJ method, which can help structuring problems, is explained. Furthermore, to understand the concept of these method, the exercise is conducted. Group exercise, 8 times, Students are divided into several groups and discuss desirable social infrastructure with group members. Presentation, 2 times, Each group is asked to make a presentation about desirable social infrastructure based on the discussion. "
	[Course requirements]
	None
	Continue to Exercises in Infrastructure Design(2) ↓ ↓

ercises in Infrastructure Design(2)	未更新 Course number U-ENG23 13503 SE73
	Course title Instructor's
luation methods and policy] is scored based on class participation, presentations, and a final report.	(and course Computer Programming in Global Eng name, job title, Graduate School of Engineering
	title in English) Computer Programming in Global Engineering of affiliation and department of affiliation Associate Professor, PIPATPONGSA, This
poks] aandouts will be distributed as appropriate	
11 1	Target year Ist year students or above Number of credits 2 Year/semesters 2021/Second seme
nces, etc.]	Days and periods Thu.5 Class style Seminar Language distructor English
erence books)	[Overview and purpose of the course] This course aims to introduce the basic computational tools needed in Global Engineering fields, and to le
ly outside of class (preparation and review)]	and practice a computer programming language Fortran 90. Not only the fundamentals of the Fortran language, but this course also focus on numerical algorithms that are actually encountered in researches a applications such as root finding, numerical differentiation and integration methods, sorting techniques are matrix inversion.
	[Course objectives]
r information (office hours, etc.)) visit KULASIS to find out about office hours.	To understand basic IT processing capabilities in Global Engineering areas and to acquire basic logic and syntax of Fortran 90 programming knowledge.
Ist KULASIS to find out about office nours.	
	[Course schedule and contents] Overview, Itime, Overview on using computer terminals and description of programming language Fortrar
	Basic program and data types, I time, Main parts of a basic program and data types (integer, real, character
	Branches and loops,2times,Conditional branching to change the flow of a program and create repetition is explained
	Array concepts,2times,The array concept is explained for practical calculations such as sorting algorithms
	Formats and basic I/O concepts,2times,The basics of reading and writing of files to disk is presented. Methods and formats will be explained via an example
	Subprograms,2times,Explanation of the use of subroutines and function subprograms to work in large-sca
	programs. Numerical analyses,2times,Declaration and operation methods, I/O, multiplication, referencing are explai
	via a programming exercise Exercise,2times,QampA practice of the topics studied so far.
	Class feedback, 1 time, Confirmation of understanding
	[Course requirements]
	None
	[Evaluation methods and policy]
	Grading will be based on reports (30%), a mid-term exam (30%), and a final exam (40%).
	Continue to Computer Programming in Global Engl
	Continue to Computer Programming in Global Eng
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ter Programming in Global Eng(2)	
	未更新 Course number U-ENG23 23504 LE57 Course title Instructor's
poks]	大更新 Course number U-ENG23 23504 LE57 Course title (and course Fundamental Mechanics name, job title, Graduate School of Engineering
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ooks] book will be provided. Class materials are provided thru KULASIS.	Course number U-ENG23 23504 LE57 Course title (and course title in English) Fundamental Mechanics Fundamental Mechanics Instructor's name, job title, and department of affiliation Graduate School of Engineering Associate Professor, AN RIN
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books] book will be provided. Class materials are provided thru KULASIS. mces, etc.] prence books) Chapman: quotFortran for Scientists and Engineers: 1995-2003quot isbn{}{9780071285780} hn: quotFortran 90 for Scientists and Engineersquot isbn{}{9780340600344} outside of class (preparation and review)] ents are delivered and submitted thru PANDA	Course number U-ENG23 23504 LE57 Course title (and course Fundamental Mechanics Fundamental Mechanics Fundamental Mechanics Target year Ind year students or above Number of credits 2 Year/semesters 2021/First semest Days and periods Mon.4 Class style Lecture urgage distincte English Toverview and purpose of the course] Newtonian mechanics and its application to engineering are interpreted with concentration on single parti multi-partical system and rigid body. Especially,some mathematical approaches necessary for mechanics
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is] bk will be provided. Class materials are provided thru KULASIS. es, etc.] nce books) upman: quotFortran for Scientists and Engineers: 1995-2003quot isbn{}{9780071285780} quotFortran 90 for Scientists and Engineersquot isbn{}{9780340600344} tside of class (preparation and review)] is are delivered and submitted thru PANDA formation (office hours, etc.)) Thirapong PIPATPONGSA artment of Urban Management, C1-2-236 atpongsa.thirapong.4s@kyoto-u.ac.jp)	Course number U-ENG23 23504 LE57 Course title (and course English) Instructor's Fundamental Mechanics Fundamental Mechanics Instructor's name, job title, and department of affiliation Graduate School of Engineering Associate Professor, AN RIN Target year Ind year students or abov Number of credits 2 Year/semesters 2021/First semest Days and periods Mon.4 Class style Lecture appart instructor English IOverview and purpose of the coursej Newtonian mechanics and its application to engineering are interpreted with concentration on single parti multi-partical system and rigid body. Especially, some mathematical approaches necessary for mechanics introduced based on those mathematical knowledge learned in the first academic year. Meanville, the relationship between mechanical interpretation and mathematical terms of some classical problems ar specifically emphasized. Study of this lecture would not only make the students grasp basic principles of mechanics but also think more logically and systematically. ICourse objectives] As an intermediate course in mechanics at undergraduate level, this course aims at training students to thi about mechanical problems and for the mechanical interpretation of the mathematical solutions. ICourse schedule and contents] Kinematics of a single particle in space, 2times, algebra and calculus of vectors tangent and normal vectors a curve definition of velocity and acceleration in 2-D motion by phane polar coordinates definition of velo and acceleration in 3-D motion b
is] bk will be provided. Class materials are provided thru KULASIS. es, etc.] nce books) upman: quotFortran for Scientists and Engineers: 1995-2003quot isbn{}{9780071285780} quotFortran 90 for Scientists and Engineersquot isbn{}{9780340600344} tside of class (preparation and review)] is are delivered and submitted thru PANDA formation (office hours, etc.)) Thirapong PIPATPONGSA artment of Urban Management, C1-2-236 atpongsa.thirapong.4s@kyoto-u.ac.jp)	Course number U-ENG23 23504 LE57 Course title (and course English) Fundamental Mechanics Instructor's name, job title, and department of affiliation Graduate School of Engineering Associate Professor, AN RIN Target year Ind year students or above Number of credits 2 Year/semesters 2021/First semester Days and periods Mon.4 Class style Lecture Lappar disturbe English IOverview and purpose of the course] Newtonian mechanics and its application to engineering are interpreted with concentration on single parti- multi-partical system and rigid body. Especially,some mathematical approaches necessary for mechanics introduced based on those mathematical knowledge learned in the first academic year. Meanwhile, the relationship between mechanical interpretation and mathematical reatment of some classical problems ar specifically emphasized. Study of this lecture would not only make the students grasp basic principles of mechanics but also think more logically and systematically. ICourse objectives] As an intermediate course in mechanics at undergraduate level, this course aims at training students to thi about mechanical problems and for the mechanical interpretation of the mathematical solutions. ICourse objectives] Mas an intermediate course in mechanics at undergraduate level, this course aims at training students to thi about mechanical problems and for the mechanical interpretation of the mathematical formulation of mechanical problems and for the mechanical interpretation of the

motion of a system of particles, 2 times, degrees of freedom, energy principle linear momentum principle,
conservation of linear momentum, collision theory and two-body scattering angular momentum principle
conservation of angular momentum

conservation of angular momentum Rotating reference frames, I time, transformation formulaeparticle dynamics in a non-framemotion relative to the Earthmulti-particle system in a non-inertial frame motion of rigid body, 2times, dynamical problem of the motion of a rigid body rotation about an axis statics of rigid bodies statics of structures equilibrium of flexible strings and cablesequilibrium of solid beamsangular momentum of a rigid bodyinerital and stress tensors foundation of analytical mechanics, 1 time, Constraint condition, constraint force, generalized coordinate, generalized for, Lagrange#039s equations confirmation of achievement, 1 time, The achievement assessment is intended to measure students#039 knowlege, skill and aptitude on the subject using quiz and viva-voce.

Continue to Fundamental Mechanics(2)↓↓↓

Course title (and course title in English) Prob. & Statistical Analysis & Exercises Probabilistic and Statistical Analysis & Exercises and department of affiliation Instructor's (Associate Professor,KIM SUNMI) rarget year 2nd year students or above and year students or above Number of credits 2 Year/semesters 2021/First semester Days and periods Tuc.3,4 Class style Seminar Impage/Instruct analysis is introduced as a basic tool to cope with incertainty in natural and social systems dealt with in global engineering. The main topics are concepts and pasic theorems of probability, probability distributions and their uses, statistical estimation and testing, and nultivariate analysis. [Course objectives] Implemental theory of probability and to be capable of undamentals of statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, 1time,Role of probabilistic and statistical approaches in global engineering and in other agais: theory of probabilistic analysis,4times,The concepts and basic theories of probability: Conditional probability, Bayesrsque theorem and total probability. Random variables: probability mass function (PMF), probability distribution function (CDF), moment generating function, characteristic function, multivinering probability infortion (CDF), moment generating function, probability density function (PDF), cumulative distribution function (CDF), moment generating function, characteristic function, multivinering probability istribution function (CDF), moment generating function, characteristic function, multoimensional pr
(and course bitte in Brglish) Prob. & Statistical Analysis & Exercises probabilistic and Statistical Analysis and Exercises and department of affiliation Graduate School of Engineering Associate Professor, RIM SUNMI associate Professociate Professor, RIM SUNMI associate Professocinte
Constraint Constra
Constraint
Class style Seminar angage/instance 2011 Hist Sellicster Days and periods Tue.3,4 Class style Seminar angage/instance English [Overview and purpose of the course] Image of instance English English [Overview and purpose of the course] Image of instance English [Course and purpose of probabilistic and statistical analysis is introduced as a basic tool to cope with mecratainty in natural and social systems dealt with in global engineering. The main topics are concepts and asaic theorems of probability, probability distributions and their uses, statistical estimation and testing, and multivariate analysis. [Course objectives] Image of instance Image of instance The goal is to understand fundamental theory of probability and to be capable of using well-known listributions in analysis and design. It is also required that students acquire knowledge of fundamentals of statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Imroduction, Itime, Role of probabilistic and statistical approaches in global engineering and in other engineering fields. Basic theory of probabilistic analysis, Atimes, The concepts and basic theories of probability: Conditional probability. Bayesrsquo theorem and total probability. Random variables: probability mass function (PMF), robability destribution function (CDF), moment generating function, PMF), robability destribution function (CDF), moment generating function, function, PMF), robability des
[Overview and purpose of the course] Theory and methodology of probabilistic and statistical analysis is introduced as a basic tool to cope with mcertainty in natural and social systems dealt with in global engineering. The main topics are concepts and asic theorems of probability, probability distributions and their uses, statistical estimation and testing, and multivariate analysis. [Course objectives] The goal is to understand fundamental theory of probability and to be capable of using well-known distributions in analysis and design. It is also required that students acquire knowledge of fundamentals of statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, Itime,Role of probabilistic and statistical approaches in global engineering fields. Sasic theory of probabilistic analysis,4times,The concepts and basic theories of probability: Conditional probability, Bayesrsque theorem and total probability. Random variables: probability: Conditional probability, Bayesrsque theorem (DPF), comulative distribution function (CDF), moment generating function, PDF).
[Overview and purpose of the course] Theory and methodology of probabilistic and statistical analysis is introduced as a basic tool to cope with mcertainty in natural and social systems dealt with in global engineering. The main topics are concepts and asic theorems of probability, probability distributions and their uses, statistical estimation and testing, and multivariate analysis. [Course objectives] The goal is to understand fundamental theory of probability and to be capable of using well-known distributions in analysis and design. It is also required that students acquire knowledge of fundamentals of statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, Itime,Role of probabilistic and statistical approaches in global engineering and in other regimeering fields. Sasic theory of probabilistic analysis,4times,The concepts and basic theories of probability: Conditional probability, Bayesrsque theorem and total probability. Random variables: probability: Conditional probability, Bayesrsque theorem (DPF), cumulative distribution function (CDF), moment generating function, (PMF), probability density function (PDF), cumulative distribution function (CDF).
Incertainty in natural and social systems dealt with in global engineering. The main topics are concepts and asic theorems of probability, probability distributions and their uses, statistical estimation and testing, and nultivariate analysis. [Course objectives] The goal is to understand fundamental theory of probability and to be capable of using well-known distributions in analysis and design. It is also required that students acquire knowledge of fundamentals of statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, Itime,Role of probabilistic and statistical approaches in global engineering fields. Basic theory of probabilistic analysis,4times, The concepts and basic theories of probability: Conditional probability. Bayesrsque theorem and total probability. Random variables: probability Sunction (PDF), comulative distribution function (CDF), moment generating function, (PMF), probability density function (PDF).
assic theorems of probability, probability distributions and their uses, statistical estimation and testing, and multivariate analysis. [Course objectives] The goal is to understand fundamental theory of probability and to be capable of using well-known distributions in analysis and design. It is also required that students acquire knowledge of fundamentals of statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, I time, Role of probabilistic and statistical approaches in global engineering and in other engineering fields. Basic theory of probabilistic analysis, 4times, The concepts and basic theories of probability: Conditional probability, Bayesrsquo theorem and total probability. Random variables: probability mass function (PMF) probability ensity function (PDF), cumulative distribution function (CDF), moment generating function,
nultivariate analysis. [Course objectives] The goal is to understand fundamental theory of probability and to be capable of using well-known distributions in analysis and design. It is also required that students acquire knowledge of fundamentals of statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, Itime,Role of probabilistic and statistical approaches in global engineering and in other engineering fields. Basic theory of probabilistic analysis,4times,The concepts and basic theories of probability: Conditional probability, Bayesrsque theorem and total probability. Random variables: probability mass function (PMF) probability density function (PDF), cumulative distribution function (CDF), moment generating function,
[Course objectives] The goal is to understand fundamental theory of probability and to be capable of using well-known distributions in analysis and design. It is also required that students acquire knowledge of fundamentals of statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, I time, Role of probabilistic and statistical approaches in global engineering and in other engineering fields. Basic theory of probabilistic analysis, 4times, The concepts and basic theories of probability: Conditional probability, Bayesrsquo theorem and total probability. Random variables: probability mass function (PMF), robability density function (PDF), cumulative distribution function (CDF), moment generating function,
The goal is to understand fundamental theory of probability and to be capable of using well-known distributions in analysis and design. It is also required that students acquire knowledge of fundamentals of statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, Itime,Role of probabilistic and statistical approaches in global engineering and in other engineering fields. Basic theory of probabilistic analysis,4times,The concepts and basic theories of probability. Conditional probability, Bayesrsque theorem and total probability. Random variables: probability mass function (PMF), orobability density function (PDF), cumulative distribution function (CDF), moment generating function,
distributions in analysis and design. It is also required that students acquire knowledge of fundamentals of tatistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, Itime,Role of probabilistic and statistical approaches in global engineering fields. Basic theory of probabilistic analysis,4times,The concepts and basic theories of probability: Conditional probability. Random variables: probability struction (DPF), comment generating function, GPF).
statistical population and samples, and principle of statistical estimation and testing. [Course schedule and contents] Introduction, Itime,Role of probabilistic and statistical approaches in global engineering and in other engineering fields. Basic theory of probabilistic analysis,4times,The concepts and basic theories of probability: Conditional probability, Bayesrsquo theorem and total probability. Random variables: probability mass function (PMF), orobability density function (PDF), cumulative distribution function (CDF), moment generating function,
[Course schedule and contents] Introduction, 1time, Role of probabilistic and statistical approaches in global engineering and in other engineering fields. Basic theory of probabilistic analysis, 4times, The concepts and basic theories of probability: Conditional probability, Bayesrsquo theorem and total probability. Random variables: probability mass function (PMF) probability density function (PDF), cumulative distribution function (CDF), moment generating function,
Introduction, I time, Role of probabilistic and statistical approaches in global engineering and in other engineering fields. Basic theory of probabilistic analysis, 4times, The concepts and basic theories of probability: Conditional probability, Bayesrsquo theorem and total probability. Random variables: probability mass function (PMF) probability density function (PDF), cumulative distribution function (CDF), moment generating function,
engineering fields. Basic theory of probabilistic analysis,4times,The concepts and basic theories of probability: Conditional probability, Bayesrsquo theorem and total probability. Random variables: probability mass function (PMF) probability density function (PDF), cumulative distribution function (CDF), moment generating function,
Probability distribution models,4times,Probability distributions often used in global engineering are ntroduced: Bernoulli series and binomial distribution, Poisson series and distribution, normal distribution, geometric distribution (return period), etc. Statistical estimation and testing,3times,Basic theory on sampling. Chi-square distribution, t- distribution, s -distribution. Methods for statistical estimation and testing. Multivariate analysis,2times,Basic methods in multivariate analysis: regression analysis and principal component analysis. Computer-based simulation methods in probability,1time,Introduction to the computer-based simulation nethods such as Monte-Carlo simulation, will be given.
[Course requirements]
Prerequisite courses are calculus and linear algebra. Continue to Prob. & Statistical Analysis & Exercises[2] J

rob. & Statistical Analysis & Exercises(2)	Course r									
Evaluation methods and policy]		numper	er U	U-ENG2	3 23506 L	E73				
Valuation in Neurosci and policy] Valuation is based on written tests (midterm exam: 40%, final exam: 40%), assignment (10%), and ttendance (10%). Textbooks] fot specified. Some handout materials will be provided during the class.	Course title (and course title in English)	Desig		(nfrastruc			Instructor's name, job ti and departn of affiliation	tle, Graduate S Professo Graduate S Professo Graduat Associate Graduat	e School of Engine r,UNO NOBUHII chool of Global Envirom r,SUGIURA KUN Professor,SAWAMU e School of Engine Professor,ONDA SHI e School of Engine vrofessor,PIPATPONGS	RO nental Studies IITOMO eering RA YASUO eering NICHIROU eering
References, etc.]	Target ye	ar 21	2nd year st	tudents or ab	ove Num	er of cre	dits 2	Year/semes	ers 2021/First se	emester
(Reference books) M.S. Ang and W.H. Tang: Probability Concepts in Engineering: Emphasis on Applications in Civil and invironmental Engineering. isbn{} {9780471720645}	Days and per				ass style		re	Language of i	struction English	
Study outside of class (preparation and review)]									e to improve the s	
elf-review is strongly recommended after each lecture.	comfortabl	e cities	squot, q	quotsafe o	countries	o live inqu	ot, quoteco-f	riendly global	quotconvenient ar ocietyquot, and n to learn Civil En	
(Other information (office hours, etc.))									gineering (Structur	
to specific office hour. Email communication is preffered through [kim.sunmin.6x@kyoto-u.ac.jp].									and Management).	
Please visit KULASIS to find out about office hours.	of Civil En						ig lecturers,	the student is e	spected to learn the	e essence
	[Course	object	tives]							
								hnology and kr tion of environ	owledge related to ment.	social
	[Course	sched	dule ar	nd conte	ents]					
		neering	g includ	ling lates					Then, the study fie out the achievement	
	Structual E which inclu	ènginne udes na	ering,3t atural d	times,Civ isasters a	and structa				of Structural Engir chnology and rese	
	Hydrology	and Hy , which	Iydrolog h includ	gy,3times les conse	s,Civil En rvation ar	d construc	ion of river o		oint of Hydraulics rediction of rainfal	
	Engineerin	cal Engi 1g, whic	gineerin	ng,3times	,Civil Eng	ineering is	introduced f		oint of Geotechnica ient, international	al
		nd Man social Iı	Infrastr	ucture, w	hich inclu	des an asse			oint of designing a astructure, soft me	
		ent conf	nfirmati	on,1time			nent is inten	ded to measure	students#039 kno	wledge,
								Continue to	Design for Infrastruct	ure I(2)↓↓↓

	未更新
Design for Infrastructure I(2)	Course number U-ENG23 23507 LE73
[Course requirements] No specific prior knowledge is required.	Course title (and course title in English) Systems Analysis & Exe. for Plan. & Mng. Systems Analysis and Exercises for Planning and Management for affiliation Instructor's name, job title, and department of affiliation Graduate School of Engineering Associate Professor, SCHMOECKER, Jan-Dirk
[Evaluation methods and policy] Grade is evaluated comprehensively from reports for each lecture (including attendance) and a final	Target year 2nd year students or above Number of credits 2 Year/semesters 2021/Second semester
examination. 50 percent of the final score is due to reports, and the other 50 percent from the final examination.	Days and periods Mon.1,2 Class style Seminar Language distution English
[Textbooks]	[Overview and purpose of the course]
Handouts will be distributed as appropriate. [References, etc.] (Reference books)	Attendants of this course should already have a basic knowledge about planning of civil engineering projects. In this course students will learn about this subject in a more systematic way. Students will be introduced to policy-making, management and planning and in particular to useful mathematical tools for doing so. They will gain a deeper understanding of linear, nonlinear and dynamic programming. This is achieved through lectures, and practical exercises with these methods.
	[Course objectives]
[Study outside of class (preparation and review)] (Other information (office hours, etc.))	This course aims to provide students with the basic knowledge required for planning of civil engineering projects and to provide an understanding of basic planning theory and its role. The focus is on mathematical planning methods for system design. By attending this lecture students should obtain the basic knowledge and thinking of planners. Further, students should understand the importance of the above mentioned three programming methods as useful mathematical tools for creating plans. Finally students should obtain practical skills through exercises.
*Please visit KULASIS to find out about office hours.	[Course schedule and contents] Basic Theory of Civil Engineering Planning (CEP),3times, These lectures provide a basic overview of CEP and teach about the science underpinning CEP. Therefore lectures introduce the students to the role of OR, economics, psychology, sociology and political science in CEP. Linear programming (LP),10times, Lectures about LP as basic method for mathmatecial planning. Various issues of LP are discussed and in particular the Gauss Jordan Elimination Method and the Simplex methods are taught. Further the dual problem, marginal value and sensitivity analysis are introduced. Non linear programming (NLP),10times,NLP formulation of problems, global optimality, and description as programming problem. Optimality conditions of nonlinear programming problems (Lagrange function, Kuhn Tucker conditions) are examined. Dynamic programming (DP),7times,These lectures will introduce DP as a useful tool to solve complex systems. Formulation and solution of DP problems are discussed. Further, PERT as DP network method is introduced, describing process management based on arrow diagrams.
	[Course requirements] Students are assumed to have taken the calculus courses.
	*更新
Systems Analysis & Exe. for Plan. & Mng.(2)	Course number U-ENG23 23508 LE73
[Evaluation methods and policy] Assignments, Midterm Exam 40%; Final Exam 60%	Course title Instructor's Graduate School of Global Environmental Studies Professor,KATSUMI TAKESHI Graduate School of Engineering Professor,KIMURA MAKOTO Disaster Prevention Research Institute
[Textbooks] Handouts distributed during lectures [References, etc.]	(and course Soil Mechanics I and Exercises name, job title, and department of affiliation Professor, UZUOKA RYOSUKE title in English) Soil Mechanics I and Exercises and department of affiliation Graduate School of Engineering Associate Professor, SAWAMURA YASUO Graduate School of Global Environmental Studies Associate Professor, TAKAI ATSUSHI
(Reference books)	Graduate School of Engineering Associate Professor,PIPATPONGSA, Thirapong
Hillier, F.S. Lieberman, G.J.: Introduction to Operations Research isbn{} {9781259253188} Iida, Y.: Civil Engineering Planning System Analysis (Optimization Guide) isbn{} {14C2747204} Iida V. (Out al. N. Civil Engineering Planning System Analysis (Optimized States) and States) (M22747204)	Target year 2nd year students or above Number of credits 2 Year/semesters 2021/Second semester
Iida, Y./ Okada, N.: Civil Engineering Planning System Analysis (Behaviour Analysis) isbn{} {4627427301} Fujii, S.: Infrastructure planning studies isbn{} {9784761531669}	Days and periods Tue.3,4 Class style Seminar Language distution English
(Related URLs)	[Overview and purpose of the course] By the end of the semester, the student is expected to understand the basics of soil formation, classification
(Presented during the first lecture.) [Study outside of class (preparation and review)]	for engineering purposes, soil compaction, seepage and water flow through soil, consolidation theory, settlement due to consolidation, rate of consolidation, shear strength, and deformation behaviors of different soils.
(Other information (office hours, etc.)) *Please visit KULASIS to find out about office hours.	[Course objectives] This course aims at providing a fundamental understanding of the mechanical behavior of soils including soil classification, compaction, scepage, permeability, effective stress, consolidation, and shear strength as well as problem-solving skills through exercises in gravimetric-volumetric relationships, Darcy#039s law, flow nets,
	consolidation theory, Mohr#039s stress circle, and failure criteria. [Course schedule and contents] Introduction, 0.5 times, Introductory concepts and roles of soil mechanics, engineering aspects of soil
	behaviors and geotechnical practices dealing with disasters and environments Soil classification and compaction, 3.5 times, Soil classification and soil formation, basic soil properties and
	Atterbergrsquos limits, compaction, unsaturated soil and frozen soil Water flow through soil, 3 times, Fundamentals of water flow through soil, permeability and Darcy's law, quick sand condition, seepage and flow nets
	Midterm Exam, 0.5 times,
	Consolidation and settlement, 3.5 times, Principle of effective stress and Terzaghi's one dimensional consolidation theory, characteristics and mathematical descriptions of consolidation, prediction of ground settlement due to consolidation
	Shear strength of soil, 3 times, Visualization of stress states using Mohr's stress circle, interpretation of shear strength using the Mohr-Coulomb failure criterion, experiments and behaviors of clay and sand under drained and undrained conditions
	Continue to Soli Mechanics I and Exercises(2)↓↓↓

il Mechanics I and Exercises(2)	Course n	umber	U-E	NG23 2	3509 LE	73				
lass feedback, 1 time, Confirmation of understanding	Course title	Hydrau	lics and	Exercis	ses		Instructor	s	Professor,G Graduate Sc Professor,T	hool of Engineering OTOH HITOSHI hool of Management DDA KEIICHI hool of Engineering
Course requirements]	title in		ilics and				and depar	tment		fessor,KHAYYER ABB.
one	English)	·					of affiliatio	n		hool of Engineering
Evaluation methods and policy]										fessor,IKARI HIROYU hool of Engineering
nal Exam (70%), Midterm exam and classworks (30%)								_	Assistant Profe	ssor,OKAMOTO TAKA
	Target yea	r 2nd	year studen	its or abov	Numbe	or of cred	lits 2	Year	r/semesters	2021/Second semes
Textbooks]	_					-			1	
oil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual	Days and peri	ods Wed	1.3,4	Clas	s style	Lectur	e		Language of instruction	English
Handouts will be distributed	[Overviev	v and p	urpose	of the	course]				
										matically in relation t
[References, etc.]										dimension analysis,
(Reference books)	fundamenta							opics. Sy	ystematic und	lerstanding of
A. Knappett and R.F. Craig, IdquoCraigrsquos Soil Mechanicsrdquo isbn {} {9780415561266}	Tunuamenta	i iiyurau	mes uno	ugnexe	icises an	cuntvate				
F. William Lambe and R.V. Whitman, IdquoSoil Mechanicsrdquo isbn{} {0471022616} Braja M. Das,quotFundamentals of Geotechnical Engineeringquot isbn{} {9781111576752}	[Course of	bjectiv	/es]							
K. Terzaghi, R. B. Peck, G. Mesri, IdquoSoil Mechanics in Engineering Practicerdquo isbn{}}	Systematic		-	f fundar	nental hv	draulics th	rough exe	rcises		
780471086581}										
Fusao Oka, quotSoil Mechanics Exercisesquot, Morikita publishing Co., Ltd. isbn{} {4627426607}	[Course s	chedu	le and o	conten	ts]					
	<lecture(l< td=""><td>ec) 90mi</td><td>inutes:1</td><td>time, E</td><td>xercises(1</td><td>Ex) 90min</td><td>utes:0.5 tir</td><td>nes></td><td></td><td></td></lecture(l<>	ec) 90mi	inutes:1	time, E	xercises(1	Ex) 90min	utes:0.5 tir	nes>		
(Related URLs)					~					
(http://geomechanics.kuciv.kyoto-u.ac.jp/lecture/text/kakomon.html)	Fluid Sta								inad and thai	r exercises are
Study outside of class (preparation and review)]	implemente		e, buoya	ney ion	e, staom	ty of float	ing body a	ie expia	med and mer	r exercises are
Practice yourself from Tutorial Exercise										
	Elementa									
(Other information (office hours, etc.))	Continuum deimension								nentum equat	ion and one-
3. Flores (flores.giancarlo.3v@kyoto-u.ac.jp)	deimension	ai anaiys	sis are ex	cplained	and thei	rexercises	are imple	mented.		
Γ. Pipatpongsa (pipatpongsa.thirapong.4s@kyoto-u.ac.jp)	Potential	Flows []	Lec:1tim	ne, Ex:0	.5 times]					
Please visit KULASIS to find out about office hours.							low is exp	lained a	and their exer	cises are implemented
Please visit KULASIS to find out about office nours.						_				
Courses delivered by instructors with practical work experience]	Viscous I Deformatio						a for lami	or flow	and friation	al loss, laminar and
1) Category	turbulent flo								and medona	a 1055, taninar and
A course with practical content delivered by instructors with practical work experience			-				are expi			
	 Compreh 									
2) Details of instructors' practical work experience related to the course	Comprehen	sion che	eck regar	ding to	each tern	n is impler	nented.			
	Intermed	iate ever	mination							
3) Details of practical classes delivered based on instructors' practical work experience	Intermediat				out.					
								·		
								C	continue to Hyd	raulics and Exercises(2)↓↓
	-									

Hydraulics and Exercises(3)

*Please visit KULASIS to find out about office hours.

1 [

Hydraulics and Exercises(2)

Dimensional Analysis, Similitude [Ex:0.5 times]: Dimensional analysis, pi-theorem and similarity rule are explained and their exercises are implemented.

●Viscous Flow in Pipes [Lec:2times, Ex:1time]: Energy equation, frictional law, form drag loss, siphon and pipe flow are explained and their exercises are implemented.

Open-Channel Flow [Lec:3times, Ex:2times]:

Open-Channel Flow [Lec:3times, Ex2(ztimes)]: Energy equation, momentum equation, open channel equation, specific energy, specific force, hydraulic jump and analysis of gradually varied flow are explained and their exercises are implemented.

Achievement confirmation:

Comprehension check of course contents.

Feedback

[Course requirements]

Differential and integral calculus, linear algebra etc., standard mathematics of general education course, and Dynamics and electromagnetism etc., standard physics of general education course. Taking the credits for [Fundamental Physics A] and [Fundamental Physics B] is highly recommended before taking this class. Taking the credits for [Advanced Dynamics] is preferable.

[Evaluation methods and policy]

Based on the results of examination

[Textbooks]

Handout is used in the Lectures and Exercises.

[References, etc.]

(Reference books) Non

(Related URLs) (Non)

[Study outside of class (preparation and review)]

Review the lecture contents. Prepare the exercises questions and review them.

(Other information (office hours, etc.)) Lecture is opened along with exercise. How to contact with instructors is announced during lecture and

exercise.

Continue to Hydraulics and Exercises(3) ↓ ↓ ↓

未更新	未更新
Course number U-ENG23 23510 LE55	Course number U-ENG23 23511 LE73
Course title (and course title in Engineering Mathematics B1 Engineering Mathematics B1 Engineering Mathematics B1 Engineering Mathematics B1 Engineering Mathematics B1 of affiliation of affiliation	Course title (and course title in English) Course I and Exercises Instructor's name, job title, and department of affiliation Instructor's Professor,KIM Chul-Woo English Structural Mechanics I and Exercises and department of affiliation Instructor's Graduate School of Engineering Senior Lecturer,Chang, Kai-Chun
arget year 2nd year students or above Number of credits 2 Year/semesters 2021/Second semester	Target year 2nd year students or above Number of credits 2 Year/semesters 2021/Second semes
ays and periods Thu.2 Class style Lecture Language distuction English	Days and periods Fri.1,2 Class style Seminar Language distuction English
Overview and purpose of the course]	[Overview and purpose of the course]
The course introduces the theory of complex functions and their applications.	The following topics are covered: external forces acted upon structures; properties of forces; sectional force
Course objectives]	stress and strain; displacement/deformation; cross sectional properties; calculation of displacement; bucklin of column. Statically determinate structures are to be focused on.
o understand the properties of holomorphic or analytic functions. To learn Taylor and Laurent series#039	of column. Staticarly determinate structures are to be focused on.
xpansion. To calculate the residue and to learn the engineering applications of complex function theory.	[Course objectives]
[Course schedule and contents] Review, 3 times, Definition of complex numbers, complex plane and review of vector analysis.	To grasp the methods for studying structures at static equilibrium conditions; to understand stress and strain
Basic theory of complex functions, 3 times, Derivative of complex functions, Cauchy-Riemann equation.	and the relationship between them; to understand the buckling phenomenon in columns.
Concept and properties of holomorphic functions. Cauchy#039s integral theorem, Cauchy#039s integral	[Course schedule and contents]
prmula, Taylor series and Laurent series. Classification of singularities. Residue theorem. Various complex unctions and their properties.	- Introduction: 1 time,
Application of theory of complex functions, 2 times, Application of residue theorem to calculate the definite	 Structures and elements; Purpose and application scope of structural mechanics Assumptions; Forces & Equilibrium condition: 2 times,
ntegral. Deviation principle and its application. Solution of boundary value problems of partial differential guations.	- Êxternal forces; Modeling of external forces; Force equilibrium conditions; Static determinate, static
ltimes,	indeterminate and instability; Internal force diagrams: 9 times, - Equilibrium of free body; Sectional forces; Axial force; Flexural moment and shear force: 4 times,
2times, 1time,	- Influence line; Construction of Influence line; use of Influence line: 2 times,
	 Sectional properties; Centroid; Geometrical moment of area; Moment of inertia of area: 4 times, Hooke's Law; Stress and strain; stress state and stress transformation; Mohr's Circle: 4 times,
[Course requirements]	- Elastic curve and deflection; Deflection of beam; Deflection of truss: 2 times,
asic Calculus (From the university curriculum: Calculus A and B, Advanced Calculus A)	 Buckling of column; Buckling phenomenon; Euler's buckling load: 1 time, Confirmation of achievement: 1 time
Evaluation methods and policy]	- Commination of achievement. I time
lass participation, quiz, mid-term and end of term examination.	[Course requirements]
[Textbooks]	Classical mechanics
	[Evaluation methods and policy]
References, etc.]	Grade is given based on the final examination, mid-term examination, quiz, assignments and participation.
(Reference books)	[Textbooks]
faterials given during the lecture.	Lecture note will be provided.
Study outside of class (preparation and review)]	
	[References, etc.]
	(Reference books)
(Other information (office hours, etc.)) Office hours will be allocated for students to consult with the instructor and ask relevant questions as needed.	References
The nous will be anotated for students to consult with the instructor and ask relevant questions as needed.	Continue to Structural Mechanics I and Exercises(2) ↓
Please visit KULASIS to find out about office hours.	
Please visit KULASIS to find out about office hours.	
Please visit KULASIS to find out about office hours.	
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Please visit KULASIS to find out about office hours.	
Please visit KULASIS to find out about office hours.	
	Course number U-ENG23 33512 LE73
tructural Mechanics I and Exercises(2)	Course title Instructor's Graduate School of Engineering
tructural Mechanics I and Exercises(2) Kenneth M. Leet, et al., FUNDAMENTALS OF STRUCTURAL ANALYSIS, 4th edition, McGraw-Hill, 011	Course title (and course Dynamics of Soil and Structures Instructor's name, job title, Professor, KIYONO JIYUNJI
ructural Mechanics I and Exercises(2) Kenneth M. Leet, et al., FUNDAMENTALS OF STRUCTURAL ANALYSIS, 4th edition, McGraw-Hill,)11 Timothy A. Phiplot, MECHANICS OF MATERIALS, 3rd edition, Wiley, 2012.	Course title Instructor's Graduate School of Engineering
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Please visit KULASIS to find out about office hours. tructural Mechanics I and Exercises(2) Kenneth M. Leet, et al., FUNDAMENTALS OF STRUCTURAL ANALYSIS, 4th edition, McGraw-Hill, 011 . Timothy A. Phiplot, MECHANICS OF MATERIALS, 3rd edition, Wiley, 2012. 基礎土木シリーズ1・崎元達郎著 構造力学 [上] 森北出版 (in Japanese) Study outside of class (preparation and review)] tudents are expected to prepare for the class utilizing the handout uploaded on the PANDA or KULASIS. or the review of the class, Students are expected to read the lecture note once again and complete the omework assignment. (Other information (office hours, etc.)) Please visit KULASIS to find out about office hours.	Course title (and course title in English) Dynamics of Soil and Structures Dynamics of Soil and Structures Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor,KIYONO JIYUNJI Disaster Prevention Research Instit Professor,IGARASHI AKIRA Target year Brd year students or above Mon.2 Number of credits 2 Year/semesters 2021/First semester Days and periods Mon.2 Class style Lecture Impugatistudent English This course deals with fundamentals and application of vibration theory and elastic wave propagation in cive engineering. The course of the course o
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Free vibration (1 week) Definition of the natural period and damping ratio for single degree-of-dreedom systems. Derivation of free vibration response.

Force vibration (1 week)

Resonance curves and phase response curves for forced harmonic vibration. Frequency response characteristics.

Principle of vibration measurement (1 week) Background theory of vibration measurement. Accelerometers and seismometers.

Response to arbitrary input (2 weeks) Evaluation of dynamic response to arbitrary forcing and earthquake excitation. Response spectra.

Nonlinear vibration (1 week)

Fundamental properties of nonlinear dynamic response of structures associated with elasto-plastic behavior.

Vibration of 2-DOF systems (1 week) Solution of equations of motions for 2-degree-of-freedom systems representing free vibration. Concept of normal vibration modes.

Continue to Dynamics of Soil and Structures(2)↓↓↓

Natural frequencies and natural modes of vibration (1 week)		
Shind frequencies and name mode of Vhanior (1964) Relationship between the name and propercies, normal vibration modes of multi-degree-of-freedom systems and eigenvalue analysis. Dumped free vhation of MDOF systems (1964) Vibration of multi-degree-of-freedom systems with dumping. Analysis of MDOF systems using damping tange normal vibration modes. Forced vibration modes. Vibration of continuum (1964) Vibration of continuum (1996) Vibration of students' behavior. Vibration of students' behavior. Vibration of students' advince requires. Solution of shear vibration problem. Elastic wave propagation problems. Elastic wave propagation problems. Evaluation of students' achievements in understanding of the course material Peadmatic (Losek) A celobad, stassion on the class material and examination problems. Evaluation methods and policy] Must and of the performance during the course (including homework) and the results of a final examination. Forter set (Losek) A celobad stassion propagation problems. Evaluation methods and policy] Must and chastic and elastic hypers. Evaluation the class (preparation and review) To be outlide by instructor during his her lecture.	Dynamics of Soil and Structures(2)	Dynamics of Soil and Structures(3)
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Modal analysis to evaluate the dyamnic response of multi-degree-of-freedom systems for harmonic and arithrary excitation. Vibration of continuum (1 weck) Vibration of shear beams. Flexural vibration. Wave equation. Solution of shear vibration problem. Elastic wave (2 wecks) Properties of Elastic waves travelling in elastic media and elastic layers. Fundamental concept in deriving solutions of clantic waves propagation problems. Evaluation of students' achievements in understanding of the course material Feedback (1 weck) A feedback session on the class material and examination problems. [Course requirements] Calculus. Linear algebra. Structural Mechanics I and Exercises [Evaluation methods and policy] Based on the performance during the course work) and the results of a final examination. [Fextback] Not used. Class hand-outs are distributed when necessary. [References, etc.] (Reference books) [Study outside of class (preparation and review)] To be notified by instructor during his-her keture.	Vibration of multi-degree-of-freedom systems with damping. Analysis of MDOF systems using damping	*Please visit KULASIS to find out about office hours.
Vibration of shear beams. Flexural vibration. Wave equation. Solution of shear vibration problem. Image: Care Solution of Shear Vibration problems. Elastic wave (2 weeks) Properties of clastic waves propagation problems. Image: Care Solution of Clastic waves propagation problems. Examination (1 week) Examination (1 week) Image: Care Solution of the course material Feedback (1 week) A feedback session on the class material and examination problems. Image: Care Solution of Shear Vibration Bio Structural Mechanics I and Exercises [Course requirements] Calculus, Linear algebra, Structural Mechanics II and Exercises Image: Care Solution methods and policy] Based on the performance during the course (including homework) and the results of a final examination. Image: Care Solution Solution of Class (proparation and review)] To be notified by instructor during his/her lecture. [Study outside of class (proparation and review)] Image: Care Solution Sol	Modal analysis to evaluate the dyanmic response of multi-degree-of-freedom systems for harmonic and	
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To be notified by instructor during his/her lecture.	(Reference books)	
	[Study outside of class (preparation and review)]	
Continue to Dynamics of Soil and Structures(3)↓↓↓	To be notified by instructor during his/her lecture.	
	Continue to Dynamics of Soil and Structures(3)↓↓↓	

未更新 Course number U-ENG23 33513 LE73 Course titl nstructor's name, job title, and department of affiliation Graduate School of Engineering Construction Materials (and course title in Construction Materials Associate Professor, AN RIN English) Brd year students or above Number of credits 2 Year/semesters Target year 2021/First semester Days and periods Mon.1 Class style anguage of instruc English Lecture [Overview and purpose of the course] Knowledge and techniques to use construction materials, especially on concrete material, are introduced on micro-, meso- until macro-scale. [Course objectives] The students are expected to understand the microstructure, properties, production and testing methods of concrete, steel, composite materials etc employed in civil engineering [Course schedule and contents] ntroduction, 1 time, Classification of materials, history of construction materials, ethics for civil engineers and current topics crystal structure, 1 time, Bond between atoms, ideal strength, dislocation, yield, and mechanical properties are troduced Metallic material, 1 time, Mechanical properties of metals, steel, phase diagrams, Dislocations and metallic ew materials Corrosion amp protection, I time, durability, corrosion, deterioration mechanism, carbonation, chloride induced orrosion and corrosion protection Cement, 1 time, Types of cements, chemical composition, chemical compound, hydration, hydration heat and blended cement admixtures, 1 time, Chemical admixture, water-reducing admixture, air-entraining admixture, mineral admixture, pozzolanic reaction, latent hydraulic property and high-range admixture are introduced. aggregate, I time, Moisture condition, Chloride ion, Total chloride ion content, alkali-silica reaction and total alkali content fresh concrete, 1 time, Workability, rheology, consistency, segregation and mix design hardened concrete, I time, water cement ratio, compressive strength, flexural strength, tensile strength, durability and testing methods mechanical properties of concrete, ltime, Interfacial transition zone in concrete, strength-porosity relationship, Behavior of concrete under various stress states,Dimensional Stability, Non-destructive testing method,1time,Surface hardness, ultrasonic pulse, thermography, half cell potential and polarization resistance Special concrete, ltime, Fiber reinforced concrete, flowing concrete, MDF cement and mineral new materials Polymer material, ltime, Resin, rubber, fiber, polymer concrete and organic new materials review, 1 time, review mainly on concrete and steel achievement assessment, Itime, The achievement assessment is intended to measure students#039 knowledge, skill and aptitude on the subject using quiz. -----Continue to Construction Materials(2) ↓ ↓ ↓

Construction Materials(2)

[Course requirements] None

[Evaluation methods and policy] Reports and Final examination.

[Textbooks] P.Kumar Mehta, Paulo J.M.Monteiro:Concrete microstructure, properties and materials, McGraw-Hill,2006

P.Kumar Menta, ratio J.M.Monterro-Concrete incressfuncture, properties and materials, incortain Transpose isbn{} (9780071797870) William D. Callister, Jr. David G. Rethwisch:Materials science and engineering an Introduction, John Wiley amp Sons, Inc.,2014 isbn{} {9781118477700}

[References, etc.]

(Reference books) 宮川豊章、六郷恵哲共編: 『土木材料学』、朝倉書店 isbn {} {9784254261622}

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Please visit KULASIS to find out about office hours.

Course number U-ENG23 33514 LE73	Structural Mechanics II and Exercises(2)
hourse title nd course Structural Mechanics II and Exercises name, job title, name, job title, Graduate School of Engineering	[Evaluation methods and policy]
e in Structural Mechanics II and Exercises and department glish) glish)	Grade is given based on the final examination, mid-term examination and reports.
	[Textbooks]
rget year Brd year students or above Number of credits 3 Year/semesters 2021/First semester	To be informed by the lecturer in charge in his/her first lecture
s and periods Mon.4,5 Class style Seminar Laquage distution English	[References, etc.]
verview and purpose of the course]	(Reference books)
andamentals of structural analysis based on energy principle. inciple of virtual work and some energy principles for structural analysis. pproaches for study of statically indeterminate structures.	M. Matsumoto, E. Watanabe, H. Shirato, K. Sugiura, A. Igarashi, T. Utsunomiya, Y. Takahashi: Structure mechanics II, Maruzen Ltd. isbn{} {4621046403}(in Japanese)
indamentals of elastic stability.	[Study outside of class (preparation and review)]
andamentals of structural analysis by matrix methods.	Study exercise and assignment repeatedly.
Course objectives]	(Other information (office hours, etc.))
o solve structures such as truss and beam by the principle of virtual work/energy principles o solve statically indeterminate structures by force method and displacement method	Office hour (contact information and consultation hours) of the lecturer(s)will be given in his/her first lectur
o understand the stability of equilibrium	*Please visit KULASIS to find out about office hours.
o get the stiffness matrix of simple trusses	ricase visit KOLASIS to find out about office nours.
Course schedule and contents]	
/eak 1: Introduction, Work and energy	
/eak 2: Principle of virtual work for rigid bodies	
/eak 3: Principle of virtual work for deformable bodies /eak 4: Principle of complementary virtual work (virtual force) - 1	
eak 4: Principle of complementary virtual work (virtual force) - 1 Veak 5: Principle of complementary virtual work (virtual force) - 2	
/eak 6: Castigliano' s theorems	
/eak 7: Reciprocal theorems and Influence lines	
/eak 8: Learning level check	
/eak 9: Statically indeterminate structures, and Force method by compatibility equations - 1 /eak 10: Force method by compatibility equations - 2	
eak 11: Displacement method (matrix structural analysis): introduction	
/eak 12: Displacement method (matrix structural analysis): truss	
/eak 13: Displacement method (matrix structural analysis): beam	
/eak 14: Stability of rigid body-elastic spring system	
<final exam="">> /eak 15: Feadback</final>	
Course requirements]	
alculus A and B, Linear Algebra A and B, Structure mechanics I and Exercises	
Continue to Structural Mechanics II and Exercises(2)↓↓↓	

未更新 Course number U-ENG23 33515 LE73 Graduate School of Engineering Associate Professor, ONDA SHINICHIROU Course tit Instructor's name, job title, and department of affiliation Continuum Mechanics Graduate School of Engineering Professor,HIGO YOUSUKE Graduate School of Engineering Associate Professor,PIPATPONGSA, Thirapon (and course title in Continuum Mechanics English) Year/semesters 2021/First semester Brd year students or above Number of credits 2 Target year Days and periods Tue.5 Class style Lecture Language of instruction English [Overview and purpose of the course] Continuum Mechanics is a branch of the physical sciences concerned with the deformations and motions of continuous media under the influence of external effects. The following basic items are explained with exercises such as fundamentals of tensor analysis, Mathematical formulation of stress, strain, motion and displacement, Conservation laws of continuous media (mass, momentum, angular momentum, energy conservation laws), constitutive laws of solids and fluids, principle of virtual work and minimum potential energy based on the calculus of variations and applications in elasticity, stress distribution, wave propagation and fluid dynamics. [Course objectives] Based on the clear understanding of the mathematical formulation on deformation, stress and constitutive laws, students are required to understand the derivation of the equation of motion, conservation laws of angular momentum and energy. Principle of energy, variational method and initial-boundary-value problems are appended for enhancing understanding through theoretical applications [Course schedule and contents] Elementary knowledge on tensor analysis,2times,Definition of tensors, Integral theorem, Material derivative over a material volume, Transformation of components of tensors, etc. Stress, strain and strain rate tensors,2times,Definition of stress, strain and strain rate tensors, Transformation of components of these tensor variables, Invariants under coordinates transformation, Compatibility condition f strain, etc Mathematical formulation of conservation laws, 2times, Mathematical expression of conservation laws of constitutive low of solids and fluids,2times,Constitutive laws of elastic amp visco-elastic body and Newton fluids Principle of energy, variational method and initial-boundary-value problems, 2times, Principle of virtual work and minimum potential energy based on the calculus of variations as well as initial-boundary-value problems Applications in elasticity and fluid dynamics,4times,Applications in Elasticity and Fluid Dynamics. Stress distribution and Wave propagation in elastic body, Thermal convection and Lorentz Chaos, etc. Class feedback,1time,Achievement confirmation [Course requirements] Basic understanding on differential and integral calculus, linear algebra and matrix analysis Continue to Continuum Mechanics(2)

Continuum Mechanics(2)

[Evaluation methods and policy]

Mainly regular examination. Assignments are also considered to some extent.

[Textbooks]

rinted materials on the contents of this subject are distributed

[References, etc.]

(Reference books) P. Chadwick, quotContinuum Mechanics: Concise Theory and Problemsquot, Dover Publications isbn{} { 0486401804}

0480401804) A.J.M. Spencer, quotContinuum Mchanicsquot, Dover Publications isbn{} {0486435946} G.E. Mase, quotSchaum#039s Outline of Continuum Mechanicsquot, McGraw-Hill isbn{} {0070406634}

[Study outside of class (preparation and review)]

Elementary knowledge of vector analysis is required.

(Other information (office hours, etc.))

Students can contact with Prof. Hosoda by e-mail: hosoda.takashi.4w@kyoto-u.ac.jp or office at Katsura C1-265 Assoc. Prof. Higo by e-mail: higo.yohsuke.5z@kyoto-u.ac.jp or office at Katsura C1-211 Assoc. Prof. Thirapong by e-mail: pipatpongsa.thirapong.4s@kyoto-u.ac.jp or office at Katsura C1-236

*Please visit KULASIS to find out about office hours.

Course number U-ENG23 33516 LE73	Hydraulics and Hydrodynamics(2)
Course title (and course title in English) Oracle 255710 EEF5 Graduate School of Management Professor,TODA KEIICHI Disaster Prevention Research Institute Professor,NAKITA EIICHI Graduate School of Engineering Associate Professor,SANIYOU MICHIO Disaster Prevention Research Institute	[Evaluation methods and policy] Attendance, reports and final examination [Textbooks]
Target year Brd year students or above Number of credits 2 Year/semesters 2021/First semester	
Days and periods Tue.2 Class style Lecture Language distruction English	[References, etc.] (Reference books)
[Overview and purpose of the course]	
Lecture of fundamental theories of fluid dynamics and applications to hydraulic engineerging Basic equations, potential flow theory, boundary layer theory and turbulent flow Introduction of basic modelings about fluid motion and heat transfer in atmosphere related to hydrology and meteorology [Course objectives]	[Study outside of class (preparation and review)]
Learning elementary knowledge of hydraulics and important topics of hydrodynamics science	(Other information (office hours, etc.))
Open channel flow (1), Itime,Basic equations of non-uniform flow, longitudinal profile Open channel flow (2), Itime,Non-uniform flow computation Unsteady pipe flow,Itime,Basic equations of unsteady pipe flow, application to water hummer phenomenon and surge tank Unsteady open-channel flow, Itime,Basic equations of unsteady open-channel flow, theories of flood flow and hydraulic bore Introduction of fluid dynamics (1),Itime,Boundary theory and application to hydraulic engineering Introduction of fluid dynamics (1),Itime,Primer of turbulence theory and application to hydraulic engineering pplied hydraulics (2), Itime,Fundamentals of sediment transport Applied hydraulics (2), Itime,Fundamentals of sediment transport Applied hydraulics (2), Itime,Thermodynamics of rivers Hydrometeorology (1),Itime,Thermodynamics of atmosphere, Dry-adiabatic process Hydrometeorology (3), Itime,Vertical stability of atmosphere, Moist-adiabatic process Hydrometeorology (4), Itime,Latent instability, Land surface process of atmosphere Achievement confirmation, Itime,Achievement of learning is confirmed.	
None Continue to Hydraulics and Hydrodynamics(2)↓↓↓	

										未更新
Course num	ber	U-ENG	323 3	3517 LE73						
	burse title hd course Fundamentals of Hydrology le in siglish) Fundamentals of Hydrology fundamentals of Hydrology fundame							Professor, TA Graduate Scl Associate Profe Disaster Prev Associate Profe Graduate Scl	nool of Engineering CHIKAWA YASUTO nool of Engineering ssor,ICHIKAWA YUTAKA ention Research Institute ssor,SAYAMA TAKAHIRO nool of Engineering rer,YOROZU KAZUAKI	
Target year	3rd y	ear students o	r above	Number o	of cred	its	2	Yea	r/semesters	2021/First semester
Days and periods	Tue.	3	Class	s style	Lectur	e			Language of instruction	English
[Overview a	nd pı	irpose o	f the	course]						
water movements in the atmosphere, land surfaces, and occans. Solar energy and gravity forces play major roles for the hydrological cycle. Solar energy drives the dynamic processes of water vapor formation from occans and land surfaces, and transport of vapor in the atmosphere. The vapor changes to liquid and fall on the land surfaces as precipitation, then the flow of water on and under the land surfaces are driven by gravity. Hydrology is the study of the movement of water on and under the land surface are driven by gravity. Hydrological processes such as solar radiation, precipitation, evapotranspiration, infiltration, surface and subsurface flow, and river flow are described. [Course objectives] The aim of the course is to understand the basic hydrological processes to obtain the knowledge for analyzing hydrological phenomenon and the engineering background for water resources development.										s are driven by gravity. applications to t. In the class, basic ation, surface and
[Course sch	edule	and co	ntent	ts]						
is provided. The Precipitation, the mechanism Interception and governing equa Groundwater f groundwater is and momentum Surface runoff.	time, i of rad d infil ation of low, 11 expla h equa ,3time is der	of hydrol The mecha dar rainfal ltration, 1 ti of unsatura time, The r ined. The tions of w s, The mechi ived from	ogy in anism l obse me,T nted fl necha physic rater f chanis the m	n the field o a of precipitatervation are the process of low and the unism of rain ical equation flow. Som of rainfa momentum e	of civil e ation is describ of preci basic e nfall-run n to rep ll-runof equation	engin desc ed. pitat quat noff rese f in	neering cribed. A tion inte ions of in mou nt groun mounta water flo	is deso A num crceptio potent ntaino ndwate inous ow, an	cribed. erical rainfall on by trees is ial infiltration us slope The r er flow is deriv slope is expla id then the ana	mechanism of ved from the continuity ined. The kinematic alytical solutions of the

Capatradiation and energy balance, Itime, Energy and water cycle driven by solar radiation is described. Basic mechanism of global warming ant its influence on hydrologic cycle is introduced. Evaporation and transpiration, 3times, The mechanism of water and energy cycle through evapotranspiration is

described. Energy balance at land surface and the wind of boundary layer is introduced. Then, methods to measure the evapotranspiration is described. Flood routing, Itime, The mechanism of flood routing is explained. Numerical representation method to

Fundamentals of Hydrology(2)

represent channel network structure is introduced, then typical flow routing methods are described. Hydrological model, Itime, A physically-based hydrological model which consists of various hydrological processes is described. Typical lumped hydrological models are also introduced. Society and hydrology, Itime, How the hydrological sciences are related to the society is described through various examples. Achievement confirmation, Itime, Quiz, report and the final examination is conducted to measure

tudents#039 knowledge, skill and aptitude on the subject.

[Course requirements]

It is desiarable to study Hydraulics (2nd year) and probability and statistical analysis (2nd year).

[Evaluation methods and policy]

The score is evaluated comprehensively with quiz, reports and the final examination.

[Textbooks]

An English text book is provided, which is compiled based of the text books used in Japanese hydrology class

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Please visit KULASIS to find out about office hours.

		未更新	
Course number U-ENG23 33519 LE73			Soil Mechanics II and Exercises(2)
Course title and course itte in Soil Mechanics II and Exercises English)	Graduate School of Engineering Professor,KIMURA MAKOTO Graduate School of Engineering Professor,MIMURA MAMORU Disaster Prevention Research Institute Professor,UZUOKA RYOSUKE Graduate School of Engineering Associate Professor,AVAMURA YASUO Graduate School of Engineering Professor,HIGO YOUSUKE Graduate School of Engineering Associate School of Engineering Associate Professor,PIPATPOOGSA, Thirapong		 ultimate bearing capacity, net safe bearing capacity and allowable bearing pressure, and derivation of Terzaghi's general bearing capacity equation for continuous footing and basic numerical problems associated with it. Slope stability, 2 times, Understand the failure mechanisms of both infinite and finite slopes and methods of slope stability analysis. Soil dynamics and liquefaction, 2 times, Understand the nature of dynamic loads, mechanism of liquefaction and liquefaction parameters, and stress conditions on soil element under earthquake loading. Practice, 1 time, Problem solving in geotechnical engineering
arget year Brd year students or above Number of cr	edits 3 Yea	ar/semesters 2021/First semeste	
ays and periods Wed.1,2 Class style Sen	inar	Language of instruction English	Class feedback, 1 time, Confirmation of understanding
[Overview and purpose of the course]			[Course requirements]
Students are expected to learn consolidation and stre earth pressures, bearing capacity of shallow and dee Fundamental analyses and design criteria of various	o foundations, slope	e stability, and soil dynamics.	A required prerequisite is knowledge of soil mechanics. Soil mechanics I and Exercises(35080) would be helpful as a prerequisite.
exercises.	geotecnnicai engin	leering problems are drilled through	[Evaluation methods and policy]
Course akiestingal			Final Exam (70%), Midterm exams and classworks (30%)
Course objectives]			
The course objective is to provide understanding of	cev engineering cou	ncepts and mechanical behaviors of	[Textbooks]
oil materials including consolidation and soil impro excessive pore water pressure to shear strength, effe ests, lateral earth pressure acting on retaining walls.	vement, load transi ctive stress paths in bearing capacity o	mission in elastic medium, effect of iterpreted from conventional triaxia of foundations, stability of slopes an	[Textbooks] Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts
The course objective is to provide understanding of soil materials including consolidation and soil impre excessive pore water pressure to shear strength, effe ests, lateral earth pressure acting on retaining walls excavations, soil liquefaction, and dynamic characte	vement, load transi ctive stress paths in bearing capacity o	mission in elastic medium, effect of iterpreted from conventional triaxia of foundations, stability of slopes an	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual
soil materials including consolidation and soil impro excessive pore water pressure to shear strength, effe ests, lateral earth pressure acting on retaining walls.	vement, load transi ctive stress paths in bearing capacity o ristics of soils subje of consolidation, la	mission in elastic medium, effect of terpreted from conventional triaxia of foundations, stability of slopes an ected to earthquake.	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts [References, etc.] (Reference books) Braja M. Das,ldquoFundamentals of Geotechnical Engineeringrdquo, Cengage Learning isbn{} { 9781111576752} Muni Budhu,ldquoSoil Mechanics and Foundationsrdquo, John Wiley amp Sons, INC. isbn{} {
ioil materials including consolidation and soil impre- excessive pore water pressure to shear strength, effe ests, lateral earth pressure acting on retaining walls excavations, soil liquefaction, and dynamic character [Course schedule and contents] Consolidation, 2 times, Understand Terzaghi's theory consolidation curve, normally consolidated condition	vement, load transi tive stress paths in bearing capacity o ristics of soils subje of consolidation, l n and over consolid	mission in elastic medium, effect of terpreted from conventional triaxia of foundations, stability of slopes an ected to earthquake. aboratory consolidation test, field lated condition, and problems on fir	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts [References, etc.] (Reference books) Braja M. Das,ldquoFundamentals of Geotechnical Engineeringrdquo, Cengage Learning isbn{} { 9781111576752} Muni Budhu,ldquoSoil Mechanics and Foundationsrdquo, John Wiley amp Sons, INC. isbn{} { 9780470556849 Isao Ishibashi, Hemanta Hazarika,ldquoSoil Mechanics Fundamentalsrdquo, CRC Press isbn{} {
soil materials including consolidation and soil impre- excessive pore water pressure to shear strength, effe ests, lateral earth pressure acting on retaining walls excavations, soil liquefaction, and dynamic character [Course schedule and contents] Consolidation, 2 times, Understand Terzaghi's theory consolidation curve, normally consolidated condition and time rate of consolidation. Stresses in ground, 1 time, Understand stresses in th listribution below foundation.	vement, load transi tive stress paths in bearing capacity o ristics of soils subje of consolidation, l and over consolid e ground due to loa	mission in elastic medium, effect of tterpreted from conventional triaxia of foundations, stability of slopes an ected to earthquake. aboratory consolidation test, field lated condition, and problems on fir ding, soil strength and pressure	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts [References, etc.] (Reference books) Braja M. Das,ldquoFundamentals of Geotechnical Engineeringrdquo, Cengage Learning isbn{}{ 9781111576752} Muni Budhu,ldquoSoil Mechanics and Foundationsrdquo, John Wiley amp Sons, INC. isbn{} 9780470556849} Isao Ishibashi, Hemanta Hazarika,ldquoSoil Mechanics Fundamentalsrdquo, CRC Press isbn{}{
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oil materials including consolidation and soil impre- xcessive pore water pressure to shear strength, effe ests, lateral earth pressure acting on retaining walls xcavations, soil liquefaction, and dynamic character (Course schedule and contents] Consolidaton, 2 times, Understand Terzaghi's theory onsolidation curve, normally consolidated condition and time rate of consolidation. tresses in ground, 1 time, Understand stresses in the istribution below foundation. hear strength, 2 times, Understand measurement of arameters, drained and undrained behavior of clay farth pressure, 2 times, Understand the lateral earth	vement, load transi tive stress paths in bearing capacity o ristics of soils subje of consolidation, li and over consolid e ground due to loa shear strength and and sand, and stress pressure in active a	mission in elastic medium, effect of tterpreted from conventional triaxia of foundations, stability of slopes an ected to earthquake. aboratory consolidation test, field lated condition, and problems on fir ding, soil strength and pressure triaxial compression tests, strength s path for conventional triaxial test. and passive states, Rankine's theory	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts [References.etc.] (Reference books) Braja M. Das,ldquoFundamentals of Geotechnical Engineeringrdquo, Cengage Learning isbn{} { 978111576752 } Muni Budhu,ldquoSoil Mechanics and Foundationsrdquo, John Wiley amp Sons, INC. isbn{} { 9780470556849 } Isao Ishibashi, Hemanta Hazarika,ldquoSoil Mechanics Fundamentalsrdquo, CRC Press isbn{} { 9781439846445 } Fusao Oka,ldquoSoil Mechanics Exercisesrdquo, Morikita publishing Co., Ltd. isbn{} {4627426607 } (Related URLs) (http://geomechanics.kuciv.kyoto-u.ac.jp/lecture/text/kakomon.html)
oil materials including consolidation and soil impre- xcessive pore water pressure to shear strength, effe ests, lateral earth pressure acting on retaining walls xcavations, soil liquefaction, and dynamic character Course schedule and contents] Consolidaton, 2 times, Understand Terzaghi's theory onsolidation curve, normally consolidated condition and time rate of consolidation. tresses in ground, 1 time, Understand stresses in th istribution below foundation. hear strength, 2 times, Understand measurement of	vement, load transt tive stress paths in bearing capacity o ristics of soils subje of consolidation, la and over consolid e ground due to loa shear strength and and sand, and stress pressure in active a cory with condition	mission in elastic medium, effect of tterpreted from conventional triaxia of foundations, stability of slopes an ected to earthquake. aboratory consolidation test, field lated condition, and problems on fir ding, soil strength and pressure triaxial compression tests, strength s path for conventional triaxial test. and passive states, Rankine's theory	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts [References, etc.] (Reference books) Image: Solid S
bil materials including consolidation and soil impre- coessive pore water pressure to shear strength, effe sis, lateral earth pressure acting on retaining walls xeavations, soil liquefaction, and dynamic character Course schedule and contents] onsolidaton, 2 times, Understand Terzaghi's theory onsolidation curve, normally consolidated condition d time rate of consolidation. tresses in ground, 1 time, Understand stresses in th siribution below foundation. hear strength, 2 times, Understand measurement of arameters, drained and undrained behavior of clay arth pressure, 2 times, Understand the lateral earth ohesive and cohesionless soil, Coloumb's wedge th ressure on retaining walls of simple configurations	vement, load transt tive stress paths in bearing capacity o ristics of soils subje of consolidation, la and over consolid e ground due to loa shear strength and and sand, and stress pressure in active a cory with condition	mission in elastic medium, effect of tterpreted from conventional triaxia of foundations, stability of slopes an ected to earthquake. aboratory consolidation test, field lated condition, and problems on fir ding, soil strength and pressure triaxial compression tests, strength s path for conventional triaxial test. and passive states, Rankine's theory	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts [References.etc.] (Reference books) Braja M. Das,ldquoFundamentals of Geotechnical Engineeringrdquo, Cengage Learning isbn{} { 978111576752} Muni Budhu,ldquoSoil Mechanics and Foundationsrdquo, John Wiley amp Sons, INC. isbn{} { 9780470556849} Isao Ishibashi, Hemanta Hazarika,ldquoSoil Mechanics Fundamentalsrdquo, CRC Press isbn{} { 9781439846445} Fusao Oka,ldquoSoil Mechanics Exercisesrdquo, Morikita publishing Co., Ltd. isbn{} {4627426607} (Related URLs) (http://geomechanics.kuciv.kyoto-u.ac.jp/lecture/text/kakomon.html) [Study outside of class (preparation and review)] Practice yourself from Tutorial Exercise
bil materials including consolidation and soil improvessive pore water pressure to shear strength, effe stst, lateral earth pressure acting on retaining walls accavations, soil liquefaction, and dynamic character Course schedule and contents Tonsolidaton, 2 times, Understand Terzaghi's theory onsolidation curve, normally consolidated condition and time rate of consolidation. tresses in ground, 1 time, Understand stresses in the istribution below foundation. hear strength, 2 times, Understand measurement of arameters, drained and undrained behavior of clay arth pressure, 2 times, Understand the lateral earth shesive and cohesionless soil, Coloumb's wedge th	vement, load transi tive stress paths in bearing capacity o ristics of soils subje of consolidation, l and over consolid e ground due to loa shear strength and and sand, and stress pressure in active a eory with condition	mission in elastic medium, effect of tterpreted from conventional triaxia of foundations, stability of slopes an ected to earthquake. aboratory consolidation test, field lated condition, and problems on fir uding, soil strength and pressure triaxial compression tests, strength s path for conventional triaxial test. and passive states, Rankine's theory n for critical failure plane, earth	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts [References, etc.] (Reference books) Braja M. Das,ldquoFundamentals of Geotechnical Engineeringrdquo, Cengage Learning isbn{} { 9781111576752} Muni Budhu,ldquoSoil Mechanics and Foundationsrdquo, John Wiley amp Sons, INC. isbn{} { 9780470556849} Isao Ishibashi, Hemanta Hazarika,ldquoSoil Mechanics Fundamentalsrdquo, CRC Press isbn{} { 9781439846445} Fusao Oka,ldquoSoil Mechanics Exercisesrdquo, Morikita publishing Co., Ltd. isbn{} {4627426607} (Related URLs) (http://geomechanics.kuciv.kyoto-u.ac.jp/lecture/text/kakomon.html) [Study outside of class (preparation and review)] Practice yourself from Tutorial Exercise (Other information (office hours, etc.)) Flores (flores.giancarlo.3v@kyoto-u.ac.jp)
bil materials including consolidation and soil improvessive pore water pressure to shear strength, effe ests, lateral earth pressure acting on retaining walls exeavations, soil liquefaction, and dynamic character Course schedule and contents] Fonsolidation, 2 times, Understand Terzaghi's theory onsolidation curve, normally consolidated condition ind time rate of consolidation. Tresses in ground, 1 time, Understand stresses in the istribution below foundation. hear strength, 2 times, Understand measurement of arameters, drained and undrained behavior of clay arth pressure, 2 times, Understand the lateral earth ohesive and cohesionless soil, Coloumb's wedge th ressure on retaining walls of simple configurations fidterm exam, 0.5 times,	vement, load transi tive stress paths in bearing capacity o ristics of soils subje of consolidation, li and over consolid e ground due to loa shear strength and and sand, and stress pressure in active a eory with condition	mission in elastic medium, effect of tterpreted from conventional triaxia of foundations, stability of slopes an ected to earthquake. aboratory consolidation test, field lated condition, and problems on fir uding, soil strength and pressure triaxial compression tests, strength s path for conventional triaxial test. and passive states, Rankine's theory n for critical failure plane, earth	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts [References.getc.] (Reference books) Braja M. Das,ldquoFundamentals of Geotechnical Engineeringrdquo, Cengage Learning isbn {} {978111576752} Muni Budhu,ldquoSoil Mechanics and Foundationsrdquo, John Wiley amp Sons, INC. isbn {} {9780470556849} Isao Ishibashi, Hemanta Hazarika,ldquoSoil Mechanics Fundamentalsrdquo, CRC Press isbn {} {9781439846445} Fusao Oka,ldquoSoil Mechanics Exercisesrdquo, Morikita publishing Co., Ltd. isbn {} {4627426607} (Related URLs) (http://geomechanics.kuciv.kyoto-u.ac.jp/lecture/text/kakomon.html) [Study outside of class (preparation and review)] Practice yourself from Tutorial Exercise (Other information (office hours, etc.))
sil materials including consolidation and soil impre- cessive pore water pressure to shear strength, effe sts, lateral earth pressure acting on retaining walls ceavations, soil liquefaction, and dynamic character Course schedule and contents] onsolidaton, 2 times, Understand Terzaghi's theory onsolidation curve, normally consolidated condition ad time rate of consolidation. ressess in ground, 1 time, Understand stresses in the stribution below foundation. near strength, 2 times, Understand measurement of aramters, drained and undrained behavior of clay arth pressure, 2 times, Understand the lateral earth whesive and cohesionless soil, Coloumb's wedge th essure on retaining walls of simple configurations lidterm exam, 0.5 times,	vement, load transi tive stress paths in bearing capacity o ristics of soils subje of consolidation, li and over consolid e ground due to loa shear strength and and sand, and stress pressure in active a eory with condition	mission in elastic medium, effect of terpreted from conventional triaxia of foundations, stability of slopes an ected to earthquake. aboratory consolidation test, field lated condition, and problems on fir uding, soil strength and pressure triaxial compression tests, strength s path for conventional triaxial test. and passive states, Rankine's theory a for critical failure plane, earth ity, ultimate bearing capacity, net	Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts [References, etc.] (Reference books) Braja M. Das,ldquoFundamentals of Geotechnical Engineeringrdquo, Cengage Learning isbn{} { 9781111576752} Muni Budhu,ldquoSoil Mechanics and Foundationsrdquo, John Wiley amp Sons, INC. isbn{} { 9780470556849 Isao Ishibashi, Hemanta Hazarika,ldquoSoil Mechanics Fundamentalsrdquo, CRC Press isbn{} { 9781439846445} Fusao Oka,ldquoSoil Mechanics Exercisesrdquo, Morikita publishing Co., Ltd. isbn{} {4627426607} (Related URLs) (http://geomechanics.kuciv.kyoto-u.ac.jp/lecture/text/kakomon.html) [Study outside of class (preparation and review)] Practice yourself from Tutorial Exercise (Other information (office hours, etc.)) Flores (flores.giancarlo.3v@kyoto-u.ac.jp) Pipatpongsa (pipatpongsa.thirapong.4s@kyoto-u.ac.jp)

Soil Mechanics II and Exercises(3)

*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category A course with practical content delivered by instructors with practical work experience

(2) Details of instructors' practical work experience related to the course

(3) Details of practical classes delivered based on instructors' practical work experience

						未更新
Course n	umber	U-ENG23 33	3520 EE73			
Course title (and course title in English)		Soil M & Ex tents on Soil Mech	nanics and Exercise	Instructor's name, job tit s and departm of affiliation	Professor,KJI Disaster Prev Professor,UZ Graduate Scho Associate Profe Graduate Scho Professor,HI Graduate Scho Professor,HI Graduate Scho Associate Profe Graduate Sch Associate Profe Graduate Sch Assistant Prof Graduate Sch Assistant Prof Graduate Sch Assistant Profe Disaster Prev	nool of Engineering SHIDA KIYOSHI ention Research Institut ZUOKA RYOSUKE tool of Engineering Sor, SAWAURA YASU of Global Environmental Studi fessor, TAKAI ATSUSI nool of Engineering GO YOUSUKE nool of Engineering sor, PIPATPONGSA, Thirapor ention Research Institu sor, GYOTO UIROYUN nool of Engineering fessor, KIDO RYUNOSUK nool of Engineering ssor, MIYAZAKI YUSUK ention Research Institu ensor, KIYOH
Target yea		·	Number of cre		Year/semesters	2021/First semester
Days and peri	ods Wee	134 Class				
Overview	and n		s style Semir	lar	Language of instruction	English
The purpose	e of this ain engi	urpose of the course is to teacl	course] h students how to	conduct labor	Language of instruction ratory experiments f soils which were	and in-situ tests in
The purpose order to obta	e of this ain engi courses.	urpose of the course is to teach neering propertie	course] h students how to	conduct labor	ratory experiments	and in-situ tests in
The purpose order to obta mechanics c [Course o To help stud	e of this ain engi- courses.	urpose of the course is to teacl neering propertie res] epen their unders	course] h students how to es and mechanical	conduct labor parameters o ots of soil me	ratory experiments f soils which were chanics and to deve	and in-situ tests in
The purpose order to obta mechanics c [Course o To help stud experiences	e of this ain engi- courses. bjectiv dents dec in fund	urpose of the course is to teacl neering propertie res] epen their unders	course] h students how to is and mechanical standing on conce ents as well as col	conduct labor parameters o ots of soil me	ratory experiments f soils which were chanics and to deve	and in-situ tests in studied in the soil
The purpose order to obta mechanics of [Course o To help stude experiences [Course s	e of this ain engi- courses. bjectiv dents der in funda	urpose of the course is to teacl neering propertie res] epen their unders amental experim	course] h students how to ss and mechanical standing on conce ents as well as col s]	conduct labor parameters o ots of soil me	ratory experiments f soils which were chanics and to deve	and in-situ tests in studied in the soil
The purpose order to obta mechanics of [Course o To help stude experiences [Course s Introduction	e of this ain engin courses. bjectiv dents der in fund: chedul n and ori operties	urpose of the course is to teach neering propertie es] epen their unders amental experim e and content entation, 1 time, 5 of soils, 1 time, 5	course] h students how to ss and mechanical standing on conce ents as well as col s]	conduct laboi parameters o pts of soil me lecting, analy	ratory experiments f soils which were chanics and to deve	and in-situ tests in studied in the soil clop their skills and ng experimental data.
The purpose order to obta mechanics c [Course o To help stuc experiences [Course s Introduction Physical pro grain size di	e of this ain engine courses. bjectiv dents dee in fund chedul a and ori operties istributio	urpose of the course is to teach neering propertie espen their unders amental experim de and content entation, 1 time, 5 on	course] h students how to ss and mechanical standing on conce ents as well as col s]	conduct labor parameters o ots of soil me lecting, analy ineering class	ratory experiments f soils which were chanics and to deve zing and interpretin ification of soils, c	and in-situ tests in studied in the soil clop their skills and ng experimental data.
The purpose order to obti mechanics c [Course o To help stuc experiences [Course s Introduction Physical pro- grain size di Compaction Hydraulic c Hydraulic c	e of this ain engi- courses. bjectiv lents der in fund- chedul a and ori operties istribution test, 1 to onductiv radient,	urpose of the course is to teach neering propertie es] epen their unders amental experim le and content entation, 1 time, of soils, 1 time, Son uime, Laboratory vity test and parti	course] h students how to ss and mechanical standing on conce ents as well as col s] Soil structure, eng compaction tests, icle size distributi	conduct labor parameters o ots of soil me lecting, analy incering class factors affec on test, 2 time	ratory experiments f soils which were chanics and to deve zing and interpretin ification of soils, c ting compaction es, Permeability and	and in-situ tests in studied in the soil clop their skills and ng experimental data.
The purpose order to obti mechanics or [Course o To help stuce experiences [Course s Introduction Physical pro- grain size di Compaction Hydraulic or Hydraulic g the particle	e of this ain engi- courses. bjectiv dents dec in fund chedul and ori opperties istribution test, 1 to onductiv radient, size dist	urpose of the course is to teach neering propertie es] entation, 1 time, of soils, 1 time, 5 on ime, Laboratory /ity test and parti determination ourve	course] h students how to ss and mechanical standing on conce ents as well as col s] Soil structure, eng compaction tests, icle size distributi hydraulic conduc	conduct labor parameters o ots of soil me lecting, analy incering class factors affec on test, 2 time tivity, flow n	ratory experiments f soils which were chanics and to deve zing and interpretin ification of soils, c ting compaction es, Permeability and	and in-situ tests in studied in the soil clop their skills and ng experimental data. onsistency Limits, d seepage, Darcy's law, nalysis for determining

Exp on Soil M & Ex(2) Exp on Soil M & Ex(3) -----[Study outside of class (preparation and review)] Uniaxial compression test, 1 time, Stress-strain and strength behavior of clavs It is recommended to read testing procedure beforehand Direct shear test, 1 time, Mohr-Coulomb failure criterion, laboratory tests for shear strength determination (Other information (office hours, etc.)) This class is intended mainly for students of the International Course, and will be delivered in English. You cannot join this class from middle of the semester. Sounding methods, 0.5 times, N-values of standard penetration test and elastic wave exploration Centrifuge model test, 0.5 times, Experiments using the similitude law of centrifuge test Contact: Instructors in charge of this subject will be informed in guidance. The following two professors are also available. Flores (flores.giancarlo.3v@kyoto-u.ac.jp) Shaking table test, 1 time, Experiments using the shaking table test on dynamic behaviors of soils and foundations Pipatpongsa (pipatpongsa.thirapong.4s@kyoto-u.ac.jp) Please visit KULASIS to find out about office hours. Computer exercise and numerical analysis, 2 times, Fundamentals of math and physics for geotechnical engineering [Courses delivered by instructors with practical work experience] Special lecture, 1 time, Special lecture on soil mechanics (1) Category a course with practical content delivered by instructors with practical work experience Exercise, 1 time, Practical applications of laboratory testing data (2) Details of instructors' practical work experience related to the course Class feedback, 1 time, Confirmation of understanding (3) Details of practical classes delivered based on instructors' practical work experience [Course requirements] oil mechanics I and exercises. It is recommended to take soil mechanics II and exercises in parallel. [Evaluation methods and policy] tudents are expected to conduct all experiments. Full attendance to laboratories and submission of all reports are compulsory. [Textbooks] oil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Handouts will be distributed [References, etc.] (Reference books) JAPANESE GEOTECHNICAL SOCIETY STANDARDS Laboratory Testing Standards of Geomaterials (ol.1)] (Japanese Geotechnical Society) ISBN:4886448200 [JAPANESE GEOTECHNICAL SOCIETY STANDARDS Laboratory Testing Standards of Geomaterials Vol.1).[[Vol.2,]] (Japanese Geotechnical Society) ISBN:4886448224 [JAPANESE GEOTECHNICAL SOCIETY STANDARDS Laboratory Testing Standards of Geomaterials (Vol.3,)] (Japanese Geotechnical Society) ISBN:4886448240 Braja M. Das, IdquoSoil Mechanics Laboratory Manualrdquo, Oxford University Press isbn{} { 9780190209667} Dante Fratta et al., IdquoIntroduction to Soil Mechanics Laboratory Testingrdquo, CRC Press isbn{} { Data Fisca & an aggression 2018 土質試験:基本と手引き、地盤工学会 isbn {} {9784886440846} 土質試験の方法と解説、地盤工学会 isbn {} {4886440584} Continue to Exp on Soil M & Ex(3) ↓ ↓ ↓

										未更新
Course nu	mber	U-ENO	323 33	3521 LE73	U-EN	IG2:	3 33521	LE55	U-ENG23	33521 LE24
Course title (and course title in English)				t of Social S	Systems	nan and	tructor's ne, job ti I departn Iffiliation	nent	Professor,Cr Graduate Scl Associate Pro Graduate Scl	rention Research Institute uz Ana Maria hool of Engineering fessor,QURESHI, Ali Gul hool of Engineering sor,SCHMOECKER, Jan-Dirk
Target yea	- Brd	year students o	r above	Number	of cred	its	2	Yea	r/semesters	2021/First semester
Days and perio	ds Thu.	2	Class	style	Lecture	e			Language of instruction	English
[Overview	and p	urpose o	f the	course]						
[Course of To provide s planning and	ojectiv tudents manag	es] with a con gement. Fu	nplex	system per	spective	of	society	and to		e planning. le of infrastructure nd psychological typical
systems anal	chedul 1time,I ysis and	e and co Problems o 1 quotphys	f infra ics of	structure p societyquo	ot.		0			odology. Abstract of
Average mod Queuing the Game theory Typical mod Social psych	predicti lel. ory,2tin and ge els. Soc ology a ysis,2ti	ng model, nes,single a neral socia cial dilemn nd plannin mes,Exam	2times and m al dilen na situ g,2tin ples o	"Serial corr ultiple quer mma situati ations and nes,Attitude f major acc	relation. ues, exa ions,3tii infrastru es, value	Au mple nes, actu	to-Regr es of va Strategi re plann nd their	essive rious l c inter ing. influe	model. Autol M/D/k queues rdependency.	Nash equilibrium. or and planning
[Course re	quirer	nents]								
None										
[Evaluatio	n meth	nods and	polic	y]						
Joined judge	ment of	f report and	1 end (of term exa	m.					
								(Continue to Pla	n & Mng of S Sys(2) ↓ ↓ ↓

Plan & Mng of S Sys(2)

[Textbooks] None

[References, etc.] (Reference books)

Hillier, F.S. and Lieberman, G.J. (2015) Introduction to Operations Research. 10th Edition. McGraw Hill. isbn{} {9781259253188}

ISUN (12710122923100) Straffin, P.D. (1993). Game Theory and Strategy. The Mathematical Association of America. New Mathematical Library. John (10833856379)

Mathematical Library. isbn{} (883856379) Further useful textbooks and materials are introduded during the lectures.

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Offices hours of the teachers are notified during the first class.

*Please visit KULASIS to find out about office hours.

	未更新	
Course number U-ENG23 33522 LE55 U-ENG		Engineering Mathematics B2(2)
	Instructor's name, job title, Graduate School of Engineering	[Textbooks]
Engineering intuiterintites D2	and department Associate Professor, SCHMOECKER, Jan-Dirk	None.
English)	of affiliation	
arget year Brd year students or above Number of credit	ts 2 Year/semesters 2021/First semester	[References, etc.]
		(Reference books) Pinkus, A. and Zafrany,S.: Fourier Series and Integral Transforms, Cambridge University
ays and periods Fri.1 Class style Lecture	Language of instruction English	0521597714}
Overview and purpose of the course]		Further material is introduced during classes.
Fhis course deals with Fourier analysis and with the solu It discusses Fourier series for periodic functions and its		(Related URLs)
he student gets familiar with its characteristics, the cour		(None)
analysis to various engineering problems. The lecture en	nphasises the relationship between the numerical	
analysis and todayrsquos applications.		[Study outside of class (preparation and review)]
[Course objectives]		
To get students acquainted with an understanding of Fou		
get students familiar with the various types of partial diff	terential equations and their applications.	(Other information (office hours, etc.))
[Course schedule and contents]		*Please visit KULASIS to find out about office hours.
Introduction,1time,What is Fourier Analysis? How to ap		
Fourier series,4times,A periodic function which is expan is called a Fourier series. Convergence behaviour and ser		
calculations.	ites properties are discussed with specific example	
Fourier transform,5times,Fourier analysis of non-periodi		
class of functions is the actual Fourier integral. The lectu functions and shows the various properties of the Fourier		
transform is improved through examples. The relationship	ip to the Laplace transform is further discussed.	
Application to Partial Differential Equations,4times,In th		
differential equations (Laplace equation, wave equation, Fourier series and Fourier transform is discussed to obtai		
Numerical Fourier analysis, 1 time, Fast Fourier transform	n (FFT) is a basic Fourier transform algorithm. In this	
ecture it is explained and a software illustration provide	ed.	
[Course requirements]		
Calculus, Linear Algebra, Engineering Mathematics B1.		
[Evaluation methods and policy]		
Participation, assignment and 2 tests (mid and end)		
antelpation, assignment and 2 tests (into and end)		
	Continue to Engineering Mathematics B2(2) ↓ ↓	
	Solution to Engineering matteriaties DE(E) + + +	

未更新 Course number U-ENG23 33523 EE73 Graduate School of Engineering Professor,GOTOH HITOSHI Graduate School of Engineering Professor, TACHIKAWA YASUTO Graduate School of Manag Professor, TODA KEIICHI Disaster Prevention Research Institute Professor, MORI NOBUHITO Graduate School of Engineering Associate Professor,ICHIKAWA YUTAKA Graduate School of Engineering Associate Professor, ONDA SHINICHIRO Graduate School of Engineering Associate Professor, KHAYYER ABBAS Graduate School of Engineering Associate Professor, SANJIYOU MICHIC Graduate School of Global Environmental Studie Associate Professor, HARADA EIJI Associate Professor, MAKADA EJJ Disaster Prevention Research Institut Associate Professor, KAWAIKE KENJ Disaster Prevention Research Institut Associate Professor, SAYAM TAKAHIRC Disaster Prevention Research Institut Experiments on Hydraulics (and course name, job title Associate Professor.SHIMURA TOMOY Associate Professor, SHIMORA TOMOTA Disaster Prevention Research Institut Associate Professor, TAKEBAYASHI HIROSH Disaster Prevention Research Institut Experiments on Hydraulics and department of affiliation . title in English) Associate Professor, TANAKA KENJI Disaster Prevention Research Institute Associate Professor, YAMAGUCHI KOSEI Graduate School of Engineering Senior Lecturer, YOROZU KAZUAKI Graduate School of Engineering Assistant Professor, IKARI HIROYUK Graduate School of Engineering Assistant Professor, OKAMOTO TAKAAK Graduate School of Engineering Graduate School of Lingheering Assistant Professor, Yuma Shimizu Graduate School of Global Environmental Studies Assistant Professor,田中智大 Academic Center for Computing and Media Studies Assistant Professor, TORIU DAISUKE Disaster Prevention Research Institut Assistant Professor, NOHARA DAISUKI Assistant Professor, NOTAKA DAISOKI Disaster Prevention Research Institut Assistant Professor, MIYASHITA TAKUYA Disaster Prevention Research Institut ssistant Professor, Yamanoi Kazuk Brd year students or above Number of credits 2 Year/semesters 2021/Second semester Target year Days and periods Thu. 3,4 _ _ Class_style_ _ Experiment _ _ _ _ larguage of instruction English

Experiments on Hydraulics(2)

[Overview and purpose of the course]

Guidance of laboratory experiments in hydraulics and measurement instruments. Eight experiments are conducted about pipe flow, open-channel flow, waves, flow in porous media, density flow, hydrodynamic force, sediment transport

[Course objectives]

Understanding hydraylic phenomena through various flows observed in the hydraulic laboratory

[Course schedule and contents]

Guidance, Itime, Guidance of hydraulics laboratory and course goals Instruments in hydraulics laboratory, Itime, Introduction of measurement instruments Methods and principles

of hydraulic experiments

Experiments 1 - 4,8times,Rotation for eight experiments A to H as mentioned below Rotation for eight experiments A to H as mentioned below,4times,Guide for writing reports A)Transition from lamiar to turbulent flows, friction law in pipe flows,(1)times,Observation of dye patterns in lamiar and turbulent flows in pipesUnderstanding Hagen-Poiseuille flow and Prandtl-Karman flow B)Velocity and free-surface profiles in open-channel flows,(1)times,Measurements of free-surface and

velocity profilesComparison measured results with theories C)Hydraulic jump in horizontal bed,(1)times,Understanding hydraulic jump Comparison measured free-surface variations with theories

D)Transmission and deformation behaviors of waves.(1)times, Measurements of wave deformations, wave veight and orbits of water particlesComparison measured data with small amplitude wave theory and preaking-wave formula

E)Flow in porous media and underground water,(1)times,Measurements steady flows in porous media by using pipenet model and Hele-Shaw model F)Density flow,(1)times,Measurement and understanding transport mechanisms in density flowsEvaluations

of front speed and related friction laws G)Hydraulic force on cylinder,(1)times,Measurements of pressure distributions on cylinder surface in open-channel flows Observation of Karman vortex behind cylinder

H)Sediment transport.(1)times,Measurements and observations of bed load in open-channel flows. Comparison with theories and formulae

Achievement confirmation, Itime, Achievement of learning is confirmed.

[Course requirements]

Hydraulics and Exercises

[Evaluation methods and policy]

Attendance : 40 points Reports and homework : 60 points total : 100 points

[Textbooks]

Continue to Experiments on Hydraulics(3) ↓ ↓ ↓

	未更新
xperiments on Hydraulics(3)	Course number U-ENG23 33524 LE73
	Course title Instructor's Graduate School of Engineering
eferences, etc.] Reference books)	(and course Public Economics name, job title, Associate Professor, MATSUSHIMA KAK
	title in English) Public Economics and department of affiliation Associate Professor, YOKOMATSU MUN
udy outside of class (preparation and review)]	Target year Brd year students or above Number of credits 2 Year/semesters 2021/First semester
	Days and periods Thu.1 Class style Lecture Language distinction English
ther information (office hours, etc.))	[Overview and purpose of the course]
ase visit KULASIS to find out about office hours.	The purpose of this lecture is to understand the basic concept of micro economics to evaluate infrastructure projects. For the sake of this purpose, the detailed concept of micro economics is explained including the function of the market, the behaviour of firms and consumers, and the methodology to evaluate the social welfare is explained. The concept of market failure and policies to conquer it are also explained. Finally, consumers, and the infrastructure is explained with economic aspects of infrastructure.
	[Course objectives] To understand the basic concept of micro economics for project evaluation of infrastructure
	[Course schedule and contents]
	Introduction,1time,The outline of this course, the role of public Consumers#039 behaviour,2times,Consumers#039 behaviour model (the preference of household, utility, utility maximisation behaviour, demand function, compensated demabd function, Slutsky equation, aggregated demand fuction, welfare measures and their feature) Exercise (1).1time,Exercise related to above three lectures Firms#039 behaviour,2times,Firms#039 behaviour (technology, production function, profit maximisation behavior, cost minimisation behaviour, cost function and supply function, market structure and firms#039 behaviour) Exercise (2).1time,Exercise related to above three lectures Perfect Comititive Market,1time,Perfect competitive market, the difference between general equiribrium a partial equiribrium, Pareto efficiency Imperfect Competition,1time,Monopolistic Market, Oligopoly Market Measurement for Economic Evaluation,1time,Consumers#039 surplus, Producers#039 surplus, social surp equivalent variation, compensating variation Extercise (3).1time,The concept of externalities, its mechanism and variation, policy to internalise externalit Public Goods,1time,The feature of public goods, Samuelson condition Exercise (3).1time,Exercise related to above three lectures Cost Benefit Analysis, 1time,The concept of cost and benefit, social discount rate, evaluation nindex, cost benefit analysis and financial analysis, quantification of the benefit, the way of piofect evaluation from the viewpoint of engineers#039 ethic 1time,
	Continue to Public Economics(2) ↓
ublic Economics(2)	大更新 Course number U-ENG23 33526 LE73
I	
valuation methods and policy]	Course title (and course Urban and Regional Planning name, job title, Graduate School of Engineering
al Exam: 70-80%, Reports during classes: 20-30%	title in Urban and Regional Planning and department Associate Professor,QURESHI, A
xtbooks]	
R. Varian: Intermediate Microeconomics : A Modern Approach, seventh Edition, W. W. Norton amp	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second seme
npany, 2014 isbn {} {9780393919677}	Days and periods Mon.4 Class style Lecture Language distution English
ferences etc.	[Overview and purpose of the course]
ferences, etc.] Reference books)	Outlines of the processes of urban planning, planning of urban facilities, land use policies and transportati policy. In addition, the basic theory and models of land use, transportation, environment protection and un economics will be discussed.
	[Course objectives]
Idy outside of class (preparation and review)] advisable to read the corresponding parts of the textbook in advance.	To understand the structure of urban problems and to learn the basics of urban planning.
	[Course schedule and contents]
ther information (office hours, etc.)) ase visit KULASIS to find out about office hours.	Introduction to Urban and Regional Planning, Itime, Concept and problems of urban and regional areas, ne and social background of planning, Particularly factors affecting the future of cities such as the internationalization, aging and environmental issues will be described. Histroy of Urban Planning in Japan, Itime, Historical background of urban planning in pre-war Japan. Land-use Planning and District Planning, Jitmes, Basic concepts of urban planning, domain of urban plan urbanization, regulations and basic zoning measures. Policies of urban planning, domain of natur and historical environment of the city. Environmental Issues and Urban Systems, 2times, Environmental issues, contemporary challenges and planning requirements of regional and urban environment from the environmental economics point of vic Current Urban Development, Itime, Current trends of the urban and regional planning such as eco-towns a smart growth. Basic Theory of Urban Transport Policy, Itime, Transport policy framework considering factors such as mobility, environment, landscape, attractiveness and vitality of the city. Classification of transport policy (regulatory policy, conomic policy, infrastructure development policy). Urban Transport Policy, Jimes, Urban transport policies will be explained from the perspective of urban development. In particular, the transport policies required to achieve a sustainable city with respect to environment and energy use. Deregulation, basic theory of deregulation, limitations and the effects of deregulation. Urban Transportation Planning, 2times, Basic concepts and models of the four-step transportation model w be discussed. , Itime,
	Continue to Urban and Regional Planning(2

	未更新
rban and Regional Planning(2)	Course number U-ENG23 33527 LE73
	Course title
Course requirements]	(and course Transportation Management Engineering name, job title, Graduate School of Engineering
one	title in Transportation Management Engineering and department Associate Professor,SCHMOECKER, Jan- English)
Evaluation methods and policy]	
ass participation, quiz and end of term examination.	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second semes
extbooks]	Days and periods Mon.3 Class style Lecture Larguage distruction English
aterials will be provided in the class from time to time.	[Overview and purpose of the course]
	To provide the student with sufficient knowledge to explain the significance of the various methodologies
References, etc.]	used for transportation planning, operation and traffic engineering. To enable the student to apply each
(Reference books)	method appropriately.
Jseful textbooks and material will be introduded during the lectures.	[Course objectives]
	To provide the student with sufficient knowledge to explain the significance of the various methodologies
Study outside of class (preparation and review)]	used for transportation planning, operation and traffic engineering. To enable the student to apply each
	method appropriately.
	[Course schedule and contents]
(Other information (office hours, etc.))	Introduction,2times,The role of transport in the city and the role of motorisation. Definition of Transportati
Office hours will be allocated for students to consult the instructor and ask questions as needed.	planning and traffic engineering. Status of transport in cities and current global transport planning problem: Observing and analysing travel behaviour,2times,Purpose of travel surveys, in particular person trip survey
Please visit KULASIS to find out about office hours.	How to analyse travel behaviour with these and how to use these data.
	Road network survey and analysis,2times,Explaining methods for road traffic flow and travel demand estimation.
	Traffic Flow Theory, 3 times, Mechanisms of congestion, characteristics of traffic flow and traffic flow mode
	traffic capacity of road.
	Traffic operations, 3times, Grade intersection, Traffic capacity at intersections, traffic signal control method. Traffic management methods, 3times, Introduction to the various traffic management techniques currently
	being implemented, their benefits and challenges.
	[Course requirements]
	None
	[Evaluation methods and policy]
	Joined judgement of report and end term exam.
	[Textbooks]
	None
	[References, etc.]
	(Reference books)
	Iida, Kitamura: Traffic Engineering. 2008. isbn{}{9784274206382}
	Continue to Transportation Management Engineering(2)

Transportation Management Engineering(2)

Roess R.P. Prassas E. S. McShane W.R (2004) Traffic Engineering, 4th Ed, Prentice Hall. isbn{} { 9780136135739} Further useful material will be introduced during the class.

(Related URLs) (None)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.)) It is recommended to take this course jointly with quotUrban and Regional Planningquot taught by Assoc. Prof. Ali Qureshi on Mondays, 3rd period, as some exercises will be conducted jointly.

*Please visit KULASIS to find out about office hours.

Course n	umber	U-ENC	G23 3	3528 LE73						
Course title (and course title in English)	de course Geoenvironmental Engineering le in Geoenvironmental Engineering and department A Graduate School of Engi Professor,KAT SOUTI TA Graduate School of Engi Professor,KIMURA MAI						ATSUMI TAKESHI nool of Engineering MURA MAKOTO ention Research Institute			
Target yea	Bard year students or above Number of credits 2 Year/semesters 2					2021/Second semester				
Days and peri	ods Tue.	1	Class	s style	Lecture	e			Language of instruction	English
[Overview and purpose of the course]										
This course provides the knowledge on geoenvironmental engineering related to environmental geotechnics, remedial technologies, disaster mitigation and ground improvement/reinforcement.									onmental geotechnics,	
[Course o	bjectiv	es]								
The goal of this course is to understand how geotechnical engineering contributes to disaster prevention and environmental issues.									isaster prevention and	
[Course s	chedul	e and co	ntent	s]						
[Course schedule and contents] Environmental geotechnics,6times,Remediation of contaminated soils and groundwaters, waste containment, and reuse of waste materials in geotechnical applications, are introduced Ground improvement,2times,Principles of ground improvement are introduced Geo-disaster,2times,Measures against geo-disasters are introduced Class feedback,1times,Remedial technics are introduced Class feedback,1time,Confirmation of understanding [Course requirements] Soil mechanics I and Exercises (35080) [Evaluation methods and policy] Final exam (70%) and class works (30%) [Textbooks] Handouts will be distributed.										
Marcel Dek	nce bo Reddy, ker, Inc.	oks) Hilary I. Ii isbn{}{08	32470	0457}						and Applicationsrdquo, 80727741875}

未更新

Continue to Geoenvironmental Engineering(2) $\downarrow \downarrow \downarrow$

	未更新
Geoenvironmental Engineering(2)	Course number U-ENG23 33529 LE73 U-ENG23 33529 LE77
Tôngh agtria de las (annantias and antiqui)	Course title Instructor's Graduate School of Engineering
[Study outside of class (preparation and review)] There is one lecture for which Computer programming using FORTRAN is practiced; so please review FORTRAN and bring your own device to the class on the day specified by instructor.	(and course title in English) Rock Engineering Rock Engineering name, job title, and department of affiliation Professor,KISHIDA KIYOSHI Figure 2 Figure 2 Figure 2 Figure 2 Figure 2
(Other information (office hours, etc.))	Target year Students or above Number of credits 2 Year/semesters 2021/Second semest
o specific office hour is scheduled. Please contact the instructors individually.	
Please visit KULASIS to find out about office hours.	Days and periods Tue.2 Class style Lecture Language distinctor English
Courses delivered by instructors with practical work experience]	[Overview and purpose of the course] Unlike soil, rock is strong and hard materials consisting of solid aggregates of various minerals. Still, rock
1) Category course with practical content delivered by instructors with practical work experience 2) Details of instructors' practical work experience related to the course 期 8.5年 3) Details of practical classes delivered based on instructors' practical work experience	mass is different from concrete because it is not merely a mixture of materials binding together but it has undergone geological process and formed structural discontinuities. Therefore, strength of rock mass is controlled by planes of weakness and extents of fractures. Moreover, water can have impact on rocks, not by breaking rock into pieces, but rather breaking rock into block through permeable discontinuities. Design an construction technology of rock structures (such as tunnel, rock slope, dam), geology, mechanical properties of rock and rock fracture, laboratory tests and field measurements of rock and rock mass are introduced in this lecture.
	[Course objectives] This lecture aims to provide basic understanding of engineering properties of rock and rock masses for applications in both civil engineering works and mining operations. Design exercise of rock structure is also introduced.
	[Course schedule and contents]
	 3) Discontinuity and surface roughness 4) Description of discontinuous planes 5) Griffith and Hock-Brown failure criteria 6) Fractures in rock mass 7) Hydro-mechanical behaviors in rock 8) Mid-term examination 9) Geological survey and geophysics 10) Seepage in fractured rock 11) Subsurface stresses and measurements 12) Application to plane failure of slope 13) Application to plane failure of slope 14) Application to understanding
	Continue to Rock Engineering(2)↓↓
	未更新
Rock Engineering(2)	Course number U-ENG23 33530 LE73
[Course requirements] None [Evaluation methods and policy]	Course title (and course title in English) Design for Infrastructure II Instructor's name, job title, and department of affiliation Graduate School of Engineering KANKEI KYOIN Graduate School of Engineering Kankei Kyoin Graduate School of Engineering Kankei Kyoin Graduate School of Engineering Associate Professor, ONDA SHINICHIRG
Mid-term exam (35%), Final exam (40%), report and classworks (25%)	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second semester
[Textbooks]	

ome handouts are distributed thru KULASIS or PanDA.

[References, etc.] (Reference books)

ldquoIntroduction to Rock Mechanicsrdquo, R.E. Goodman, John Wiley amp Sons isbn{} {0471617180} ldquoEngineering Rock Mechanicsrdquo, J.A. Hudson and J.P. Harrison, Pergamon isbn{} {9780080438641}

IdquoFundamentals of Rock Mechanicsrdquo, J.C. Jaeger, N.G.W. Cook and R.W. Zimmerman, Blackwell Publishing isbs{}{9780632037597} IdquoRock Mechanicsrdquo, Society of Materials Science, Japan (in Japanese) isbn{}{4765516288}

[Study outside of class (preparation and review)]

Quiz during lecture encourages students to review lecture contents before class (Other information (office hours, etc.)) Prof. Kiyoshi KISHIDA Office: Department of Urban Management, C1-3-265 Smooth Department of Orban Management, C1 9 200 E-mail: kishida.kiyoshi.3r@kyoto-u.ac.jp Assoc.Prof. Thirapong PIPATPONGSA Office: Department of Urban Management, C1-2-236 E-mail: pipatpongsa.thirapong.4s@kyoto-u.ac.jp) *Please visit KULASIS to find out about office hours.

Language of instruction English Class style Lecture Days and periods Tue.4 [Overview and purpose of the course] Civil Engineering widely contributes to our society. This course explains Civil Engineering from the viewpoint of how technology and knowledge is applied and integrated for a safe, comfortable and sustainable society. This class consists of lectures not only from academic staffs but also visiting lecturers and it is expected to comprehensive teach what is Civil Engineering including the expected roles and ethics for civil engineers. [Course objectives] To understand how technology and knowledge cultivated in Civil Engineering contributes to the promotion of social infrastructure, prevention or diminishment of disaster, and creation of environment. Furthermore, by overviewing the current research trend, it is expected to comprehend the challenges and future directions of Civil Engineering. [Course schedule and contents] Expected role for Civil Engineers,2times,Firstly, the outline of this course is explained. Then, reflecting the current examples, the role and the field related to civil engineers are explained. Finally, the ethics for Civil Engineers are explained. Application of Civil Engineering to the society, 7times, It is explained how technology and knowledge cultivated in Civil Engineering contributes to the promotion of social infrastructure, prevention or diminishment of disasters, and creation of environment. Concretely, the relationship between the academic studies and the application to practice, and the real image of Civil Engineering are explained from the viewpoint of major fields where many Civil Engineers work. Understanding the currentresearches in Civil Engineering, Stimes, Firstly, the research trend in Civil Engineering, which aims to realise safe, comfortable and sustainable society, is explained. Then, each student selects specific research field based on his/her interests and investigates their research topics and future directions Achievement assessment, I time, The achievement of the lecture is assessed. [Course requirements] one [Evaluation methods and policy] The grade is evaluated based on the record of attendance and reports assigned by lecturers. Continue to Design for Infrastructure $II(2) \downarrow \downarrow \downarrow$

sign for Infrastructure II(2)	大更 Course number U-ENG23 33531 LE73
extbooks]	Course title (and course title in English) Water Resources Engineering Water Resources Engineering Instructor's name, job title and department of affiliation Graduate School of Engineerin Professor, TACHIKAWA YAS English) Water Resources Engineering Instructor's name, job title of affiliation Graduate School of Engineerin Professor, HORI TOMOHARU Graduate School of Engineerin Associate Professor, IM SUN
eferences, etc.]	Target year Brd year students or above Number of credits 2 Year/semesters 2021/Second sem
Reference books)	Days and periods Wed.1 Class style Lecture Language districtor English
	[Overview and purpose of the course]
dy outside of class (preparation and review)] her information (office hours, etc.))	Methodology for water resources development, management and conservation is introduced from the engineering viewpoint. Main topics are distribution of water resource on the earth, grasp and prediction of water demand, planning and design of water resources systems, estimation and prediction of river flow, policy and water rights, and operation of reservoirs.
ase visit KULASIS to find out about office hours.	[Course objectives] The goal is to understand the basic theory and methodology for water demand prediction, water resource systems design, river flow estimation, water resources policy and reservoir operation.
ourses delivered by instructors with practical work experience]	[Course schedule and contents]
Category omnibus course delivered by invited lecturers and guest speakers from different companies, etc.	Water resources systems planning, ltime, Target of water resources engineering. Temporal and spatial distribution of water resources on the earth.
Details of instructors' practical work experience related to the course	Development of water resources,2times, Concept and measures of water resources development. Efficiency and limit of water resources develop
3) Details of practical classes delivered based on instructors' practical work experience	Design of water resources systems, l time, Estimation of water demand and design of water resources systems.
	Operation and management of water resources systems, 2times, Planning and management, off-line and real time operation, optimization of reservoir control.
	Social and legislation system for water resources, ltime, Social and legislation system for water resources, water right, public and private water, management and defect.
	Water resources evaluation (1): Hydrologic predictions,1time, Hydrologic predictions play an important role for water resources evaluation. The basic role of hydrologi predictions for a river planning and river management are explained.
	Water resources evaluation (2): Hydrologic frequency analysis,4times, The basis of the hydrologic frequency analysis is explained. Hydrologic variables used for the river plant and water resources planning are introduces as probabilistic variables; the concept of non-exceedance an exceedance probability and T-year probabilistic hydrologic variables are explained. Then, the procedure hydrologic frequency analysis, distribution functions used for the frequency analysis, and estimation met Continue to Water Resources Engineering
ter Resources Engineering(2)	Course number U-ENG23 33532 LE73
arameters of a distribution function is described.	Course title Instructor's Graduate School of Engineerin
er resources evaluation (3): Real-time hydrologic forecasting,2times, hods for real-time rainfall forecasting and river discharge forecasting are focused.	(and course title in English) River Engineering name, job title, and department of affiliation Associate Professor,ONDA SHINICH Disaster Prevention Research In Associate Professor,TAKEMON YASI
evement confirmation, 1 time,	Target year Students or above Number of credits 2 Year/semesters 2021/Second sem
vement assement is intended to measure students knowledge, skill and aptitude on the subject.	
urse requirements]	Days and periods Wed.2 Class style Lecture Language of instruction English [Overview and purpose of the course]
	This subject deals with a wide range of basic knowledge on rivers required to make an integrated river ba
desirable that students have already learned fundamental hydrology and systems analysis for planning	management plan based on natural amp social sciences and engineering. The contents included in this su
nanagement.	
	are described as follows: various view-points in relation to river systems, long term environmental chang rivers and their factors, river flows and river channel processes, structure and function of river and lake ecosystems, recent characteristics of flood disasters, integrated river basin planning including flood contr

[References, etc.]

(Reference books) Introduced during class

[Study outside of class (preparation and review)]

It is necessary to review based on lecture materials and to complete the report assignments given during the lecture.

(Other information (office hours, etc.))

Active participation is expected in the lectures through questions and so forth. The content and number of lectures may change depending on circumstances. In addition, some lecture items may be replaced with special lectures given by researchers and others outside the university on current topics.

*Please visit KULASIS to find out about office hours.

 Course number
 U-ENG23 5332 LE73

 Course number
 U-ENG23 5332 LE73

 Course number
 Course number
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 Course number
 River Engineering
 Instructor's name, job tits, and department of second participation of second participation of affiliation
 Graduate School of Engineering

 Target year
 ad year students or abov
 Number of credits
 2
 Year/semesters
 2021/Second semester

 Days and periods
 Wed.2
 Class style
 Lecture
 impagified to the subject are to subject are subject are described as follows: various view-points in relation to river systems, long term environmental changes of rivers and their factors, river flows and river channel processes, structure and function of river and lake ecosystems; creent characteristics of flood disasters, integrated river basin planning including flood control, sustainable reservoir management, nature restoration, and sediment transport management.

 ICourse schedule and contents]
 Precipitation, water view and fixer basins, ltime, Various viewpoints on rivers and river basins, Vvrious rivers and river basins, ltime, Various viewpoints on rivers and river basins, Vvrious rivers and river channel processes, dimes, law, of Analysis

 River individual by drawing and main factors
 Precipitation, and Rain Fall Rum-off Analysis

 River individual by drawing and main factors
 Precipitation of numerical hydraulics to environmental issues, ltime, Relati

River Engineering(2)	Course n	umber	U-F	ENG23	33534 P	E73				未更新
dams, asset management of dam reservoirs, management of sediment dynamism for integrated river planning, etc. Integrated river basin planning,3times.(1) River environmental improvement plan, Normal discharge, River restoration projects, Environmental assessment, etc. (2) Classification of river structures and their functions, Impact assessment for construction of dam reservoirs and estuary barrages, etc. (3) Comprehensive	Course title (and course title in English)		ational In ational In				Instructo name, jo and dep of affilia	b title, artment		l of Global Environmental Studies ofessor,TAKAI ATSUSHI
impact assessment for construction of dam reservoirs and estuary barrages, etc. (5) Comprehensive management of sediment outflow and sediment budgets in river basins, concepts of recent sediment control dams, asset management of dam reservoirs, management of sediment dynamism for integrated river planning,	Target yea	n r Br	d year stude	ents or abo	ve Numl	ber of c	redits 2	Yea	ar/semesters	2021/Intensive, Second semester
etc.	Days and peri	ods In	tensive	Cla	ss style	e Pra	ctical trainin	ıg	Language of instruction	English
Confirmation of understanding, Itime, Students can check their understanding giving questions to Hosoda and Takemon.	[Overview	and	purpos	e of th	e cours	se]				1
[Course requirements] Elementary knowledge of Hydraulics, Hydrology and Ecology	planning an This intern	d mana ship wi	agementr	dquo, e	tc) on re ide pract	al societ	y. 1	ain at for	1 /	ldquoinfrastructure on or enterprise in Japan
[Evaluation methods and policy]	[Course o	bjecti	ives]							
Mainly regular examination. Quiz in classes, attendance and reports are considered for grading to some extent.										ngrsquos methodology
[Textbooks]	in real socie of business.		l to induc	ce high	motivati	on of tec	hnical capac	ity impro	ovement throu	ugh practical experience
Printed materials on the contents will be distributed in each lecture.	[Course s	chedu	ule and	conte	nts]					
[References, etc.]									internship in A	August or uld submit daily work
(Reference books)	report to ins Individual r meeting wil meeting.	tructer eport n l be ho	: neeting,1 Id by sel	(Octob ected ir	er)times nterview	Instructe,	er will arranş ıty teacher).	ge indivis Students	isual report me s should repor	eeting. Individual t to interviewer in this Each students should
(Related URLs) (http://www.geocities.jp/kyoto u rivereng/)									erviewer in th	
	[Course r	oquire	montel							
[Study outside of class (preparation and review)]	-				on meeti	ng for 3r	d year stude	nt in Apı	ril.	
(Other information (office hours, etc.))	[Evaluation Final preserve					work re	port, summa	ry report	rt): 50-60%	
Students can contact with instructors by sending e-mail to hosoda.takashi.4w@kyoto-u.ac.jp amp takemon.			10 5070	, 100001			port, summ	i y repon		
yasuhiro.5e@kyoto-u.ac.jp.	[Textbool None	(s]								
*Please visit KULASIS to find out about office hours.	None									
									Continue to Inte	ernational Internship(2) $\downarrow \downarrow \downarrow$

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I	Course num	iber U-ENG23	33535 LE73					
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	Target year	Brd year students or abo	Number	of credits	2	Year/se	emesters	2021/Second semester
cants for employing institute of internship	Days and periods	Fri.3 Clas	ss style	Lecture		Lar	nguage of instruction	English
	[Overview and	nd purpose of the	e course]					
	To understand	fundamentals of des	ign theory f	or civil infr	astructur	res. To exp	plain vario	us design loads,
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xperience]		n, demand performa		gn structure	es consid	lering relia	ability, opt	imal design,
	serviceability, a	aesthetics, and envir	onment.					
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e course	[Course obje							
course		fundamentals of des						
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		fundamentals of ear	thauaka ma	chanism and	1 coiemic	rechonce	of structu	res seismic load and
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	seismic design. Introduction of The concept an design process, explained. Introduction of classification o characteristics and Prediction of ec earthquake groov vibration. Equa order to estiman basis of theorie Characteristics strong wind are (vortex-induced geometric shap Limit state of s	tedule and conter f design theory of cir and significance of d , mechanical design. f load, 3times, Design of design loads are e: of random loads, ic arthquake ground m yund motion are intra tation of motion for t und motion are intra tatien of motion for t the earthquake respo- es of elasticity and p s of natural wind and e explained and prox d vibration, gallopir se and their generati structure and reliabil	nts] il infrastruc sign, object multi-level loads for ci cplained anc. seismic loa seismic loa seismic loa seismic loa seismic loa duced bassen he single dej seo of struct lasticity. aerodynam g, flutter, bl on mechanisi ty analysis,	sture,2times tive of desig decision m vil infrastru their quan d and wind and wind rthquake re d on the the gree of free ure. Design gree of free ure. Design tics of struct n wind for r uffeting, etc m are expla 3times,The	s,Design gn, chara aking ar actures at titative e load, ar sponse c ories of d dom syst method: sures,2tir structure c.) acting uined.	theory of cteristics of e discusse re introduc expression of structure earthquak tem and it s for infra- mes.The cl es is discus on structure of structure con structure necetanitie	civil infras of civil infra- of civil inf d. Enginee ced. The cl is discusse ad. e,2times, we mechanis is solution is structures is haracteristi ssed. And wural section ral safety a es in variou	structures is introduced. rastructures, flow of rring ethics are also haracteristics and ed. Especially statistic fethods for predicting sm and ground is also explained in are interpreted on the ics of natural wind and various aerodynamics n with various nalysis is introduced is actions to structures
	seismic design. Introduction of The concept an design process, explained. Introduction of classification o characteristics and Prediction of ec earthquake groov vibration. Equa order to estiman basis of theorie Characteristics strong wind are (vortex-induced geometric shap Limit state of s	tedule and conter f design theory of cir and significance of d , mechanical design. f load, 3times, Design of design loads are e: of random loads, ic arthquake ground m yund motion are intra tation of motion for t und motion are intra tatien of motion for t the earthquake respo- es of elasticity and p s of natural wind and e explained and prox d vibration, gallopir se and their generati structure and reliabil	nts] il infrastruc sign, object multi-level loads for ci cplained anc. seismic loa seismic loa seismic loa seismic loa seismic loa duced bassen he single dej seo of struct lasticity. aerodynam g, flutter, bl on mechanisi ty analysis,	sture,2times tive of desig decision m vil infrastru their quan d and wind and wind rthquake re d on the the gree of free ure. Design gree of free ure. Design tics of struct n wind for r uffeting, etc m are expla 3times,The	s,Design gn, chara aking ar actures at titative e load, ar sponse c ories of d dom syst method: sures,2tir structure c.) acting uined.	theory of cteristics of e discusse re introduc expression of structure earthquak tem and it s for infra- mes.The cl es is discus on structure of structure con structure necetanitie	civil infras of civil infra- of civil inf d. Enginee ced. The cl is discusse ad. e,2times, we mechanis is solution is structures is haracteristi ssed. And wural section ral safety a es in variou	structures is introduced. rastructures, flow of rring ethics are also haracteristics and ed. Especially statistic fethods for predicting sm and ground is also explained in are interpreted on the ics of natural wind and various aerodynamics n with various nalysis is introduced
	seismic design. Introduction of The concept an design process, explained. Introduction of classification o characteristics and Prediction of ec earthquake groov vibration. Equa order to estiman basis of theorie Characteristics strong wind are (vortex-induced geometric shap Limit state of s	tedule and conter f design theory of cir and significance of d , mechanical design. f load, 3times, Design of design loads are e: of random loads, ic arthquake ground m yund motion are intra tation of motion for t und motion are intra tatien of motion for t the earthquake respo- es of elasticity and p s of natural wind and e explained and prox d vibration, gallopir se and their generati structure and reliabil	nts] il infrastruc sign, object multi-level loads for ci cplained anc. seismic loa seismic loa seismic loa seismic loa seismic loa duced bassen he single dej seo of struct lasticity. aerodynam g, flutter, bl on mechanisi ty analysis,	sture,2times tive of desig decision m vil infrastru their quan d and wind and wind rthquake re d on the the gree of free ure. Design gree of free ure. Design tics of struct n wind for r uffeting, etc m are expla 3times,The	s,Design gn, chara aking ar actures at titative e load, ar sponse c ories of d dom syst method: sures,2tir structure c.) acting uined.	theory of cteristics of e discusse re introduc expression of structure earthquak tem and it s for infra- mes.The cl es is discus on structure of structure con structure necetanitie	civil infras of civil infra- of civil inf d. Enginee ced. The cl is discusse ad. e,2times, we mechanis is solution is structures is haracteristi ssed. And wural section ral safety a es in variou	structures is introduced. rastructures, flow of rring ethics are also haracteristics and ed. Especially statistic fethods for predicting sm and ground is also explained in are interpreted on the ics of natural wind and various aerodynamics n with various nalysis is introduced is actions to structures

International Internship(2)

[References, etc.] (Reference books)

None

[Study outside of class (preparation and revie

(Other information (office hours, etc.)) Priority is given to the international course student who program are a large number.

*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practic

(1) Category A course that includes off-campus training classes.

(2) Details of instructors' practical work experience

(3) Details of practical classes delivered based on instru

E & WR of S. & RSDP(2)

and the resistance of structures, the design methods such as allowable stress method, limit states method with partial safety factors will be discussed in conjunction with reliability analysis. Seismic design, wind resistant design, optimal design, and landscape design,3times,Seismic design, wind resistant design, optimal design and landscape design for various structures, including long span bridge.

[Course requirements]

Probabilistic and Statistical Analysis and Exercises(35050), Dynamics of Soil and Structures(35120), Structural Mechanics I and Exercises(35110), Structural Mechanics II and Exercises(35140), and Fluid Mechanics.

[Evaluation methods and policy]

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Please visit KULASIS to find out about office hours.

Based on the performance during the course (including homework) and the results of a final examination

Office hour (contact information and consultation hours) of the lecturer will be given in the first lecture.

[Textbooks] Hand-outs are distributed when necessary

[References, etc.]

(Reference books)

tudents are expected to understand the mechanical behaviors of RC and PC structures members such as eams and collumns, based on the fundamentals learned in this course.

[Course schedule and contents]

Course number

Course title

(and cours

Farget year

Days and periods Wed.5

ructure are explained.

[Course objectives]

title in

English)

Introduction, 1 time, Introduction of concrete structures (RCampPC) Fundamental of design, 2 times, Design code and specifications

U-ENG23 33536 LE73

3rd year students or above Number of credits 2

Class style

Concrete Engineering

Concrete Engineering

[Overview and purpose of the course]

Materials, I time. The mechanical behavior of concrete, reinforcing steel and others are explained

Finding that one incommendation of control of the service of the s oment and/or the uniaxial force are explained

Lecture

The basic analysis theory and the design technique of reinforced concrete (RC) and prestressed concrete (PC)

Instructor's

name, job title, and department of affiliation

Shear behavior, 2 times, The mechanical behavior and the capacity of RC section subjected to the shear are explained

Crack and deflection,2times,Cracking mechanism and evaluation of deflection of RC member are explained. Prestressed concrete I,1time,Effects of Prestressing Prestressing steel concrete for prestressed construction Prestressed concrete II.1 time. Elastic flexural analysis Flexural strength

Confirmation of understanding of lecture, l time, A confirmation of understanding of lecture is examined

[Course requirements]

Students of this class had better take lsquoStructural Mechanics I and Exercises (30080)rsquo in 2nd year and squoConstruction Materials (30240)rsquo in 3rd year.

[Evaluation methods and policy] rading is based on the result of final examination and reports

Continue to Concrete Engineering(2)↓↓↓

未更新

2021/Second semester

Graduate School of Engineering Associate Professor, AN RIN

inquage of instruction English

Year/semesters

Concrete Engineering(2)

[Textbooks]

Arthur H.Nilson, David Darwin and Charles W.Dolan: Design of Concrete Structures, Mc Graw Hill,2010 isbn{} {0073293490}

[References, etc.] (Reference books

K. Kobayashi: Concrete Engineering, Morikita Publishing Co., Ltd., 3,240JPY isbn{} {9784627425651} James K. Wight, James G. MacGregor: Reinforced Concrete Mechanics amp Design, Pearson, 2010 isbn {}{ 9780132176521}

[Study outside of class (preparation and review)]

(Other information (office hours, etc.)) Please visit KULASIS to find out about office hours

未更新 Course number U-ENG23 33537 EE73 Graduate School of Engineering Professor, TAKAHASHI YOSHIKAZU Graduate School of Engineering Professor, YAGI TOMOMI Disaster Prevention Research Institute Professor,IGARASHI AKIRA Disaster Prevention Research Institute Professor,SAWADA SUMIO Graduate School of Engineering Associate Professor.AN RIN Graduate School of Engineering Associate Professor, KITANE YASUO Course title (and course CP & Exp on Struct M name, job title, and department itle in Computer Programming and Experiment on Structural Mechanic Graduate School of Engineering Associate Professor, SAITOU JIYUN English) of affiliation Graduate School of Engineering Associate Professor, FURUKAWA AIKO Disaster Prevention Research Institute Associate Professor, GOTOU HIROYUKI Associate Professor, GO TO MIRO FOR Graduate School of Engineering Senior Lecturer, Chang, Kai-Chun Graduate School of Engineering Assistant Professor, UEMURA KEITA Graduate School of Engineering Assistant Professor, NOGUCHI KYOHEI Brd year students or above Number of credits Year/semesters Farget vear 2021/Second semester Days and periods Fri.4,5 Class style Semina anguage of instructio English [Overview and purpose of the course] Practical understanding and application of the theory that have been learned in Structure mechanicsIand Exercises and Structure mechanicsIIand Exercises. To learn the measurement technique on strain, deflection and vibration in experiment, and the fundamentals/ application on computer programming for matrix methods for structural analysis in computational exercise which are needed for understanding the mechanical properties of member and/or structure. [Course objectives] To understand the fundamentals of measurement of strain, deflection and vibration To deeply understand theory of structure mechanics by beam experiment To understand numerical analysis approach of structures by use of matrix methods To deeply and synthetically understand mechanical behaviors and validation methods of structures by mparing the experimental results with those resulted from matrix methods [Course schedule and contents] Introduction 1 time Explanation of the significance and the role of structural experiment and computer analysis Introduction of relationship among structural mechanics, structural experiment and computer analysis, and examples of ractical failure structures ------

Continue to CP & Exp on Struct $M(2) \downarrow \downarrow \downarrow$

CP & Exp on Struct M(2)	Course number U-ENG23 43538 GE14 U-ENG23 43538 GE73
tructural Experiment, 6 times ntroducing fundamentals of experiment method and measurement technique for structure model, 5 xperiments (cantilver, frame, metal, vibraition test, concrete)	Course title (and course title in English) Graduation Research Instructor's name, job title, and department of affiliation Graduate School of Engineering Professor, TAKAHASHI YOSHIKAZ Graduate School of Engineering Associate Professor, ONDA SHINICHIRU
Computer Analysis, 7 times Computation of the global stiffness matrix, boundary condition, solution procedure, calculation of strain, Visualization, Numerical analysis of a simple beam, Numerical analysis of the test cases (flexural deflection	Target year tudents or above Number of credits 5 Year/semesters 2021/Intensive, year-round
f and a frame)	Days and periods Intensive Class style Seminar Language distuction English
eeback lecture, 1 time	[Overview and purpose of the course]
Review structural experiments and computer analysis. Confirm the attainment level of learning	To acquire the skills of grasping the trends of research related to the educational administration and policy,
[Course requirements]	and basic skills of the master's thesis writing along with the improvement of writing skills. At the same time, students will learn writing strategies for submitting their papers to an academic journal.
CompuTer Programming in Global Engineering, Structure mechanics I and Exercises, Structure mechanics II	
ind Exercises	[Course objectives]
[Evaluation methods and policy]	 To be able to grab the trends of research and read previous studies thoroughly and critically.
Grade is given based on attendance and reports.	To acquire the ability of pursuing the originality and learn ethics, structures, and
Experiment: 50 points (each experiments 10 points), Computer programming:50 points	writing styles that are required to write the thesis to carry out their research.
Evaluation of experiment and computer programming must be over 30 points.	[Course schedule and contents]
[Textbooks]	We will provide tutorials according to the progress of individual students' graduation thesis regarding "
To be distributed in lectures	Decide on the theme of thesis", "Collecting previous studies, and critical considerations, Examination of
	research methods", "Investigation of materials", "Reading materials", "Consideration of writing the
	", etc. It will be conducted based on their theme of studies.
[References, etc.]	The indication of course goals is as shown as below(half of a year).
(Reference books)	Week1, 2: Decide the theme of thesis
	Week3-5: Collecting previous studies and critical considerations, Examination of research methods
	Week6-9: Investigation of materials
[Study outside of class (preparation and review)]	Week10-12: Reading materials
Students will review frame analysis.	Week13-15: Consideration of writing thesis
(Other information (office hours, etc.))	[Course requirements]
Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her	Satisfying the graduation requirement and conditions for starting graduation research
first lecture.	Envelopeting grothede and golievi
*Please visit KULASIS to find out about office hours.	[Evaluation methods and policy]
These visit KOENDID to find out about office nouis.	Based on thesis and presentation and review results
	Continue to Graduation Research(2)↓
] [
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]	
Graduation Research(2)	Course number U-ENG23 33539 LE73
aduation Research(2)	Course number U-ENG23 33539 LE73
Graduation Research(2)	Course number U-ENG23 33539 LE73 Graduate School of Engineering Professor,GOTOH HITOSHI

[References, etc.]

(Reference books) consult with supervisor

<u>^</u>

[Study outside of class (preparation and review)]

onsult with supervisor

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours

Associate Professor,KHAYYER ABBAS ourse title Instructor's name, job title, and department of affiliation (and course Coastal Engineering Associate Professor,HARADA EIJI Graduate School of Global Environmental Studies Associate Professor,HARADA EIJI Graduate School of Engineering Assistant Professor,IKARI HIROYUKI title in English) Coastal Engineering Graduate School of Engineering Assistant Professor, Yuma Shimizu Year/semesters 2021/First semester Brd year students or above Number of credits 2 Target year Language of instruction English Days and periods Tue.4 Class style Lecture [Overview and purpose of the course] Fundamental items related to coastal engineering (i.e., coastal process, sediment transport, near shore current, shoaling, irregular wave, tsunami, storm surge, tidal wave, wave force)are to be lectured. Especially, sediment transport controlling physical environment significantly around coastal area is to be explained systematically together with river sediment transport. [Course objectives] Our goal is systematic understanding of fundamental hydraulic phenomena around coastal zone which is indispensable for designing coastal environment. [Course schedule and contents] Introduction to Coastal Engineering[1time]: Introduction to coastal engineering with focusing on beach deformation Small Amplitude wave theory[2times] Characteristics of small amplitude wave theory and its application are explained. Wave Statistics / Wave Transformation[2times]: Developing process of wind wave and expression method of irregular waves are explained. Mechanics of wave transformation is outlined. Wave Force on Coastal Structures[1time]: Several experimental formulae of wave force acting on coastal structures are introduced. Problems for stability of rubble mound is mentioned. Design of Coastal Structures (Exercise)[1time]: Exercise of design of coastal structure Introduction to Computational Design of Coastal Structures[1time]: State-of-the-art numerical wave flume and its applications are explained. Sediment Hydraulics[4times]: Sediment hydraulics (i.e., basic characteristics, calculation of river-bed, bed load and suspended load, nonnt nydraunes (ne, basic characterize) Continue to Coastal Engineering(2)↓↓↓

Coastal Engineering(2)	Course number U-ENG23 43999 GJ14 U-ENG23 43999 GJ73 U-ENG23 43999 GJ77
quilibrium sediment transport) is explained.	Course title (and course 特別研究(土木工学コース) Instructor's name, job title, Professor, KIMURA MAKOTO
Vearshore Current / Coastal Sediment Transport[1time]: Near-shore current due to wave deformation and resultant coastal sediment transport are outlined.	title in English) Graduation Thesis Graduation Thesis and department of affiliation of affiliation discrete for the formula formula formula and department of affiliation discrete formula and department and depart
sunami and Storm Surge: Evacuation Planning under Coastal Disasters[1time]: Characteristics of tsunami and storm surge are explained. Additionally, evacuation process and evacuation	Target year 4th year students or above Number of credits 5 Year/semesters 2021/Intensive, year-round
lanning are introduced.	Days and periods Intensive Class style Seminar Laquagedistrution Japanese
Achievement confirmation[1time]: Comprehension check of course contents.	[Overview and purpose of the course] To acquire the skills of grasping the trends of research related to the educational administration and policy,
reedback	and basic skills of the master's thesis writing along with the improvement of writing skills. At the same time, students will learn writing strategies for submitting their papers to an academic journal.
[Course requirements]	[Course objectives]
To have already completed the class of Hydraulics and Exercises is desirable.	• To be able to grab the trends of research and read previous studies thoroughly and
[Evaluation methods and policy]	 critically. To acquire the ability of pursuing the originality and learn ethics, structures, and
Based on the results of examinations	writing styles that are required to write the thesis to carry out their research.
	[Course schedule and contents]
[Textbooks]	We will provide tutorials according to the progress of individual students' graduation thesis regarding "
Aandout is used in the lectures as needed.	Decide on the theme of thesis", "Collecting previous studies, and critical considerations, Examination of research methods", "Investigation of materials", "Reading materials", "Consideration of writing the
[References, etc.]	", etc. It will be conducted based on their theme of studies.
(Reference books) Supplemental textbook is announced in the first lecture.	The indication of course goals is as shown as below(a half year). Week1, 2: Decide the theme of thesis Week3-5: Collecting previous studies and critical considerations,
(Related URLs)	Examination of research methods
(Non)	Week6-9: Investigation of materials Week10-12: Reading materials
Robushy autorida of alage (anonamation and review)]	Week13-15: Consideration of writing thesis
[Study outside of class (preparation and review)] Review the lecture contents.	[Course requirements]
teview me lecture contents.	Satisfying the graduation and conditions for starting graduation research.
(Other information (office hours, etc.))	Sausrying the graduation and conditions for starting graduation research.
Reexamination is not provided.	[Evaluation methods and policy]
How to contact with instructors is announced in the first lecture.	Based on thesis, presentation and review results.
Please visit KULASIS to find out about office hours.	
	Continue to 特別研究(土木工学コース)(2)↓

特別研究(土木工学コース)(2)	Course number U-ENG23 43999 GJ14 U-ENG23 43999 GJ73 U-ENG23 43999 GJ77
[Textbooks] consult with your supervisor	Course title (and course title in English) お別研究(資源工学コース) Graduation Thesis Instructor's name, job title, and department of affiliation Structure of affiliation Graduate School of Engineering Associate School of Engineering Associate School of Engineering Associate School of Engineering
[References, etc.]	Target year 4th year students or above Number of credits 5 Year/semesters 2021/Intensive, year-round
(Reference books)	
consult with your supervisor	Days and periods Intensive Class style Seminar Language distructor Japanese
[Study outside of class (preparation and review)]	[Overview and purpose of the course]
consult with your supervisor	資源工学コース所属の教員の指導のもとにテーマを決め研究を遂行し、研究計画、データ取得、論 議の進め方などを修得するとともに、得られた研究成果を「特別研究論文」としてまとめる。
(Other information (office hours, etc.))	年度後半に開催される特別研究発表会にて研究発表を行い、研究内容を分かりやすく発表し、質問 に適切に答えるスキルを身につける。
*Please visit KULASIS to find out about office hours.	に過りに合んる人ヤルで芽につける。
	[Course objectives]
	研究計画、データ取得、論議の進め方、研究成果のまとめ方、発表のスキル等、研究を遂行する上 で必要な能力を養う。
	[Course schedule and contents] 集中講義・演習形式のため進捗に応じて変動はあるが、大きく分けて下記の通りである。
	条中調我・便智形式のだめ進歩に応じて変動はのるか、人きく力けて下記の通りである。
	第1回 資源工学コース所属の教員の指導のもと,具体的な研究テーマの検討と決定を行う.また,論議 の進め方や研究に際して安全衛生上の留意点を講述する.
	第2回〜第74回 各自の研究テーマに応じて,研究計画の設定(2~10回),先行研究の調査と検討(11~20回), 研究方法の吟味(20~30回),データ収集(31~55回),得られた結果の考察(56~65回)などを 行う。また適宜,研究発表を通した論議,論文執筆の検討を実施する.毎回の予定は進捗に応じて その都度調整する.
	第66回〜第75回 研究・調査の成果と残された課題を特別研究論文としてまとめる.また第75回に,特別研究発表 を実施する.

別研究(資源工学コース)(2)	Course number U-ENG23 43999 GJ14 U-ENG23 43999 GJ73 U-ENG23 43999 GJ77
Course requirements] 源工学コースの研究室に配属されることが必須となる。	Course title (and course title in English) ないのでのでは English) ないのでのでは Fillの研究(環境工学コース) Craduate School of Engineering Craduate School of Engineering Associate Professor, TOH SADAHIKO Graduate School of Engineering Associate Professor, YOKO SHIM
Evaluation methods and policy]	Target year 4th year students or above Number of credits 5 Year/semesters 2021/Intensive, year-ro
員の指導のもとに「特別研究論文」を作成・提出すること、さらに特別研究発表会で研究発表を うことにより評価する。	Days and periods Intensive Class style Seminar Langua distution Japanese
[extbooks]	[Overview and purpose of the course]
ot used	Acquisition of ability to solve problems through taking an initiative to carry out a research subject of environment-related issues under the supervision of staffs of Environmental Engineering Course. To writ thesis of graduation study based on the research results and give a presentation.
References, etc.]	[Course objectives]
(Reference books) 導教員の指導によるものとする。	To understand and acquire research activities involving a subject set, development of a research plan, research implementation, writing a thesis, and making a presentation.
	[Course schedule and contents]
Study outside of class (preparation and review)] 員の指導のもとにテーマを決め研究を遂行するとともに、先行研究や関連する研究の論文や専門 を自主的に勉強することが望まれる。	(1) A research subject set (3 times): To set a research subject under supervision of staffs.
Other information (office hours, etc.))	 (2) Review of previous researches and investigation of research procedures (3 times): To collect and critically review literature of previous researches, and to investigate the research procedure
員の指導のもとに研究を遂行してください。	(3) Development of a research plan (3 times):To develop a research plan under supervision of staffs.
Please visit KULASIS to find out about office hours.	 (4) Experiments, survey and data analysis (15 times): To carry out experiments, survey, data analysis and so on under supervision of staffs.
	(5) Thesis writing (5 times): To write a thesis of graduation study based on the research results.
	(6) Presentation (1 time):To deliver presentation of the graduation study and discuss with examiners and audiences.
	[Course requirements]
	To meet the requirement for starting graduation research described in the Guidance of Global Engineerin about requirements for graduation and starting graduation research.

特別研究(環境工学コース)(2) [Evaluation methods and policy] Grade is evaluated by graduation research thesis which must follow the guideline for authors and its presentation. [Textbooks] To follow supervision of the staffs. [References, etc.] (Reference books) [Study outside of class (preparation and review)] To follow supervision of the staffs. (Other information (office hours, etc.)) To follow supervision of the staffs. *Please visit KULASIS to find out about office hours.