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[Outline an	nd Pi	urpo	se of t	the C	ourse]							
The course in	ıtrod	aces	theory of	of con	plex functi	ions and	its applica	ations				
[Course Go												
To understan calculate resi								expai	nsion and I	Laure	nt expansio	on. To
[Course So	ched	ule	and Co	onten	ts]	-	-					
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Definition of	com	plex	number	rs, con	nplex plane	and revi	iew of vec	tor a	nalysis			
Basic theory							é e e c				£	
Derivative of Cauchy's inte												
singularities,												
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Application							ons and th	eir pr		serres	, Clussifie	
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[Textbook]
Instructed during class

None.

[Reference books, etc.]

(Reference books) Introduced during class

[Regarding studies out of class (preparation and review)] A Report is assigned for every class for review.

(Others (office hour, etc.))

Only T1 and T2 class students can take the class.

Numbering	cc	ode									
		業数学B1(T3 gineering Math				dep	liated partment title,Na				ol of Engineering essor,SAITOU JIYUN
Target yea	ır	2nd year students of	or above Nurr	nber	of cred	its	2			e offered eriod	2019/Second semester
Day/period	1	Fri.3	Class st	yle	Lecture	e				Language	Japanese
-		Purpose of t									
The course ir	tro	oduces theory of	of complex	functi	ons and	its a	pplicat	ions			
[Course G	ba	ls]									
		he properties o es. To learn so						xpai	nsior	n and Laure	ent expansion. To
[Course So	:he	edule and Co	ontents]								
Preperation, 2 definition of		imes mplex number,	complex p	lane,	vector a	naly	sis				
Application of application of Confirmation The achieven	of c f re of	sidue theorem complex functi- esidue theorem f achievement, nt assessment is le on the subject	to integral 1 time s intended t	o mea	isure stu	dent					
[Class req	Jir	ement]									
Basic Calcult	15	(From the univ	ersity currie	culum	: Calcul	us A	and B	, Ad	lvano	ced Calculu	18 A).
[Method, P	oi	nt of view, a	nd Attainn	nent	levels	of E	valuat	ion]		
Evaluation w	ill	be based on as	signments ((13 or	14 time	s, 20)~30 pc	oints), an	ıd an exami	ination (70~80 points).
Students will	su	ıbmit all assign	ments.								
									- Co	ntinue to 工蕦	ἔ数学B1(T3 · T4)(2)

工学倫理(2)

medicines and food productions. Associated with it, problems of their safety and ethics are arising, which should be addressed by our societies. In this class, the recent progress in biology-related techniques, and problems we have and will have in near future are described. (M. Shirakawa: Industrial Chemistry) Patents and ethics (Part 1). (6/6) Itime. 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 comparisons to the patent systems in the world 's major countries and international framework. (M. Nakagawa: Electrical and Electronics Engineering)

Patents and ethics (Part 2). (6/13) Itime. Students, equipped with the basic knowledge of patent systems by the previous lecture, will get familiar with actual case studies on ethical and legal issues in patents. (M. Nakagawa: Electrical and Electronics Engineering)

Ethics required for advanced science. (6/27) 1time. Engineers and researchers are at the forefront of preventing harm caused by advanced chemistry. Think about social roles and ethics required by engineers and

preventing name caused by advanced chemistry. Think about social fores and entry required by engineers and researchers through relationships between chemical substances and environmental problems, efforts to avoid hazards of nanomaterials. (K. Miura: Industrial Chemistry)

Ethics in press release. (7/4) 1 time. Press Release is an essential process for introducing the research to our society through various medias. In this lecture, issues related to Press Release in University are addressed and discussed. (K. Umeno: Informatics and Mathematical Science) Failure accidents and inspection/maintenance (7/11) time. On the occasions of failure accidents of vehicles

Failure accidents and inspection/maintenance (7/11) 1time. On the occasions of failure accidents of vehicles and plants, the appropriateness of inspection/maintenance of their structures is often questioned. Some actual failure accidents are reviewed to discuss the importance of inspection/maintenance together with the relation to engineering ethics. (S. Biwa: Engineering Science)

to engineering ethics. (S. Biwa: Engineering Science) Ethics in nuclear engineering. (7/18) 1time. Discussion on engineering ethics in the TEPCO accident from view point of Tsunami evaluation by the Japanese government. (I. Takagi: Engineering Science) Ethical issues on sound design. (7/25) 1 time. Every working things consuming energy emits acoustic sound.

Ethical issues on sound design. (7/25) 1 time. Every working things consuming energy emits acoustic sound Even a small sound energy affect human as noise and may create annoyance and health problems. Sound problems of various things are introduced in the lecture. Ethical issues, which shall be considered during design and operation environment, will be discussed. (Y. Takano: Architecture)

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation] Class participation and reports.

[Textbook]

Lecture materials will be distributed

[Reference books, etc.]

(Reference books) ⁹Omnibus Engineering Ethics a (Kyoritsu Shuppan Co., Ltd.) ISBN:978-4320071964 ⁹Practical Engineering Ethics - A Short Course, New Edition a (Kagaku-Dojin Publishing Company,INC) ISBN:9784759811551 ⁹Engineering Ethics (Revised Edition) a (CORONA PUBLISHING CO.,LTD.) ISBN:978-4-339-07798-⁸ ⁹World of Engineering Ethics (3rd Edition) a (Morikita Publishing Co., Ltd.) ISBN:978-4-627-97303-9

Continue to 工学倫理(3)

工学倫理(3) [Regarding studies out of class (preparation and review)] The assignment of the report will be given for each lesson. (Others (office hour, etc.))

The class order is subject to change

*Please visit KULASIS to find out about office hours.

Numbering code Graduate School of Engineering Senior Lecturer,MAEDA MASAHIRO Graduate School of Engineering Senior Lecturer.MATSUMOTO RIYOUSUKE Affiliated Graduate School of Engineering Senior Lecturer, YOROZU KAZUAKI Course title 工学序論 department, Job title,Name <English> Introduction to Engineering Graduate School of Engineering Senior Lecturer, KANEKO KENTAROU Graduate School of Engineering Senior Lecturer, ASHIDA RIYUUICHI Course offered 2019/Intensive First competer 2019/Intensive, First semeste Target year lst year students or above Number of credits year/period Day/period Intensive Class style Lecture Language Japanese [Outline and Purpose of the Course] [Course Goals] [Course Schedule and Contents] 1~2times, 6times [Class requirement] Jone [Method, Point of view, and Attainment levels of Evaluation] [Textbook] [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours

Numbering	g code										
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Target ye	ear 2n	d year students o	or above	Number	of cred	its	1			e offered eriod	2019/Intensive, year-round
Day/perio	d Int	ensive	Cla	ss style	Semina	r				Language	Japanese
[Outline a	nd Pu	rpose of t	he C	ourse]							
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[Course G	ioals]										
work. [Course S Week 1, Gu Week 2-13, Week 14, Pr	idance Hands	ule and Co	onten								ompanies by group
Week 14, Pf Week 15, Fi											
[Class req	luirem	nent]									
How to regis class.	ster wil	ll be annour	nced l	ater. Studer	its who	wan	t to join	this	cou	irse is reque	ested to attend the first
[Method, I	Point	of view, ar	nd At	tainment	levels	of E	valuat	ion]		
Students are	prohit	pited to skip	hand	s-on trainin	g. Evalı	atic	n will t	e ba	ised	on presenta	ation.
[Textbook	4]										
Not used											

(Reference books) (Related URLs) http://www.glc.t.kyoto-u.ac.jp/ugrad [Regarding studies out of class (preparation and review)] Investigating companies in advance. Analyzing the result from hands-on training. Preparing presentation. (Others (office hour, etc.)) How to register will be announced later. Students who want to join this course is requested to attend the f class. Students are prohibited to skip hands-on training. Evaluation will be based on presentation. *Please visit KULASIS to find out about office hours.	[Reference	books, etc.]
http://www.glc.t.kyoto-u.ac.jp/ugrad [Regarding studies out of class (preparation and review)] Investigating companies in advance. Analyzing the result from hands-on training. Preparing presentation. (Others (office hour, etc.)) How to register will be announced later. Students who want to join this course is requested to attend the f class. Students are prohibited to skip hands-on training. Evaluation will be based on presentation.	(Referen	ce books)
http://www.glc.t.kyoto-u.ac.jp/ugrad [Regarding studies out of class (preparation and review)] Investigating companies in advance. Analyzing the result from hands-on training. Preparing presentation. (Others (office hour, etc.)) How to register will be announced later. Students who want to join this course is requested to attend the f class. Students are prohibited to skip hands-on training. Evaluation will be based on presentation.	(Related	
[Regarding studies out of class (preparation and review)] Investigating companies in advance. Analyzing the result from hands-on training. Preparing presentation. (Others (office hour, etc.)) How to register will be announced later. Students who want to join this course is requested to attend the f class. Students are prohibited to skip hands-on training. Evaluation will be based on presentation.	<u>`</u>	
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class. Students are prohibited to skip hands-on training. Evaluation will be based on presentation.		
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Day/period	d Inte	nsive	Cla	ss style	Semina	ır				Language	Japan	ese and I	English
[Outline ar	nd Pur	pose of t	he C	ourse]									
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[Method, P	oint o	of view, a	nd At	tainment	levels	of E	Evaluat	ion]				
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[Reference	e book	s, etc.]											
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	5 L セミナー I Global Leadershi	I (課題解決演 p Seminar II	(音) de	filiated epartment, ob title,Nan	Sei Gra	nior Lecture aduate Scho	ol of Engineering r,MAEDA MASAH ol of Engineering ,KANEKO KENTA
Target yea	r 2nd year students	or above Number	of credits		Cours year/p	e offered eriod	2019/Intensive, Second semester
Day/period	Intensive	Class style	Seminar			Language	Japanese
[Outline and	d Purpose of	the Course]					
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	hedule and Co	gh group works.					
organized. Lectures,2time Group works, are done. Residential tra	es,Lectures by e 3times,Setting u aining,7times,Th						tion, and group wor
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GL	セミ	ナー	Ι	Ι	(課題解決演習)	(2)

[Reference books, etc.]

(Reference books) Will be indicated as necessary.

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

(Others (office hour, etc.))

Course open period: October to January How to register the course will be instructed. *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.

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Numbering	g code											
Course title <english></english>		『国際イン of Engineeri			ernship 2	de	filiated partment b title,Na		Аррі	roved		
Target ye	ar Bro	d year students of	or above	Number	of cred	its	2			e offered eriod	2019/Intens	ive, year-round
Day/perio		ensive		s style	Semina	ır				Language	Japanese	and English
[Outline a	nd Pu	rpose of t	he Co	ourse]								
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[Reference	e boo	ks, etc.]								_	_	
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Target ye	ar 1st	year students of	or above	Number	of cred	lits	2		urse offer ar/period	red	2019/First semester
Day/perio	d We	d.4	Cla	iss style	Lectur	e			Langu	uage	Japanese
[Outline a	nd Pu	rpose of t	he C	ourse]							
[Course G	ioals]										
[Course S	chedı	ile and Co	onten	nts]							
Guidance,1ti Safety and E General Lect Seminars,6ti Laboratory V	inginee tures,5 mes,	times,	,1time	e,							
[Class req	luirem	ent]									
None											
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[Textbook]										
[Reference	e boo	ks, etc.]									
(Referer	nce bo	oks)									
[Regardin	g stud	lies out o	f clas	ss (prepar	ation a	nd	review))]			
(Others (office	hour, etc.))								
*Please visit	KULA	ASIS to find	l out a	about office	e hours.						

department, Job title,Name <English> Probabilistic and Statistical Analysis and Exercis Graduate School of Energy Science Associate Professor. TAKAYUKI KAMEDA Course offered vear/period Target year 2nd year students or above Number of credits 2019/First semester Day/period Tue.3,4 Class style Seminar Language Japanese [Outline 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 Goals] Getting familiar with the concept of probability and the basic theorem, and understanding various distributions 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] Significance of probability statistical method (1 time): A lecture will be given on the significance, in terms of engineering, of probability statistics, and the necessity in general engineering will be outlined. Probabilistic grasp of uncertain phenomena (4 times): 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 momen generating function, and the characteristic function will be explained. Multidimensional probability distribution and the transformation of random variables will also be discussed. Probability distribution model (4 times): 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. Sample distribution and statistical estimation/test (3 times): 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 statistical test method to verify the significance of engineering phenomena. Multivariate statistical analysis/regression analysis (2 times): 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 confidence limits by taking the first order regression analysis as an example will be outlined. _____Continue to 確率統計解析及び演習(T1)(2)

Affiliated

Graduate School of Global Environmental Studie

Associate Professor, UEDA KAYO

確率統計解析及び演習**(T1)(2)**

Confirmation of learning achievement (1 time): The level of achievement regarding the contents of this lecture will be confirmed and feedback will be given.

[Class requirement]

Numbering code

urse title

確率統計解析及び演習(T1)

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

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

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.

[Textbook]

Kitamura,S and Hori,T(eds.) ^PAn Introduction to Probability and Statistics for Engineering (Asakura Publishing Co., Ltd.) ISBN:9784254111132

[Reference books, etc.]

(Reference books) Introduced during class

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

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

(Others (office hour, 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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Target ye	ear	2nd year stud	ents or	above Nurr	nber of	credits	2 Co	ourse offered ar/period	2019/First semester	Target ye	ar	2nd year studen	ts or abov	Numbe	r of cred	lits 2	Cour year/	se offered period	2019/First semester
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[Course G	Goals	5]								[Course G	oal	ls]							
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確率統計解析及び演習(T2)(2)

Confirmation of learning achievement (1 time): The level of achievement and the level of achievement and the level of the The level of achievement regarding the contents of this lecture will be confirmed and feedback will be given.

[Class requirement]

It is desirable that students have taken calculus and linear algebra

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

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.

[Textbook]

Kitamura, S and Hori, T(eds.) ^P An Introduction to Probability and Statistics for Engineering (Asakura Publishing Co., Ltd.) ISBN:9784254111132

[Reference books, etc.]

(Reference books) Introduced during class

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

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

(Others (office hour, 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.

Course title <english></english>		率統計解析及 babilistic and Stat			Exercise	dej	iliated partment title,Na				ntion Research Institu I TOMOHARU
Target ye	ar	2nd year students of	r above	Number	of credi	ts	2			e offered eriod	2019/First semester
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distributions forth. Addit	tha ona		ed in to un	the field of derstand the	geotech e basic n	nol atu	ogy and e of po	its pula	prop	erties and u s and specir	sage for design, and s nens and the principle
[Course S	ch	edule and Co	onter	its]							
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The charact	eris		ies o	f various pro							ressing real phenome ill be described.
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確率統計解析及び演習(T3)(2)

Confirmation of learning achievement (1 time): The level of achievement regarding the contents of this lecture will be confirmed and feedback will be given.

[Class requirement]

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

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

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.

[Textbook]

Kitamura,S and Hori,T(eds.): ^PAn Introduction to Probability and Statistics for Engineering a (Asakura Publishing Co., Ltd.,) ISBN:9784254111132

[Reference books, etc.]

(Reference books) Introduced during class

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

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

(Others (office hour, 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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explained. In ac sample values, statistical test n Multivariate sta Based on the th are mainly used	ddition, regardi a lecture will b nethod to verify atistical analysi neory of probab d to analyze sur	A 2 distrib ng statisti e given o v the sign s/regressi ility statis vey data	ution, t distr cal estimation n the concepticance of er on analysis (tics, multivativation)	ibution, F ons to deri t and met ngineering 2 times): riate anal ibed. In p	ive probal hod of po g phenom ysis and t particular,	bilistic propertie int and interval ena. he method of ar	calculate them will be so of a population from estimation, and the halysis of variance that c model and the	(Reference [Regarding s		

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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	[Course Goa	ls]	
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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).	[Method, Poi	nt of view, a	nd Attai
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Affiliated department, Job title,Name *

Graduate School of Energy Science Associate Professor,HAKAMADA MASATAKA Graduate School of Energy Science Assistant Professor,CHIN YUUSEI

rding studies out of class (preparation and review)]

Computer Programming in Global Engineering

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*Please visit KULASIS to find out about office hours.

Course title <english></english>		造力学 I 及び actural Mechai		and Exercis	ses	de	iliated partment b title,Na	t, ime	Professor, KIY iraduate School of Professor, SUG Graduate Scho Professor, YA Graduate Scho Associate Pro Graduate Scho Associate Prof	ool of Engineering ONO JIYUNJI (Global Environmental Studies SIURA KUNITOMO ool of Engineering GI TOMOMI ool of Engineering fessor, KITANE YASUO ool of Engineering 2550r, FURUKAWA AIKO
Target ye	ar	2nd year students of	or above	Number	of cred	lits	2		rse offered /period	2019/Second semester
Day/perio				iss style	Semin	ar			Language	Japanese
•		Purpose of t		-						
stress; strain	and	displacement	/defo	rmation; cro	oss secti	onal	proper	ties; r	elationship b	forces; sectional forces; etween stress and strain; re to be focused on.
[Course G		-								
		ne methods for elationship bet								understand stress and columns.
[Course S	che	edule and Co	onter	its]						
Assumption Properties o determinate, Sectional fo Axial force\ Stress,2time Displacemen Sectional pr Stress and si Calculation Statically de Buckling of column Confirmatio	s\\E: f for , stat rces, \Fle: s,Sti nt ar oper train of d: ctern colu	xamples relate cces, 1 time,Extk ic indetermina 9 times,Equili xural moment ress: force per di deformatior ties,2 times,Goc ,2 times,Hookk isplacement,44 ininate and ind umn,2 times,Bu the attainmen	ed to e ernal : ate an brium and si unit a n,5tim comet ersquo times, eterm acklin	engineer#03 forces\\Moo d unstability a of free bod hear force\\ hear force\\ rical mome s Law\\Sec Element in inate structu g phenomet	9s ethic deling of y ly\\Secti Torsion es and c ement\\E nt of are ctional fi tension. ures non\\Eu	s f ext mot oorc Defo Defo Defo cea\\N orce /con	ernal fo l forces\ ment\\Ir linate sy rmation' foment and def upressio quos bu	VSect offluent vstem VStra of ind forma n\\De	Force equilib ional forces c ce lines in\\Curvature rtia of area tion\\Section. flection of be g load\\Eccer	am\\Deflection of truss\\ trically compressive
[Class red	luire	ement]								
calculus A a	nd I	3								

Continue to 構造力学 I 及び演習(2)

Numbering code

構造力学 I 及び演習(2)

Numbering	code									
		学基礎数 naticsl for		Γ4) al Engineer	ing	de	iliated partment p title,Na	me	Associate Profe Graduate Scho	ool of Engineering ssor,NARA YOSHITAK ool of Energy Science r,HAKAMADA MASATAK
Target ye	ar 2nd y	ear students	or above	Number	of cred	lits	2		urse offered ar/period	2019/First semester
Day/perio				ss style	Lectur	e			Language	Japanese
[Outline a	nd Purj	pose of	the C	ourse]						
-										
[Course G	oals]									
-						_		_		
[Course Solution .7times.	chedul	e and Co	onten	itsj						
,3times,										
,4times,										
,1time,										
[Class req	uireme	ent]								
-										
[Method, F	oint o	f view, a	nd Af	ttainment	levels	of E	valuat	tion]	
-										
[Textbook	-									
Original text										
[Reference	e book	s, etc.]								
(Referen		oks)								
Not specified	1.									
[Regarding	g studi	es out o	f clas	ss (prepar	ation a	nd	review)]		
Preview and	review	the origin	al tex	t						
(Others (office h	our, etc	.))							
-										
*Please visit	KULA	SIS to fin	d out a	about office	e hours.					
						_				

[Method, Point of view, and Attainment levels of Evaluation] Grade is given based on the final examination, mid-term examination and reports. [Textbook] To be informed by individual lecturer in his/her first lecture [Reference books, etc.] (Reference books) To be announced by individual lecturer in his/her first lecture [Regarding studies out of class (preparation and review)] To be announced by individual lecturer in his/her first lecture. (Others (office hour, 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. *Please visit KULASIS to find out about office hours.

Numbering code Course title <english> Fundamental Mechanics</english>		Affiliated department Job title,Na	· A		ol of Engineering essor,SAITOU JIYUN
Target year 2nd year students or above Numbe	r of credi	its 2	Course year/pe	offered	2019/First semester
Day/period Mon.2 Class style	Lecture			Language	Japanese
[Outline and Purpose of the Course] This class introduces foundations of Newtoni application to engineering. The motion of a p systems and rigid bodies are mainly introduce studied in specialized subjects are explained. [Course Goals]	article, mu ed, and Rel	lti-particle ated mecha	anics		
The goal is to acquire a systematic knowledge particle, multi-particle systems, and rigid bod mechanical problems. [Course Schedule and Contents]					
Fundamental mathmatics, 2 times, Simple harmonic motion, Eigenvalue and eig Laws of motion, 3 times, Equation of motion, Velocity and acceleration coordinates, linear momentum and angular m Damped Harmonic Oscillator, Driven Harmo Work and Energy, 2 times, Work, Conservative force and potential, Cons Non-inertial systems, 1 time, Galilean Transformation, motion in a rotating (Coriolis force and centrifugal force) Multi-particle systems, 2 times,	n vector in omentum, nic Oscilla servation o	polar conservatio tor, Resona f mechanic	on laws, ance	,	
Center of Mass, Conservation of Momentum, Motion of rigid bodies, 3 times, Degree of freedom, statics of rigid bodies, M Rotation of a rigid body about a fixed axis, M Foundation of analytical mechanics, 2 times, Constraint condition, Constraint force, Gener	oment of in lotion of a	nertia, rigid body		mode	
Generalized force, Lagrange's equations.			<u>-</u> Cor	ntinue to -	

一般力学 (T1・T2)(2)	
'he achievement assessment is intended to measure students' knowledge,	
cill and aptitude on the subject using quiz and viva-voce.	
[Class requirement]	
t is desirable that students complete Calculus A, B and linear algebra A, B.	
[Method, Point of view, and Attainment levels of Evaluation]	
Evaluation will be based on assignments (13 or 14 times, 20~30 points), and an examination (70~80 p	oints)
Students will submit all assignments.	
[Textbook]	
Instructed during class	
[Reference books, etc.]	
(Reference books)	
Introduced during class	
[Regarding studies out of class (preparation and review)]	
A Report is assigned for every class for review.	
(Others (office hour, etc.))	
Only T3 and T4 class students can take the class.	
*Please visit KULASIS to find out about office hours.	
rease visit KOLASIS to find out about office nours.	

Course title - <english> Fr</english>	-般力学(T3・1 undamental Me		de	filiated partment, b title,Nam	1 1 D C	ool of Energy Scier or,HAKAMADA MASA
Target year	 2nd year students 	or above Number	of credits		Course offered /ear/period	2019/First semes
Day/period	Mon.4	Class style	Lecture		Language	Japanese
application to	engineering. Th	ions of Newtonia ne motion of a pa nics studied in sp	rticle, multi-	particle sy	ystems, and rigid explained.	body are mainly
[Course Go	als]					
mechanical pro		ontents	to solve bas	sic		
1-04.00 001						
Vector calculu	nathmatics, 1 ti Is					
Vector calculu Laws of motio Equation of m coordinates, lii driven harmon Work and Ene	nathmatics, 1 ti is on, 4 times, otion, Velocity near momentum ic oscillator, re rgy, 2 times,	mes, and acceleration	mentum, co l oscillations	nservation and their	modes	armonic oscillator,
Vector calculu Laws of motion Equation of m coordinates, lin driven harmon Work and Ene Work, conserv Non-inertial sy Galilean Trans	nathmatics, 1 ti is n, 4 times, otion, Velocity near momentun ic oscillator, re rgy, 2 times, rative force and ystems, 1 time,	mes, and acceleration n and angular mo sonance, coupled potential, conser ion in a rotating	mentum, co l oscillations	nservation and their echanical	modes	armonic oscillator,
Vector calculu Laws of motio Equation of m coordinates, lin driven harmon Work and Ene Work, conserv Non-inertial sy Galilean Trans (Coriolis force Multi-particle	nathmatics, 1 ti is n, 4 times, otion, Velocity near momentum ic oscillator, re rgy, 2 times, rative force and ystems, 1 time, formation, mot	mes, and acceleration a and angular mo sonance, coupled potential, conser ion in a rotating l force)	mentum, co l oscillations	nservation and their echanical	modes	armonic oscillator,
Vector calculu Laws of motio Equation of m coordinates, li driven harmon Work and Ene Work, conserv Non-inertial sy Galilean Trans Galilean Trans Galilean Trans Cortoris force Multi-particle Center of Mas Motion of rigi Degree of free	mathmatics, 1 ti is n, 4 times, otion, Velocity near momentum ic oscillator, re rgy, 2 times, rative force and ystems, 1 time, formation, mot and centrifuga systems, 1 time, s, conservation d bodies, 3 time dom, statics of	mes, and acceleration a and angular mo sonance, coupled potential, conser ion in a rotating l force) 2, of Momentum	mentum, co l oscillations vation of me coordinate s ment of iner	nservation and their echanical ystem tia,	modes	armonic oscillator,
Vector calculu Laws of motio Equation of m coordinates, li driven harmon Work and Ene Work, conserv Non-inertial sy Galilean Trans (Coriolis force Multi-particle Center of Mas Motion of rigi Rotation of a r Foundation of a r	mathmatics, 1 ti is n, 4 times, otion, Velocity near momentum ic oscillator, re rgy, 2 times, rative force and ystems, 1 time, s, conservation, and centrifuga systems, 1 time, s, conservation d bodies, 3 time dom, statics of igid body abou analytical mecl	and acceleration a and angular mo sonance, coupled potential, conser ion in a rotating of l force) c, of Momentum es, rigid bodies, Mo ta fixed axis, Mo hanics, 2 times, nt force, generali	mentum, co l oscillations vation of me coordinate s ment of iner tion of a rig	nservation and their echanical ystem tia, tid body	modes	armonic oscillator,

-	quirement]
Elementary	calculus and linear algebra
[Method,	Point of view, and Attainment levels of Evaluation]
Examinatio	n: 85%, Weekly assignment: 15%
[Textbool	-
Worksheet	(in Japanese) is provided via web.
-	e books, etc.]
(Kelele	nce books)
	d URLs)
https://pano	la.ecs.kyoto-u.ac.jp/
[Regardin	g studies out of class (preparation and review)]
Preparation	and reviewing are recommended, although the details are arbitrary.
-	office hour, etc.))
No particula	ar office-hour is set.
*Please visi	t KULASIS to find out about office hours.

	g cod	le								
	水理	学及び演習 raulics and Ex	tercises			dep	iliated partment, o title,Nan	Pr Gi Pr Gi As Gi As Gi As Di As As	ofessor,GOT aduate Schoo ofessor,TOD aduate Schoo ofessor,HOS raduate Schoo sociate Profess aduate School of ssociate Profes aduate School of ssociate Profe sascier Preven ssociate Profess	ol of Engineering OH HITOSHI OH HITOSHI A KEIICHI Ol of Engineering ODA TAKASHI OI of Engineering sor, ONDA SHINICHIROU ol of Engineering sor, SANIYOU MICHIO Global Environmental Studies essor, HARADA EIJI titon Research Institute ssor, KAWAIKE KENJI tion Research Institute or, YONEYAMA NOZOMU
Target ye	ar	2nd year students o	r above N	lumber	of cred	its			se offered period	2019/Second semester
Day/perio	od W	/ed.3,4	Class	s style	Lecture	•			Language	Japanese
[Course G Systematic t [Course S Fluid Statics Hydrostatic implemented	Soals ander Scheo s, Buo press d.	standing of fu dule and Co oyancy, Flotat ure, buoyancy	indame intents tion Sta y force,	ntal hydra 5] bility[1.5 stability (ulics the	roug			ned and their	r exercises are
Continuum o	dynai	Dynamics[2. nics, control v lysis are expl	volume	method,						on and one-
Potential Flo Bernoulli's t			imensii	onal irrota	tional f	low	is explai	ned a	nd their exer	cises are implemented.
Bernoulli's t Viscous Flov Deformation	heore w and	em and two-di	1time]: kes equ	uation, she	ar stres	s for	r laminar	flow		cises are implemented. l loss, laminar and
Bernoulli's t Viscous Flor Deformatior turbulent flo Comprehens	heore w and n stree ow an sive E	em and two-di d Turbulence[ss, Navier Sto	[1time]: kes equ tributio e]:	iation, she n of turbu	ear stres lent flo	s for w ar	r laminar e explaii	flow		L.

水理学及び演習**(2)**

Intermediate examination[1time]: Intermediate examination is carried out.
Dimensional Analysis, Similitude[0.5times]: Dimensional analysis, pi-theorem and similarity rule are explained and their exercises are implemented.
Viscous Flow in Pipes[2times]: Energy equation, frictional law, form drag loss, siphon and pipe flow are explained and their exercises are implemented.
Open-Channel Flow[3.5times]: Energy equation, momentum equation, open channel equation, specific energy, specific force, hydraulic jun and analysis of gradually varied flow are explained and their exercises are implemented.
Achievement confirmation[1time]:Comprehension check of course contents.
Feedback[1time]
[Class requirement]
Differential and integral calculus, linear algebra etc., standard mathematics of general education course, and Dynamics and electromagnetism etc., standard physics of general education course
[Method, Point of view, and Attainment levels of Evaluation]
Based on the results of examinations
[Textbook]
Handout is used in the Lectures and Exercises.
[Reference books, etc.]
(Reference books)
(Related URLs)
(Non)
[Regarding studies out of class (preparation and review)]
Review the lecture contents. Prepare the exercises questions and review them.
(Others (office hour, etc.))
Lecture is opened along with exercise. How to contact with instructors is announced during lecture and
exercise.
exercise.

(理学及び演習(3)

Please visit KULASIS to find out about office hours.

Thease visit ROLA	SIS to find out about off	nce nours.	

Numberin	g code										
Course title 環境衛生学 <english> Environmental Health</english>							nt, ame	Pro Grac	Graduate School of Global Environme Professor, TAKANO HIROHI Graduate School of Global Environme Associate Professor, UEDA K		
Target ye	ear 2nd	ear students or	above	Number	of credi	its 2			e offered eriod	2019/First semester	
Day/perio	d Thu.	1	Cla	ss style	Lecture				Language	Japanese	
[Outline a	nd Pur	pose of th	ne C	ourse]							
" in engine	ering m tures, th	ay have sec	onda n the	ry effects o relationshi	n living p of basi	beings, in c matters	cludi of hy	ing h ygier	umans, as v ie and publi	at " the manufacturing well as the environment ic health and recent ng.	
[Course G	Goals]										
related field [Course S Health, illne	s. Schedul ess, its pr ationship	e and Cor evention, a p with envir	nten ind e	ts] nvironmenta	al factors	s (1 time):	The	con	cept of heal	e to the development of th and illness (disease he prevention of illness	
Environmer from a toxic pollutants, e Health effec explained, f	tal toxic cological etc.), met ets of env ocusing	ology (3 tir viewpoint, abolism/ex vironmental	mes) focu creti l poll	: Lectures w using on pha on, and so f utants (2 tir	armaco(t orth. nes): Th	oxico)kin e health e	etics ffects	of e: s of e	xogenous m environmen	vironmental factors naterial (environmenta tal pollutants will be tion, while taking up	
and the imp	mpact of									ics of the ecosystem taking up actual	
examples. Pollution an explained, f Environmer	d global	environme									

ire contents. Additionally, questions can be asked and answered.

lone	
Method, Point of view, a	and Attainment levels of Evaluation]
n principle, the results will be	e evaluated based on attendance (about 10%) and a written test (about 90%)
[Textbook]	
hers; to be introduced from	time to time during the lecture.
[Reference books, etc.]	
(Reference books) Others; to be introduced from	time to time during the lecture.
Regarding studies out o	of class (preparation and review)]
articular preparations are nec	•
(Others (office hour, etc Please visit KULASIS to fin	

環境生物・化学(2) [Textbook] Bruce Alberts *Essential細胞生物学(原書第4版)a (南江堂) ISBN:978-4524261994 (It will be used for latter half of this class (biology part).) [Reference books, etc.] (Reference books) Introduced during class [Regarding studies out of class (preparation and review)] Several reports will be given for preparation and review. (Others (office hour, etc.)) We appreciate active discussions and questions. *Please visit KULASIS to find out about office hours.

- This course a This course is	I Tue.1 d Purpose of the second secon	Class style	of credits	2	Cours year/p	e offered eriod	2019/Second semeste
[Outline an This course a This course is second half is	d Purpose of the second	-	Lecture				
This course a This course is second half is	ims to learn ba	the Coursel				Language	Japanese
	biology inclu	two parts. The first h	alf is basic	water cl	hemistr	y and analyt	nce and technology. ical chemistry. The espiratory system and
[Course Go To learn basic	-	d biology essential f	for environr	nental so	cience a	nd technolo	gy.
diagram and j Methods to co sedimentation Midterm exan Cell and bion protein, nucle The central do respiratory sy environmenta	proton conditie ontrol the aqua a with logarith nination, I time iolecules, 2 tim ic acids. ogma, 3 times, I sstem and enerr al microorgania of achievemen	e,Midterm examinati es,Structure and fun DNA replication, tra gy metabolism,2tim	th closed an mes,Alkalin ion is on 7th action of cel nscription a es,Aerobic	id open s ity and . n time ar lar organ nd trans respirati	systems Acidity. cound. nelles au lation.	. Coagulatio nd biomolec	n, flocculation and
		and Attainment score of a midterm			-	examination	L.

Course title <english></english>		科学 istruction Mat	erials			dep	iliated partment p title,Na	, /	Associate Profe Graduate Scho	ool of Engineering essor,HATTORI ATS ool of Engineering sor,YAMAMOTO TAK
Target year Brd year students or above Number of credits 2 Course offered year/period 2019/First ser								2019/First semes		
Day/perio	d	Mon.2	Cla	iss style	Lecture				Language	Japanese
[Outline a	nd I	Purpose of	he C	ourse]						
Knowledge are introduc		techniques to	use co	onstruction	structura	l m	aterials	from	micro-structu	ares to macro-struct
[Course G	ioal	s]								
materials etc	c. In	addition, the	studer	nt will unde						e, steel, composite ction materials.
1. Introducti		edule and Co	onter	ntsj						
 Metallic ra Metallic ma are introduc Matellic c Corrosion and 5. Polymer r Resin, rubbá Cement Types of cer are introduc Admixtur Chemical ad reaction, late Aggregata Aggregate, 1 Mechanic 	en at mate teria ed. corro nd co mate er, fil ment ed. re for lmix ent h e & r mixin al pr emer	toms, ideal str rials & steel II, iron, blast f osion & protect rials ber, polymer of ts, chemical co r concrete ture, water-re nydraulic prop mixing water, ng water and roperties of co nt ratio, comp	ducing ducing fresh for the sh	e, refine, sto of metals a ete and orga sition, chen g admixture nd high-ran concrete concrete (w e	eel, transf re explair anic new hical com e, air-entr age admix orkability	forr ned. mai ipou cain ctur y, rl	nation, i terials a und, hyc ing adm e are in heology	heat t re exp lratio iixtur trodu , con	plained. n, hydration h e, mineral adu ced.	introduced. metallic new mater neat and blended cer mixture, pozzolanic egation) are explain oughness of concret
10. Durabili Durability, a 11. Corrosic Corrosion o 12. Mix desi Mix desig o	ilkal on of f rein ign c f cor	i-silica-reaction reinforcing sum nforcing steel,	ined.	concrete	oride ind		d corro	sion a	re introduced	L.

材料学(2)	
High performance concrete and special reinforcement are introduced. 14. Inspection & investigation methods for concrete structures Surface hardness, ultrasonic pulse, elastic wave, thermography, half cell potential and pola are explained. 15. Achievement confirmation Achievement of learning is confirmed.	rization resistance
[Class requirement]	
"Basic Physical Chemistry" in Liberal Arts and General Education Courses.	
[Method, Point of view, and Attainment levels of Evaluation]	
Evaluate considering the scores of final examination and the submitted reports.	
[Textbook]	
Toyoaki Miyagawa and Keitetsu Rokugo [®] Construction materials a (Asakura ltd) ISB (in Japanese)	N:9784254261622
[Reference books, etc.] (Reference books)	
Introduced during class	
(Related URLs)	
http://csd.kuciv.kyoto-u.ac.jp/(Department of Urban Manatement, Structures Management (Atsushi Hattori)) http://sme.kuciv.kyoto-u.ac.jp/(Department of Civil & Earth Resources Engineering, Struc Engineering (Takashi Yamamoto))	0 0
[Regarding studies out of class (preparation and review)]	
1. Preview of today's chapter. 2. Review of each mini-quiz based on explanation.	
(Others (office hour, etc.))	
Visiting Atsushi Hattori at rm C1-218, Katsura and/or Takashi Yamamoto at rm C1-456, H welcome.	Katsura are
*Please visit KULASIS to find out about office hours.	

コンクリート工学**(2)**

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

Grading is based on the result of a term-end examination with the homework and attendance.

[Textbook]

K. Kobayashi: Concrete Engineering, Morikita Publishing Co., Ltd., 3,240JPY ISBN:9784627425651

[Reference books, etc.] (Reference books)

S.Inoue, et al.: Zusetu Concrete structures, Gakugei Publishing Co., Ltd., 3,024JPY ISBN:9784761525958

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

Preview of today's chapter.
 Review of each mini-quiz based on explanation.

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

Numbering	g co	de				_						
Course title <english></english>							iliated partment b title,Na		Graduate School of Management Professor, KAWANO HIROTAKA Graduate School of Engineering Professor, TAKAHASHI YOSHIKA: Graduate School of Engineering Associate Professor, HAATORI ATSUS Graduate School of Engineering Associate Professor, YAMMOTO TAKA:			
Target ye	ar	3rd year students	or above	Number	of crec	lits	2			e offered eriod	2019/Second semester	
Day/perio				ss style	Lectur	e				Language	Japanese	
[Outline a	nd	Purpose of t	he C	ourse]								
Materialsrsq	uo. atte	nd the lecture									uoConstruction	
Students of	this	class learn to									reinforced concrete onse of simple RC/PC	
[Course S	che	dule and Co	onter	Itsl								
Fundamenta Structural m explained. Bond behave Flexural and Shear and to flexural mor Crack and d force and/or Verification including th Others,1 time	l of ater ior a l cor orsio nent efleo the met e co e,Th	nd anchorage npression beh n behavior,2ti t and/or the no ction,2times,T torsional mon	The of mech avior, mes,T rmal he me nent a nance reinfo ch ano	design meth nanical beha es, The mech 2times, The Che mechani force are ex echanical be echanical be echanical be echanical be echanical be echanical be echanical be echanical set e over time, orcing steel d technique	od, the wior of anism of cracks s ical beh plained havior s l. ltime, T is expla relating	safe con- of bo and avio and he v ined	ty factor crete, re ond and deflection r and th the capa erification concrete	r and info ancl on o e ca acity on r	d etc orcin hora of RO paci y of l neth ginee	c. are explai ag steel and age is explai C member a ity of RC se RC section s and of perfor	polymer material is ned. re explained. ction subjected to the subjected to the shear rmance over time	
[Class red	uir	ementl										
-	this	class had bette	er take	e 'Structural	Mecha	nics	I and E	xerc	rises	' in 2nd yea	r and 'Construction	

Continue to コンクリート工学(2)

							*
Numbering of	ode:						
	《文学基礎 undamentals of	Hydrology		Affiliated department Job title,Na	t, ime Pro Grad Pro Gr As Di As Gr	ofessor, TAC atte School of Advance of essor, TAK aduate Schoo sociate Profes saster Prevez sociate Profess aduate Scho	ol of Engineering HIKAWA YASUTO d Integrad Studies Huma Survivabiliy ARA KAORU ol of Engineering sor,ICHIKAWA YUTAKA tion Research Institute sor,SAYAMA TAKAHIRO ol of Engineering r,YOROZU KAZUAKI
Target year	3rd year students	or above Number	of credit	t s 2	Cours year/p	e offered eriod	2019/First semester
Day/period	Tue.5	Class style	Lecture			Language	Japanese
[Outline and	Purpose of	he Course]					
water moveme roles for the hy oceans and lar the land surfac Hydrology is t	ents in the atmos ydrological cycl d surfaces, and es as precipitati he study of the -related disaster	sphere, land surfa- e. Solar energy di- transport of vapo on, then the flow movement of wat s, develop water	ces, and o rives the o r in the at of water er on and resources	oceans. So dynamic p mosphere on and un under the and prese	lar ener rocesse . The va der the land su rve the	gy and grav s of water va apor changes land surface urface and its environmen	t. In the class, basic

[Course Goals]

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.

[Course Schedule and Contents]

The hydrologic cycle, 1 time, The contents of the class is overviewed and the concept of the hydrological cycle is provided. The role of hydrology in the field of civil engineering is described. Precipitation, Itime, The mechanism of precipitation is described. A numerical rainfall prediction model and

the mechanism of radar rainfall observation are described. Interception and infiltration, 1 time, The process of precipitation interception by trees is introduced. Then the

governing equation of unsaturated flow and the basic equations of potential infiltration are explained. Groundwater flow,1time,The mechanism of groundwater is explained. The physical equation to represent

groundwater flow is derived from the continuity and momentum equations of water flow. Surface runoff,3times,The mechanism of rainfall-runoff in mountainous slope is explained. The kinematic wave equation is derived from the momentum equation of water flow, and then the analytical solutions of the kinematic wave model are provided.

Solar radiation and energy balance, ltime,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 neasure the evapotranspiration is described.

Flood routing, 1time, The mechanism of flood routing is explained. Numerical representation method to g.tunie, its international for a second s

水文学基礎(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 sciences are related to the society is described through various examples. Achievement confirmation, Itime, Quiz, report and the final examination is conducted to measure students#039 knowledge, skill and aptitude on the subject. [Class requirement] It is desiarable to study Hydraulics (2nd year) and probability and statistical analysis (2nd year). [Method, Point of view, and Attainment levels of Evaluation] The score is evaluated comprehensively with quiz, report, and the final examination. [Textbook] [Reference books, etc.] (Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

Numbering code Graduate School of Engineering Professor, TACHIKAWA YASUTO Affiliated 水資源工学 Disaster Prevention Research Ins Professor,HORI TOMOHARU Course title Water Resource Engineering <English> Job title,Nam Graduate School of Engi sor.KIM SUNMIN Associate Profe Course offered 3rd year students or abov Number of credits Target year 2019/Second semester Dav/period Wed.2 Class style Lecture Japanese Language [Outline and Purpose of the Course] 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. [Course Goals] 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. [Course Schedule and Contents] Water resources systems planning, l time, Target of water resources engineering. Temporal and spatial distribution of water resources on the earth. Development of water resources,2times, Concept and measures of water resources development. Efficiency and limit of water resources development. Design of water resources systems, 1time, 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, 1time, Social and legislation system for water resources, water right, public and private water, management and defect. Water resources evaluation (1): Hydrologic predictions, 1 time, 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 explained. Hydrologic variables used for the river planning 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 methods of parameters of a distribution function is described.

_____Continue to 水資源工学(2)

水資源工学**(2)**

Water resources evaluation (3): Real-time hydrologic forecasting,2times, Methods for real-time rainfall forecasting and river discharge forecasting are focused.

Achievement confirmation.1time.

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

[Class requirement]

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

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

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.

[Textbook]

Not used

[Reference books, etc.]

(Reference books) Introduced during class

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

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

(Others (office hour, 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.

*

Course title <english></english>		及び実習(ng and Fie		以前入学者 actice	i)	Affiliated Jepartment Job title,Na	t, mme A G A G A G A G A G G	rofessor, UNC isaster Preve; rofessor, HAT raduate Scho ssociate Profe; raduate Scho ssistant Professor raduate Scho ssistant Profe raduate Scho ssistant Profe raduate Scho	ol of Engineeri) NOBUHIRO YAYAMA MIC ol of Engineeri sor,SUSAKI JIY ol of Engineeri sor,KIMURA Y ol of Engineeri sor,KIMURA Y ol of Engineeri ssor,SEGI SHU ol of Engineeri ssor,NAKAO S
Target ye	ear Brd y	ear students o	or above	Number	of credit	s 2	Cour	se offered period	2019/First ser
Day/perio	d Fri.2	,3,4	Clas	ss style	Practical	training		Language	Japanese
[Course G The student data and to e The student	Goals] will und estimate t will be	erstand the reliabl able to der	e back le para rive th	meters.	d theory to	o reduce tl	he erro		ted in the meas e least square n
[Course G The student data and to e The student and the law The student	soals] will und estimate t will be of error t will und exercise	erstand the the reliabl able to der propagatic derstand th , the stude	e back le para rive th on. he purp ent will	ground and imeters. ie most pro pose of the l acquire th	d theory to bable valu various k ae prepare	o reduce the reduce the reduce the reduce the reduced the reduced to the reduced	he erro ndard o rvey.	error using th	
[Course C The student data and to e The student and the law The student In the field	will und estimate t will be of error t will und exercise tudents f	erstand the the reliabl able to der propagatic derstand the , the stude or the acco	e back le para rive th on. he purp ent will omplis	aground and imeters. ie most pro pose of the l acquire th shment of t	d theory to bable valu various k ae prepare	o reduce the reduce the reduce the reduce the reduced the reduced to the reduced	he erro ndard o rvey.	error using th	e least square n

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

GPS survey, 3times, The theory of GPS and GPS survey are introduced, and the practice of GPS survey is

conducted. Evaluation of understanding, 1 time, The student will be evaluated for their understanding of the contents offered by the course.

[Class requirement] Linear Algebras, Mathematical Statistics

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

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

[Textbook]

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

[Reference books, etc.]

(Reference books)

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

社会システム計画論**(2)**

[Reference books, etc.]

(Reference books) Wordmap: Human science for disaster prevention and reduction science, Shinyosha pub. (in Japanese) isbn{} (9784788512184)

(Related URLs) (None)

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

(Others (office hour, 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.

*

Numbering	code										
		ステム計 g and Man		nt of Social :	Systems	de	iliated partment b title,Na	t,	Pro Dis	ofessor, TAT saster Prever	ntion Research Institute ANO HIROKAZU ntion Research Institute pr,OONISHI MASAMITSU
Target ye	ar 3rd y	ear students	or above	Number	of cred	lits	2			e offered eriod	2019/First semester
Day/perio	d Thu.	1	Cla	ss style	Lectur	e				Language	Japanese
[Outline a	nd Pur	pose of	he C	ourse]							
infrastructur typical math	e planni ematica and disa	ng and ma l models a ster inform	anagei ire exp natior	ment. In the plained. In t science are	first ha	lf of nd h	f the cla alf, theo	ss, th ories	e b in i	asic concept social science	basic knowledge of ts and frameworks of the that includes social and methods of social
[Course G	oals]										
It is targeted analysis, fun											odels for systems
[Course S	chedul	e and Co	onten	its]							
Institutional design Policy mana Test of unde	king the design, gement, rstandin	eory under 3times,Ga 2times,Pu 1g ,1time,7	unce me the	rtainty,2tim eory \\ Func articipation	es,Decision of plannir	sion cont	tree \\ M ract and	l its c	les	ign \\ Functi	ocess modeling on of law and its overnance
[Class req		-									
Fundamenta	unders	tanding of	f prob	ability							
[Method, F	oint o	f view, a	nd At	tainment	levels	of E	Evaluat	tion]			
On the presu	mption	of sufficie	ent att	endance, 30)% of sc	ore	is valua	ted o	n r	eports and 7	0% on examination.
[Textbook]										
Systems ana 4627427301		· Infrastru	cture j	planning: ph	nenome	nal a	unalysis,	, Moi	riki	ta pub. (in J	apanese) isbn{}{
									C	ontinue to 社	会システム計画論 (2)

Numbering	g cod	le								
Course title <english></english>		ō・地域計画 an and Region	nal Planning		de	filiated partment b title,Na		Ass Gra	ociate Profes iduate Scho	ol of Management sor,OOBA TETSUHARU ol of Engineering or,MATSUNAKA RYOUJI
Target ye	ar	3rd year students o	r above Numbe	er of crea	lits	2			e offered eriod	2019/Second semester
Day/perio	d M	Ion.4	Class style	e Lectur	e				Language	Japanese
[Outline a	nd P	Purpose of t	he Course]							
policy, and t	ransp	portation polic	cy will be disc	ussed in d	etail	. In add	itior	n, lec	ctures will a	es planning, land use Iso be given on basic d urban economy.
[Course G	ioals	;]								
To master b	asic k	cnowledge of	urban plannin	g and to u	nder	stand th	e sti	ructu	ire of urban	problems.
[Course S	cheo	dule and Co	ontents]							
planning wil international Basic Policy The basic id urbanization Kyoto. Land Use Pl	ll be o lizatio of U eas a adju annir	described. In on, aging, and Jrban Plannin, nd key measu istment areas, ng/District Pla	particular, imp l responding to g (2 times) tres of urban p and application anning (2 time	oortant vie o environn lanning, su on areas wi s)	wpo nenta uch a ill be	ints to c al proble as urbar e explai	ons ems pla ned	ider will unnir whil	for the futu: be explaine ng areas, urb le covering	panization areas, case examples from
using case e	xamp nd rea	oles from Kyo allocation, urb	to we will exp	lain the ba	isic	measure	es re	elatin	ng to urban o	ttlined. In addition, developments, that are key to historic
Urban mode	ls, su	d Theory (2 t ich as the pop be explained.	ulation foreca	st/migratic	on m	iodel, ec	ono	mic	cycle/base	model, land use model,
Current issu requirement	es rel s for	lated to enviro planning fron		lems, the g it of enviro	glob; onm	ental ec	onoi	mics	will be des	nvironment, and cribed. In particular, as 1 detail.
System and	Finar	icial Resource	es of Urban Pl	anning (2	time	es)				

The social benefits achieved through urban planning will be explained, while focusing on the relationship between benefits and burdens. Basic theories of urban planning systems and financial resources will also be described.

都市・地域計画**(2)**

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

ummary of all Lectures (1 time)

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

[Class requirement] None

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

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

[Textbook]

Not used None used

[Reference books, etc.]

(Reference books) Yoshitsugu Kanemoto [@]Urban Economics (TOYO KEIZAI INC.) ISBN:9784492813034 (The content s somewhat advanced, but it is recommended as a book that is useful for understanding urban problems.)

[Regarding studies out of class (preparation and review)] Review of each lecture is essential.

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours.

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, 3 times, (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 nanagement 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,

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

[Class requirement]

Elementary knowledge of Hydraulics, Hydrology and Ecology

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

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

[Textbook]

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

[Reference books, etc.]

(Reference books)

(Related URLs)

(http://www.geocities.jp/kyoto_u_rivereng/)

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

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours.

								*	
Numbering code	Э								
Course title 河川] <english> River</english>	Nish> River Engineering				iliated partment p title,Na		Graduate School of Engineering Professor,HOSODA TAKASHI Graduate School of Engineering Associate Professor,ANDA SHINICHIROI Disaster Prevention Research Institute Associate Professor,TAKEMON YASUHIR		
Target year 3	rd year students or a	bove Number o	of cred	its	2		urse offered ar/period	2019/Second semester	
Day/period We	ed.1	Class style	Lecture	•			Language	Japanese	
[Outline and Pu	urpose of the	e Course]							
management plan included in this su	based on natur bject are descr inges of rivers s, recent charac	ral amp social s ibed as follows and their factor cteristics of floo	ciences variou rs, river od disas	and s vie flov ters,	engine ew-poir vs and r , integra	ering its in iver ited	gamp technolog n relation to rive channel proces river basin plan	er systems, long term ses, river and lake ning including flood	
[Course Goals]									
	vironment con							f view such as flood social sciences and	
[Course Sched									
changes of rivers a Precipitation, wate Statistical Hydrolo River flow and riv simulation, sedime waves, etc. Application of nur endangered bird c: near the bottom of sedimentation due Structure and func river ecosystems, l microhabitats and Function of river c communities, Mas and Physical Habi ponds by thermal flora), Characteris Integrated river ba	and main facto er cycle and run egy of precipiti er channel pro ent transport in merical hydrau alled #/039Kam f the northern p to sediment ri tions of river a Relations betw their maintena ecosystems, Rc is transfer meci- tat Simulation stratification au tics of man-ma sin planning,3	rs n-off phenomet ation and Rain i ccesses, 2times, E alluvial rivers, alluvial rivers, lics to environr ogawa-Chidor art of Lake Biv n-off from a ca and lake eco-sy een river geom veen river geom nece mechanism of biodiver hanism in river hanism in river Model (3) Fun nd thermal com ade reservoir eco times,(1) River	na, 1 time Fall Run Basics o , format nental is i#039 ar wa due t atchmen stem, 3 ti oorpholo ns, Long sity, Sus s, Nutri ction of vection, sosystem law, Fu	e,Ba n-of n un ion j ssue of th t are mes ogy a itud stair ent s lake Rel ns unda	sic know f Analys steady of processor s, 1 time and-bar e climat ea, etc. s, (1) Hie and hab linal dis nable co spiraling e ecosys lations b	wled sis oper es of ,Rel forn te ch erarc itat s tribundit g, In stem betw	lge on Meteorol a channel flows f meso-scale an ation between ti mation, Mechan angeon the eart chical structure - tructure, Classi ution of biologi ions of habitats npact assessmer s, Classificatior een lake types a r management p	and classification of fication of cal communities (2) for biological t of river environments of natural lakes and nd biota (fauna and blan, River tlysis and Hazard Map, res(groines and levees)	

* Numbering code Graduate School of Global Environmental Studies Professor.FUJII SHIGEO Graduate School of Global Environmental Studies Associate Professor, TANAKA SHUHEI ∆ffiliated 水質学 urse title departn Graduate School of Engineering Associate Professor, NISHIMURA FUMITAKE <English> Water Quality Job title,Name Graduate School of Global Environmental Studies Assistant Professor, HARADA HIDENORI Course offered year/period Target year Brd year students or above Number of credits 2019/First semester Class style Lecture Language Japanese Day/period Mon.2 [Outline and Purpose of the Course] [Course Goals] [Course Schedule and Contents] .1time. 2times, .4times. 4times 3times, 1time [Class requirement] Jone [Method, Point of view, and Attainment levels of Evaluation] [Textbook] [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours

ourse title English>						dep	iliated partment p title,Na	ne Rr Gr Gr	Graduate School of Engineering trofessor,ITOH SADAHIKO Graduate School of Engineering Associate Professor,ECHIGO SHINYA Graduate School of Engineering usistant Professor,NAKANISHI TOMOHIRO			
Target ye	ar	3rd year students o	d year students or above Number of credits 2 Course offered year/period 2019/Second semester									
Day/perio	d N	Mon.2	Clas	s style	Lecture	•			Language	Japanese		
ater suppl ole of wate e targeted Course G	y is i er su in cl ioal: nd ba	pply system a ass. Class is c s]	one of nd risk onduc	the urban at managem ted through	ent of w h thinkin	ater g to	quality ogether.	as wel	ll as water pu	s of protection of life. nrification technologies		
-		dule and Co		Ũ	ISK IIIdild	agen		water	suppry.			
'atershed i ole of wata ad integrat ver view o otal water troduced. 'ater purifi asics of water products, dvanced v 'ater quali inking wa	nana er su ed ri of wa supp ccatic ater p on sy harn vater ties c ter b	ver basin man ter supply sys ly system from purification pr stems, disinfe nful compoun purification p	vater su n water ageme tem (1 m catcl times) cocesse ection a ds sucl rocesss r are w l wate	upply syste cycle of w nt and its s time) ment to co s are turbic und pathoge n as carcino (2 times) idely varie r purificatio	m (1 tin vatershe ignifica onsumer lity rem ens in w ogenicity ed. It is o on proce	ne) d is nce · tap oval ater y, af	introduc are disc s and ou and dis are intr iter disir cult to n s. Advan	eed. Co ussed. itline o infectio duceo ifectio neet m	of topics cover ion. Mechani 1. Formation n is also state any types of rater purifica	needs of consumers for tion processes such as		

Achievement confirmation (1 time) Achievement of learning is confirmed.
[Class requirement]
It is preferable to have knowledge of the courses of Biology and Chemistry for Environmental Engineers, and Water Quality.
[Method, Point of view, and Attainment levels of Evaluation]

Grade is evaluated by reports, a paper test, and attendance. Breakdown: sum of the results of the reports and the paper test (60%), attendance (40%).

[Textbook]

上水道工学**(2)**

Not used

[Reference books, etc.]

(Reference books) [Iob S., Ohtani S., Kozuki Y., Nishimura F., Hashimoto O., Higuchi T., Fujiwara T., Yamazaki S., Yamanaka R., Yamamoto H. ^PIntelligible Environmental Engineering a (Rikoh Tosho) ISBN:9784844608318 Itoh S. and Echigo S ^PDisinfection byproducts in water. a (Gihodo) ISBN:9784765534284

(Related URLs)

http://www.urban.env.kyoto-u.ac.jp

Instruction will be given by the professors

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

$(\mbox{ Others (office hour, etc.) })$

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

*Please visit KULASIS to find out about office hours

Numbering c	ode							
	水道工 werage	学 System Engi	neering		Affiliated departmen Job title,Na		Professor, TAN Graduate Scho Associate Profess Graduate Scho	ol of Engineering VAKA HIROAKI ool of Engineering or,NISHIMURA FUMITAKE ool of Engineering vr,HIDAKA TAIRA
Target year	3rd year	students or abov	Number	of cred	its 2		urse offered ar/period	2019/Second semester
Day/period	Mon.1	Cla	iss style	Lecture			Language	Japanese
[Outline and	l Purpo	se of the C	ourse]					
[Course Goa • To acquire t • To understand design the faci	he funda nd the ro					syst	em and to be al	ble to explain and
[Course Sch	nedule a	and Conter	nts]					
creation of des wide planning drainage facili (2) Sewage col	n sewera irable wa of sewer ties for a lection s	ge system ar ater environr rage systems gricultural co system[2 wee	nd course gu nent and ma , relationshij ommunities. eks]:	nagemen p among . Enginee	nt. Type o the sewers ering ethics	f sev age-l s.	verage system,	erage system for comprehensive basin- ich as Jokaso and
(3) Treatment Lecture on the selection proce	treatmer ss, and b	gy[5 weeks] nt type(prima basic flow of	ary treatment.	t, second Solid-lic	lary treatm juid separa	ent, tion	and complete t and biological	n. reatment), their process(activated lesign & operational

(4) Advanced treatment[2 weeks]:

Lecture on the advanced treatment such as nutrient removal, removal of trace harmful organic compounds by ozone. Background, treatment principle, design & operation, and system configuration.

(5) Treatment and disposal of sewage sludge[1 week]: Lecture on the final disposal of the sludge and fundamental component of the process. Direction of future treatment of sewage sludge from the view point of energy saving.

(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 Continue to下水道工学(2)

下水道工学**(2)**

Tourism.

Future perspective, technological trends and expansion, attitudes of governments

(7) Final examination/ Learning achievement evaluation

(8) Feedback

[Class requirement]

Water quality engineering, hydraulics

[Method, Point of view, and Attainment levels of Evaluation] Evaluation will be based on the written examination

[Textbook]

-津野洋・西田薫 『環境衛生工学』(共立出版)ISBN:4320073878

[Reference books, etc.]

(Reference books)

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

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

(Others (office hour, etc.))

Please visit KULASIS to find out about office hours

	code						
	b射線衛生工学 adiological Heal	th Engineering	d	Affiliated lepartment, ob title,Nan	e Pro Gra As	ofessor, YON aduate Scho sociate Profe	ol of Engineering IEDA MINORU ol of Engineering essor,YOKO SHIMAD/
Target year	3rd year students of	r above Number	of credits			e offered eriod	2019/First semester
Day/period	Tue.2	Class style	Lecture			Language	Japanese
	d Purpose of t						
Lectures will b radiation on hu treatment, radi environmental	be given on prop uman beings and ation protection radioactivity, ar	erties of radiation organisms, the e methods, radiation and its impact asse	n, the inter exposure d on enviror essment m	action betwork ose limit, i iment mon ethod.	ween r adiatio itoring	adiation and on shielding , engineerin	l matter, the effects of , radiation sources, g problems related to
[Course Go	als]						
							on sources in the living influences, and the e, understanding the on risk assessment
[Course Sch	nedule and Co	ntents]					
							ngineering, its l be outlined. In v of atomic nuclei, type:
radiation, and	so forth.						tion between rays, principles of activation elding of gamma rays, essment by ionizing
Biological/hur beings from D classified, and exposure limit covered.	nan body effect of NA, cells, and th the concept of ra- values, the regu	of radiation (2 tin ne solid level wil adiation protection lated values by h	mes): The l be explai on, exposu aw, metho	mechanisn ned. Radia re limit va ds to avoic	n of th tion el lue and l radia	e influence of ffects on the d risk, the m tion exposur	of radiation on living human body will be ethod of setting re, and so forth will be
Method of rad lecture will be	iation manageme given on the uni	ent (3 time): Rad it of exposure do	iation effe ses and ma	cts on the l anagement	human metho	n body will b ods of radiat	e classified and a ion exposure.
Measurement usage of vario	method of radioa us radiation mea	activity and radia suring devices.	tion (1 tin	ne): A lectu	ıre wil	ll be given o	n the principle and
Regulation val method of sett	ue of radiation (ing an exposure	1 time): The con limit value, the r	cept of rac egulated v	liation prot alue by lav			imit value and risk, the d radiation exposure,
					C	ontinue to 1	放射線衛生工学(2)
放射線衛生工	学(2)						
	ill be covered						
and so forth w	in be covered.		(1 time): A	lecture w	ill be o	viven on the	mothed of estimating
and so forth was Movement of a	radioactivity in t	he environment	ent and eve	nosure asse	ssmer	st ven on me	method of estimating
Movement of a the movement	radioactivity in t of radioactivity of achievement c						e lecture content.
Movement of a the movement	of achievement of						

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

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

[Textbook] Not used

Handout will be given at each lecture.

[Reference books, etc.]

(Reference books)

[Regarding studies out of class (preparation and review)] completely understand the contents of each handout

(Others (office hour, etc.))

Please visit KULASIS to find out about office hours

Numbering	g cod	e								
Course title <english> 廃棄物工学 Affiliated department, Job title,Name Agency for Health, Safety and Environment Professor,SAKAI SHINICHI Agency for Health, Safety and Environment Associate Professor,SIRAI YASUHIRO</english>						AI SHINICHI h, Safety and Environment				
Day/period Mon.3 Class style Lecture					Lecture	e			Language	Japanese
[Outline and Purpose of the Course]										
This course is designed to study measures used to manage waste generated by household and industrial activities in cities and towns. Students will learn basic and hierarchical measures used in solid waste										

management, including waste prevention, reuse, recycling, bioconversion, thermal conversion, and final disposal. We will explain the concept of the 3Cs#8212Clean, Cycle, and Control#8212as they relate to hazardous waste and international management systems. We will also introduce strategic case examples for controlling asbestos waste. The course also covers (1) legal systems used for the definition and classification of municipal solid waste (MSW), (2) basic properties of MSW, (3) management plans and collection/ transportation methods for MSW, and (4) basic waste management techniques and systems such as MSW treatment, recycling, and final disposal.

[Course Goals]

The major objectives of the course are:

to learn about the waste management hierarchy and the processes of waste prevention, reuse, recycling, bioconversion, thermal conversion, and final disposal;

(2) to gain an understanding of hazardous waste definitions and international legal systems pertaining to (a) (b) give manufacture of the second determined determined

MSW collection, transportation, treatment, recycling, and disposal.

[Course Schedule and Contents]

1. Hierarchical Measures for MSW, 5times We will explain the waste management hierarchy and elucidate the processes of waste prevention, reuse, recycling, bioconversion, thermal conversion, and final disposal in light of their benefits and limitations. Students will learn how the techniques and systems are adopted in practice in Japan and some Western countries.

2. Definitions of Hazardous Waste and the 3Cs (Clean, Cycle, Control) Concept, 2times We will discuss the Basel Convention, OECD hazardous waste management, and specially controlled waste systems in Japan, with a particular emphasis on the definitions of hazardous waste in these regulations. As an effective hierarchical measure used in hazardous waste management, we will examine the 3Cs concept. While keeping the Clean and Cycle aspects in mind, we will take a closer look at the Control aspect, which focuses on the maximum reduction of emissions of hazardous substances into the environment and stabilizing hazardous substances used in products by decomposition as much as possible. Students will learn from studying case examples related to asbestos

3. Definitions of Waste, Laws and Regulations for Waste Classification, Analysis of Waste Composition,

1time Continue to 廃棄物工学(2)

廃棄物工学(2)

Students will study the objectives and current problems of waste management, as well as the definitions of waste and laws/regulations related to waste classification. Special attention will be paid to the analysis of waste composition and interpretation of MSW composition data.

4. Resource Consumption and Waste Generation, 2times

We will study the relationships between resource consumption and waste generation from the viewpoint of material flow in nature and human society. We will examine indices for resource consumption (e.g., the amount of direct input of resources, hidden flow, ecological footprint, and environmental carrying capacity), classification of the patterns of waste generation, major products and their useful lifespans, resource yield, and transitions in waste amounts and characteristics

5. MSW Generation and Collection, and Payment and Collection Methods for MSW Disposal, 2times We will target MSW to examine waste flow in depth, including separate collection by local governments collection by residents, collection and trade-ins by manufacturers and dealers, and purchase by secondhand tores. We will also study MSW management plans and the breakdown of waste disposal costs together with collection and payment methods.

6. Appropriate MSW Management and Assessment of Environmental Burdens due to Waste Disposal, 2times We will introduce Life Cycle Assessment (LCA) and Risk Assessment as effective tools for evaluating the environmental impacts of waste disposal. Referring to case examples, we will study the outlines of these tools Students will also gain an understanding of the application of assessment techniques for hazardous waste and standard criteria for waste disposal.

7. Students ' Learning Outcomes, 1time Students ' level of understanding of course topics will be checked.

[Class requirement]

[Method, Point of view, and Attainment levels of Evaluation] Evaluating method: test scores, 70%; report paper and attendance rates, 30%.

[Textbook]

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

[Reference books, etc.] (Reference books)

To be announced in class

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

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

Please visit KULASIS to find out about office hours.	Others (office hour, etc.))		
	Please visit KULASIS to find out ab	out office hours.	

Numbering	g cod	de									
Course title <english></english>		境装置工学 vironmental Plant Engineering btile,Name department, Job title,Name department, Job title,Name Affiliated department, Job title,Name Associate Professor,OSHITA KAZU Graduate School of Engineering Associate Professor,OSHITA KAZU Graduate School of Engineering Assistant Professor,TAKASHI FUJI						AOKA MASAKI ol of Engineering sor,OOSHITA KAZUYUKI ol of Engineering			
Target ye	ar	3rd year students o	r abov	Number	of cred	lits	2			e offered eriod	2019/First semester
Day/perio	d V	Ved.2	Cla	iss style	Lecture	е				Language	Japanese
		Purpose of t		-							
perations s	uch a	as fluid transp	ortati	on, separati	on, ther	mod	ynamic	s, mas	s t	transfer, hea	ironment. Unit at transfer and reaction blid are shown.
Course G		-									
Inderstand or the plant		ole of environ	ment	al plant to c	onserve	the	enviror	ment	an	id common	engineering techniques
1						_			_		
		dule and Co ction to Enviro									
he enginee	ring nit c	ethics are introperations and	oduc	ed based on	acciden	its in			ar	nd importan	t parameters used in
class 2-3: S ecture ons ltration, du	prop	erty of particle	es su	ch as dust a	nd sludg	ge ai	nd separ	ation	pro	ocesses suc	h as thickening,
		ical reaction tion pattern an	d Re	actor types s	such as	batc	h, conti	nuous	sti	irred-tank a	nd plug flow reactors
lass 6-7: H ecture on h		ransfer ransfer such a	s the	rmal conduc	ction, co	nve	ction an	d radi	ati	ion and the	applications
lass 8: Mic	ltern	n examination									
		l flow process flow processe		the applica	tions su	ch a	s measu	remei	nt o	of air veloc	ity
		conditioning and						e of s	tea	am table an	d humidity chart
lass 13-14 ecture on r			as ga	s liquid eq	luilibriu	m a	nd the tl	ne app	olic	cations such	as gas absorber tower
lass 15: Cl	iecki	ng the degree	of le	arning achie	evement	and	l making	g the a	ıns	swers for qu	izzes, Feed back
									C o	ontinue to	環境装置工学 (2)

環境装置工学(2)

Class 16: Final examination

[Class requirement]

It is desirable that students have already learned Hydraulics and Exercises

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

Evaluated by the final examination (60 points) and the participation including attendance, midterm examination and quizzes (40 points)

[Textbook]

Not used

[Reference books, etc.]

(Reference books) 平岡正勝、田中幹也著『新版 移動現象論』(朝倉書店)ISBN:9784254250237 水科篤郎、桐栄良三編『化学工学概論』(産業図書)ISBN:4782825102

[Regarding studies out of class (preparation and review)] Lecture materials are delivered in class. Review the class and the materials.

(Others (office hour, etc.))

The order of lecture content can be changed. This lecture does not have a specific office hour Questions about each class should be given to Masaki TAKAOKA using E-mail takaoka.masaki.4w@kyotou.ac.jp or phone: 075-383-3335.

*Please visit KULASIS to find out about office hours.

Numbering co	ode										
Course title <english> Me</english>		則 ement Sys	tems			de	filiated partment b title,Na				ol of Engineering or,TSUKADA KAZUHIKO
Target year	3rd y	ear students o	or above	Number	of cred	lits	2			e offered eriod	2019/Second semester
Day/period				iss style	Lecture	e				Language	Japanese
[Outline and	Purp	oose of t	he C	ourse]							
[Course Goa	ls]										
[Course Sch	edul	e and Co	onter	nts]							
Configulations Physics on Tran Measurement o Transformation Statictical Proce Modern Instrum ,1time, [Class require None	isduc f Fun and l essing nenta	ers,2times damental Recording g of Data, ion,2time	s, Physi g of Si 2time	ical Quantit ignals,2time	ies,4tim		iis,2time:				
[Method, Poi	nt of	view, a	nd At	ttainment	levels	of I	Evaluat	ion]		
[Textbook]											
[Reference b	ook	s, etc.]									
(Reference	boc	iks)									
(Related U											
(http://www.ku		•		*							
[Regarding s	tudi	es out of	f clas	ss (prepar	ation a	nd	review)]			
(Others (offi											
*Please visit K	ULAS	SIS to find	l out a	about office	hours.						

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Numbering c	ode							
Course title 分 <english> Se</english>	離工学 eparation Tec	hnology		depa	iated artment title,Na	, me	Associate Profes Graduate Schoo Assistant Profe	ol of Energy Science ssor,KUSUDA HIROMU ol of Energy Science ssor,KUSAKA EISHI
Target year	3rd year studer	nts or above N	umber of cre	dits 2	2		urse offered ar/period	2019/Second semester
Day/period		Class		re			Language	Japanese
[Outline and	Purpose o	of the Cou	rse]					
[Course Goa	als]							
-	-							
[Course Sch	edule and	Contents]						
,1time,								
,3times,								
,2times,								
,3times,								
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[Class requi	rementl					_		
None	rementj							
[Method, Po	int of view.	and Attai	nment levels	of Ev	/aluat	ion		
L								
[Textbook]								
[Reference b	oooks, etc.]				_		
(Reference	e books)							
[Regarding s	studies out	t of class (preparation	and re	eview)1		
					,			
(Others (off	ice hour, e	tc.))						
*Please visit K	ULASIS to f	find out abo	ut office hours.					

Numbering of	code									
Course title <english> Public Economics</english>						Affiliated department, Job title,Name Associate Professor,MATSUSHIMA KX Associate Professor,YOKOMATSU MI Graduate School of Engineering Associate Professor, FOKOMATSU MI Graduate School of Engineering				r,MATSUSHIMA KAKUYA ation Research Institute r,YOKOMATSU MUNETA
Target year	r 3rd year students of	or above	Number	of cred	lits	2			e offered period	2019/First semester
Day/period	ay/period Thu.2 Class style Lect					ure Language			Japanese	
[Outline and Purpose of the Course]										

"The aim is to learn basic concepts of microeconomics and understand concepts related to the theory of evaluation of social infrastructure projects. For this purpose, a relatively detailed lecture will be conducted on the basic concepts of microeconomics, as well as the concepts concerning market functions, the behavior of conomic agents, and the evaluation of social welfare. Next, market failure and how to deal with it will be explained. At that time, the economic characteristics of infrastructure and general cost benefit analysis as a nethod of evaluation will be explained.

[Course Goals]

Mastering the basic concepts of microeconomics and understanding concepts related to the theory of the evaluation of infrastructure projects

[Course Schedule and Contents]

"Outline and public role (1 time): The outline of this lecture and the public role will be explained onsumer behavior model (2 times): The consumer behavior model will be described in detail. In particular, after describing the preference, utility, utility maximizing behavior of households, the nature of the demand function, the compensation function, the Slutsky equation, and the aggregate demand function will be described. Furthermore, the type and nature of households' welfare measures will be explained. Text 2 Practice on consumer behavior (1 time): A practice of the above two lectures will be conducted. Corporate behavior model (2 times): The behavioral model of a company will be explained. First, technology, production function, profit maximization behavior, and cost minimization behavior will be explained as basic knowledge. Next, the nature and points of cost and supply functions will be described in detail, and the

market structure and corporate behavior will be explained. Text 3 Practice of company behavior (1 time): A practice of the above two lectures will be conducted

Market of perfect competition (1 time): The markets of perfect competition will be explained. Additionally, differences between general equilibrium analysis and partial equilibrium analysis, and the concept of Pareto efficiency will be described in detail. Text 4 Market of imperfect competition (1 time): The characteristics of markets of imperfect competition, such as

nonopolistic markets and oligopolistic markets, and factors that cause monopolies and regulations incomposite markets and explained. Text 5 Indicator of economic valuation (1 time): Various indicators necessary for measuring benefits, such as

onsumer surplus, producer surplus, social surplus, compensation variance, and equivalent variance will be

lescribed. Text 7 Externality (1 time): The generation mechanism of externality and its types, and the internalization policy of externality will be explained. Text 14.1

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公共経済学(2)

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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 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

[Class requirement]

It is desirable that students have taken the course of planning system analysis and practice.

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

Periodical tests, reports, and attendance are comprehensively taken into consideration. (Periodic tests: 70 to 80%; reports and attendance: 20 to 30%)

[Textbook]

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 Company, 2014 isbn{}{9780393919677}

[Reference books, etc.]

(Reference books) 小林潔司『知識社会と都市の発展』(森北出版) ISBN:4627494610

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

It is advisable to read the corresponding parts of the textbook in advance.

(Others (office hour, etc.))

Questions and so 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.

Numbering	ode:											
								t, ime	Graduate School of Engineering Associate Professor, HATTORI ATSUSF Graduate School of Engineering Associate Professor, YAMAMOTO TAKASF Graduate School of Engineering Assistant Professor, TAKAYA SATOSF			
Target yea	r 4th y	ear students o	r above	Number	of crec	lits	2			e offered eriod	2019/First semester	
Day/period	Mon	.3,4	Cla	ss style	Experi	men	t			Language	Japanese	
[Outline and	d Pur	pose of t	he C	ourse]								
Experiments on the materials for concrete and concrete member are carried out in the main. Properties of												

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 cture because they are to be divided into some groups.

[Course Goals]

Students of this class practically learn to understand the properties of concrete material and member ntroduced in 'Construction Materials' and 'Concrete Engineering', and its measurement technique.

[Course Schedule and Contents]

Introduction, 1 time, The objective and contents of this laboratory are introduced. The fundamentals of the neasuring and testing method are also introduced.

Cement, Itime, The density, the fineness and the setting time of cement, and the flow of mortar are tested. Aggregate, 1 time, The density, the water absorption ratio, the grading, unit mass and surface water ratio of fine nd coarse aggregate are tested.

Mix proportion design of concrete and fresh concrete, 1 time. Mix proportion of concrete is designed using the results of lsquocementrsquo and lsquoaggregatersquo. The condition of fresh concrete made by using the designed mix proportion is examined. The test specimens for lsquohardened concretersquo are also cast. Hardened concrete,2times,Some destructive and non-destructive tests are performed in the test specimens ca

in lsquofresh concretersquo. Reinforcing steel bar, 1 time, The yield strength, the tensile strength and the elongation are obtained in the

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, 1 time, Achievement of learning is confirmed.

Continue to 材料実験(2)

材料実験(2)	
[Class requirement]	
Members of this class had better take 'Construction Materials' and 'Concrete Engineering' in 3rd y	ear.
[Method, Point of view, and Attainment levels of Evaluation]	
A report with the experimental results and discussion is assigned in each time. The grading is base	ed on the
total point of reports and attendance.	
[Textbook]	
The Society of Materials Science, Japan: Construction Materials Laboratory, 2,200JPY ISBN:978	34901381406
[Reference books, etc.]	
(Reference books)	
[Regarding studies out of class (preparation and review)]	
Construction Materials' and 'Concrete Engineering' should be reviewed.	
* *	
(Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.	
*Please visit KULASIS to find out about office hours.	

Course title 水理実験 English> 本理実験 Experiments on Hydraulics Atfiliated dipattment, Job title, Name Atfiliated dipattment, Job title, Name Atfiliated dipattment, Job title, Name Target year Ind year students or abov Number of credits 2 Course of Engineering Course, NAME HID Target year Ind year students or abov Number of credits
Graduate School of Engineering Professor,GOTOH HITOSHI Graduate School of Engineering Professor,TACHIKAWA YASUTO

水理実験**(2)**

[Outline 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 Goals] Understanding hydraylic phenomena through various flows observed in the hydraulic laboratory [Course Schedule and Contents] Guidance,1time,Guidance of hydraulics laboratory and course goals Instruments in hydraulics laboratory ,1time,Introduction of measurement instruments\\ Methods and principles of hydraulic experiments Experiments 1 - 4 ,8times,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 velocity profiles\\ Comparison measured results with theories C)Hydraulic jump in horizontal bed.(1)times,Understanding hydraulic jump \\ Comparison measured freesurface variations with theories D)Transmission and deformation behaviors of waves ,(1)times,Measurements of wave deformations, wave height and orbits of water particles\\ Comparison measured data with small amplitude wave theory and breaking-wave formula E)Flow in porous media and underground water ,(1)times, Measurments steady flows in porous media by sing 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 openchannel 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 Presentations of experimental results ,1time,Presentations for experimental results and related discussions [Class requirement] Hydraulics and Exercises [Method, Point of view, and Attainment levels of Evaluation] Attendance : 40 points Reports and homework : 60 points total: 100 points

Continue to 水理実験(3)

[Textbook]

水理実験(3)

[Reference books, etc.]

(Reference books)

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

(Others (office hour, etc.))

Numbering	g code										
Course title <english></english>		工学概論<地 luction to Ar		ctural Engi	neering	Affiliated department Job title,Na	· .	Graduate : KANKEI I		ol of Engineeri IN	ng
Target ye	ar 4t	h year students o	r above	Number	of cred	lits 2		Irse offer r/period	ed	2019/Second	semester
Day/perio	d Mo	on.1	Clas	ss style	Lecture	e		Langu	age	Japanese	
Outline a	nd Pu	Irpose of the	he Co	ourse]							
naterials tha vill focus or in the natur	at com 1 the r al and	prise archite elationship b artificial env	cture, etwee vironr	as well as en the char nent), on th	the structure acteristic he one has	ctural princi es of various and, and the	ples s type s resp	of archited es of distu oonse of bi	cture. rbanc uildir	cs of structural These explana a affecting built g structures, o ined principles	ations ildings n the
Course G	-										
		e of the study l learn about						ecessary f	unda	mental knowle	dge and
Course S	ched	ule and Co									
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f various lo tructures an ormulas wh eformation	ads, a d the eneve , mech	l mechanics a nd internal fo basic concep r possible. W	and st orces ots of l Ve wil	tructural de arise. We building st ll discuss d tics of stru	will disc ructural isplacen ctural ele	uss the mechanics the mechanics the transformer and deferments such	hanic hat p orma	es laws go predict it, v ation, force	verni vitho e and	deformed by th ng such behavi ut use of mathe equilibrium, f d columns, and	ior of ematical orce and
f various lo tructures an ormulas wh eformation tructures su teel structu echniques a material and Ve will exp	ads, a d the eneve , mech ch as re, 3 c nd the their lain th	I mechanics a nd internal fo basic concep r possible. W nanical chara framed struc classes: These ir history, pr detailed struc	and st orces ots of l Ve wil icterist tures e class roperti ctures of ear	ructural de arise. We v building st ll discuss d tics of stru and shell c ses will ex ies of steel s, c) proces thquake-re	will disc ructural isplacen ctural ele onstruct plain the material s from d esistant s	uss the mec mechanics t hent and def ements such ion. following: l, b) exampl esign to cor tructures an	hanic hat p orma a as jo a) ra es of istruc d bas	es laws go predict it, v ation, force oists, bean w materia buildings ction and e	verni witho e and ns an ls of cons exam	ng such behavi ut use of mathe equilibrium, f	ior of ematical orce and l various ing l ction.
f various lo tructures an ormulas wh eformation tructures su teel structu echniques a naterial and Ve will exp nderstand, tructural m bout main s omposite st	ads, a d the eneve , mech ch as re, 3 c nd the their lain th and pr aterial structur	I mechanics and internal for basic concept r possible. We annical chara framed struct classes: These ir history, pr detailed struct e principles esent variour ls in building ral materials res such as R	and st orces ots of I Ve will acteriss tures e class ropertic ctures of ear s dam gs, cor s such C, SR	ructural de arise. We v building st Il discuss d tics of stru and shell c ses will ex ies of steel c, c) proces upers to dan necrete struc as iron, sta C, and CF	will disc ructural isplacen ctural ele onstruct plain the material s from d ssistant s nper bui ctures, 4 eel, conc T, we w	uss the mec mechanics t ent and def ements such ion. following: l, b) exampl esign to cor tructures an lding vibrat classes: The rete, and we ill explain f	hanic hat p orma a) ra es of sstruc d bas ion. ese cl ood.	es laws go redict it, v ation, force oists, bear w materia buildings ction and e se isolation lasses will With resp- ational str	verni witho e and ns an ls of cons examp n in a disc ect to uctur	ng such behavi ut use of mathe equilibrium, f d columns, and steel, ironmaki structed of stee ples of constru	ior of ematical orce and l various l ction. s easy to mation steel principles
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建築工学概論<地球>(2)	
圧米上ナ1%1┉~℃∽~(≤)	
attainment.	
attanment.	
[Class requirement]	
None	
[Method, Point of view, and Attainment levels of Evaluation]	
Based on the final examination, but attendance is also emphasized.	
*	
[Textbook]	
Not used	
[Reference books, etc.]	
(Reference books)	
[Regarding studies out of class (preparation and review)]	
None	
(Others (office hour, etc.))	
[Office hours] Will be detailed during class.	
*Please visit KULASIS to find out about office hours.	
*Please visit KULASIS to find out about office hours.	

Numbering	g cod	de										
Course title <english></english>	土質力学II及び演習 Soil Mechanics II and Exercises					de	iliated partment p title,Na	, me G	Graduate School of Engineering Professor,KIMURA MAKOTO Disaster Prevention Research Institute Professor,UZUOKA RYOSUKE Graduate School of Engineering Associate Professor,SAWAMURA YASUC Graduate School of Engineering Associate Professor,HIGO YOUSUKE			
Target ye	ar	3rd year students o	r above	Number	of cred	its	3		se offered period	2019/First semester		
Day/perio					Semina	Seminar Languag				Japanese		
[Outline and Purpose of the Course]												
The student is expected to learning all consolidation and stress distribution in soil model, shear strength of soil												

The student is expected to learn:soil consolidation and stress distribution in soil media, shear strength of soil, ateral earth pressure-active and passive conditions, bearing capacity of shallow and deep foundations, stability of slope and soil dynamics.

[Course Goals]

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: 1. Understand the principles of strength and deformation behavior of different soils.
- 2. Understand and apply the fundamentals of soil mechanics and geotechnical compitation methods.
- 3. 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

Stresses 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's theory in cohesive and cohesionless soil, Coloumb's wedge theory with condition for critical failure plane, earth 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 Continue to 土質力学II及び演習(2)

土質力学II及び演習(2)

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

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

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

[Class requirement]

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

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

Grading Policy:Final exam(70%), Midterm exam and assigned homework(30%)

[Textbook]

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

[Reference books, etc.]

(Reference books) usao Oka,quotSoil Mechanics Exercisesquot,Morikita publishing Co., Ltd isbn{}{4627426607}.

(Related URLs)

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

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

Review of Soil Mechanics I and Exercises is recommended

(Others (office hour, etc.))

ontact Information will be delivered in their first lecture

Numberin Course title <english></english>	波動	・ い振動学 amics of Soil	and Stru	ctures		Affiliated departme Job title,	ent,	Professor,K Disaster Pre	IYC ven	l of Engineering DNO JIYUNJI tion Research Institute ASHI AKIRA
Target ye	ear	3rd year students o	or above N	umber c	of credi	its 2		ourse offeree ar/period	k	2019/First semester
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		on (1 week) perties of nor	ılinear dy	namic re	sponse	of structu	ires as	sociated with	n ela	sto-plastic behavior.
Vibration o	f 2-D equat	OF systems (ions of motic	1 week)							pration. Concept of
Natural free Relationshi		ies and natura								

波動・振動学**(2)**

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 using 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.

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

[Class requirement]

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

[Method, Point of view, and Attainment levels of Evaluation] Based on the performance during the course (including homework) and the results of a final examination [Textbook]

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

[Reference books, etc.] (Reference books)

[Regarding studies out of class (preparation and review)] There may be a couple of homework assignments throughout the course.

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours.

Course title 連続 <english> Co</english>			Affiliated departmen Job title,Na		Graduate School of Engineering Professor,HOSODA TAKASHI Graduate School of Engineering Associate Professor,HIGO YOUSUKI Graduate School of Engineering Associate Professor,PHATPNOKSA, Thirapon			
Target year	3rd year students	or above	Number	of cred	lits 2		urse offered ar/period	2019/First semester
Day/period	Tue.3	Clas	ss style	Lecture	e		Language	Japanese
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angular momen	tum, energy co ual work and i	onserva ninimu	tion laws), 1m potentia	Constitute Constitute	tutive laws y based on	of el	astic body and I	a (mass, momentum, Newtonian fluids, tions, Finite Element
[Course Goa	ls]							
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potential energy		calculu	is of variati	ions, Fii	nite Elemen	t Ŵ	ethod, etc.	rk and minimum

[Class requirement]

Basic understanding on differential and integral calculus and linear algebra

連続体の力学**(2)**

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

Mainly regular examination. Reports and attendance are also considered for grading.

[Textbook]

Printed materials on the contents of this subjetc are distributed in class.

[Reference books, etc.] (Reference books)

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

(Others (office hour, etc.))

Students can contact with Prof. Hosoda by sending e-mail to hosoda.takashi.4w@kyoto-u.ac.jp (Katsura C1-3-265).

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None
[Method, Point of view, and Attainment levels of Evaluation]
Breakdown of grading: paper tests results (60%) and attendance (40%). Short tests are also conducted for grading.
[Textbook]
Printed materials are distributed in class.
[Reference books, etc.]
(Reference books) Ministry of the Environment [®] Annual Report on the Environment in Japan _d Graduate School of Global Environmental Studies, Kyoto University (ed.) [®] Global Environmental Studie Learning of Way of Thinking from Several Points of View and Ability to Solve Problems, Kyoto Universi Popular Lecture Series _d (Maruzen) ISBN:9784621088074
[Regarding studies out of class (preparation and review)]
To follow guide of the staffs.
(Others (office hour, 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.

基礎環境工学 I (2)

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Course title 計画システム分析及び演習 <english> Systems Analysis and Exercise for Planning and Management</english>							, me	Pro Dis Pro Gra Ass Gra Gra	fessor,FUJI aster Preven fessor,TAT duate Scho ociate Profes duate Scho stant Professo duate Scho	ol of Engineering I SATOSHI tion Research Institute ANO HIROKAZU ol of Management sor,OOBA TETSUHARU ol of Engineering r,KAWABATA YUICHIRO ol of Engineering sor,NAKAO SATOSHI
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Basic concept for planning and management,6times, Linear Programming,5times, Non linear programming,5times, Dynamic programming, PERT,6times, Confirmation of progress,1time,										
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Continue to 水理水工学(2)

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attendance, reports and final examination	
Textbook]	
Reference books, etc.]	
(Reference books)	
Regarding studies out of class (preparation and review)]	
(Others (office hour, etc.))	
Please visit KULASIS to find out about office hours.	

Day/period Wed.3,4 Class style Seminar Language Japanese [Outline and Purpose of the Course]	Course title <english></english>		質実験及び演 periments on Soi	-	nics and E	xercises	Affiliated department Job title,Na	Pro Dis Pro Gr. As Gr. As Gr. As Dis As Gr. As Gr. As Gr. As Dis Cr. As Dis Dis Dis Dis Dis Cr. As Cr. Cr. As C Cr. As C As C C As C C As C C As C C As C C C C	sfessor,KISI saster Preversion fessor,UZU aduate Scho sociate Profesa duate School of sociate Profesa duate School of sociate Profesa duate Scho sociate Profesa duate Scho sistant Profess aduate Scho sistant Profess aduate Scho sistant Profess aduate Scho	ol of Engineering HIDA KIYOSHI HIDA KIYOSHI OKA RYOSUKE Ol of Management ssor, KIMOTO SAYUR ol of Engineering or, SAWAMURA YASU(Global Environmental Studi essor, TAKAI ATSUSH ol of Engineering essor, HIGO YOUSUKI ation Research Institute ssor, GOTOU HIROYUK ol of Engineering or, KITAOKA TAKAFUM ol of Engineering ssor, SAWADA MAI tition Research Institute ence UEDA VYOUUH
[Outline and Purpose of the Course] The first aim of this course is to acquire laboratory and in situ testing methods to assess engineering properties of soil, which were taught in the soil mechanics course. [Course Goals] To help students in understanding the soil mechanics concepts given in the Soil Mechanics course with han on experience. To belp students in understanding the soil mechanics concepts given in the Soil Mechanics course with han on experience. To collect, analyze and interpret experimental data. To have a feeling of engineering properties of geomaterials. [Course Schedule and Contents] Introduction and Orientation, 1 time, Physical properties of soils, 1 time, Structure of soil, Engineering classification of soils, Consistency Limits Grain size distribution Compaction Test, 1 time, Laboratory compaction tests, Factors affecting compaction Hydraulic Conductivity Test & Particle size distribution test, 1 time, Permeability and seepage, Darcy's law	Target ye	ear	3rd year students of	or above N	lumber	of cred	lits 2	Cours	e offered	2019/First semester
The first aim of this course is to acquire laboratory and in situ testing methods to assess engineering properties of soil, which were taught in the soil mechanics course. [Course Goals] To help students in understanding the soil mechanics concepts given in the Soil Mechanics course with han on experience. To be able to carry out all soil mechanics fundamental experiments. To collect, analyze and interpret experimental data. To have a feeling of engineering properties of geomaterials. [Course Schedule and Contents] Introduction and Orientation, 1 time, Physical properties of soils, 1 time, Structure of soil, Engineering classification of soils, Consistency Limits Grain size distribution Compaction Test, 1 time, Laboratory compaction tests, Factors affecting compaction Hydraulic Conductivity Test & Particle size distribution test, 1 time, Permeability and seepage, Darcy's law				Class	s style	Semina	r		Language	Iananese
Introduction and Orientation, 1 time, Physical properties of soils, 1 time, Structure of soil, Engineering classification of soils, Consistency Limits Grain size distribution Compaction Test, 1 time, Laboratory compaction tests, Factors affecting compaction Hydraulic Conductivity Test & Particle size distribution test, 1 time, Permeability and seepage, Darcy's law	-				-	ory and	in city toot	na met		
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Hydraulic Conductivity Test & Particle size distribution test, 1 time, Permeability and seepage, Darcy's law	The first air properties o [Course C To help stud on experien To be able To collect, To have a f [Course S	n of f soi dents ce. to ca anal feelin	this course is t il, which were Is] s in understand arry out all soil lyze and interp ng of engineeri edule and Co	to acquin taught in ling the l mechan ret expe ing prop	re laborat n the soil soil mech nics funda rimental perties of p	mechan anics co amental data.	ics course. oncepts give experiment	en in the	nods to asses	s engineering
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Continue to 土質実験及び演習(2)

土質実験及び演習**(2)**

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

Unconfined 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

Sounding 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 foundations

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

[Class requirement]

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

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

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.

[Textbook]

To be announced in the class.

[Reference books, etc.]

(Reference books)

[Regarding studies out of class (preparation and review)] It is recommended to read testing procedure beforehand.

土質実験及び演習(3)	
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(Others (office hour, etc.))

ontact information will be announced in the orientation.

*Please visit KULASIS to find out about office hours

基礎環境工学II(2)

Movement mechanism of water and materials in bedrock and bedrock use (3 times): The movement echanism of water and materials in bedrock, which is necessary for bedrock use, will be described.

Confirmation of achievement level (1 time): Confirming the degree of comprehension of the lecture contents

[Class requirement] Jone

[Method, Point of view, and Attainment levels of Evaluation] Evaluated by the score or the final examination. The score of some reports will be also considered, if some are given by lectures.

[Textbook] Not used

Handout will be given at each lecture.

[Reference books, etc.] (Reference books) Introduced during class

[Regarding studies out of class (preparation and review)] Completely understand the contents of each handout.

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours

Numbering	g cod	de											
Course title <english></english>	基礎環境工学II Fundamental Environmental Engineering I						Affiliated department, Job title,Name			Graduate School of Global Environmental Stu Professor, KATSUMI TAKESHI Graduate School of Engineering Professor, KOIKE KATSUAKI Graduate School of Engineering Professor, SHIMIZU YOSHIHISA Graduate School of Engineering Professor, YONEDA MINORU			
Target ye	ar	3rd year students	or above	Number	of cred	lits	2		ar/period 2019/First semester				
Day/perio	d T	ue.1	Cla	ss style	Lectur	e				Language	Japanese		
[Outline a	nd F	Purpose of t	he C	ourse]									
environmen mechanisms	tal st and	andards and s the character	o fort istics	h; the histor of soil and g	ry and c groundv	urre vatei	nt state	of po iel fo	ollu r p	tion in Japa ollution eva	ystem based on n, pollution luation, pollution ect to various kinds of		

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 vater and materials in bedrock will be explained.

[Course Goals]

Protecting the soil and groundwater that is closely related to the geosphere environment, especially our lives, from contamination, and understanding the knowledge that is the basis for thinking rationally and for the 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, he 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:

 Hydrology and permeability coefficient in the soil (type of soil and permeability coefficient and permeability of multilayered ground); 2. characteristics and effects of waterproofing material, underground walls, 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/ lesorption 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. _ _ _ _ _ _ _

Continue to 基礎環境工学II(2)

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Numbering	Numbering code										
Course title 大気・地球環境工学 Affiliated department, Job title,Name Graduate School of Engineering Associate Professor,FUJIMORI SHINICHIRG											
Target ye	ar	3rd year students of	r above	Number	of cred	its	2	Cou year		offered riod	2019/First semester
Day/perio	Day/period Mon.1 Class style Lecture Language Japanese									Japanese	
[Outline and Purpose of the Course]											
The history	of g	lobal environn	nental	issues are l	ectured	wit	h a spec	ial fo	ocus	on climate	change,地球環境問

ne depletion and acid rain. Moreover, the energy consumption and its environmental relationship would be discussed. The governmental and international organization roles are also presented. Finally the air ollution, its mechanism, health impact and abatement technologies are lectured.

[Course Goals]

To understand the systematic knowledge about global environment and air pollution problem

[Course Schedule and Contents] Global environmental change, 1 time, 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 environment, climate change perspective and impacts are explained. Finally, climate change mitigations are resented

Ozone layer protection and acd rain, 1 time, Ozone depletion history, the source substance, ozone layer distribution, ultraviolet effect on health, international ozone layer protection, Montreal protocol effectiveness and Japanese countermeasures are explained. Acid rain mechanism, its ecosystem effect, and the mitigation

neasures for acid rains are presented. 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

onsumptions are lectured. Global environmental protection, l time, International activities for global environmental issues, and Japanese

olicy as well as private sectorrsquos role are explained.

Air pollution, Itime, Global and Japanese air pollution history is introduced. Then, industrial development and its relationship with air pollutions are discussed.

Air pollutants and health impact, 1 time, Individual air pollution species and its chemical characteristics, as well as health impacts are lectured. Air pollution law and abatement technology. 1 time. Environmental standard and emissions regulations for air

pollutions are explained. Also, abatement technologies are presented Air pollution mechanism, 1time, 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, l time, Emissions source data, meteorological data, and air chemical transport model

ulations are lectured Confirmation of understanding,1time,Confirm the understanding

Continue to 大気・地球環境工学(2)

ne Method, Point of view, and Attainment levels of Evaluation] ere to be writing test every class and final exam are evaluated as well. Fextbook] Stribute handout copy Reference books, etc.] (Reference books) · 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)公書防止の 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) Regarding studies out of class (preparation and review)] n Others (office hour, etc.)) plain in the first lecture	大気・地球環境工学(2)
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Target ye	ar 3rd year students of	or above	Number	of cred	its	3			e offered eriod	2019/First semester
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Target year	ar providents of above Number of Credits 2 year/period							2019/Intensive, Second semester		
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		習(環境] uinning	二学コ	-ス)		dej	iliated partment p title,Na				ol of Engineering or,FUJIMORI SHINICHIRO
Target year	3rd ye	ear students (or above	Number	of cred	its	2		ourse ar/pe	offered riod	2019/Intensive, Second semester
Day/period	Inten	isive	Cla	ss style	Practica	al tr	aining		-	Language	Japanese
[Outline and	Purp	ose of t	he C	ourse]							
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[Class requir		-		<u></u>	1			,		· , ,	
systems analysi											raulics, soil mechanics, eering).
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Grade is given b presentation after				liary during	g the inte	rnsl	hip, a re	por	t abou	ut outcome	of the internship, and
[Textbook]											
Not used No textbook.									- <u>-</u>	tinue to 学外	実習(環境工学コース)(2)

学外実習(環境工学コース)(2)

[Reference books, etc.]

(Reference books)

[Regarding studies out of class (preparation and review)] To follow guide of the staffs

(Others (office hour, etc.))

The contents of internship are dependent on accepting organizations. *Periods of internship is about one month during summer holidays. *Briefing attendance at the beginning of fiscal year is necessary. To confirm information on details of office hours via KULASIS.

*Please visit KULASIS to find out about office hours

Numbering code Disaster Prevention Research Institute 空間情報学 Professor, HATAYAMA MICHINOR Course title department, Job title.Nam <English> Geoinformatics Graduate School of Engineering Associate Professor, SUSAKI JIYUNICHI Course offered year/period Target year 3rd year students or above Number of credits 2019/Second semest Day/period Thu.3 Language Japanese Class style Lecture [Outline 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 and digital photogrammetry are focused on. [Course Goals] The student will understand the techniques to obtain the spatial data, e.g. remote sensing and photogrammetry and the system to effectively show and analyze such data, e.g. GIS. In addition, the student will understand the relationship between the techuniques and the system. [Course Schedule and Contents] Introduction, Itime, The purpose and role of geoinformatics, and the techniques related to geoinformatics are introduced. In addition, the student will understand the concept of CIM (Construction Information Modeling) 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 orientation, and (3) colinearity condition. Remote sensing,4times,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 by light detection and ranging (LiDAR) will be introduced. Evaluation of understanding, 1 time, The student will be evaluated for their understanding of the contents offered by the course. [Class requirement] It is expected that the student has completed the courses (1) Statistics (first semester in the second year), and (2) Surveying and practice (first semester in the third year). [Method, Point of view, and Attainment levels of Evaluation] Evaluate considering the scores of intermediate examination (GIS) and final examination (remote sensing and photogrammetry), and the submitted reports.

*

_____Continue to 空間情報学(2)

空間情報学(2)	
[Textbook]	
Susaki, J. and Hatayama M., quotGeoinformaticsquot Corona Publishing Co., Ltd., isbn{}{978433905	6389}
[Reference books, etc.]	
(Reference books) Japan Association on Remote Sensing, quotRemote Sensing Notequot ibid{}{BB01990469}, Kohei Cho, quotSpatial Data Analysis using GISquot isbn{}{9784772231244}	
[Regarding studies out of class (preparation and review)]	
(Others (office hour, etc.))	
*Please visit KULASIS to find out about office hours.	

Numbering	g co	de								
Course title <english></english>		造実験・解析 Juter Programming an		nent on Structural	Mechanics	Affiliate departm Job title	ent,	e Gra Ass Gra Ass Gra Ass Gra Ass Gra Ass Gra Ass Gra Cor Cor Cor Cor Cor Cor Cor Cor Cor Cor	ofessor,SUG aduate Schoofessor,TAK, saster Prever ofessor,IGAI saster Prever ofessor,SAW aduate Schoo sociate Profe aduate Schoo sociate Profe aduate Schoo sociate Profe saster Prever sociate Profes saster Prever sociate Profes aduate Schoo sister Profes aduate Schoo sister Profes aduate Schoo sister Profes aduate Schoo sister Profes	Global Environmental Studies IURA KUNITOMO ol of Engineering AHASHI YOSHIKAZU ntion Research Institute RASHI AKIRA titon Research Institute /ADA SUMIO ol of Engineering essor, KITANE YASUO ol of Engineering sosor, FURUKAWA AIKO ntion Research Institute (sor, GOTOU HIROYUKI) ol of Engineering soor, GOI YOSHINAO ol of Engineering sor, GOI YOSHINAO ol of Engineering
Target ye	ar	3rd year students of	or above	Number	of cred	lits 2			e offered eriod	2019/Second semester
Day/perio	dI	Fri.4,5	Cla	ss style	Semina	ır			Language	Japanese

[Outline 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 Goals]

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.1time

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 practical failure structures

Structural Experiment,6times

Introducing fundamentals of experiment method and measurement technique for structure model, 5 xperiments (cantilver, frame, metal, vibraition test, concrete)

Computer Analysis,6times

itimes _____ Continue to 構造実験「解析演習(2)

構造実験・解析演習(2)

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, 2 times

Review structural experiments and computer analysis. Confirm the attainment level of learning

[Class requirement]

Computer Programming in Global Engineering, Structure mechanics and Exercises, Structure mechanics and Exercises

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

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.

[Textbook]

Instructed during class To be distributed in lectures

[Reference books, etc.]

(Reference books) Introduced during class

[Regarding studies out of class (preparation and review)] Students will review frame analysis.

(Others (office hour, etc.))

Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture

It is desirable to bring your own laptop.

*Please visit KULASIS to find out about office hours.

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Numberin	g co	de									
Course title <english></english>		震・耐風・設 uske and Wind Resistance of i		nd Related Structural Di	esign Principles	de	iliated partment b title,Na	t,	Pro Gra Pro Gra Pro Dis Pro Gra	ofessor,SUG aduate Schoo ofessor,TAKA aduate Schoo ofessor,YAG saster Prever ofessor,SAW aduate Schoo	Global Environmental Studies UURA KUNITOMO J of Engineering AHASHI YOSHIKAZU J of Engineering I TOMOMI titon Research Institute ADA SUMIO J of Engineering sor, MOGUCHI KYOHEI
Target ye	ar	3rd year students of	or above	Number	of cred	lits	2			e offered eriod	2019/Second semester
Day/peric	d	Fri.3	Cla	ss style	Lecture	e				Language	Japanese
Outline a	nd	Purpose of t	he C	oursel							

Fulpose d

To understand fundamentals of design theory for civil infrastructures. To explain various design loads, ncluding dead load, live load, temperature load, seismic load, and wind load, limit states of structures and their evaluation, demand performance. To design structures considering reliability, optimal design, erviceability, aesthetics, and environment

[Course Goals]

To understand fundamentals of design for civil infrastructures. To understand fundamentals of load, limit state of structures, reliability design and optimal design

To understand fundamentals of characteristics of natural wind, aerodynamics of structures, design wind and wind resistant design.

To understand fundamentals of earthquake mechanism and seismic response of structures, seismic load, and seismic design.

[Course Schedule and Contents]

Introduction of design theory of civil infrastructure, 2times, Design theory of civil infrastructures is introduced. The concept and significance of design, objective of design, characteristics of civil infrastructures, flow of design process, mechanical design, multi-level decision making are discussed. Engineering ethics are also explained.

Introduction of load, 3times, Design loads for civil infrastructures are introduced. The characteristics and classification of design loads are explained and their quantitative expression is discussed. Especially statistic characteristics of random loads, i.e. seismic load and wind load, are explained.

Prediction of earthquake ground motion and earthquake response of structure,2times,Methods for predicting earthquake ground motion are introduced based on the theories of earthquake mechanism and ground vibration. Equation of motion for the single degree of freedom system and its solution are also explained in order to estimate earthquake response of structure. Design methods for infrastructures are interpreted on the asis of theories of elasticity and plasticity.

Characteristics of natural wind and aerodynamics of structures.2times.The characteristics of natural wind and Characteristics of natural wind and aerodynamics of structures, zimites, the characteristics of natural wind and strong wind are explained and process of design wind for structures is discussed. And various aerodynamics (vortex-induced vibration, galloping, flutter, buffeting, and etc.) acting on structural section with various geometric shape and their generation mechanism are explained. Limit state of structure and reliability analysis,3times,The outline of structural safety analysis is introduced

for serviceability, ultimate and fatigue limit of structures. As for uncertanities in various actions to structures

耐震・耐風・設計論(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, 3 times, Seismic design, wind resistant design, optimal design and landscape design for various structures, including long span bridge [Class requirement]

[Class requirement]

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 Mechanics(31650)

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

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

Hand-outs are distributed when necessary

[Reference books, etc.]

(Reference books)

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

(Others (office hour, etc.))

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 title <english></english>		通マネジメ) nsportation S	. —	-	ent	Affiliated department Job title,Na	t,]	Graduate School of Engineering Professor,FUJII SATOSHI Graduate School of Managemen Professor,YAMADA TADASH			
Target ye	ar	3rd year student	s or above	Number	of cred	its 2	Cou	rse	offered riod	2019/Second sem	
Day/perio	d	Mon.3	Cla	ss style	Lecture	e		L	anguage	Japanese	
[Outline a	nd I	Purpose of	the C	ourse]							
This lecture transportation										urban traffic and of travel.	
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used for sur students are [Course S Outlines of 7 Road Trans] Survey and Approaches	vey, expe che Traff porta Anal for '	desgin and o ecting to app edule and (fic and Tran ation Plannir lysis of Trav Travel Mana	operation oly the r Conten sportation g,2time el Beha agement	on of transp nethodolgio nts] on Enginee es, avior,2times,	ortation tes for the pring,1tin	planning an e actual case	id tra			n the methodologie: g. In addition, these	
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[Textbook]

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Y. Iida and R. Kitamura: Traffic Engineering (written in Japanese), Ohmsha, 2008 isbn{}{9784274206382}.

[Reference books, etc.]

(Reference books)

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

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

(Others (office hour, 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 title <english></english>		醫環境工学 penvironmenta	境工学 ironmental Engineering			Affiliated department, Job title,Nar	ne Pro Pro Di Pro	raduate School of Global Environmental Studie trofessor, KATSUMI TAKESHI Graduate School of Engineering trofessor, KIMURA MAKOTO bisaster Prevention Research Institute trofessor, UZUOKA RYOSUKE				
Target ye	Target year Brd year students or above Number of credits 2 Course offered year/period 20								2019/Second semester			
Day/perio	d	Гue.2	Cla	ss style	Lecture	e		Language	Japanese			
[Outline a	nd	Purpose of t	he Co	ourse]								
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[Course G	Goal	s]										
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		d (3) reuse of v										
									aster, (3) mechanism of			
		d (4) prediction							aster, (3) mechanism or			
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Numbering code Graduate School of Engineering Professor, TAKAOKA MASAKI Graduate School of Engineering Professor, YONEDA MINORU Graduate School of Engineering Associate Professor.OOSHITA KAZUYUKI Graduate School of Energy Science Associate Professor, TAKAYUKI KAMEDA Graduate Professor, YOKO SHIMADA Agency for Health, Safety and Environment Affiliated 環境工学実験2 Course title Associate Professor, MATSUI YASUTO departr Environmental Engineering , LaboratoryII Graduate School of Engineering Assistant Professor, KUSAKABE TAKETOSHI <English> Job title.Nar Graduate School of Engineering Assistant Professor, GOMI RYOUTA Graduate School of Engineering Assistant Professor, NAKANISHI TOMOHIRO Graduate School of Engineering Assistant Professor, TAKASHI FUJIMORI Graduate School of Energy Science Assistant Professor, YAMAMOTO KOUHEI Institute for Integrated Radiation and Nuclear Science Assistant Professor, IKEGAMI MAIKO Course offered Brd year students or above Number of credits Target year 2019/Second semeste year/period Day/period Tue.3,4,5 Class style Experiment Language Japanese [Outline and Purpose of the Course] This class is aimed at learning fundamental knowledge, principles and methods on monitoring of atmospheric environment, noise measurement and radiation measurement through various experiments. Also, basic experiments on physical and chemical unit operations in environmental engineering are conducted. [Course Goals] Learning experimental methods to measure various factors in the environment and physical and chemical unit operations in environmental engineering. [Course Schedule and Contents] 1st and 2nd Class: Introduction to the laboratory and monitoring of atmospheric environment The outline of 12 experiments in this course and general information for attending students are presented on the first day of class. These classes cover the following contents to learn the methodology for monitoring atmospheric environment and analyzing air quality. • Lecture on the measurement techniques of air pollutants, such as nitrogen oxides (NOx) and particulate matter (PM). · Practice of the measurements of air quality, meteorological observation, and estimation of the amount of mission in the field. ------Continue to 環境工学実験2(2)

	-]
ith Class: Report writing	
To write the reports on these experiments	
th to 11th Class: Environmental process experiments	
1) Air flow condition	
Experiment on measurement of air velocity and volumetric airflow to understand the flow condition in a du	ct.
2) Flow characteristics of reactors	
To evaluate the degree of mixing in reactors by impulse response tracer experiments	
3) The overall heat transfer coefficient of turbulent flow	
Detaining the overall heat transfer coefficient of turbulent flow by heat exchange experiments between hot	
nd cold water.	
4) Coagulation Fo decide optimal dosage of a coagulant to turbid samples by conducting jar-test	
5) Settling Characteristics	
Fo 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	
process	
2th and 13th Class: Radiation measurement	
1) 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	
adioactive 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.	
4th Treatment of Wastewater and Waste	
Freat the wastewater and waste generated from experiments	
5th Report writing and feed back	
To write the reports on these experiment	
ι · · · <u>τ</u> · · · · ·	
[Class requirement]	
Vone	
[Method, Point of view, and Attainment levels of Evaluation]	

環境工学実験2(3)
[Textbook]
Textbook for the experiments is delivered in class.

Continue to 環境工学実験2(3)

[Reference books, etc.] (Reference books)

None

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

Read thoroughly the textbook and understand procedures of the experiments

(Others (office hour, etc.))

The date on report writing can be changed. Questions about each class should be given to each faculty ember. Questions about overall class should be given to Professor Takaoka.

*Please visit KULASIS to find out about office hours

* Numbering code Graduate School of Engineering Affiliated 波動工学 Professor, MIKADA HITOSHI Course title <English> Wave Motions for Engineering Graduate School of Engineering Assistant Professor.TAKEKAWA JUNICHI Job title,Nam Course offered Target year Brd year students or above Number of credits 2019/Second semeste vear/n Day/period Mon.4 Class style Lecture Language Japanese [Outline and Purpose of the Course] 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 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 is described. Although the lesson is based on a lecture, an understanding is deepened by studying an exercise problem according to circumstances [Course Goals] Students will be able to manipulate vibrations and wave motion phenomena freely using mathematical formula. Moreover, the ability to explain vibration and wave motion phenomena is mastered during this class [Course Schedule and Contents] Simple harmonic motion and its superposition, 1 time, The oscillating phenomenon and the wave motion phenomena of appearing in the resource engineering are described focusing on using examples. Furthermore, 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, 1 time, A one-dimensional wave equation is drawn taking the case of a string, and the character of a wave is stated. Analytic Mechinics, 2 times, 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

oscillating phenomenon is described. Elastic Waves, 2 times, 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 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, 1 time, The fundamentals of numerical methods are introduced to

simulate wave pheno Check of Progress, 1 times, Furthermore, the degree of study achievement is checked about whether an

understanding of the wave phenomenon progressed through this whole lecture.

_____Continue to 波動工学(2)

波動工学(2)

[Class requirement]

Vector Analysis, Classical Dynamics, Electromagnetics

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

Although experimental mark is based on fundamental score, attendance to a lesson and report results may be aken into consideration

[Textbook]

[Reference books, etc.]

・ (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}

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

(Others (office hour, etc.))

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

Numbering c	ode										
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Target year	3rd y	ear students o	or above	Number	of cred	its	2		ourse ar/pe	offered riod	2019/Second semester
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[Outline and	Purp	oose of t	he C	ourse]							
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[Outline and	nd F	Purpose of t	he C	ourse]							

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 Goals]

The goal of this course is to master the evaluation method of mechanical properties for both rock and metal materials 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, 4.5times, 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 determined. Tensile test and mechanical properties of sheet metals,4.5times,Overview of the testing for sheet metals is 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 peropertus are evaluated. Metallographic observation and peroperaphic 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 sections.

[Class requirement]

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)

資源工学材料実験**(2)**

*

Undergraduate Course Program of Earth Resources and Energy Engineering that are offered in the same semester.

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

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 made by the attitudes to the experiments and the grade points of every experimental report. The grading weights of them are even.

[Textbook]

This course does not specify a textbook. Lecture documents may be deribered from teachers in each experimental theme.

[Reference books, etc.]

(Reference books) Not specified

(Related URLs)

(This course does not have a web site.)

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

(Others (office hour, etc.))

It is desirable that all students belonging to the Undergraduate Course Program of Earth Resources and Energy Engineering take this course. Additional information is presented in the first class.

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HIDA KIYOSHI
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| | onsolidation and settlement, 3.5 times, Understand Terzaghi's one dimensional consolidation theory, the tal and effective stress distribution in soil. | | | | | | | | | | | |
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| 土質力学 I 及び演習 (2) |
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| [Class requirement] |
| The course is designed for students in any major;an earth science background is not required. |
| [Method, Point of view, and Attainment levels of Evaluation] |
| Grading Policy:Final exam(70%), Midterm exams and assigned homeworks(30%) |

[Textbook]

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

[Reference books, etc.] (Reference books)

Fusao Oka, quotSoil Mechanics Exercisesquot, Morikita publishing Co., Ltd isbn{}{4627426607}.

(Related URLs)

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

[Regarding studies out of class (preparation and review)] It is recommended to read the textbook beforehand.

(Others (office hour, etc.))

Mimura, Kishida, Higo and Kimoto: Contact Information will be delivered in their first lecture Katsumi and Takai: Visit their office in Yoshida Campus directly

*Please visit KULASIS to find out about office hours.

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都市景観デザイン**(2)**

[Textbook]

[Reference books, etc.]

(Reference books)

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

(Others (office hour, etc.))

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.

- - - - - - - - - - Continue to 都市景観デザイン(2)

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| 構造力学II及び演習(A班)(2) | |
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[Textbook]

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

[Reference books, etc.]

(Reference books) M. Matsumoto, E. Watanabe, H. Shirato, K. Sugiura, A. Igarashi, T. Utsunomiya, Y. Takahashi: Structure nechanics , Maruzen Ltd. isbn{}{4621046403}

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

(Others (office hour, etc.))

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.

*Please visit KULASIS to find out about office hours.

mechanics , Maruzen Ltd. isbn{}{4621046403}

構造力学II及び演習(B班)(2)

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

(Others (office hour, 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

aches for study of statically indeterminate structures mentals of elastic stability nentals of structural analysis by matrix methods se Goals]

e structures such as truss and beam by the principle of virtual work/energy principles ve statically indeterminate structures by force method and displacement method erstand the stability of equilibrium he stiffness matrix of simple trusses

se Schedule and Contents]

nce,2times,Guidance on how this class is operated, and how to use computing facility for this class.\\ knowledge on the role of IDS in network security and how machine learning can help the intrusion

Course offered

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on Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by signature-IDS by studying open source signature-based IDS and attacks, such as correspondence between alarms from IDS and communications, and adding signatures to detect attacks.

on Detection by Machine Learning,7times,Learn the method of classifying normal and malicious by machine learning algorithms and public dataset for benchmarking intrusion detection performance. tation, 1 time, Based on the exercise, students presents their methods of intrusion detection using ne learning, and discuss it with other students and instructors.

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s A and B, Linear Algebra A and B, Structure mechanics and Exercises

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rence books, etc.]

tsumoto, E. Watanabe, H. Shirato, K. Sugiura, A. Igarashi, T. Utsunomiya, Y. Takahashi: Structure Continue to 構造力学順及び演習(B班)(2)

2019/First semester

Disaster Prevention Research Institute Professor, SAWADA SUMIO

Language Japanese

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岩盤工学(土木工学コース)(2)

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als Science, Japan: Rock Mechanics isbn{}{4765516288} |
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岩盤工学(資源工学コース)(2)

[Class requirement]

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

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

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

[Textbook]

Others; prints will be distributed as necessary

[Reference books, etc.]

(Reference books)

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

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

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours

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Rock Engineering | | | | | | department, | | | Graduate School of Engineering
Professor,HAYASHI TAMETO
Graduate School of Engineering
Associate Professor,NARA YOSHITAKA | | |
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| [Outline and Purpose of the Course] | | | | | | | | | | | | |
| A material experiment for observing the mechanical properties and microscopic characteristics of rocks and
metal materials and an observation of the structure of materials will be carried out. By completing this | | | | | | | | | | | | |

experiment, students will learn how to measure the mechanical properties of rocks and metal materials, how to observe structures, and how to use equipment related to measurement and observation.

[Course Goals]

In this experiment, the aim is to be able to evaluate the Young's modulus, Poisson's ratio, uniaxial compressive strength, and the tensile strength of rocks and to determine the destruction condition of rocks, as well as the ability to observe the structure of rocks and metals using a microscope, and to be able to evaluate mechanical properties, such as yield stress, tensile strength, and the strain-hardening coefficient of metallic naterials

[Course Schedule and Contents]

Overall description (1 time): An overall explanation will be given about the purpose of the class, the program safety notes, and division into groups.

Rock material testing and destruction conditions (4.5 times): An outline of rock material tests, Young's nodulus, how to obtain Poisson's ratio, uniaxial compressive strength, and the tensile strength calculation method will be explained. Additionally, starting with preparing rock specimens for each group, the uniaxial compression test of rocks and the strain measurement by strain gauge, the tensile test of rocks (compression test), the evaluation of Young's modulus and Poisson's ratio, and destructive condition determination will be arried ou

Tensile test and mechanical properties of metallic materials (4.5 times): The outline of the test method for metallic materials will be explained. Additionally, a uniaxial tensile test of steel material/aluminum alloy material will be conducted, and a calculation of the stress-strain curve as well as the evaluation and analysis of mechanical properties will be carried out.

Tissue observation of metal and rock (4.5 times): The method of observing the structure of metals and rocks and the usage microscopes will be explained. Regarding the observation of metallic structures, grinding and corrosion of the specimen is performed by each group, and the structure observation of crystal grains and so forth is conducted. As for the observation of the structure of rocks, the principle and usage of polarizing microscopes will be studied and the observation of rocks and minerals by means of polarized microscopes will be conducted; in addition, discussions on the observation results will be carried out.

Continue to 岩盤工学(資源工学コース)(2)

Numbering code Graduate School of Engineering Professor, KAWASAKI MASASHI Graduate School of Engineering Professor, TAKAHASHI YOSHIKAZU Graduate School of Engineering Professor, YAGI TOMOMI Graduate School of Engineering Associate Professor, YAMAGUCHI KEITA ∆ffiliated urse title 地球工学デザインA departn Design Exercise for Global Engineering A <English> Job title.Name Part-time Lecturer, IWASE RYOKO Part-time Lecturer NAGAHAMA NOBUTAKA Part-time Lecturer, YAGI HIROKI Course offered year/period 4th year students or abo Number of credits Target year 2019/First semester Day/period Tue.3,4 Class style Lecture Language Japanese [Outline and Purpose of the Course]

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 ectures by 3 practitioners who are active in the front line.

[Course Goals]

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, Itime, Guidance \\ Outline of Civil engineering design: design and architecture, idea and image of design, shape and scale, method of design.

Civil engineering design exercise. Stimes, Through a design exercise, students execute a design process: the field survey, arrangement of conditions, planning, creating ideas, structural analysis, detailed study, drawing, nodel 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 Achievement confirmation, times, Achievement of learning is confirmed.

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| 地球工学デザイン A(2) | |
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| [Class requirement] | |
| t is desirable to have taken the class of quotUrban and Landscape Designquot. It is expected to have | _ |
| astered basic knowledge of quotStructural Mechanicsquot and quotConstruction Materialsquot. | |
| [Method, Point of view, and Attainment levels of Evaluation] | |
| otal points will be scored in attitude of attendance (40%) and results of design practice and reports (6 | 50%) |
| [Textbook] | |
| | |
| [Reference books, etc.] | |
| (Reference books) | |
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| [Regarding studies out of class (preparation and review)] | |
| | |
| (Others (office hour, etc.)) | |
| Office hours are not especially set. Ask any questions by mailing or visiting professors (Kawasaki, rm Kubota, rm.201, C1-1 at Katsura Campus). The theme of design practice could be changed partially. | 1.202 |
| *Please visit KULASIS to find out about office hours. | |
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BUCHI MAMORU
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HAKAMADA MASATAKA
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or, KASHIWAYA KOUKI
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ssor, KUSAKA EISHI
ol of Engineering
or, TAKEKAWA JUNICHI
ol of Energy Science
ssor, CHINY VUUSEI |
| Target ye | ear 4th year students of | or above Number | of cred | its 2 | Cours
year/p | e offered
period | 2019/First semester |
| Day/perio | d Fri.3,4 | Class style | Lecture | | | Language | Japanese |

[Outline and Purpose of the Course]

Two courses (a, b) are opened in parallel. In the course (a), the aim is understanding theories of numerical simulation, and carrying out the simulation analysis. Lectures on simulation theory and analysis are conducted with exercises. In the course(b), lectures and exercises on basic knowledge related to resources and energy are conducted.

[Course Goals]

Course (a): getting skill solving problems using simulation, and presentation technique. Course (b): getting basic knowledge on resources and energy.

[Course Schedule and Contents]

a-1. Simulation Theory and Introduction of Each Theme,3times,Explanations of theories of numerical simulations analysis, and each theme for students.

a-2. Simulation exercise,6times,Students carry out numerical simulation analysis based on each theme.
a-3. Interim report, Itime,Each student explains their own theme, and reports the method and the progress.

a-4. Simulation exercise, 4times, Continue simulation analysis for each theme.
a-5. Presentation of final results, 1time, Summary of the analysis results, and the presentation

b-1. Deformation and Strength of Metallic Material,4 ~ 6times,Learning deformation behavior and strength

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地球工学デザイン**B(2)**

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 ~ 6times,Observations and Analysis of production and ssolution of methane hydrate using microscope. Observation rock minerals, rock texture, microcracks Knowledge of rock minerals.

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

[Class requirement]

None

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

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 based on student's attendance and reports.

[Textbook]

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

[Reference books, etc.]

(Reference books) It will be shown in the lectures.

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

It will be shown in the lectures.

(Others (office hour, etc.))

Details are explained at the guidance

*Please visit KULASIS to find out about office hours

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Design Exercise for Global Engineering C | | | | | | iliated
partment
b title,Na | ;, ne (| Graduate School of Engineering
Professor, ITOH SADAHIKO
Graduate School of Engineering
Professor, TAKAOKA MASAKI
Graduate School of Engineering
Associate Professor, ECHIGO SHINY,
Graduate School of Engineering
Associate Professor, NGSHITA KAZUYUK
Graduate School of Engineering
Assistant Professor, NAKANISHI TOMOHIR
Graduate School of Engineering
Assistant Professor, NAKANISHI TOMOHIR
Graduate School of Engineering | | | |
| Target ye | ar | 4th year students of | or above | Number | of cred | its | 2 | | | e offered
eriod | 2019/First semester | |
| Day/perio | bay/period Wed.3,4 Class style Lectur | | Lecture | 2 | | | | Language | Japanese | | | |
| [Outline a | nd | Purpose of t | he C | ourse] | | | | | | | | |

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 Goals]

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) Unrent 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 proceed 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 sewage 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) Methodologies to determine placement and volume of water supply facilities are expressed. Exercise of a simple case is conducted, and the design of an existing facility is read. An actual water supply facility is also visited

Basic design of sewerage system (2 times)

Update status of design of sewerage system, and methodologies to determine placement and capacity of sewage pipe and treatment facility are explained. Exercises of such determinations using a simple case are Continue to 地球工学デザインC(2) are

| 也球工学デザイン C(2) | Numberin |
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| onducted. | |
| Exercise of design (5 times)
Fo conduct planning and design about certain cities selected by students. That is, hydrologic and capacity
arameters 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 | Course title
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| of the results of the series of the works are prepared. Some works may be simplified or cut for time. | Day/peric
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| or conduct planning and design adout certain terites selected by students. That is, hydrologic and capacity
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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. | - |
| 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
varameters of a certain city targeted. | [Course G |
| Basic design of a waste incineration facility (2 times)
Fo understand heat and mass balances through combustion calculation and calculate a basic design based on
ertain setting conditions. | ,1time,
,3times,
,3times,
,4times, |
| Environmental Impact Assessment (1 time)
Environmental impact assessment is introduced using a construction of a waste incineration facility as a
ubject. | ,3times,
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| Class requirement] | [Class red
None |
| t 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. | [Method, |
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Materials and Plasticity</english> | | | | | | | Affiliated
department,
Job title,Name | | | Graduate School of Energy Science
Professor, TAKUDA HIROHIKO
Graduate School of Energy Science
Professor, MABUCHI MAMORU
Graduate School of Energy Science
Associate Professor, HAMA TAKAYU | | | |
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gn for Infrast | | re I | | Affiliated
department,
Job title,Name | | | Graduate School of Engineering
Professor, UNO NOBUHIRO
Graduate School of Global Environmental Studies
Professor, SUGIURA KUNITOMO
Graduate School of Management
Professor, TODA KEIICHI
Graduate School of Global Environmental Studies
Associate Professor, HARADA EIJI
Graduate School of Engineering
Associate Professor, HIGO YOUSUKE | | | |
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| - | | urpose of t | | - | | | | | | to improve social | | |
| nfrastructures. 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. | | | | | | | | | | | | |
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f environment | edge related to social | | |
| [Course S | chec | dule and Co | onten | ts] | | | | | | | | |
| [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
oredecessors is introduced.
Structual Enginnering,3times,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.
Hydraulics and Hydrology,3times,In order to resolve various problems caused by the rapid change of global
nvironment, it is important to understand the formation processes of river basins in the world and the
levelopment processes of cities located along a river. Several river basins with well-known cities are
ntroduced including the natural conditions, history amp culture developed for many years. The Kyoto city,
which is famous for a complicated water channel network system, is of course considered as a typical
example.
Beotechnical 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.
Planning and Management,3times,Civil Engineering is introduced in the view point of designing and
nanaging social Infrastructure, which includes an asset management of social infrastructure, soft measures
or traffic jam, logistic vehicles in urban area, etc. | | | | | | | | | | | | |
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社会基盤デザイン I **(2)**

Achievement confirmation,1time,Achievement of learning is confirmed.

[Class requirement]
No specific prior knowledge is required
[Method, Point of view, and Attainment levels of Evaluation]
The score is evaluated comprehensively from reports for each lecture (including performance scores in the class) and the final examination.

[Textbook]
Handouts will be distributed as appropriate.

[Reference books, etc.]
(Reference books, etc.]
(Reference books)

[Regarding studies out of class (preparation and review)]
To be notified by instructor during his/her lecture.
(Others (office hour, etc.))
*Please visit KULASIS to find out about office hours.

社会基盤デザインII**(2)**

[Textbook]

Distribute printed materials as needed

[Reference books, etc.] (Reference books)

(Reference books)

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

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year/period 2019/Second semester | | | | | | |
| Day/perio | y/period Tue.5 Class style Lecture Language Japanese | | | | | | | | | | | | | | |
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| Numbering code U-ENG23 33184 PJ73 Course title 測量学及び実習(H27以降入学者)
Surveying and Field Practice Affiliated
department,
Job title,Name Graduate School of Engineering
Professor,LWO NOBUHIRO
Disaster Prevention Research Institut
Professor,HATAYAMA MICHINO
Graduate School of Engineering
Assistant Professor,SKAU H7VUNE
Graduate School of Engineering
Assistant Professor,KAWABATA YUUCHI
Graduate School of Engineering
Assistant Professor,KAWABATA YUUSU
Graduate School of Engineering
Assistant Professor,KAWABATA SCHOOL OF Engineering
Assistant Professor,SCHOOL OF Engineering
Assistant Professor,SCHOOL OF Engineering
Assistant Professor,SCHOOL OF Engineering
Assistant Professor,SCHOOL OF Engineering
Assistant Professor,SCHO SCHONSUL |
|---|
| Course title 測量学及び実習(H27以降入学者) Affiliated
department,
Job title,Name Professor,UNO NOBUHIRO
Disaster Prevention Research Institu
Professor,HATAYAMA MICHINO
Graduate School of Engineering
Associate Professor,SUSAKI JIVUNIC
Graduate School of Engineering
Assistant Professor,KAWABATA YUICHI
Graduate School of Engineering
Assistant Professor,KAWABATA YUICSU
Graduate School of Engineering |
| Graduate School of Engineering
Assistant Professor,NAKAO SATOS |
| Target year Srd year students or above Number of credits 3 Course offered year/period 2019/First semester |
| Day/period Fri.2,3,4 Class style Practical training Language Japanese |
| [Outline and Purpose of the Course] |
| ける誤差の扱いと調整方法について講述する。実習では、測量機器を用いて野外で測量を行い、
量機器の扱いや測量の方法を学ぶ。さらに、得られたデータを整理して調整計算を行うことで、
測情報についての理解を深める。
[Course Goals]
・誤差が含まれるデータから最確値や標準誤差などを推定する背景と論理を理解する。
・観測値へ最小二乗法や誤差伝播の法則を適用して、最確値や標準誤差を求められるようになる・
・様々な測量の内容を理解する。
・測量実習では、事前に計画を立てる計画性と、班員と協力しながら所期の目標を達成できる協
性を身につける。 |
| [Course Schedule and Contents] |
| 測量学概説1回,測量学の目的、歴史、内容について概説するとともに、測量技術の適用事例や最
の測量技術動向を紹介する。
距離測量と角測量、3回,測量技術の基本である距離測量と角測量の方法を学ぶ。また、実習を通し
測量機器の設置方法整準、求心)とセオドライトを用いた角測量技術を体得する。
基準点測量、8回,基準点測量のための測量計画について概説するとともに、代表的な基準点測量法
ある三角測量、トラパース測量について詳説し、野外における実習を実施する。
水準測量、3回,測点の標高を定めるための水準測量の方法とデータの調整法について説明し、野外
おける実習を行う。
平板測量と地形測量、4回,測量区域の細部を明らかにするための平板測量、地形測量の方法につい
述べるとともに、その成果物である地形図の特性、測量と空間の認識との関連性について解説す
あわせて実習を行う。
農業に関する基本的な概念を説明するとともに、誤差伝播の法則、一般算術平均値の
え方を説明する。
最小二乗法、3回,測量データの処理の基本となる最小二乗法の考え方とその計算方法について演習
交えながら習熟させる。 |

測量学及び実習**(H27**以降入学者**)(2)**

| 調整計算,4回,三角 | -
角測量、トラバース測量データの調整法を解説し、実習で得られたデータを用いた |
|---|--|
| | 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 |
| | 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
学習到達度の確認 | €を確認りる。
図,1回,本講義の内容に関する到達度を確認(講評)する。 |
| [Class requirem | nent] |
| 船型代数学、数理 | - |
| [Method, Point | of view, and Attainment levels of Evaluation] |
| 測量学の中間・其 | 朋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。 |
| [Textbook] | |
| 田村正行・須崎約 | 屯一 『新版 測量学』(丸善)ISBN:9784621087480 |
| [Reference boo | ks, etc.] |
| (Reference bo | noks) |
| (| |
| [Regarding stud
実習では6~7名の | dies out of class (preparation and review)]
D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
&告書の作成が求められるため、十分な学習が必要である。 |
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B告書の作成が求められるため、十分な学習が必要である。 |
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hour, etc.)) |
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&告書の作成が求められるため、十分な学習が必要である。
hour, etc.)) |

| Course title
<english></english> | 英語(地球 | | ¹) | | Affiliated
department | | Graduate School of Energy Science
Associate Professor,HAMA TAKAYU | | | | |
|-------------------------------------|--|---------------|----------------|-----------|--------------------------|--------------|--|----------------------|---------------------------|--|--|
| <english></english> | Scien | tific English | | | | Job title,Na | me P | art-time Lectu | ime Lecturer,Stephen Gill | | |
| Target ye | Target year 2nd year students or above Number of cre | | | | | | | se offered
period | 2019/First semest | | |
| Day/perio | d W | ed.5 | Cla | ss style | Seminar | | | Language | Japanese | | |
| [Outline a | nd Pu | urpose of t | he Co | ourse] | | | | | | | |
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| [Course G | ioals | | | | | | | | | | |
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| [Class red | quirer | nent] | | | | | | | | | |
| None | | | | | | | | | | | |
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| [Method, | Point | of view, a | nd At | tainment | levels o | f Evaluat | ion] | | | | |
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| | | 語(地球
ic English | | | dep | iliated
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b title,Na | | Graduate School of Energy Science
Associate Professor,HAMA TAKAYUKI | | | | |
| | | _ | | | | , nuc, nu | _ | | | urer,Stephen Gill | | |
| Target yea | ar 2nd y | year students o | or above Number | of cred | its | 1 | | | e offered
eriod | 2019/First semester | | |
| Day/period | | | Class style | Semina | ır | | | | Language | Japanese | | |
| [Outline an | nd Purj | pose of t | he Course] | | | | | | | | | |
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| [Course So | chedul | e and Co | ontents] | | | | | | | | | |
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| [Class req | uireme | ent] | | | | | | | | | | |
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| [Regarding | g studi | es out of | f class (prepar | ation a | nd I | review | /)] | | | | | |
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| (Others (o | office h | our, etc. |)) | | | | | | | | | |
| *Please visit | KULA: | SIS to find | l out about office | hours. | | | | | | | | |
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<english></english> | | Ź英語(地球
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ssor,HAMA TAKAYUKI
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| Target ye | ar | 2nd year students o | r above N l | umber | of cred | its | 1 | | | e offered
eriod | 2019/First semester |
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| Outline a | nd F | Purpose of t | he Cour | 'se] | | | | | | | |
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| (Refere | nce | books) | | | | | | | | | |
| Regardin | g st | udies out of | class (| prepar | ation a | nd | review |)] | | | |
| | | | | | | | | | | | |
| Others (| offic | e hour, etc. |)) | | | | | | | | |
| Please visi | KU | LASIS to find | l out abou | ut office | hours. | | | | | | |
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|-----------------|-----------------------------|----------|--------------|---------|------|-----------------------------------|------|-----|---|--------|--------|---------|------|
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| | 学英語(地球
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partment
b title,Na | | Ass | aduate Scho
ociate Profe
t-time Lectu | ssor,I | IAMĂ | TAKA | |
| Target year | 2nd year students | or above | Number | of cred | its | 1 | | | e offered
eriod | 201 | 9/Firs | t semes | ster |
| Day/period | Thu.4 | Cla | ss style | Semina | ır | | _ | | Language | Japa | inese | | |
| [Outline and | d Purpose of | he C | ourse] | | | | | | | | | | |
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| [Course Go | als] | | | | | | | | | | | | |
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| [Class requ | irement] | | | | | | | | | | | | |
| None | | | | | | | | | | | | | |
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| Deference | books, etc.] | | | | | | | | | | | | |
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| [Regarding | studies out o | f clas | s (prepar | ation a | nd | review |)] | | | | | | |
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| (Others (of | fice hour, etc | .)) | | | | | | | | | | | |
| *Please visit K | ULASIS to fin | d out a | about office | hours. | | | | | | | | | |
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| Course title
<english-< td=""> 科学英語(地球)(T2) Affiliated
department,
Job title,Name Graduate School of Energy Sci
Associate Professor,HAMA TAK
Part-time Lecturer,Karin L. Sw
Part-time Lecturer,Karin L. Sw Target year Ind year students or Jooned
Martine Lecturer, Karin L. Sw Ind year students or Jooned
Martine Lecturer, Karin L. Sw 2019/First sem Day/period Thu.4 Class style Seminar Language Japanese [Outline and Purpose of the Course] Image: Seminar Image: Seminar Image: Seminar Image: Seminar</english-<> | KAY
vans |
|---|-------------|
| Target year Indigent year students or above Number of credits 1 Course offered year/period 2019/First sem Day/period Thu.4 Class style Seminar Language Japanese [Outline and Purpose of the Course] Image: Purpose of the Course] | |
| Day/period Thu.4 Class style Seminar Language Japanese [Outline and Purpose of the Course] | |
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| [Course Goals] | |
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| [Course Schedule and Contents] | |
| ltime,
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| [Class requirement] | |
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| [Method, Point of view, and Attainment levels of Evaluation] | |
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| [Reference books, etc.] | |
| (Reference books) | |
| [Regarding studies out of class (preparation and review)] | |
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| *Please visit KULASIS to find out about office hours. | |

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AMA TAKAYUKI | | | 学英語(地球
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| Target year | 2nd year students of | or above Number | of credits | | ourse offere
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| [Outline and | Purpose of t | the Course] | | | | | | | [Outline and | Purpose of | the Course] |
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| (Reference | books) | | | | | | | | (Referenc | e books) | |
| [Regarding s | tudies out o | f class (prepa | ration and | l review)] | | | | | [Regarding | studies out o | of class (prepa |
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eriod | 2019/Seco | nd semester |
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| Course title 科
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entific English | | | de | filiated
partment
b title,Na | mo | Asso | ciate Profes | ol of Energy Science
sor,HAMA TAKAYUKI
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| Target year | 2nd year students | or above Numbe | r of cred | its | 1 | | urse
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riod | 2019/Second semester |
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| | | | ration a | nd | review) |)] | | | |
| *Please visit KU | JLASIS to find | d out about offic | e hours. | | | | | | |

| Course title 科学英語 (地球) (T4) Affiliated department, Job title,Name Graduate School of Energy Science Associate Professor,HAMA TAKAYUKI Job title,Name Target year Ind year students or above Number of creditts 1 Course offered year/period 2019/Second semester Day/period Thu.4 Class style Seminar Language Japanese [Course Goals] [Course Goals] Image: Second semester Image: Second semester Image: Second semester [Course Goals] [Course Goals] [Course Goals] Image: Second semester Image: Second semester [Course Schedule and Contents] [Titme, Image: Second semester] Image: Second semester Image: Second semester [Itime, Image: Image: Second semester] [Course Schedule and Contents] Image: Second semester Image: Second semester [Itime, Image: Image: Image: Second semester] [Course Schedule and Contents] Image: Second semester Image: Second semester [Itime, Image: | Numbering c | ode | | | | | | | | | | |
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| [Course Schedule and Contents] .1time, .1times, .1time, .1time, | [Outline and | Purpo | ose of t | he Co | ourse] | | | | | | | |
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| Course title
<english></english> | Job title, Name
Graduate School of Engineering
Assistant Professor, IKARI HIROYUKI
Course offered | | | | | | | | | | | |
| Target ye | ar | 3rd year students of | or above | Number | of cred | its 2 | | | se offered
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| Day/perio | | | | ss style | Lecture | • | | | Language | Japanese | | |
| | | Purpose of t | | | | | | | | | | |
| shoaling, irr
sediment tra | 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 G | ioa | ils] | | | | | | | | | | |
| | [Course Goals]
Our goal is systematic understanding of fundamental hydraulic phenomena around coastal zone which is
indispensable for designing coastal environment. | | | | | | | | | | | |
| [Course S | ich | edule and Co | onten | its] | | | | | | | | |
| | | Coastal Engine
coastal engine | | | ng on be | ach de | forma | tion | | | | |
| | | de wave theory
of small amplit | | | and its a | applica | ation a | ire exj | plained. | | | |
| Developing | pro | / Wave Transf
ocess of wind w
nation is outline | ave a | | | od of i | rregul | ar wa | ves are expla | ined. Mechanics of | | |
| Several exp | erin | Coastal Structu
nental formulae
ole mound is mo | of w | ave force a | cting on | coasta | l struc | ctures | are introduc | ed. Problems for | | |
| | | tal Structures (
ign of coastal s | | | : | | | | | | | |
| | | Computational
numerical way | | | | | | | | | | |
| Sediment hy | /dra | aulics[4times]:
aulics (i.e., basi-
liment transport | | | calculat | ion of | river- | bed, b | ed load and | suspended load, non- | | |
| | Nearshore Current / Coastal Sediment Transport[1time]:
Near-shore current due to wave deformation and resultant coastal sediment transport are outlined. | | | | | | | | | | | |
| F 1 | Rear-since current due to wave deformation and resultant coastal seamlent dansport at outlined.
Continue to 海岸工学(2) | | | | | | | | | | | |

海岸工学(2)

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Tsunami and Storm Surge: Evacuation Planning under Coastal Disasters[1time]: Characteristics of tsunami and storm surge are explained. Additionally\, evacuation process and evacuation planning are introduced.

Achievement confirmation[1time]: Comprehension check of course contents.

Feedback[1time]

[Class requirement]

To have already completed the class of Hydraulics and Exercises is desirable.

[Method, Point of view, and Attainment levels of Evaluation] Based on the results of examinations

[Textbook]

Handout is used in the lectures as needed.

[Reference books, etc.]

(Reference books) supplemental textbook is announced in the first lecture.

(Related URLs) (Non)

[Regarding studies out of class (preparation and review)] Review the lecture contents

(Others (office hour, etc.))

Reexamination is not provided How to get in touch with instructors is announced in the first lecture.

*Please visit KULASIS to find out about office hours.

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source informa | | nalysis | | de | filiated
partment
b title,Na | t,
ime | Professor,KOI
Graduate Scho
Professor,MIK
Graduate Scho
Professor,HA
Graduate Scho | ool of Engineering
KE KATSUAKI
Jool of Engineering
(ADA HITOSHI
Jool of Engineering
YASHI TAMETO
Jool of Engineering
Sor,KASHIWAYA KOUK |
| Target ye | ar | 4th year students of | or above | Number | of cred | its | 2 | | rse offered
/period | 2019/First semester |
| Day/perio | d | Mon.4 | Cla | ss style | Lecture | • | | | Language | Japanese |
| [Outline a | nd | Purpose of t | he C | ourse] | | | | | | |
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| [Course S | ch | edule and Co | onter | ts] | | | | | | |
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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 be 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 ral data analysis (3 times), 2 constant and 2 continue to 資源情報解析学(2)

資源情報解析学(2)

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 inderstanding 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 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 content of the above lectures

[Class requirement]

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

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

lass attendance and the results of reports will be evaluated togethe

[Textbook]

Others; prints will be distributed as appropriate.

[Reference books, etc.]

(Reference books)

Introduced during class

[Regarding studies out 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.

(Others (office hour, 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

固体の力学物性と破壊(2)

16th: Feedback class (Review of the whole class and examination)

[Class requirement]

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

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

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

[Textbook]

Not specified

[Reference books, etc.] (Reference books)

Naohiro Igata, Strength of matrials, Baifukan Co., ISBN:4-563-03186-0 isbn{}{4563031860} Keiichiro Togo, Zairyo Kyodo Kaiseki-gaku, Uchida Rokakuho Publishing Co., Ltd, ISBN: 4-7536-5132-0 isbn{}{4753651320}

(Related URLs)

(This course does not have a web site.)

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

Review the lecture materials and note by yourself. In the next lecture, make a qustion about the points that you could not understand well.

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours

Numbering code Graduate School of Engineering Associate Professor, TSUKADA KAZUHIKO 固体の力学物性と破壊 Course title departn Mechanical Properties of Solids and Fracture Mechanic Graduate School of Engineering Associate Professor, MURATA SUMIHIKO <English> Job title Nam Course offered year/period Target year Brd year students or above Number of credits 2019/Second semes Day/period Wed.2 Class style Lecture Language Japanese [Outline and Purpose of the Course] For crystalline materials such as rock and metal, macroscopic deformation behavior and destruction behavior is explained from the microscopic standpoint of fracture mechanicas and solid mechanics. [Course Goals] The goals of this course are to master the evaluation of elastic modulus of crystalline materials considering its anisotropy and to master the fracture mechanics for a crack containing material by estimating stress intensity factor, energy release rate and J integral. By taking this course, students can understand the elastic deformation and strength of the crystalline materials and the crack containing material. [Course Schedule and Contents] st: Explanation about the contents, schedule and evaluation etc Introduction: "Mechanical properties of materials: deformation and destruction", "Industry and materials testing" "Accident caused by material destruction", "Physics of deformation and destruction", "Materials science for Earth Resources Engineering" 2nd: Stress/strain and elasticity (Hooke's law and practical elastic modulus, Stress/strain tensor, crystal structure and symmetry) 3rd: Stress/strain and elasticity (Crystal system and elastic constant) 4th: Mechanical properties of atomic bonds and solids (bond strength between atoms, Types of atomic bonds Ionic crystal and Madelung constant) 5th: Mechanical properties of atomic bonds and solids (Covalent bond, Interatomic potential and physical properties) 6th: The latticed spring model of elastic body (Coordinate transformation and apparent Young's modulus), Theoretical strength of perfect crystal 7th: Intermediate examination 8th: Brittle fracture and ductile fracture (Characteristics of brittle fracture and ductile fracture, Griffith's fracture theory for brittle material) 9th: Linear fracture mechanics (Deformation mode, Stress field and displacement field in the vicinity of the crack tip, Stress intensity factor, Strain energy release rate) 10th: Nonlinear fracture mechanics (J integral, Crack opening displacement) 11th: Fracture toughness and fatigue (Fracture toughness value, Fracture toughness test, Mechanism of fatigue, Fatigue life) 12th: Crack and Fracture in mixed mode (Crack propagation and destruction criteria in mixed mode of mode I + mode II and mode I + mode II + mode III) 13th: Mechanical model of composite material (Voigt model, Reuss model, Intermediate model of Voigt model and Reuss model, Eshelby's equivalent inclusion method) 14th: Rheology model (Macro rheology model, Micro rheology model)

15th: Examination

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| [Class requirement] |
| Differential calculus, integral calculus, and linear algebra are necessary for taking this course. |
| [Method, Point of view, and Attainment levels of Evaluation] |
| 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. |
| [Textbook] |
| Not specified. |
| [Reference books, etc.] |
| (Reference books)
Shigeo Takezono et al., Introduction of Mechanics of elasticity-from basic theory to numerical analysis-,
Morikita Publishing Co., ISBN:978-4-627-66641-2 isbn{}{9784627666412} |
| (Related URLs) |
| (This course does not have a web site. But some lecture documents may be deribered by the net. The URL to download the lecture documents will be announced in the class.) |
| [Regarding studies out of class (preparation and review)] |
| It is strongly recommended to solve again the example problems explained in the lecture by yourself. |
| (Others (office hour, etc.)) |
| Additional information is presented in the first class of each teacher. |
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| None | | | | | | | | | | |
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| (Others (| office h | nour, etc. |)) | | | | | | | | |
| *Please visit | t KULA | SIS to find | out a | bout office | hours. | | | | | | |
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資源工学基礎実験(2) [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

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eriod | 2019/Second semester |
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[Outline and Fulpose of the Course]

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 Goals]

Geological Survey

Students can understand the relationship between the geology and topography by field observations, and also become familiar with the observation of the geological outcrops from the view point of resource geology. In addition, they can explain how the topography and geology are deeply related each other, and obtain the basic geological information, such as strike, dip, rock type (mineral species) in the field observation (measurement,

Geophysical Survey

Students carry out the field training and data analysis of seismic refraction survey and electrical resistivity exploration. In the field training, they learn deployment of geophones for land seismic survey, together with arrangement 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 transmission of 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 the 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.

Presentation,2times,Students make presentations what they learned in the excursion and analysis. 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 _ Continue to 資源工学フィールド実習(2)

資源工学フィールド実習**(2)**

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

[Class requirement]

None

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

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

[Textbook]

It will be presented in the lecture.

[Reference books, etc.]

(Reference books) It will be presented in the lecture.

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

It will be shown in the lectures.

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

Numbering code Graduate School of Engineering Professor,KOIKE KATSUAKI ffiliate 地質工学 ourse title Graduate School of Engineer departm Professor.HAYASHI TAMETO <English> Engineering Geology Job title.Nam Graduate School of Engineering Associate Professor,NARA YOSHITAKA Course offered Brd year students or above Number of credits Target year 2019/First semester year/period Day/period Tue.3 Class style Lecture Language Japanese [Outline 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 these analytical methods and to accure knowledee that can be apolied to the field of resource envinementers.

[Course Goals]

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.

[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)

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 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 content of the above lectures.

[Class requirement]

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.

[Method, Point of view, and Attainment levels of Evaluation] Class attendance and the results of reports will be evaluated together.

Class attendance and the results of reports will be evaluated toge

[Textbook] Prints will be distributed as appropriate

[Reference books, etc.] (Reference books)

Introduced during class

[Regarding studies out 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.

(Others (office hour, 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.

| <english< td=""> Introduction to Earth Resources Engineering dispartment, job title, Name Graduate School of Engineering Associate Professor, NARA YOSHITAKA Graduate School of Engineering Associate Professor, NARA YOSHITAKA Graduate School of Engineering Associate Professor, NARA YOSHITAKA Graduate School of Engineering Associate Professor, MURATA SUMIHIKO Target year Ind year students or above Number of credits 2 Course offered year/Berdod 2019/Second semester Day/period Tue.2 Class style Lecture Language Japanese [Outline and Purpose of the Course] Introduction of pring the fundamental knowledge in earth resources engineering, i.e., a synthetic research area composed of plural scientific fields such as geology, geophysics, civil engineering, nervironmental sciences, and the other engineering areas of mechanical, electrical, and material sciences. [Course Goals] Introduction to earth resources problems, Itime, The discussion is on how the earth resources engineering fields as a synthetic research areas being covered in this academic domain. [Course Schedule and Contents] Second point of igneous and pydrotearbon deposits, sedimentary deposit, diagenesis, and hydrocarbon deposits, 2) Conventional hydrocarbon deposits and the current development situation, 3) non-conventional hydrocarbon deposits and the current development situation. Seposit Geology, ditines, The following is discussed: 1). Assectate certor area and momental knowledge on earthin resources for inon, base metal, rare metal and nonmetallic resources and the current developmen</english<> | | ode | | | | | | | |
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| Target year Dad year students or above Number of creditts 2 year/period 2019/Second semester Day/period Tue.2 Class style Lecture Language Japanese Journal of the course 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 Goals] The acquisition of fundamental knowledge on earth resources engineering and its related engineering fields as a synthetic research areas being covered in this academic domain. [Course Schedule and Contents] Eneral introduction to earth resources problems, ltime. The discussion is on how the earth resources engineering fields. Deposit Geology, 4times, The following is discussed: 1) earth#039s history, generation of igneous and hydrocarbon deposits, adimentary deposit, diagenesis, and hydrocarbon deposits, 2) Conventional hydrocarbon deposits and the current development situation. Exploration Geophysics, 3times, Exploration geophysics for the development of hydrocarbon, metallic and momentals or exploration seitsmology, exploration electromagnetics, petrophysics and related fields are covered. The future direction of exploration nethodologies is discussed, i.o., Rock physics and mechanics, 3times, Reck mechanics necessary to the development of ore deposit, the storage of carbon doxide (CCS), radioactive waste, underground oil stockpiling is outlined in the lecture. Fou | | | rth Res | sources Eng | ineering | departmen | | Professor,KOII
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| Outline and Purpose of the Course] Through the understanding of natural resources that are integral to the development of our human society, a eries of lectures is given to bring the fundamental knowledge in earth resources engineering, i.e., a synthetic esearch area composed of plural scientific fields such as geology, geophysics, civil engineering, i.e., a synthetic esearch area composed of plural scientific fields such as geology, geophysics, civil engineering, i.e., a synthetic research areas being covered in this academic domain. ICourse Goals] In a coursistion of fundamental knowledge on earth resources engineering and its related engineering fields as synthetic research areas being covered in this academic domain. ICourse Schedule and Contents] Eneral introduction to earth resources problems, Itime. The discussion is on how the earth resources mgineering has developed after the industrial revolution in a chronological way with a special interest to the elations with earth sciences such as geology, geophysics, and may other engineering fields. Deposit Geology, 4times, The following is discussed: 1) earth#0398 bistory, generation of igneous and hydrotarbon deposits and the current development situation. 3) non-conventional hydrocarbon metal and nonmetallic resources and the current development situation. Stypolitic Geolphysics, 3times, Exploration geophysics for the development of hydrocarbon, metallic and nineral deposit is outlined. Fundamentals on exploration seismology, exploration electromagnetics, setrophysics and related fields are covered. The future direction of exploration nethodologies is discussed, so. Scok physics and mechanics, 3times, Rock mechanics necessary to the development of ore deposit, the storage o | Target year | 2nd year students | or above | Number | of cred | lits 2 | Co
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| Through the understanding of natural resources that are integral to the development of our human society, a teries 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, novironmental sciences, and the other engineering areas of mechanical, electrical, and material sciences. [Course Goals] 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, Itime, The discussion is on how the earth resources engineering has developed after the industrial revolution in a chronological way with a special interest to the elations with earth sciences such as geology, geophysics, and many other engineering fields. Deposit Geology, 4times, The following is discussed: 1) earth#0398 bistory, generation of igneous and hydrotarbon deposits, sedimentary deposit, diagenesis, and hydrocarbon deposits, 2) Conventional hydrocarbon deposits and the current development situation. 3) non-conventional hydrocarbon metallic and mineral deposits is outlined. Fundamentals on exploration seismology, exploration electromagnetics, betrophysics, and related fields are covered. The future direction of exploration electromagnetics, betrophysics and related fields are covered. The future direction of exploration electromagnetics, set of directores is outlined. Fundamentals on exploration seismology, exploration electromagnetics, betrophysics and related fields are covered. The future direction of exploration methodologies is discussed, oo. Schlysics and mechanics, 3times, Rock mechanics necessary to the development of ore deposit, the storage of carbon dioxide (CCS), radioactive waste, underground oil stockpiling is outlined in the lecture. Foundamental knowledge on the stress and the strain of elastic mate | | | | | Lecture | e | | Language | Japanese |
| The acquisition of fundamental knowledge on earth resources engineering and its related engineering fields as a synthetic research areas being covered in this academic domain. [Course Schedule and Contents] Teneral introduction to earth resources problems, ltime, The discussion is on how the earth resources generating and its related engineering fields. Seposit Geology, 4times, The following is discussed: 1) earth#039s history, generation of igneous and pydrothermal deposits, sedimentary deposit, diagenesis, and many other engineering fields. Seposit Geology, 4times, The following is discussed: 1) earth#039s history, generation of igneous and hydrocarbon deposits, addimany deposits, conventional adproach of posits, and the current development situation, 3) non-conventional hydrocarbon deposits and the current development situation, 3) non-conventional hydrocarbon deposits, at the current development situation. Exploration Geophysics, 3times, Exploration geophysics for the development of hydrocarbon, metallic and mineral deposits is outlined. Fundamentals on exploration seismology, exploration electromagnetics, setrophysics and mechanics, 3times, Rock mechanics necessary to the development of ore deposit, the storage of carbon dioxide (CCS), radioactive waste, underground oil stockpiling is outlined in the lecture. Foundamental knowledge on the stress and the strain of elastic materials, geopressure to subsurface artificial tructure, deformation due to geopressure, and the failure of rocks and subsurface structures will be shared in he lectures. Reservoir engineering, 3times, The importance to understand subsurface porous flow through permeable rocks a discussed in terms of the following applications: the production of fluid resources porous flow will be matured for the application of reservoir management, coal bed methane and CCS to utilize permeable nature of rocks. | eries of lecture
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Deposit Geology, 4times, The following is discussed: 1) earth#039s history, generation of igneous and
hydrothermal deposits, sedimentary deposit, diagenesis, and hydrocarbon deposits. 2) Conventional
hydrocarbon deposits and the current development situation, 3) non-conventional hydrocarbon deposits and the current development situation. Exploration Geophysics, 3times, Exploration geophysics for the development of hydrocarbon, metallic and
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Reservoir engineering, 3times, The importance to understand subsurface porous flow through permeable rocks
is discussed in terms of the following applications; the production of fluid resources, carbon dioxide capture
and storage (CCS), storage of radioactive waste, underground stockpile of oil, etc. The understanding on
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| engineering has developed after the industrial revolution in a chronological way with a special interest to the relations with earth sciences such as geology, geophysics, and many other engineering fields. Deposit Geology, 4times, The following is discussed: 10 earth#0398 history, generation of igneous and hydrothermal deposits, sedimentary deposit, diagenesis, and hydrocarbon deposits, 2) Conventional hydrocarbon deposits and the current development situation, 3) non-conventional hydrocarbon deposits and the current development situation, 3) non-conventional hydrocarbon deposits and the current development situation, 3) non-conventional hydrocarbon metal and nonmetallic resources and the current development situation. Exploration Geophysics, 3times, Exploration geophysics for the development of hydrocarbon, metallic and mineral deposits is outlined. Fundamentals on exploration seismology, exploration electromagnetics, petrophysics and related fields are covered. The future direction of exploration lectromagnetics, oo. Rock physics and mechanics, 3times, Rock mechanics necessary to the development of ore deposit, the storage of carbon dioxide (CCS), radioactive waste, underground oil stockpiling is outlined in the lecture. Foundamental knowledge on the stress and the failure of rocks and subsurface structures will be shared in the lectures. Reservoir engineering, 3times, The importance to understand subsurface porous flow through permeable rocks is discussed in terms of the following applications: the production of fluid resources, carbon dioxide capture and storage (CCS), storage of radioactive waste, underground stockpile of oil, etc. The understanding on mportant parameters of fluid saturation, permeability, etc. that are related to subsurface porous flow will be matured for the application of reservoir management, coal bed methane and CCS to utilize permeable nature of rocks. | [Course Sch | edule and Co | onten | ts] | | | | | |
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[Class requirement] Preferred students are whom has taken quotResources and Energyquot in the first semester of the sophomore grade.

[Method, Point of view, and Attainment levels of Evaluation] Grading is based on the following shares: 20% for the attendance, reports, etc., and 80% for the final exam.

[Textbook] None specified.

[Reference books, etc.]

(Reference books) Lecturer for each theme may specify supplemental textbooks if necessary.

(Related URLs)

(None)

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

Lecturer for each theme may specify the title of reports in the lecture

(Others (office hour, etc.))

After the exam, modeled answers will be distributed through KULASIS with the best delay as a feedback naterial for each student to review the lecture.

*Please visit KULASIS to find out about office hours.

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period | 2019/First semest |
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貯留層工学(2)

[Class requirement] _ _ _ _ _ _ _ _ _ _ _ _ _

The knowledge of differential calculus, integral calculus, physical chemistry and exploration geophysics are necessary for this course.

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

The grade will be evaluated by the score of three report works and final examination. Their weight for the grading is 50% each.

[Textbook]

Not specified. Materials for the course will be derivered.

[Reference books, etc.]

(Reference books) L. P. Dake: Fundamentals of Reservoir Engineering, 19th impression, Elsevier 2002, isbn{}{044441830X}

(Related URLs)

(Not specified.)

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

It is recommended to solve the homework problems with reviewing the course materials.

(Others (office hour, etc.))

Office hour will be set from 13:00 to 15:00 on the same day of this class.

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Introduction ,4times,Explaining characteristics of natural disaster and its variety, mechanisms of damage caused by natural disaster. \\ Explaining a comprehensive framework for disaster risk reduction. Planning for disaster risk reduction,3times,Explaining the process of impacts caused by disasters such as earthquake and flood. Explaining disaster risk reduction plan including engineering technologies and social nolicies

saster and information ,4times,Explaining the role of information in emergency response after disaster and policies. \\ Explaining policies which connects information and course of actions. evaluation of disaster risk ,3times,Explaining methodologies to evaluate potential natural hazards for rational

disaster risk reduction measures

Test of understanding ,1time,Test of understanding

[Class requirement]

None

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

Judged by the evaluation of essays and final exam and incorporating the attendance.

----Continue to 社会防災工学(2)

社会防災工学**(2)** [Textbook] fand-out materials will be distributed [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] Homework such as writing essays will be given as needed-basis (Others (office hour, etc.)) Office hour is not specified, but students may ask lectures questions by email. *Please visit KULASIS to find out about office hours

Numbering code U-ENG23 33280 LJ77 U-ENG23 33280 LJ58 U-ENG23 33280 LJ14 Graduate School of Engineering Professor,KOIKE KATSUAKI 物理探査学 Course title Graduate School of Engin departm Professor, MIKADA HITOSHI Graduate School of Engineering Assistant Professor, TAKEKAWA JUNICHI <English> Exploration Geophysics . .lob title Na Course offered Target year Brd year students or above Number of credits 2 2019/First semester vear/p eriod Day/period Tue.4 Class style Lecture Language Japanese [Outline and Purpose of the Course] 地球表層から地下を診る技術である各種の物理探査法について、その探査原理、データ取得技術 データ処理技術および解釈方法について基礎的な物理化学的な原理を講述するとともに、エネル エネルギ - ・資源分野、環境分野,防災分野,地盤工学分野、土木工学分野への適用についても紹介する。 [Course Goals] 物理探査手法について,電磁気学,地震学,地球化学,岩石物理学の観点から理解することを目標 とする。 [Course Schedule and Contents] 地球電磁気学と物理探査,5回,地球電磁気学的手法による探査技術の基礎理論を概説する。物理探査 の分野で用いられる地球電磁気学的手法について、その物理学的な基礎、計測される物理量を学ぶ ことにより、その物理学的な意義について理解することを目標とする。 地震学と物理探査,6回,地震学的手法による探査技術の基礎理論を概説する。地震学の基礎から屈折 720歳学ど物理保宜心回,地震学的手法による採在技術の基礎理論を構成する。ご概要での基礎から屈折 法や反射法探査について、その物理学的な基礎から、計測物理量について学ぶことにより、その応 用科学的な意義について理解することを目標とする。 地化学探査とリモートセンシング。3回地殻、マントル、コアを形成する岩石鉱物の化学的性質、あ よび金属鉱床やエネルギー資源の探査に用いられる電磁波と物質の相互作用、光学センサ、合成開口レー ダなどの基礎、リモートセンシング画像処理法および地形解析、資源探査、環境モニタリングなど への応用について説明する。 達成度の確認,1回,講義内容の理解度に関し,確認を行なう。 [Class requirement] 大学教養レベルの物理学,化学,地球科学 [Method, Point of view, and Attainment levels of Evaluation] -基本的に筆記試験で行うが,成績評価の方法について、各担当者が説明することがある。

物理探査学**(2)**

[Textbook] Not used

[Reference books, etc.] (Reference books)

伝々宏一・芦田譲・菅野強 『建設・防災技術者のための物理探査』(森北出版)ISBN:4627484402 日本リモートセンシング学会 『基礎からわかるリモートセンシング』(理工図書)ISBN: 佐々宏 4844607790

_____Continue to 物理探査学(2)

(Related URLs)

(講義中に伝達する。)

[Regarding studies out of class (preparation and review)] 必要な事項は,講義中に伝達する。

(Others (office hour, etc.))

出席・試験の配点の詳細は各担当者より説明する。 定期試験後,模範解答を配布しフィードバック とする予定。

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Introduction to Global Engineering(2)
[Reference books, etc.]
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[Regarding studies out of class (preparation and review)]

(Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

* Numbering code Graduate School of Engineering Associate Professor, KIM SUNMIN Affiliated Exercises in Infrastructure Design Course title department, Job title,Name <English> Exercises in Infrastructure Design Graduate School of Engineering KANKEI KYOIN Course offered year/period Target year 1st year students or above Number of credits 2019/First semester Day/period Mon.1,Thu.1 Class style Seminar Language English [Outline 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 Goals] 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,1time,Introduction of this course Introduction of Civil Engineering,5times,To help the exercise, the target area of civil engineering is explained with some concrete examples. Individual exercise,8times,Students are asked to pick up one of the social infrastructure in their own cour

and to summarize the outline about it. Presentation,4times,Each student is asked to make a presentation about the social infrastructure he/she examined.

Structuring problems,2times,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,8times,Students are divided into several groups and discuss desirable social infrastructure with group members.

Presentation,2times,Each group is asked to make a presentation about desirable social infrastructure based on the discussion.

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation] Grade is scored based on class participation, presentations, and a final report.

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Continue to Exercises in Infrastructure Design(2)

Exercises in Infrastructure Design(2)

[Textbook]

Printed handouts will be distributed as appropriate

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(Reference books)

Stephen Chapman: quotFortran for Scientists and Engineers: 1995-2003quot isbn{}{9780071285780} Continue to Computer Programming in Global Eng(2)

Computer Programming in Global Eng(2)

Brian Hahn: quotFortran 90 for Scientists and Engineersquot isbn{}{9780340600344}

[Regarding studies out of class (preparation and review)] Assignments are delivered and submitted thru PandA

(Others (office hour, etc.)) 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.

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energy conservation,2times,energy theorems\\ definition of potential energy, conservative force\\ conservation of mechanical energy in 3-D conservative field\\ energy conservation in constrained motion motion of a system of particles,2times,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\\

Rotating reference frames, Itime, transformation formulae\\particle dynamics in a non-frame\\motion relative to the Earth\\multi-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 cables\\equilibrium of solid beams\\ angular momentum of a rigid body\\inerital and stress tensors foundation of analytical mechanics,1time,Constraint condition,constraint force, generalized coordinate,

confirmation of anticest queries of the constraint conductor, constraint force, generalized coordinate, generalized for, Lagrange#039s equations confirmation of achievement, ltime, The achievement assessment is intended to measure students#039

confirmation of achievement, filme, 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)

Fundamental Mechanics(2)

______[Class requirement]

calculus A and B, Linear Algebra A and B

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

Grade is evaluated based on the final examination and assignments.

[Textbook]

R.DOUGLAS GREGORY: Classical Mechanics, Cambridge University Press, 2006 isbn{}{9780521534093}

[Reference books, etc.]

(Reference books)

Keith R.Symon: Mechanics, Third Edition, Addision-Wesley, 1971 isbn{}{0201073927} Fedinand P.Beer, E.Russell Johnston, etc.: Mechanics for Engineers, Dynamics, McGraw Hill, 2007 isbn{}{ 9780072464771}

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

(Others (office hour, etc.))

| Course title
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partment
b title,Na | | | ol of Engineering
essor,KIM SUNMIN |
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| [Outline a | nd P | urpose of t | he Co | urse] | | | | | |
| uncertainty | in natı
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probability, | al syste | ms dealt v | vith in glob | al engine | ering | . The main to | ic tool to cope with
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Prob. & Statistical Analysis & Exercises(2)

[Textbook]

Not specified. Some handout materials will be provided during the class.

[Reference books, etc.] (Reference books)

A.H.S. Ang and W.H. Tang: Probability Concepts in Engineering: Emphasis on Applications in Civil and Environmental Engineering. isbn{}{9780471720645}

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

Self-review is strongly recommended after each lecture.

(Others (office hour, etc.) $\)$

No specific office hour. Email communication is preffered through [kim.sunmin.6x@kyoto-u.ac.jp].

*Please visit KULASIS to find out about office hours.

Numbering code Graduate School of Engineering Professor, UNO NOBUHIRO Graduate School of Global Environmental Studie Affiliated Design for Infrastructure I urse title Professor SUGIURA KUNITOMO departmen Job title.Na Design for Infrastructure I Graduate School of Management Professor,TODA KEIICHI English> Graduate School of Engineering Associate Profe or,HIGO YOUSUKE Course offered year/period Number of credits Target year 2nd year students or abo 2019/First semester Day/period Thu.3 Class style Lecture English Language Outline and Purpose of the Course] ivil Engineering is the field that provides the essential technology and knowledge to improve the social frastructure. Various science, technology, and knowledge are required to realize quotconvenient and omfortable citiesquot, quotsafe countries to live inquot, quoteco-friendly global societyquot, and uotsustainable civilization based on resources and energyquot. As an introduction to learn Civil Engineering, his course explains the essence of Civil Engineering from four fields in Civil Engineering (Structural ngineering, Hydraulics and Hydrology, Geotechnical Engineering and Planning and Management). hroughout the lectures and exercises including visiting lecturers, the student is expected to learn the essence Civil Engineering and the ethics of engineering. Course Goals]

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 predecessors is introduced.

Structual Enginnering,3times,Civil Engineering is introduced from the viewpoint of Structural Engineering, which includes natural disasters and structural engineering, introduction of new technology and research, the collaboration with other fields, etc.

Hydraulics and Hydrology, 3times, Civil Engineering is introduced from the viewpoint of Hydraulics and Hydrology, which includes conservation and construction of river environment, prediction of rainfall and flood, prediction of environmental change, global warming etc.

Geotechnical Engineering, 3times, Civil Engineering is introduced from the viewpoint of Geotechnical Engineering, which includes soil mechanics, geo-hazard mitigation, geo-environment, international cooperation etc.

Planning and Management,3times,Civil Engineering is introduced from the viewpoint 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, 1 time, Achievement assessment is intended to measure students#039 knowledge, skill and aptitude on the subject.

Continue to Design for Infrastructure I(2)

Design for Infrastructure I(2)

[Class requirement]

No specific prior knowledge is required.

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

Grade is evaluated comprehensively from reports for each lecture (including attendance) and a final examination. 50 percent of the final score is due to reports, and the other 50 percent from the final examination.

[Textbook]

Handouts will be distributed as appropriate.

[Reference books, etc.]

(Reference books)

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

(Others (office hour, etc.))

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| projects and | to provide | an unders | standing of ba | sic plannin | g theory | and its | role. The foc | of civil engineering
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Systems Analysis & Exe. for Plan. & Mng.(2)

[Textbook]

Handouts distributed during lectures

[Reference books, etc.] (Reference books)

Hillier, F.S. Lieberman, G.J.: Introduction to Operations Research isbn { } {9781259253188 }

Iida, Y.: Civil Engineering Planning System Analysis (Optimization Guide) isbn{}{4627427204} Iida, Y./ Okada, N.: Civil Engineering Planning System Analysis (Behaviour Analysis) isbn{}{4627427301} Fujii, S.: Infrastructure planning studies isbn{}{9784761531669}

(Related URLs)

(Presented during the first lecture.)

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours

Graduate School of Global Environmental Studie Professor, KATSUMI TAKESHI Graduate School of Engineering Professor KISHIDA KIYOSHI Graduate School of Engineering Professor,MIMURA MAMORU Graduate School of Management Affiliated Associate Professor, KIMOTO SAYURI Graduate School of Global Environmental Studies Associate Professor, TAKAI ATSUSHI Mechanics I and Exercises Mechanics I and Exercises Job title,Name Graduate School of Engineering Associate Professor,HIGO YOUSUKE Graduate School of Engineering Associate Professor, PIPATPONGSA, Thirapong Graduate School of Engineering Associate Professor, FLORES GIANCARLC Course offered nd year students or above Number of credits 2 2019/Second semester year/period ie 3.4 Class style Seminar Language English

urpose of the Course]

semester, the student is expected to understand the basics of soil formation, classification urposes, soil compaction, seepage and water flow through soil, consolidation theory consolidation, rate of consolidation, shear strength, and deformation behaviors of different

at providing a fundamental understanding of the mechanical behavior of soils including soil mpaction, seepage, permeability, effective stress, consolidation, and shear strength as well as skills through exercises in gravimetric-volumetric relationships, Darcy#039s law, flow nets, ory, Mohr#039s stress circle, and failure criteria.

lule and Contents]

times, Introductory concepts and roles of soil mechanics, engineering aspects of soil technical practices dealing with disasters and environments

and compaction, 3.5 times, Soil classification and soil formation, basic soil properties and imits, compaction, unsaturated soil and frozen soil

gh soil, 3 times, Fundamentals of water flow through soil, permeability and Darcy's law, ion, seepage and flow nets

).5 times.

d settlement, 3.5 times, Principle of effective stress and Terzaghi's one dimensional ory, characteristics and mathematical descriptions of consolidation, prediction of ground consolidation

Continue to Soil Mechanics I and Exercises(2)

Soil Mechanics I and Exercises(2)

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

Class feedback, 1 time, Confirmation of understanding

[Class requirement]

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

Final Exam (70%), Midterm exam and classworks (30%)

[Textbook]

Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Handouts will be distributed

[Reference books, etc.]

(Reference books) (Reference DOOKS) J.A. Knappett and R.F. Craig, ldquoCraigrsquos Soil Mechanicsrdquo isbn{}{9780415561266} T. William Lambe and R.V. Whitman, ldquoSoil Mechanicsrdquo isbn{}{0471022616} Braja M. Das,quotFundamentals of Geotechnical Engineeringquot isbn{}{9781111576752} K. Terzaghi, R. B. Peck, G. Mesri,ldquoSoil Mechanics in Engineering Practicerdquo isbn{}{ 9780471086581}

Fusao Oka, quotSoil Mechanics Exercisesquot, Morikita publishing Co., Ltd. isbn{}{4627426607}

(Related URLs)

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

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

Practice yourself from Tutorial Exercise

(Others (office hour, etc.))

Flores (flores.giancarlo.3v@kyoto-u.ac.jp)

T. Pipatpongsa (pipatpongsa.thirapong.4s@kyoto-u.ac.jp)

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Hydraulics and Exercises(2)

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

Open-Channel Flow[3.5times]:

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[1time]:

Comprehension check of course contents.

Feedback[1time]

[Class requirement]

Differential and integral calculus, linear algebra etc., standard mathematics of general education course, and Dynamics and electromagnetism etc., standard physics of general education course

[Method, Point of view, and Attainment levels of Evaluation] Based on the results of examinations

[Textbook]

Handout is used in the Lectures and Exercises.

[Reference books, etc.]

(Reference books)

(Related URLs)

(Non)

[Regarding studies out of class (preparation and review)] Review the lecture contents.

Prepare the exercises questions and review them

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours.

Numbering code Institute for Liberal Arts and Sciences Professor, KIM Chul-Woo Affiliated Structural Mechanics I and Exercises Graduate School of Engineering Associate Professor, AN RIN Course title <English> Structural Mechanics I and Exercises Job title,Name Graduate School of Engineering enior Lecturer, Chang, Kai-Cl Course offered year/period 2nd year students or above Number of credits Target year 2019/Second semester Day/period Fri.1,2 Class style Seminar Language English [Outline and Purpose of the Course] The following topics are covered: external forces acted upon structures; properties of forces; sectional forces; stress and strain; displacement/deformation; cross sectional properties; calculation of displacement; buckling of column. Statically determinate structures are to be focused on. [Course Goals] To grasp 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] Introduction: 1 time, Structures and elements; Purpose and application scope of structural mechanics Assumptions; Forces & Equilibrium condition: 2 times, - External forces: Modeling of external forces: Force equilibrium conditions: Static determinate, static ndeterminate and instability; Internal force diagrams: 9 times, Equilibrium of free body: Sectional forces: Axial force: Flexural moment and shear force: 4 times. 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, Elastic curve and deflection; Deflection of beam; Deflection of truss: 2 times, Buckling of column; Buckling phenomenon; Euler's buckling load: 1 time, Confirmation of achievement: 1 time [Class requirement] Classical mechanics [Method, Point of view, and Attainment levels of Evaluation] Grade is given based on the final examination, mid-term examination, quiz, assignments and participation. [Textbook] Lecture note will be provided. [Reference books, etc.] (Reference books) References Continue to Structural Mechanics I and Exercises(2)

Structural Mechanics I and Exercises(2)

1.Kenneth M. Leet, et al., FUNDAMENTALS OF STRUCTURAL ANALYSIS, 4th edition, McGraw-Hill, 2011 2. Timothy A. Phiplot, MECHANICS OF MATERIALS, 3rd edition, Wiley, 2012. 3. 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)

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

Students are expected to prepare for the class utilizing the handout uploaded on the PANDA or KULASIS. For the review of the class, Students are expected to read the lecture note once again and complete the homework assignment.

(Others (office hour, 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. [Textbook] Not used; Class hand-outs are distributed when necessary.

[Class requirement]

Exercises (35140).

Dynamics of Soil and Structures(2)

[Reference books, etc.]

(Reference books)

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

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

(Others (office hour, etc.))

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

Calculus, Linear Algebra, Structural Mechanics I and Exercises (35110), Structural Mechanics II and

*Please visit KULASIS to find out about office hours.

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Continue to Construction Materials(2)

Construction Materials(2)

| [Class requirement] | |
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| [Method, Point of view, and Attainment levels | of Evaluation] |
| Reports and Final examination. | |
| [Textbook] | |
| P.Kumar Mehta, Paulo J.M.Monteiro:Concrete microst
isbn{}{9780071797870} | |
| William D. Callister, Jr. David G. Rethwisch:Materials
amp Sons, Inc.,2014 isbn{}{9781118477700} | science and engineering an Introduction, John Wiley |
| [Reference books, etc.] | |
| (Reference books)
宮川豊章、六郷恵哲共編:『土木材料学』、朝倉 | 書店 isbn{}{9784254261622} |
| [Regarding studies out of class (preparation a | nd review)] |
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| *Please visit KULASIS to find out about office hours. | |
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Structural Mechanics II and Exercises(2)

[Textbook]

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

[Reference books, etc.]

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(Reference books) M. Matsumoto, E. Watanabe, H. Shirato, K. Sugiura, A. Igarashi, T. Utsunomiya, Y. Takahashi: Structure mechanics , Maruzen Ltd. isbn{}{4621046403}(in Japanese)

[Regarding studies out of class (preparation and review)] Study exercise and assignment repeatedly.

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours.

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[Class requirement] Basic understanding on differential and integral calculus, linear algebra and matrix analysis

Continuum Mechanics(2)

| Mainly regular exa | mination. Assignments are also considered to some extent. |
|---------------------|--|
| [Textbook] | |
| Printed materials o | n the contents of this subject are distributed |
| [Reference boo | ks, etc.] |
| 0486401804} | Continuum Mechanics: Concise Theory and Problemsquot, Dover Publications isbn{}{ |
| | uotContinuum Mchanicsquot, Dover Publications isbn{}{0486435946}
chaum#039s Outline of Continuum Mechanicsquot, McGraw-Hill isbn{}{0070406634} |
| [Regarding stue | dies out of class (preparation and review)] |
| Elementary knowle | edge of vector analysis is required. |
| (Others (office | hour, etc.)) |
| Assoc. Prof. Higo | ct with
mail: hosoda.takashi.4w@kyoto-u.ac.jp or office at Katsura C1-265
by e-mail: higo.yohsuke.5z@kyoto-u.ac.jp or office at Katsura C1-211
pong by e-mail: pipatpongsa.thirapong.4s@kyoto-u.ac.jp or office at Katsura C1-236 |
| *Please visit KUL | ASIS to find out about office hours. |
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Hydraulics and Hydrodynamics(2)

[Method, Point of view, and Attainment levels of Evaluation] Attendance, reports and final examination

[Textbook]

[Reference books, etc.]

(Reference books)

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

(Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

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explained. Solar radiation and energy balance, ltime, Energy and water cycle driven by solar radiation is described. Basic mechanism of global warming ant its influence on hydrologic cycle is introduced. Evaporaion 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, ltime, 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, ltime, A physically-based hydrological model which consists of various hydrological processes is described. Typical lumped hydrological models are also introduced. Society and hydrology, ltime, How the hydrological sciences are related to the society is described through various examples. Achievement confirmation, 1 time, Quiz, report and the final examination is conducted to measure students#039 knowledge, skill and aptitude on the subject. [Class requirement] It is desiarable to study Hydraulics (2nd year) and probability and statistical analysis (2nd year). [Method, Point of view, and Attainment levels of Evaluation] The score is evaluated comprehensively with quiz, reports and the final examination. [Textbook] An English text book is provided, which is compiled based of the text books used in Japanese hydrology clas [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) Please visit KULASIS to find out about office hours

Soil Mechanics II and Exercises(2)

-----Midterm exam, 0.5 times

Bearing capacity, 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 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

Class feedback, 1 time, Confirmation of understanding

[Class requirement]

A required prerequisite is knowledge of soil mechanics. Soil mechanics I and Exercises(35080) would be helpful as a prerequisite.

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

Final Exam (70%), Midterm exams and classworks (30%)

[Textbook]

Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Exercise book and distributed handouts

[Reference books, etc.]

(Reference books) Braja M. Das, IdquoFundamentals of Geotechnical Engineeringrdquo, Cengage Learning isbn{}{ 9781111576752

Muni Budhu, IdquoSoil Mechanics and Foundationsrdquo, John Wiley amp Sons, INC. isbn{}{

9780470556849 Isao Ishibashi, Hemanta Hazarika, IdquoSoil Mechanics Fundamentalsrdquo, CRC Press isbn{}{ 9781439846445}

Fusao Oka, IdquoSoil Mechanics Exercisesrdquo, Morikita publishing Co., Ltd. isbn{}{4627426607}

(Related URLs)

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

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

Practice yourself from Tutorial Exercise

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Numbering code Graduate School of Engineering Professor.OOTSU HIROYASU Graduate School of Engineering Professor,KIMURA MAKOTO Graduate School of Engineerin Professor, MIMURA MAMORU Disaster Prevention Research Institu Soil Mechanics II and Exercises Professor.UZUOKA RYOSUKE Graduate School of Engineering Associate Professor, SAWAMURA YASUO <English> Soil Mechanics II and Exercises Job title.Nam Graduate School of Engineering Associate Professor.HIGO YOUSUKF Graduate School of Engineering Associate Professor, PIPATPONGSA, Thirapor Graduate School of Engineering Associate Professor, FLORES GIANCARLO Course offered year/period Target year Brd year students or above Number of credits 2019/First semester Language English Day/period Wed.1,2 Class style Seminar

[Outline and Purpose of the Course]

Students are expected to learn consolidation and stress distribution in soils, shear strength of soils, lateral earth pressures, bearing capacity of shallow and deep foundations, slope stability, and soil dynamics. Fundamental analyses and design criteria of various geotechnical engineering problems are drilled through exercises

[Course Goals]

The course objective is to provide understanding of key engineering concepts and mechanical behaviors of soil materials including consolidation and soil improvement, load transmission in elastic medium, effect of excessive pore water pressure to shear strength, effective stress paths interpreted from conventional triaxial tests, lateral earth pressure acting on retaining walls, bearing capacity of foundations, stability of slopes and excavations, soil liquefaction, and dynamic characteristics of soils subjected to earthquake.

[Course Schedule and Contents]

onsolidaton, 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

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

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.

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

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Soil Mechanics II and Exercises(3)

(Others (office hour, etc.))

Flores (flores.giancarlo.3v@kyoto-u.ac.jp) Pipatpongsa (pipatpongsa.thirapong.4s@kyoto-u.ac.jp)

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Physical properties of soils, 1 time, Soil structure, engineering classification of soils, consistency Limits, grain size distribution

Compaction test, 1 time, Laboratory compaction tests, factors affecting compaction

Hydraulic conductivity test and particle size distribution test, 2 times, Permeability and seepage, Darcy's law, Hydraulic gradient, determination of hydraulic conductivity, flow net analysis, Sieve analysis for determining the particle size distribution curve

solidation test, 1 time, Fundamentals of consolidation, laboratory tests, settlement-time relationship

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

Continue to Exp on Soil M & Ex(2)

Direct shear test, 1 time, Mohr-Coulomb failure criterion, laboratory tests for shear strength determine

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

Shaking table test, 1 time, Experiments using the shaking table test on dynamic behaviors of soils and foundations

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 applications of laboratory testing data

Class feedback, 1 time, Confirmation of understanding

[Class requirement]

Exp on Soil M & Ex(2)

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

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

Students are expected to conduct all experiments. Full attendance to laboratories and submission of all report are compulsory

[Textbook]

Soil Mechanics I amp II Tutorial Exercises and Soil Mechanics Laboratory Manual Handouts will be distributed

[Reference books, etc.]

(Reference books) [®] JAPANESE GEOTECHNICAL SOCIETY STANDARDS Laboratory Testing Standards of Geomaterials Vol.1) (Japanese Geotechnical Society) ISBN:4886448200

^P JAPANESE GEOTECHNICAL SOCIETY STANDARDS Laboratory Testing Standards of Geomaterials (Vol.2)_a (Japanese Geotechnical Society) ISBN:4886448224

⁹ JAPANESE GEOTECHNICAL SOCIETY STANDARDS Laboratory Testing Standards of Geomaterials (Vol.3)_a (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{}{ Dante Franzeita, inquominoucitori to con mechanico 2400-141 9781420045628} 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)

Exp on Soil M & Ex(3)

[Regarding studies out of class (preparation and review)] It is recommended to read testing procedure beforehand.

(Others (office hour, 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.

Contact: Instructors in charge of this subject will be informed in guidance. The following two professors are also available

Flores (flores.giancarlo.3v@kvoto-u.ac.jp) Pipatpongsa (pipatpongsa.thirapong.4s@kyoto-u.ac.jp)

*Please visit KULASIS to find out about office hours

* Numbering code Disaster Prevention Research Institute Professor, Cruz Ana Maria Affiliated Plan & Mng of S Sys Graduate School of Engineering Associate Professor,QURESHI, Ali Gul Planning and Management of Social Systems <English> Job title,Nam Graduate School of Engineering Associate Professor, SCHMOECKER, Jan-Dir Course offered vear/period Brd year students or above Number of credits Target year 2019/First semester Day/period Thu.2 Language English Class style Lecture [Outline and Purpose of the Course] This lecture series explains why and how society can be regarded as a system and described with

mathematical tools. Predicting changes in a society and influencing society in a desired direction are closely related to infrastructure planning and management. Basic concepts and frameworks of typical models that are indispensable for the analysis of (social) system states and trends are introduced. Moreover the lectures cover heories in social psychology and discuss how cultural differences impact infrastructure planning.

[Course Goals]

To provide students with a complex system perspective of society and to clarify the role of infrastructure lanning and management. Further, to provide understanding of some mathematical and psychological typical nodels for system analysis.

[Course Schedule and Contents]

Introduction, 1 time, Problems of infrastructure planning and management, and its methodology. Abstract of systems analysis and quotphysics of societyquot. Markov models,2times,Markov process. Transition probability matrix. Steady state.

Time-series predicting model, 2times, Serial correlation. Auto-Regressive model. AutoRegressive-Moving Average model.

Queuing theory,2times,single and multiple queues, examples of various M/D/k queues Game theory and general social dilemma situations,3times,Strategic interdependency. Nash equilibrium.

Typical models. Social dilemma situations and infrastructure planning. Social psychology and planning,2times,Attitudes, values and their influence on behavior and planning Hazard Analysis, 2times, Examples of major accident analysis; fault trees and event tree

Comprehension Test, 1 time, final exam

[Class requirement]

None

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

oined judgement of report and end of term exam

Continue to Plan & Mng of S Sys(2)

Plan & Mng of S Sys(2)

 [Textbook]

 None

 [Reference books, etc.]

 (Reference books)

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

 isbn [] (9781259253188]

Straffin, P.D. (1993). Game Theory and Strategy. The Mathematical Association of America. New Mathematical Library. isbn{}{0883856379}

Further useful textbooks and materials are introduded during the lectures

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

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours.

Engineering Mathematics B2(2)

______ [Textbook]

None.

[Reference books, etc.] (Reference books)

(Transforme books): Fourier Series and Integral Transforms, Cambridge University Press. isbn{} 0521597714} Further material is introduced during classes.

5

(Related URLs) (None)

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

(Others (office hour, etc.))

Please visit KULASIS to find out about office hours

Continue to Engineering Mathematics B2(2)

Numbering code Affiliated Engineering Mathematics B2 Course title Graduate School of Engineeri departr Associate Professor, SCHMOECKER , Jan-Dir <English> Engineering Mathematics B2 Job title.Nam Course offered Target year 3rd year students or above Number of credits 2 2019/First semester Dav/period Fri.1 Class style Lecture Language English [Outline and Purpose of the Course] This course deals with Fourier analysis and with the solution of partial differential equations as its application It discusses Fourier series for periodic functions and its relation to integrable non-periodic functions. Once the student gets familiar with its characteristics, the course aims to develop the ability to apply Fourier analysis to various engineering problems. The lecture emphasises the relationship between the numerical analysis and todayrsquos applications. [Course Goals] To get students acquainted with an understanding of Fourier series analysis and its basic concepts. Further, to get students familiar with the various types of partial differential equations and their applications. [Course Schedule and Contents] Introduction, 1 time, What is Fourier Analysis? How to apply it? Clarify the necessary background knowledge Fourier series,4times,A periodic function which is expanded into an infinite series of trigonometric function is called a Fourier series. Convergence behaviour and series properties are discussed with specific example calculations Fourier transform, 5times, Fourier analysis of non-periodic function leads to the Fourier transform. The first class of functions is the actual Fourier integral. The lecture discusses how it represents the non-periodic functions and shows the various properties of the Fourier transform. Students ability to use the Fourier ransform is improved through examples. The relationship to the Laplace transform is further discussed. Application to Partial Differential Equations,4times,In the last part of this course well known partial differential equations (Laplace equation, wave equation, heat equation, etc.) are discussed. The application of Fourier series and Fourier transform is discussed to obtain specific solutions to boundary value. Numerical Fourier analysis, 1 time, Fast Fourier transform (FFT) is a basic Fourier transform algorithm. In this ecture it is explained and a software illustration provided. [Class requirement] Calculus, Linear Algebra, Engineering Mathematics B1. [Method, Point of view, and Attainment levels of Evaluation] Participation, assignment and 2 tests (mid and end)

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| Experiments on Hydraulics(2) | Numbering code |
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| [Outline 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 title
Course title Public Economics Public Economics Public Economics Affiliated
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Job title,Name Graduate School of Engineering
Associate Professor,MATSUSHIMA KAKU
Disaster Prevention Research Institu
Associate Professor,YOKOMATSU MUNE
Graduate School of Engineering
Associate Professor,SGGI SHUNSUI |
| [Course Goals] | Target year Brd year students or above Number of credits 2 Course offered year/period 2019/First semester |
| Understanding hydraylic phenomena through various flows observed in the hydraulic laboratory | Day/period Thu.1 Class style Lecture Language English |
| [Course Schedule and Contents] | [Outline and Purpose of the Course] |
| Guidance, Itime, Guidance of hydraulics laboratory and course goals
Instruments in hydraulics laboratory, Itime, Introduction of measurement instrumentsMethods 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
height and orbits of water particlesComparison measured data with small amplitude wave theory and
breaking-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,Acasurements and observations of bed load in open-channel flows.
Comparison with theories and formulae
Achievement confirmation, Itime,Achievement of learning is confirmed. | 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, co benefit analysis which is wildy used to evaluate the efficiency of infrastracture is explained. Finally, co benefit analysis which is wildy used to evaluate the efficiency of infrastracture is explained. Finally, co benefit analysis which is wildy used to evaluate the efficiency of infrastracture is explained. Finally, co benefit analysis which is wildy used to evaluate the efficiency of infrastracture is explained with economica aspects of infrastructure. [Course Goals] 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, 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 function and supply function, market structure and firms#039 behaviour) Exercise (2), 1time,Exercise related to above three lectures Perfect Cominitive Market, 1time,Perfect competitive market, the difference between general equiribrium an partial equiribrium, Pareto effciency Imperfect Competition, Itime,Monopolistic Market, Oligopoly Market Measurement for Economic Evaluation, 1time,Consumers#039 supplus, Producers#039 surplus, social surplus |
| [Class requirement] | equivalent variation, compensating variation |
| Hydraulics and Exercises | Externality, ltime, The concept of externalities, its mechanism and variation, policy to internalise externalities
Public Goods, ltime, The feature of public goods, Samuelson condition |
| [Method, Point of view, and Attainment levels of Evaluation] | Exercise (3),1time,Exercise related to above three lectures |
| Attendance : 40 points Reports and homework : 60 points total : 100 points | Cost Benefit Analysis, 1 time, The concept of cost and benefit, social discount rate, evaluation index, cost
benefit analysis and financial analysis, quantification of the benefit, the way of pjofect evaluation from the |
| [Textbook] | viewpoint of engineers#039 ethic
,1time, |
| Continue to Experiments on Hydraulics(3) | Continue to Public Economics(2) |

Experiments on Hydraulics(3)

[Reference books, etc.]

(Reference books)

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

Public Economics(2)

[Class requirement]

Students are supposed to have earned a credit for quotSystems Analysis and Exercises for Planning and Managementquot

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

Final Exam: 70-80%, Reports during classes: 20-30%

[Textbook]

Hal R. Varian: Intermediate Microeconomics : A Modern Approach, seventh Edition, W. W. Norton amp Company, 2014 isbn{}{9780393919677}

[Reference books, etc.] (Reference books)

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

It is advisable to read the corresponding parts of the textbook in advance.

(Others (office hour, etc.))

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Continue to Urban and Regional Planning(2)

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Transportation Management Engineering(2)

Further useful material will be introduced during the class.

(Related URLs)

(None)

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

(Others (office hour, 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.

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| [Class requirem | ent] | | | | | 6) Fractures | | | | | | | | | |
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8) Mid-term
9) Geologica | exai | mination | | | | | | | |
| [Method, Point of | of view. an | d Attainment | evels of Evalua | tion1 | | | | ractured rock | | | | | | | |
| Final exam (60%) a | | | | • | | 11) Subsurfa | ice st | tresses and m
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| [Textbook] | | | | | | 13) Applicati | ion t | to plane failu | re of slo | ope | | | | | |
| Handouts will be di | istributed. | | | | | | | to wedge fail
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| | | | | Continue to Geo | nvironmental Engineering(2) | | | | | | | | , | Continue to R | ock Engineering(2) |

Geoenvironmental Engineering(2)

[Reference books, etc.]

(Reference books) Lakshmi N. Reddy, Hilary I. Inyang, IdquoGeoenvironmental Engineering: Principles and Applicationsrdquc Marcel Dekker, Inc. isbn{}{0824700457} Robert W. Sarsby, ldquoEnvirionmental Geotechnicsrdquo, ICE publishing isbn{}{9780727741875}

[Regarding studies out 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.

(Others (office hour, etc.))

G. Flores (flores.giancarlo.3v@kyoto-u.ac.jp) T. Pipatpongsa (pipatpongsa.thirapong.4s@kyoto-u.ac.jp)

*Please visit KULASIS to find out about office hours

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| 1) Introductio | n to R | ock Engin | eering | | | | | | | |

- Strength of intact rock
-) Discontinuity and surface roughness) Description of discontinuous planes
- Griffith and Hoek-Brown failure criteria
- Fractures in rock mass Hydro-mechanical behaviors in rock
- Mid-term examination
- Geological survey and geophysics)) Seepage in fractured rock
-) Subsurface stresses and measurements
-) Application to tunnel & Rock mass rating system
- 3) Application to plane failure of slope4) Application to wedge failure of slope
- 5) Evaluation of understanding

Class requirement]

Rock Engineering(2)

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

Mid-term exam (35%), Final exam (40%), report and classworks (25%)

[Textbook]

Some handouts are distributed thru KULASIS or PanDA.

[Reference books, etc.]

(Reference books)

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

ldquoFundamentals of Rock Mechanicsrdquo, J.C. Jaeger, N.G.W. Cook and R.W. Zimmerman, Blackwell Publishing isbn{}{9780632057597}

ldquoRock Mechanicsrdquo, Society of Materials Science, Japan (in Japanese) isbn{}{4765516288}

[Regarding studies out of class (preparation and review)] Quiz during lecture encourages students to review lecture contents before class

(Others (office hour, etc.))

Prof. Kiyoshi KISHIDA Office: Department of Urban Management, C1-3-265 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)

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Design for Infrastructure II(2)
[Textbook]
[Reference books, etc.]

(Reference books)

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

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nyutologic predictions pray an important role for water resources evaluation. The basic role of nyutologic 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 plannins

The basis of the hydrologic frequency analysis is explained. Hydrologic variables used for the river planning and water resources planning are introduces as probabilistic variables; the concept of non-exceedance and exceedance probability and T-year probability hydrologic variables are explained. Then, the procedure of hydrologic frequency analysis, distribution functions used for the frequency analysis, and estimation methods Continue to Water Resources Engineering(2)

Water Resources Engineering(2)

of parameters of a distribution function is described.

Water resources evaluation (3): Real-time hydrologic forecasting,2times, Methods for real-time rainfall forecasting and river discharge forecasting are focused.

Achievement confirmation.1time.

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

[Class requirement]

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

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

Grading is done based on the mark on regular examination. Minimum passing grade is sixty percent.

[Textbook] Not used

[Reference books, etc.] (Reference books)

Introduced during class

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

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

(Others (office hour, 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.

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River Engineering(2)

dams, asset management of dam reservoirs, management of sediment dynamism for integrated river planning, etc

Integrated river basin planning, 3 times, (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 nanagement 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, etc

Confirmation of understanding, 1 time, Students can check their understanding giving questions to Hosoda and Takemon

[Class requirement]

Elementary knowledge of Hydraulics, Hydrology and Ecology

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

Mainly regular examination. Quiz in classes, attendance and reports are considered for grading to some exten

[Textbook]

Printed materials on the contents will be distributed in each lecture

[Reference books, etc.]

(Reference books)

(Related URLs)

(http://www.geocities.jp/kyoto_u_rivereng/)

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

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours.

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| Day/perio | Day/period Fri.3 Class style Lecture Language English | | | | | | | | | | |
| [Outline and Purpose of the Course] | | | | | | | | | | | |

To understand fundamentals of design theory for civil infrastructures. To explain various design loads, ncluding dead load, live load, temperature load, seismic load, and wind load, limit states of structures and their evaluation, demand performance. To design structures considering reliability, optimal design, serviceability, aesthetics, and environment

[Course Goals]

To understand fundamentals of design for civil infrastructures.

To understand fundamentals of load, limit state of structures, reliability design and optimal design To understand fundamentals of characteristics of natural wind, aerodynamics of structures, design wind and

wind resistant design. To understand fundamentals of earthquake mechanism and seismic response of structures, seismic load, and seismic design.

[Course Schedule and Contents]

Introduction of design theory of civil infrastructure, 2times, Design theory of civil infrastructures is introduced. The concept and significance of design, objective of design, characteristics of civil infrastructures, flow of design process, mechanical design, multi-level decision making are discussed. Engineering ethics are also explained.

Introduction of load, 3 times, Design loads for civil infrastructures are introduced. The characteristics and classification of design loads are explained and their quantitative expression is discussed. Especially statistic characteristics of random loads, i.e. seismic load and wind load, are explained.

Prediction of earthquake ground motion and earthquake response of structure,2times,Methods for predicting earthquake ground motion are introduced based on the theories of earthquake mechanism and ground vibration. Equation of motion for the single degree of freedom system and its solution is also explained in order to estimate earthquake response of structure. Design methods for infrastructures are interpreted on the asis of theories of elasticity and plasticity.

Characteristics of natural wind and aerodynamics of structures.2times.The characteristics of natural wind and strong wind are explained and process of design wind for structures is discussed. And various aerodynamics (vortex-induced vibration, galloping, flutter, buffeting, etc.) acting on structures is used set. And various actorynames geometric shape and their generation mechanism are explained. Limit state of structure and reliability analysis,3times,The outline of structural safety analysis is introduced

for serviceability, ultimate and fatigue limit of structures. As for uncertanities in various actions to structures

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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.

[Class requirement]

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.

[Method, Point of view, and Attainment levels of Evaluation] Based on the performance during the course (including homework) and the results of a final examination.

[Textbook]

Hand-outs are distributed when necessary.

[Reference books, etc.]

(Reference books)

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

(Others (office hour, etc.))

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

*Please visit KULASIS to find out about office hours.

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

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period | 2019/Second semester | | | |
| Day/period | Fri.4,5 | Class style | Semina | ar | | Language English | | | | |
| [Outline 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 Goals]
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
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Continue to CP & Exp on Struct M(2)

| 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, 2 times
Review structural experiments and computer analysis. Confirm the attainment level of learning
[Class requirement]
CompuTer Programming in Global Engineering, Structure mechanics and Exercises, Structure mechanics
and Exercises
[Method, Point of view, and Attainment levels of Evaluation]
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.
[Textbook]
To be distributed in lectures
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[Regarding studies out of class (preparation and review)]
Students will review frame analysis. | Review structural experiments and computer analysis. Confirm the attainment level of learning [[Class requirement] CompuTer Programming in Global Engineering, Structure mechanics and Exercises, Structure mechanics and Exercises [[Method, Point of view, and Attainment levels of Evaluation] 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. [[Textbook] To be distributed in lectures [[Reference books, etc.]] (Reference books) [[Regarding studies out of class (preparation and review)] Students will review frame analysis. (Others (office hour, etc.)) Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture. | CP & Exp on Struct M(2) | |
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Visualization, Numerical analysis of a simple beam, Numerical analysis of the test cases (flexural deflection
of and a frame)
Feeback lecture, 2 times
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[Class requirement]
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Graduation Research(2)

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Associate Professor, KHAYYER, Abb
Graduate School of Global Environmental Sudi
Associate Professor, HARADA EIJI
Graduate School of Engineering
Assistant Professor, IKAR HIROYUK | | | | |
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| Coastal Engineering(2) | |
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| Nearshore Current / Coastal Sediment Transport[1time]:
Near-shore current due to wave deformation and resultant coastal sediment transport are outlined. | |
| Isunami and Storm Surge: Evacuation Planning under Coastal Disasters[Itime]:
Characteristics of tsunami and storm surge are explained. Additionally, evacuation process and evac
planning are introduced. | uation |
| Achievement confirmation[]time]:
Comprehension check of course contents. | |
| Feedback[Itime] | |
| [Class requirement] | |
| To have already completed the class of Hydraulics and Exercises is desirable. | |
| [Method, Point of view, and Attainment levels of Evaluation] | |
| Based on the results of examinations | |
| [Textbook] | |
| Handout is used in the lectures as needed. | |
| [Reference books, etc.] | |
| (Reference books)
Supplemental textbook is announced in the first lecture. | |
| (Related URLs) | |
| (Non) | |
| [Regarding studies out of class (preparation and review)] | |
| Review the lecture contents. | |
| (Others (office hour, etc.)) | |
| Reexamination is not provided. | |
| How to contact with instructors is announced in the first lecture. | |
| *Please visit KULASIS to find out about office hours. | |
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[Regarding studies out of class (preparation and review)] consult with your supervisor (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

特別研究(土木工学コース)(2)

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p title,Na | | Professo
Graduate | ol of Engineering
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ssor,SANJIYOU MICHIO | |
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| Day/perio | d I | ntensive | Cla | ss style | Semina | ır | | | Lanç | guage | Japanese |
| [Outline a | nd P | urpose of | the C | ourse] | | | | | | | |
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skills. At the same
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| [Textbook | • | | | | | | | | | | |
| consult with | your | supervisor | | | | | | | | | |
| [Reference | | | | | | | | | | | |
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consult with | | | | | | | | | | | |
| consult with | your | supervisor | | | | | | | Continue | to 特別 | 研究(土木工学コース)(2) |

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ssor,HAMA TAKAYUKI |
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としてまとめる。
Ĵやすく発表し、質問 |
| [Course G | ioals] | | | | | | | | | |
| - | データ | | 議の道 | 進め方、研 | 究成果 | のま | とめ方 | ī、発 | 表のスキル€ | 等、研究を遂行する上 |
| [Course S | chedu | le and Co | onten | ts] | | | | | | |
| | | | | | | | | | 集と検討、
別指導を行き | 开究方法の吟味、デー
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| [Class red | quirem | ent] | | | | | | | | |
| 資源工学コ | ースの | 研究室に | 配属す | されること | が必須 | とな | :る。 | | | |
| [Method, | Point o | of view, a | nd At | tainment | levels | of E | valuat | ion] | | |
| 教員の指導
行うことに | | | 研究詞 | 龠文」を作 | 成・提 | 出す | ること | :、さ | らに特別研究 | ² 発表会で研究発表を |
| [Textbook | (] | | | | | | | | | |
| Not used | | | | | | | | | Continue to 在即 | 研究資源工学コースv2) |
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特別研究(資源工学コース)(**2**)

[Reference books, etc.]

(Reference books) 指導教員の指導によるものとする。

[Regarding studies out of class (preparation and review)] 教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 書を自主的に勉強することが望まれる。

(Others (office hour, etc.)) 教員の指導のもとに研究を遂行してください。

*Please visit KULASIS to find out about office hours.

特別研究(環境工学コース)(2)

[Textbook]

To follow supervision of the staffs.

[Reference books, etc.] (Reference books)

[Regarding studies out of class (preparation and review)] To follow supervision of the staffs.

(**Others (office hour, etc.)**) To follow supervision of the staffs.

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ol of Engineering
or,FUJIMORI SHINICHIRO |
| Target ye | ar | 4th year students of | r above | Number | of cred | lits | 5 | | ourse offered
ar/period | 2019/Intensive, year-round |
| Day/perio | bd | Intensive | Cla | ss style | Semina | ar | | | Language | Japanese |
| [Outline a | nd | Purpose of t | he C | ourse] | | | | | | |
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| [Course G | ioa | ls] | | | | | | | | |
| | | | | | | | | | levelopment of | a research plan, |
| research imj | pler | nentation, writi | ng a t | hesis, and i | making a | a pre | esentatio | on. | | |
| [Course S | ich | edule and Co | nten | its] | | | | | | |
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| To set a rese | earc | h subject under | supe | rvision of s | taffs. | | | | | |
| (2) Review | ofr | revious researc | hes a | nd investig | ation of | rese | arch pro | ocec | lures (3 times): | |
| | | | | | | | | | | e research procedures. |
| (2) D | | | .1 | (2.6 | | | | | | |
| | | nt of a research
search plan une | | | f staffs | | | | | |
| | | souron plun un | 101 50 | permision o | i staris. | | | | | |
| | | s, survey and d | | | | | | | | |
| To carry out | ex | periments, surv | ey, d | ata analysis | and so | on u | nder suj | perv | vision of staffs. | |
| (5) Thesis w | riti | ng (5 times): | | | | | | | | |
| To write a tl | nesi | s of graduation | study | y based on t | the resea | ırch | results. | | | |
| (6) Presenta | tior | (1 time): | | | | | | | | |
| | | | gradu | ation study | and dise | cuss | with ex | ami | iners and audier | ices. |
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| [Class red | • | - | | | | | | | | |
| | | uirement for st
ents for gradua | | | | | | | the Guidance of | Global Engineering |
| about requir | em | ents for gradua | ion a | nd starting | graduati | on i | esearch | • | | |
| [Method, | Poi | nt of view, a | nd Af | tainment | levels | of E | Evaluat | ion |] | |
| | | ted by graduati | on res | search thesi | s which | mu | st follov | v th | e guideline for a | authors and its |
| presentation | | | | | | | | | | |
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| | | | | | · · | | | - | Continue to 45 | 研究(環境工学コース)(2) |
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