Numbering	j code									
Course title <english></english>	工業 Appli	数学A 1 ed Mathema	tics A	1		Aff dej Joi	iliated partment, b title,Nar	me G	raduate Scho sociate Professo	ol of Informatics or,SHIBAYAMA MITSURU
Target ye	ar 2n	id year students o	r above	Number	of credi	its	2	Cour year/	se offered period	2019/Second semester
Day/perio	d Th	u.2	Cla	ss style	Lecture				Language	Japanese
[Outline a	nd Pu	Irpose of t	he C	ourse]						
Complex and mathematica apply it to co	alysis, ıl analy ompute	traditionally ysis that inve e some integ	/ knov estiga ral.	wn as the th tes function	neory of t ns of com	fune iple	ctions of ex numb	a con ers. St	plex variabl udents will s	e, is the branch of tudy the foundation and
[Course G	ioals]									
To understar mathematics	nd prop and p	perties of co hysics.	mple	x functions	with a sł	kill	for evalu	uation	of integrals a	appearing in applied
[Course Section 2017]	ched	ule and Co	nten	ts]						
1. Complex	functio	on		_						
2. Holomorp	hic fu	nctions								
Elementar	ry func	ctions								
 Integrals i 	n the c	complex plai	ne							
Cauchy's i	integra	al theorem								
5. Power ser	ies									
Taylor ser	ies									
 Isolated si 	ngula	rities								
 Laurent se 	eries									
10. Multival	ued fu	inctions								
11. Analytic	contir	nuation								
12. Residue										
13. Integrals	inclu	ding trigonoi	metrie	c functions						
14. Applicat	10n to	improper in	tegra	1						
15. Point at i	ntinit	y and Riema	nn sp	here						
[Class req	uiren	nent]								
Calculus, Lii	near al	lgebra								
[Method, F	Point	of view, ar	nd At	tainment	levels o	of E	Evaluati	ion]		
Evaluation d	lenend	s mainly on	mark	s of examin	nation, b	it rr	arks of	exerci	ses are taken	into account when
needed.	opena	is many on		s or examin	uuon, ot		in the of	0.10101	ses are taiten	into account when
								C	continue to	工業数学A1 (2)

Course title <english> Aj</english>	業数学 F 1(pplied Mathen	機材エネ原: natics for Engi	学番奇数) neering F1	Affilia depart Job tit	ted ment, le,Nam	ne Gr	aduate Scho ociate Profess	ol of Engine or,NISHIKAW
Target year	2nd year student	s or above Num t	per of crea	lits 2	0	Cours year/p	e offered eriod	2019/Seco
Day/period	Tue.3	Class sty	le Lectur	e			Language	Japanese
[Outline and	Purpose of	the Course]						
[Introduction	o complex and	alysis and som	e applicatio	ns]				
The objective i and science. The applications ar	s to explain th ne differential e introduced.	e fundamental and integral ca	s of comple alculus of co	x analy omplex	sis, co functi	onside ions, tl	ring the app ne relevant b	lication to en basic ideas, a
[Course Goa	als]							
Understanding	the basics of o	complex analy	sis and obta	ining a	bility I	to prac	tice it	
[Course Sch	edule and C	contents]					_	
Definition of c	omplex and co	mplex plane	1time.					
Differential of	complex funct	tions and Cauc	hv-Rieman	n relatio	on. 2ti	mes.		
Concept and ex	amples of reg	ular functions.	2times,		, _u	,		
Line integral o	f complex fun	ctions, 1time,						
Cauchy's theor	em and integra	al formula, 2tir	mes,					
Taylor and Lau	rent series, 2t	imes,						
Singular points	and residue the	heorem, 2times	s,					
Application to	definite integr	al, 1time,						
Concept of cor	ıformal mappi	ng, other topic	s, 1time,					
Confirmation of	of learning ach	ievement, 1tin	ne,					
Feedback, 1tin	ie,							
[Class requi	rement]							
Fundamentals	of differential	and integral ca	alculus					
[Method, Po	int of view, a	and Attainme	ent levels	of Eva	luati	on]		
[nethod]							
Evaluation r								
Evaluation r Evaluation wil	l be mainly ba	sed on regular	examinatio	n.				
Evaluation r Evaluation wil n some cases,	l be mainly ba evaluation for	sed on regular homework (sl	examinatio hort reports:	n. about	four ti	imes)	will be also	considered.
Evaluation r Evaluation wil n some cases, In these cases	be mainly ba evaluation for the ratio of the	sed on regular homework (sl ne evaluations	examinatio hort reports: for regular o	n. about examin	four ti ation a	imes) v and ho	will be also mework is a	considered. bout 9:1.)
Evaluation r Evaluation wil n some cases, In these cases Evaluation s	be mainly ba evaluation for , the ratio of the tandard]	sed on regular homework (sl e evaluations	examinatio hort reports: for regular o	n. about examin	four ti ation a	imes) v and ho	will be also mework is a	considered. bout 9:1.)
Evaluation r Evaluation wil in some cases, In these cases Evaluation s Evaluation wil	l be mainly ba evaluation for , the ratio of th tandard] I be based on o	sed on regular homework (sl e evaluations class registratio	examinatio hort reports: for regular o on guideline	n. about examin	four ti ation a	imes) v and ho	vill be also mework is a	considered. bout 9:1.)
[Evaluation r Evaluation will in some cases, In these cases (Evaluation s Evaluation will [Textbook]	l be mainly ba evaluation for the ratio of the tandard] l be based on c	sed on regular homework (sh e evaluations h class registratio	examinatio hort reports: for regular e on guideline	n. about examina	four ti ation a	imes) v and ho	will be also on mework is a	considered. bout 9:1.)

⊥業数字A 1 (2)
[Textbook]
Not used
[Reference books, etc.]
(Reference books)
Lars V. Ahlfors "Complex Analysisa" (McGraw-Hill Education) ISBN:978-0070006577
(Related URLs)
(KULASIS)
[Regarding studies out of class (preparation and review)]
Students need to solve exercises.
(Others (office hour, etc.))
*Please visit KULASIS to find out about office hours.

工業数学F1(機材エネ原:学番奇数)(2) -----

[Reference books, etc.]

(Reference books) To be referred to during the course

[Regarding studies out of class (preparation and review)] Homework (short reports) for the problems stated in the textbooks will be assigned.

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

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Numbering	g co	de						
Course title <english></english>	工業 App	美数学 F 1 (横 blied Mathema	機材エネ原:学 atics for Engined	番偶数) ering F1	Affiliated departmen Job title,Na	t, ime	Part-time Lectu	ırer,
Target ye	ar	2nd year students o	or above Number	of cred	lits 2	Cou yea	urse offered ar/period	2019/Second semester
Day/perio	d 1	Tue.3	Class style	Lecture	•		Language	Japanese
[Outline a	nd l	Purpose of t	he Course]					
Introduction	to c	complex analys	sis and some ap	plications	5			
[Course G	ioal	s]						
Understandi	ng tl	he basics of co	mplex analysis	and obtai	ining ability	to p	practice it	
[Course S	che	dule and Co	ontents]					
based IDS b issued from Intrusion De Intrustion Dy Presentation machine lea [Class rec Fundamenta [Method, I Regular exa	y stu IDS etect: achin ,1tir rning quire dls of Poir mina	Idying open so and communi- ion by Machin elearning alg me,Based on th g, and discuss ement] 7 differential an at of view, an attion and Repo	urce signature- iccations, and ade the Learning,7tin gorithms and pu he exercise, stud it with other stu- nd integral calcu- nd Attainmen prts	based IDS ling signa ees,Learn olic datas ents pres dents and tlus	S and attack atures to de the method et for bencl ents their n l instructors	tion]	It as correspon- nttacks. Itassifying norm king intrusion of ds of intrusion	adence between alarms nal and malicious letection performance. detection using
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To be refern	ed to	during the co	urse (Nishikaw	a). Not us	ed (Murak	ami)		
				.,, 1 (ot us)		
[Referenc	e bo	ooks, etc.]						
(Referen	nce ed to	books) during the co	urse					
[Regardin	g st	udies out of	f class (prepa	ration a	nd review)]		
-								
(Others (offic	ce hour, etc.))					
*Please visit	t KU	LASIS to find	l out about offic	e hours.				

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Numbering	j cod	le								
Course title <english></english>	工業 App	é数学 A 2 lied Mathema	atics A2		Aff dej Jol	iliated partment p title,Na	, me	Gra Prof Gra Asso	duate Scho fessor,NAK duate Scho ociate Profess	ol of Informatics AMURA YOSHIMASA ol of Informatics sor,TSUJIMOTO SATOSHI
Target ye	ar	3rd year students o	r above Number	of cred	its	2	Co yea	urse ar/pe	e offered eriod	2019/First semester
Day/perio	d N	Ion.2	Class style	Lecture	•				Language	Japanese
[Outline a	nd F	Purpose of t	he Course]							
quotNumeric singular valu polynomials and informat the first class	cal A ie de , and tion j s.	analysisquot is composition, l numerical in processing.	s prerequisite to t iteration methods tegration method *There is a possi	his cours s for non s are exp bility to	se. l iline olain rep	In this c ear equa ned whi lace Co	ours tion ch a urse	se ma is, in re in Top	atrix eigenv terpolation nportant esp ics. Detail	value problem and methods by pecially in data science will be announced at
[Course G	oals	5]								
Understandi or programs	ng b by e	oth the theory ach student is	and practical me a goal of this co	thods fo urse.	r ap	plicatio	ns tl	hrou	gh general-	purpose softwares and/
[Course S	che	dule and Co	ontents]							
matrix eigen Gershgorin t method with matrix singu iterative met both of one a interpolation polynomials numerical in numerical in numerical in numerical in sofirmation ,1time,	valu heor the lar v hods and r met , and tegra tegra	e problem,6ti em, the powe Householder alue decompt s for nonlinear nulti variable hods ,2times, the spline fu ation methods ation formula student asses:	mes, computation r method and the transformations f ssition, 1 time, com r equations, 3 time s, and convergenc the Lagrange intenctions science, Newton-tons sment, 1 time, conf	of matri inverse or prepro- putation s, the pri- ce accele erpolatio Cotes nu irmation	ix e: iter oce: of ncip erati n fo	igenvalu ation, th ssing, Si matrix sole of co ion algo ormula a rical int	ies a le Q turm sing ntra rithi nd t egra udei	and e R me ular active ms the H ution	igenvector ethod and t orem value decor e mapping Iermitian ir formula,an sessment	s by the Jacobi method, he divide amp conquer mposition and the Newton method iterpolation formula by id the Gauss type
[Class req	uire	ement]								
Linear Algel	ora A	A, Linear Alge	ebra B, Numerica	l Analys	is					
[Method, F	Poin	t of view, a	nd Attainment	levels o	of E	Evaluat	ion]		
mainly evalu	iated	by examinati	ion score, but rep	orts of e	xer	cises wi	ll be	e take	en into acco	ount in a case.

Continue to 工業数学A 2 (2)

工業数学A2(2)

[Textbook]

puotIntroduction of Numerical Analysisquot (in Japanese) by T. Yamamoto, SAIENSU-SHA isbn{} 4781910386}

[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 Informatics 工業数学 F 2 (機:学番奇数) Course title Professor, KANOU MANABU department, Job title.Nan <English> Applied Mathematics for Engineering F2 Graduate School of Informatics Professor,OOTSUKA TOSHIYUKI Course offered year/period Brd year students or above Number of credits Target year 2019/First semester Day/period Tue.2 Class style Lecture Language Japanese [Outline and Purpose of the Course] Fourier analysis and its application will be described. The major part consists of Fourier series, Fourier ransform, and Laplace transform. [Course Goals] The goal is to understand the basics and applications of Fourier analysis. [Course Schedule and Contents] Preliminaries, 1 time, The goal and outline of this class are presented. Then, basic knowledge necessary to learn Fourier analysis is briefly reviewed. Fourier series, Itime,Fourier series expansion of periodic functions is described. Complex Fourier series,1time,Complex Fourier series, its differential and integral, and spectrum are described. Characteristics of Fourier series, 1 time, Characteristics of Fourier series are described. Fourier transform, ltime, In order to cope with aperiodic functions, Fourier transform is described. Characteristics and applications of Fourier transform is explained together with the Parseval#039s equation and its applications. Linear systems, I time, Linear systems is described. Solutions of linear differential equations are given by using Fourier series expansion. In addition, impulse responses and transfer functions of linear systems are explained. Summary of the first half, 1 time, A summary of Fourier series and Fourier transform is provided, and an examination will be given. Parseval#039s equality and its applications,1time,Parseval#039s equality, the WienerndashKhinchin theorem, and the relationship between impulse responses and cross-correlation functions in linear systems are escribed Introduction to partial differential equations, 1 time, Basic notions of partial differential equations are described. Solutions of the wave equation and their physical interpretations, ltime, The wave equation, one of important partial differential equations, is solved and physical interpretations of its solutions are discussed. Fourier series for solving the wave equation, Itime, Another expressions of solutions to the wave equation are derived in the form of Fourier series expansions. Introduction to Laplace transform ,1time,Laplace transform and its characteristics are described aiming at solving ordinary differential equations. Laplace transform for solving ordinary differential equations, 1 time, Ordinary differential equations are solved by applying Laplace transform and its inverse transform. Discrete Fourier transform and fast Fourier transform, 1time,Discrete Fourier transform for analyzing sampled data is described. Evaluation of achievement, 1 time, The achievements are evaluated _____Continue to 工業数字 F 2 (機:字香奇数)(2)

_業数学F2(機:学番奇数) (2)	
Class requirement]	
one	
Method, Point of view, and Attainment levels of Evaluation]	
he regular examination, assignments, and attitude in the class will be taken into account.	
[Textbook]	
hinichi Ohishi: Fourier Analysis, Iwanami-Shoten isbn{}{9784000077767}	
[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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Numbering	code											
Course title <english></english>	工業数 Applied	学F2(ⁱ I Mathema	機:勻 tics fo	学番偶数) or Engineer	ing F2	Aff dej Jol	iliated partment p title,Na	:, me	Grad Senio	luate Scho or Lecture	ol of Engineering r,SENAMI MASATO	b
Target yea	ır 3rd y	year students o	r above	Number	of cred	its	2	Co yea	urse ar/pei	offered riod	2019/First semester	
Day/period	Tue.	2	Clas	ss style	Lecture	e			L	anguage	Japanese	
[Outline an	d Pur	pose of t	he Co	ourse]								
[Course Go	oals]											
[Course Sc	hedul	e and Co	ontent	ts]								
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[Regarding	studi	es out of	clas	s (prepara	ation a	nd	review)]				
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*Please visit	KULA	SIS to find	l out a	bout office	hours.							

Course title I <english></english>	業数 pplied	≱F2 (Mathema	材) atics f	or Enginee	ring F2	Affil dep Job	liated artment title,Na	, me	Graduate Sch Associate Pro Graduate Sch Associate Prof	ool of Engineering ofessor,ICHII TAK ool of Engineering fessor,YUGE KORI
Target year	• 3rd ye	ar students	or above	Number	of cred	lits	2	Coi yea	urse offered ar/period	2019/First sem
Day/period	Tue.2		Cla	ss style	Lecture	e			Language	e Japanese
[Outline and	i Purp	ose of t	the C	ourse]						
Fourier analys	is, Lap	lace trans	sform,	, Linear Al	gebra an	d the	ir appli	catio	ons.	
[Course Goa	als]									
ransform and physical pheno mathematical f most appropria	cinear omena rigor bi ate one	and solvi and solvi at on dev in practi	, and t ing rel elopin cal pro	o learn to r evant diffe ng skills to oblem solv	nake full rential ec perceive ing.	quati diffe	or these ons. Pa erent ph	e ma rticu iysic	alar emphasis cal aspects of	is placed not on pu these tools and sel
[Course Sch	nedule	and Co	onten	its]						
series/\Fourier applications of basics of Lapl weeks)\\ - Vec	their Fo transfo Fourie lace tra tor spa	ourier ser orm (2-3 er transfo insform\\ ce\\ - Ma	ries ex weeks orm\\ - -appli ap and	pansion/\ - s)/\ -basics linear resp ications of matrix/\Ap	complex of Fourie onse syst Laplace pplication	Four Four er tra tem trans ns of	urier se rier seri insform Laplace form to Fourie	eries ies e \\\ -c e tra b line r tra	expansion (2 expansion\\ -ap onvolution an nsform and its ear systems\\L nsform and L	-3 weeks)// -period pplications of Foun ad correlation func s applications (2 w Linear Algebra (3- aplace transform (
runctions and i series\\Fourier applications of -basics of Lapl weeks)\\ - Vec weeks) [Class requi Prerequisite su	their Fe transfe Fourie lace tra tor spa ireme	ourier ser prm (2-3 er transform\\ ce\\ - Ma nt] complex	s(iDer ries ex weeks orm\\ - -appli ap and	pansion(\) - pasion(\) - s)(\) -basics linear resp ications of matrix(\Apple bers and ba	onse syst Laplace	:)\\Fo : Four er tra tem\\ trans ns of ilus.	urier ser rier seri nsform Laplace form to Fourie	ies e \\ -c e trai o line r trai	expansion (2 expansion\\ -ap onvolution ar nsform and it ear systems\\I nsform and L	-3 weeks)\\-period pplications of Fou Id correlation funct s applications (2 w Linear Algebra (3- aplace transform (
Inctions and I series\\Fourier applications of -basics of Lapl weeks)\\ - Vec weeks) [Class requi Prerequisite su [Method, Po	their Fo transfo Fourie lace tra tor spa ireme ibjects:	prication pourier ser form (2-3 er transfor nsform\\ ce\\ - Ma nt] complex view, a	s(iDel ries ex weeks orm\\ - -appli ap and c numl	pansion(\ - s)\\ -basics linear resp ications of matrix\\Ap bers and ba	complex of Fourie onse syst Laplace pplication	:)\\Fo : Four er tra tem\\\ trans ns of ilus.	valuat	ies e ies e ies e tran o line r tran ion]	expansion (2 xpansion\\-ap onvolution ar nsform and it ear systems\\I nsform and L	-3 weeks)\\-period pplications of Foun d correlation func s applications (2 w Linear Algebra (3- aplace transform (
tunctions and I series\\Fourier applications of -basics of Lapl weeks)\\- Vec weeks) [Class requi Prerequisite su [Method, Po The grading is	their Fo transfo Fourie lace tra tor spa ireme bjects: bint of made	pireation purier ser prm (2-3 er transform\\ ce\\ - Ma complex view, a based on	c numl the re	bers and ba ttainment gular exam	complex of Fourie onse syst Laplace pplication asic calcu	:)\\Fo : Four er tra tem\\ trans ns of ilus. of E	valuat	ies e traine tra	expansion (2 xpansion\\-aj onvolution an nsform and it nsform and L	-3 weeks)\\-period pplications of Foun d correlation func s applications (2 w Linear Algebra (3 aplace transform (
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tunctions and 1 series\\Fourier applications of -basics of Lapl weeks)\\- Vec weeks) [Class requi Prerequisite su [Method, Po The grading is [Textbook] Lecture notes a	their fe transfe Fourie lace tra tor spa ireme bjects: bint of made	pictation purier ser prm (2-3 er transform\\ ce\\ - Ma nt] complex view, a based on	s (Der ries ex weeks orm\\ - -appli ap and c numl c numl the re	pansion()- s)()-basics linear resp ications of matrix\\Ap bers and ba ttainment gular exan	(1 week complex of Fourio onse syst Laplace pplication)//Fourier transtern///Fourier transtern///	valuat	ies e ies e transition]	expansion (2 xpansion\) - ar onvolution ar nsform and it ear systems\[L nsform and L	-3 weeks)\\-period pplications of Foun d correlation func s applications (2 w _inear Algebra (3-/ aplace transform (
runctions and 1 series\\Fourier applications of -basics of Lapl weeks\\- Vec weeks\\ [Class requi Prerequisite su [Method, Po The grading is [Textbook] Lecture notes a [Reference]	their Fe transfe Fourie lace tra tor spa ireme ibjects: bint of made are dist	piretation purier ser orm (2-3 er transform\\ ce\\ - Ma nt] complex view, a based on ributed a s, etc.]	and and a communication of the	pansion()- s))(-basics linear resp lications of matrix(\Ap bers and ba ttainment ggular exan	complex complex of Fouri- onse syst Laplace pplication usic calcu))\Fo Four er tra tem\\\ trans ns of llus.	valuat	ies e training in the second s	expansion (2 xpansion\) - ar onvolution ar nsform and it ear systems\\I nsform and L	-3 weeks)\\-period pplications of Foun d correlation func s applications (2 w .inear Algebra (3- aplace transform (
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Target ye	ar Brd y	ear students	or above	Number	of cred	lits	2	Co yea	urse ar/pe	e offered eriod	2019/First semester
Day/perio	d Fri.4		Cla	ss style	Lectur	е				Language	Japanese
[Outline a	nd Pur	pose of	the C	ourse]							
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Course title <english></english>	工賞 App	巻数学A 3 bleid Mathema	tics A	.3		Aff de Jo	filiated partment b title,Na	t, ime	Gra Pro	aduate Scho ofessor,YAC	ol of Informatics GASAKI KAZUYUKI
Target ye	ar	3rd year students o	r above	Number	of cred	its	2	Co yea	urs ar/p	e offered eriod	2019/First semester
Day/perio	d N	Ved.1	Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd l	Purpose of t	he Co	ourse]							
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[Course G	ioal	s]									
To understat to concrete j	nd th prob	e fundamenta lems.	l theor	ries of Four	rier and	Lap	blace and	alysi	s an	d develop a	n ability to apply them
[Course S	che	dule and Co	onten	ts]							
One-dimens and their fur equations ar Multi-dimer given, and th Laplace tran are discusse Summary ar and the learn	iona ndan re dis nsior heir sfor d. nd le ning	l Fourier trans nental properti ccussed. al Fourier tran fundamental p ms,2-3times,P arning achieve achievement o	form, es suc nsform ropert ropert ement of stuc	3-4times, Tl h as the inv n,2-3times, ' ies and app ies of Lapl evaluation, lents is eva	he defin version f The defi blication ace tran ,1time,A luated.	ition form nitions s to sfor sfor	n of one nula and on of m partial ms and mmary	-dim l app ulti-c diffe their and s	lica dim ren ap	ional Fouri tions to par ensional Fo tial equation plications to plements of	er transforms is given, tial differential urier transforms is as are discussed. o differential equations this course are given
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Calculus, Li	near	Algebra and	Differ	ential Eqau	tions						
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Evaluation c account whe	lepe en ne	nds mainly on eded.	mark	s of examin	nation, b	ut n	narks of	exe	rcis	es and home	ework are taken into
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S. Nakamur	a: Fo	ourier analysis	, Asak	ura shoten	isbn{}{	978	3425411	5741	1}		
[Referenc	e bo	ooks, etc.]									
(Refere H.Fukawa: 1	nce Math	books) ematics of co	ntrol a	nd vibratio	on, KOR	ON	A-SHA	ibic	1{} Co	TW86010	572} 工業数学A 3 (2)

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工業数学A3(2)	
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[Regarding studies out of class (preparation and review)]	
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(Others (office hour, etc.))	
*Please visit KULASIS to find out about office hours.	
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Course title <english></english>	工業数 ⁴ Applied	学F3(Mathema	機原) atics for Engine	ering F3	Affiliated departmer Job title,N	nt, G ame	raduate Scho rofessor,INO	ol of Engineering UE YASUHIRO
Target yea	ar Brd y	ear students (or above Numbe	r of cred	lits 2	Cour year/	se offered period	2019/Second ser
Day/period	H Fri.2		Class style	Lecture	e		Language	Japanese
[Outline an	nd Purp	oose of t	the Course]					
Introduction (to speci	al functio	ns and mathem	atical met	hods for th	e physi	cal sciences.	
[Course Go	oals]							
Understandin problem solv	ig specia ing skill	al functio ls.	ns and mathema	atical met	hods for th	e physi	cal sciences,	and developing
[Course Sc	chedul	e and Co	ontents]					
Generalized f Green#039s f Partial differe Short Exam a	function function ential eq and Disc	,2times, ,1time, juations fe	or physical scie	nces,2tim	es,			
			line,					
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Target ye	ar	3rd year students o	r above	Number	of credit	s 2	Co ye	ourse ar/p	e offered eriod	2019/First semester
Day/perio	d V	Ved.2	Cla	ss style	Lecture				Language	Japanese
[Outline a	nd F	Purpose of t	he C	ourse]						
[Course G	ioal	s]								
[Course S	che	dule and Co	onten	ts]						
,4times,										
,1time,										
,3times,										
,2times, 4times										
,1time,										
[Class red	uire	ement]								
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[Textbook]									
[Referenc	e bo	oks, etc.]								
(Refere	nce	books)					_	_		
[Regardin	g st	udies out of	f clas	s (prepara	ation an	d reviev	v)]			
(Others (offic	e hour, etc.))							
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ourse title English>	工業 Engi	〔力≒ ineer	≱A (エ ring Mec	ネ) hanics	A		Aff de Joi	iliated partment b title,Na	, me	Graduate Scho Associate Profess	ool of Energy Science or,KINOSHITA KATSUYUK
Target ye	ar	3rd ye	ear students	or above	Number	of cred	its	2	Co yea	urse offered ar/period	2019/First semester
Day/perio	od M	lon.	1	Cla	ss style	Lecture	e			Language	Japanese
Outline a	nd F	Purp	ose of	he C	ourse]						
Course G	oals	5]									
Course S	che	dule	and Co	onten	ts]						
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Class rec	quire	me	nt]								
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Textbook	(]										
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Regardin	g st	udie	es out o	f clas	s (prepara	ation a	nd	review)]		
Others (offic	e h	our, etc	.))							
Please visi	t KU	LAS	IS to fin	d out a	bout office	hours.					

Numbering	code												
Course title <english> E</english>	」 学倫 nginee	理 ering Ethic	cs			Aff dej Jol	Affiliated department, Job title,Name			Graduate School of Energy Science Professor, TAKUDA HIROHIKO Graduate School of Engineering Professor, ATOMI HARUYUKI Graduate School of Engineering Senior Lecturer, KANEKO KENTAROU			
Target yea	• 4th y	ear students o	or above	Number	of cred	lits	2	Co ye	ourse ar/pe	e offered eriod	2019/First semester		
Day/period	Thu.	3	Cla	ss style	Lectur	e				Language	Japanese		
[Outline and	d Pur	pose of t	he C	ourse]									
Modern ethics Instructors fro	Modern ethics based on engineering aspect are becoming essential to present engineers and scientists. Instructors from various faculties give lectures about ethics in their research fields.												
[Course Goals]													
The goal of this class is to understand engineering ethics, and to develop the ability to judge by yourself when you encounter ethical issues.													
[Course Sc	nedul	e and Co	onten	ts]									
Significance ti engineering et examples are e Geotechnical discussing the generating. In engineering an Engineering e Engineering e the age of infc Ethical theoric (utilitarianism particular ethi Art-view conc engineering. S the QOL-eval Tomita: Engir Ethics of biott technology an possible, at lei problems acco Research and belongs theret discussed in tc research or en Ethics in bion as reproductiv) learn hics are a on or liscuss under roduction roduction of the second roduction of the second ro	engineeri d the sign daily disa: ed. (K. H ering and ground puing some exponential of the sign of the singer of the optimized and the engineering ethic social sign of the social sign of the social sign of the social sign of the engineering ethic social sign of the social sign of the social sign of the engineering ethic social sign of the social sign of	ing eth inificar strouss arada: engin ublic u examplicu engin engin engin (g ethi rtue et engin engin (g ethi rtue et engin (g ethi rtue et et engin (g ethi rtue et et engin (g ethi rtue et engin (g ethi rtue (g ethi rtue ethi (g ethi rtue (g ethi (g ethi)) (g ethi) (g ethi)) (g ethi))) (g ethi))) (g ethi))) (g ethi))) (g ethi))) (g ethi)))) (g ethi)))) (g ethi)))) (g ethi))))) (g ethi)))))) (g ethi))))))))))))))))))))))))))))))))))))	tics. (4/11) tice to learn accidents a Architectu eering ethic se, slope st oles of natu will be disc ics. (4/25) tics. (4/25) tic the othe M. Mizutan cs. (5/2) 1 thics, profes eering ethic (5/9) 1 time. (5/9) 1 time. (5/9) 1 time. (5/9) 1 time. (1) research. (2) editing of lecture, I w cal develop (23) 1 time. (2) e of equitab (2) Global Er (30) 1 time.	1 time. <i>i</i> . In the second sec	As a a e exp even geo- sters K. I in the of A uate eda: t of ' and on-o l tim man duce G. Ei l tha a c or l faii ng) dra mina a	n introd plained. it. The s ime. Ge sequest: and cor Cishida: is lectur poplied I School Cture fo School Cture	ucti Ex. iigni cotec ratio istru Gld e, I Ethi iccus whice the Sofi fiel ng v the e th ates adus at we esea tion	ion to amplificat chnicon of obal : cs. A Lette on v ch will cs. A Lette on v ch will cs. A Lette on v ch will ds w life" tabu at go st tec: strial iill do urch a tecs in a strial cs. a choose to a strial cs. a choose tabu at go st tec strial cs. i co st tec strial cs. i co st tec strial cs. i co st tec strial cs. i co st tec strial cs. i co st i co i co st i co st i co st i co st i co st i co i co st i co st i co st i co co st i co st i co st i co st i co st i co st i co st i co st i co st i co i co i co st i co st i co st i co st i co i co st i co st i co i co i co i co i co st i co i co st i co st i co s i co s i co i co s i co s i co s i co s i c i co s i co	this course les are show nices of engi al Enginee byproduct n accidents. Engineering show the b and show its rs) arious idea 11 be useful 11 be useful 11 be instell 11 be instell 10 be	2, the meaning of <i>m</i> in building incering ethics to those ring is indispensable in for the energy geotechnical g) asic Idea of s unique character in s in ethics for thinking about () for human related luced, and problem of rt view point. (N. ent of genome editing generations has become and think about ethical) st do nothing that ring work in society is leated techniques, such volutions in the fields of <u>Tracement</u>		
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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) 1time. 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)

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 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) Ethics in nuclear engineering. (7/18) 1time. Discussion on engineering ethics in the TEPCO accident from

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. 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.]

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[#] World of Engineering Ethics (3rd Edition) _a (Morikita Publishing Co., Ltd.) ISBN:978-4-627-9730.	3-9
8	
[®] Engineering Ethics (Revised Edition) (CORONA PUBLISHING CO.,LTD.) ISBN:978-4-339-077	/98-
ISBN:9784759811551	
[®] Practical Engineering Ethics - A Short Course, New Edition (Kagaku-Dojin Publishing Company, I	NC)
[®] Omnibus Engineering Ethics a (Kyoritsu Shuppan Co., Ltd.) ISBN:978-4320071964	
(Reference books)	

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

Numbering	g cod	e									
Course title <english></english>	工学. Introd	序論 duction to E	nginee	ering		Aff de Jo	filiated partment b title,Na	t, ime	Gra Seni Gra Seni Gra Gra Sen Gra	aduate Scho nior Lecture aduate Scho ior Lecturer, aduate Scho nior Lecture aduate Scho nior Lecture aduate Scho nior Lecture	ol of Engineering r,MAEDA MASAHIRO ol of Engineering IATSUMOTO RIYOUSUKE ol of Engineering r,YOROZU KAZUAKI ol of Engineering ,KANEKO KENTAROU ol of Engineering ,ASHIDA RIYUUICHI
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Day/perio	d In	tensive	Cla	ss style	Lectur	e				Language	Japanese
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[Course G	oals										
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Day/period	Inter	nsive	Cla	ss style	Semina	ar				Language	Japanese
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[Course Sch	edul	e and Co	onten	its]							
Week 1, Guidar	nce										
Week 2-13, Ha	nds-o	n training									
Week 14, Pre-p	resen	tation									
week 15, 1 mai	prese	intation									
[Class requir	eme	nt]									
How to register	will	- be annou	nced 1	ater. Studen	ts who	wan	t to join	this	s cou	rse is reque	ested to attend the first
class.										1	
[Method, Poi	nt of	view, a	nd Al	tainment	levels	Of E	valuat	ion	1		
Students are pro	ohibit	ed to skip	hand	s-on trainin	g. Evan	latic	on will b	e ba	ased	on presenta	ition.
[Textbook]											
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GLセミナーI(企業調査研究)(2)

[Reference books, etc.]

(Reference books)

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(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 first class. Students are prohibited to skip hands-on training. Evaluation will be based on presentation.

*Please visit KULASIS to find out about office hours

Numbering code Affiliated 工学部国際インターンシップ1 Course title department, Job title,Name <English> Faculty of Engineering International Internship Approved Course offered year/period Target year Brd year students or above Number of credits 2019/Intensive, year-round Day/period Intensive Class style Language Japanese and English Seminar [Outline and Purpose of the Course] Acquisition of international skills with the training of foreign language through the internship programs hosted by the University, the Faculty of Engineering, or the undergraduate school the applicant belongs to. [Course Goals] The acquisition of international skills with the training of foreign language through the to internship programs hosted by the University is the major expectation to the students. [Course Schedule and Contents] Overseas Internship,1time,The contents to be acquired should be described in the brochure of each internship Final Presentation, 1 time, A presentation by the student is required followed by discussion among participants. [Class requirement] Described in the application booklet for each internship program. The registrant is requested to have enough language skills for the participation. [Method, Point of view, and Attainment levels of Evaluation] Marit rating is done based on the presentation or reports after each internship program. Each Department responsible to identify if the credit earned by this subject to be included as mandatory ones or not. If the credit is not included in the undergraduate school in which the participant belongs to, the credit is granted by the Global Leadership Education Center as a optional credit. The number of credits, either 1 or 2, will be determined depending on the contents and the duration of the program that the participant has participated in. [Textbook] [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) It is required for students to check if the internship program to participate in could be evaluated as part of mandatory credits or not and could earn how many credits before the participation to the undergraduate school or educational program the student in enrolled. If the credit could not be treated as mandatory ones,

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get in touch with the Global Leadership Engineering Education Center.

program.

	g code									
Course title <english></english>	G L セ Global	L ミナー I Leadership	I(訪 p Semi	県題解決演 inar Ⅱ	習)	Aff dej Jol	iliated partment b title,Na	, me	Graduate Scho enior Lecture Graduate Scho enior Lecturer	ol of Engineering r,MAEDA MASAHIRO ol of Engineering ,KANEKO KENTAROU
Target y	ear 2nd	year students o	or above	Number	of cred	its	1	Cou year	rse offered /period	2019/Intensive, Second semester
Day/peri	od Inte	nsive	Clas	ss style	Semina	r			Language	Japanese
[Outline a	and Pur	pose of t	he Co	ourse]						
This course by themselv trained thro enhanced th preliminary	is a sma ves aimin ugh grou rrough or draft to	ll-group w g at creati p works in al present its comple	orksho ng nev n resid ations etion.	op progran v social va ential train regarding	n where a lues. In a ing and contents	stud cone skil of t	lents are crete, ab ls of pre the prop	supp ilities senta osal a	osed to extrac of planning a tion and com t each step of	t or set up challenges ind problem-solving are nunication are the process from a
[Course (Goals]									
Ability of p social value	lanning, es, is trair	from extra ned throug	action h grou	or setting u p works.	ıp challe	nge	s to proj	posal	of solutions a	iming at creating new
[Course \$	Schedul	e and Co	onten	ts]						
Orientation	,1time,A	brief over	view a	and a sched	lule of th	ne co	ourse ar	e exp	lained and wo	rking groups are
organized.	imes Lec	tures by e	vnarte	ara giyan						
Group worl	ks,3times	Setting up	p chall	enges, exti	action o	f pr	oblems,	colle	cting informa	tion, and group works
are done.				8,		r				, 51
Residential	training,	7times,Th	rough	intensive g	roup wo	orks	based o	n dis	cussion, a pro	posal for solving
Preliminary	review i	, a draft re meeting.1t	ime.A	made, and preliminar	i a rew p rv reviev	rese v m	entations eeting is	held	nade. and discussio	ns are made.
Report mee	ting,1tim	e,Final pr	esenta	tions are m	ade and	rep	orts are	subm	itted.	iis are made.
[Class re	quireme	ent]								
None										
[Method,	Point o	f view, ai	nd Att	tainment	levels (of E	Evaluat	ion]		
It is require	d to join	the reside	ntial tr	aining. A 1	eport me	eetii	ng is hel	d and	comprehensi	ve evaluation
concerning	abilities	in group d	iscuss	ion to extra	act or set	up	challen	ges a	id to propose	solutions for achieving
a goai is ina	ide unou	gn present	anon	n me prop	usai as v	ven	as a suc	minuc	u report.	
[Textboo	k]									
Will be ind										
	icated as	necessary	•							
	icated as	necessary								
	icated as	necessary								
	icated as	necessary	-							
	icated as	necessary	•							
	icated as	necessary								

GLセミナーII(課題解決演習)(2)	Numbering code
[Reference books. etc.]	Course title 計算機数学(原)
(Reference books)	English> Mathematics for C
Will be indicated as necessary.	
	Target year 2nd year students or
[Regarding studies out of class (preparation and review)]	Day/period Fri.2
	[Outline and Purpose of the
	This course deals with numeric
(Others (office hour, etc.))	processing methods such as pla
Course open period: October to January	programming language.
How to register the course will be instructed.	[Course Goals]
*It depends on divisions which students belong to whether the earned credits are admitted as credits require	d The goal is to acquire a series of
for graduation. Please refer to the synabus of your division.	analysis of results.
*Please visit KULASIS to find out about office hours.	
	[Course Schedule and Co
	(1) Orientation and terminal op
	Login method of the terminal o
	(2) Learn the mechanism of nur
	Understanding the principle of
	(3) Basic programming, 3 class
	Acquisition of essential items f
	subprogram and function three
	number
	(4) Applicative programming, 4
	Roots of the equation (dichotor
	linear equation (Gauss eliminat
	method) Acquire the basic idea
	(3) Constructive programming,
	(6) Confirmation of learning at
	Post explanation and review of
	[Class requirement]
	Recommend to take basic infor
	[Method, Point of view, an
	[Grading method]
	Grade is based on reports (30%
	[Grading criterion]
	Must score 60 or above out of 1
	59 or below: fail

Target year	3rd year students of	or above Number	of credits	2	year/p	eriod	2019/Intensive, ye
Day/period	Intensive	Class style	Seminar			Language	Japanese and I
[Outline and	Purpose of t	he Course]					
Acqusition of in international in	nternational ski ternship progra	ills with wth the ms held by the H	training of for Faculty of En	oreign lar gineering	nguage g or its	through the subsidiary	e participation t bodies.
[Course Goa	ls]						
The acquisition programs is exp	of internationa bected. Detailed	al and foreign la d objectives of th	nguage skills ne participatio	through on should	the par 1 be ide	ticipation to entified by e	o international each program.
[Course Sch	edule and Co	ontents]					
Final Presentati	on,1time,A pre	esentation by the	student is re	quired fo	ollowed	by discuss	ion among part
[Class requir	rement]	1-1 - 4 fe h - 1					
language skills	e application be	ooklet for each 1	nternsnip pro	gram. 11	ne regis	strant is req	uested to have
	for the particip	ation.					
[Method, Poi	for the particip int of view, and done based on t	ation. nd Attainment	t levels of E	valuati	on] nternsh	in program	Fach Departs
[Method, Poi Marit rating is or responsible to incredit is not incredit is not incredit dep	for the particip int of view, and done based on t dentify if the cr luded in the un dership Educati ending on the c	nd Attainment attention the presentation redit earned by t dergraduate sche ion Center as a o contents and the	t levels of E or reports aft his subject to ool in which ptional credit duration of th	er each in be inclu the partic t. The nu he progra	on] nternsh ded as cipant b mber c am that	ip program mandatory belongs to, p f credits, ei the particip	Each Departi ones or not. If the credit is gra ther 1 or 2, wil pant has partici
[Method, Poi Marit rating is c responsible to is credit is not inc the Global Lead determined dep [Textbook]	for the particip int of view, ar done based on t dentify if the cr luded in the un lership Educati ending on the c	ation. nd Attainment the presentation redit earned by t dergraduate sch ion Center as a o contents and the	t levels of E or reports aft his subject to ool in which ptional credit duration of th	er each in be inclu the partic t. The nu he progra	on] nternsh ded as cipant l mber o am that	ip program mandatory pelongs to, + f credits, ei the particip	. Each Departu ones or not. If the credit is gra ther 1 or 2, wil pant has partici
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[Method, Poi responsible to i credit is not inc the Global Lead determined dep [Textbook] [Reference b (Reference b (Reference [Regarding s (Others (offf It is required for mandatory cred	for the particip int of view, an done based on t duded in the un dership Educati ending on the c oooks, etc.] books) itudies out of itudies out of itudies out of itudies out of itudies out of a itudies out of a it	ation. md Attainment the presentation dergraduate sch on Center as a o contents and the f class (prepa))	e levels of E or reports aft his subject to ool in which ptional credit duration of th ration and r ship program nany credits is	valuation er each in be inclu the partici- t. The number program review)]	on] nternsh ded as cipant l mber c m that cipate i cipate i	ip program mandatory selongs to, f credits, ei the particip n could be ipation to t	. Each Departi ones or not. If the credit is gra ther 1 or 2, wil yoant has particip one partici

*Please visit KULASIS to find out about office hours.

Numbering code

Numbering	g co	de										
Course title <english></english>	計算 Mat	单機数 hem	数学(原 atics for () Comp	utation		Aff dep Job	iliated partment p title,Na	, me	Gra Ass	aduate Scho ociate Profes	ol of Engineering sor,TAISHI KOBAYASHI
Target ye	ar	2nd ye	ear students o	or above	Number	of cred	lits	2	Co yea	ours ar/p	e offered eriod	2019/First semester
Day/perio	d F	ri.2		Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd F	Purp	ose of t	he C	ourse]							
This course processing n programmin	This course deals with numerical calculation method by computer. The goal is to acquire a series of processing methods such as planning processing method, program creation, analysis of results by learning the programming language.											ire a series of f results by learning the
[Course Goals]												
The goal is t analysis of r	o ac esult	quire s.	e a series	of pro	cessing me	thods su	ich a	ıs plann	ing	pro	cessing meth	od, program creation,
[Course S	che	dule	and Co	onten	ts]							
(1) Orientation (2) Learn the Understandi calculation. (3) Basic pre- aclaulation. (3) Basic pre- acquisition subprogram number (4) Applicat Roots of the linear equati method) Acc (5) Construct Acquire abo (6) Confirm Post explana Class processing and account of the second second second second second second second second second second second second second secon	on a od of e me ng th ogran of es and ive p equi- con ((quire ctive ation	ind the the property of here and the prope	arminal of isrm of nu inciple of ng, 3 clas ial items tion three amming, (dichoto is elimina basic ide rramming l develop earning a review o	training ferance	off, 2 class satellite exceeded astellite exceeded ogramming s, \\ task: su sees lewton's me nethod), eig alculation m tsses problems an ent, 1 class nination que	ercise rc on, 2 cl: lation, r such as m-diffe ethod), r genvalue nethod a nd solut s estions t	inp inp renc (Ja nd c ions o K	, how to s sentatio ut / outp e produ erical in cobi me lo actua , and we ULASIS	o ope on of out, (ct q ttegr tthoo 1 pro ork (S.	erate f nui brar juoti d), d ogra	e the editor, mbers, error nch, repeat, ent, sum of n (Simpson lifferential e imming. ssues.	etc. s accompanying variable, array, sequence, prime method), simultaneous quation (Runge-Kutta
[Class red	luire	eme	ntj									
Recommend	l to t	ake t	basic info	rmatio	on processir	ng and t	oasic	inform	atio	n pr	ocessing ex-	ercises.
[Method, I	Poir	t of	view, a	nd At	tainment	levels	of E	valuat	ion]		
[Grading me Grade is bas [Grading cri Must score 6 60 or above: 59 or below:	ethod ed o terio 50 or pas fail	i] n rep n] abo s	oorts (309 ve out of	6) and 100 o	l one written	n exami ts and w	natio ritte	on (70%	inat	ion		
										Co	ontinue to 計	算機数学(原) (2)

Textbookl	
iot used	
Poforonoo hooko oto l	
(Reference books, etc.)	
「Nelerence books」 ■川隼人『演習と応用 FOR	TRAN77』(サイエンス社)ISBN:4781905110
屈之内他 『ANSICによる数	直計算法入門 (第2版)』(森北出版) ISBN:4627093829
Regarding studies out of c	lass (preparation and review)]
As needed, practice exercises wi	Il be conducted in class, so please review after class.
	-
(Others (office hour, etc.))
ecture 1s given in Japanese.	
Please visit KULASIS to find o	ut about office hours.

Numbering Course title	g co 計算	ode 算機数学(材)			Aff	iliated		Gra	aduate Scho	ol of Engineering
<english></english>	Ma	thematics for (Ćomp	utation		de Jol	b title,Na	i, ime	As	sociate Prof	essor,OKUDA HIRO
Target ye	ar	2nd year students of	or above	Number	of cred	lits	2	Co yea	ours ar/p	e offered eriod	2019/First semeste
Day/perio	d	Tue.1	Cla	ss style	Lectur	е				Language	Japanese
[Outline a	nd	Purpose of t	he C	ourse]							·
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[Course G	JUai	19]									
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,2times,											
Jumes, Atimes											
.3times.											
,1time,											
[Class req	uir	ement]									
None											
[Method, I		nt of view, a	nd At	tainment	levels	of E	valuat	lion			
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Deservin	~ ~	4			ation o	in al i		\1	_		
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(Others (otti	ce hour, etc.))								
*Please visit	KU	JLASIS to find	l out a	about office	e hours.						

Numbering	g code								
Course title <english></english>	計算機 Mather	数学(エ natics for (ネ) Computation		Affiliate departr Job title	d nent, e,Name	Gra Ass Gra Ass	aduate Scho sociate Prof aduate Scho sociate Prof	ol of Energy Science essor,HACHIYA KAN ol of Energy Science essor,Jun HAYASHI
Target ye	ear 2nd	year students o	r above Numbe	r of crec	lits 2	Co ye	ours ar/p	e offered eriod	2019/First semester
Day/perio	d Tue.	.1	Class style	Lectur	e			Language	Japanese
[Outline a	nd Pur	pose of t	he Course]						
To acquire t computatior	he abilit al progr	y of basic raming.	computational	programi	ng and le	arn the	e bas	ic mathema	tics underlying the
[Course G	ioals]								
To acquire t computatior	he abilit al progr	ty of basic raming.	computational	programi	ng and le	earn the	e bas	ic mathema	tics underlying the
[Course S	chedu	le and Co	ontents]						
room; Lectu Basics of thi 3times, Inpu Basic progra (Newton's n etc. Advanced p Exercise of Summary ar [Class rec None	re on the e numer tt/Outpu aming, 4 hethod), rogrami advance nd confin quireme	e procedur ical compu- it; Subrouti times, Lec numerical ng, 3times d program rmation,1ti	e to build up th trational langua ne; etc.// Exerc ture on the bas integration (Si , Lecture on the ming, me,	e comput ige, 2time ise of the ics of app mpson M e procedu	ational e s, Lectu arithme roximati ethod); §	nviron re on the tic oper ons of Simulta	ment ne ba ratio root neou	t sics of the r ns, Sequend s of the real is equation e of the con	numerical computation, ves, etc. -valued function (Gaussian elimination), nplicated issues//
[Method,	Point o	f view, a	nd Attainmer	t levels	of Eval	uatior	ןו		
Comprehens	sive eva	luation of a	attendance, exe	rcises and	examin	ation.			
[Textbook	(]								
Not used									
[Referenc	e book	s, etc.]							
(Referent Introduced of	nce bo luring cl	oks) lass							
[Regardin	g stud	ies out of	class (prepa	aration a	nd revi	ew)]			
Learn the ba Try to under	sics of l rstand th	FORTRAN ne exercise	and C. s in each lectur	e.					
(Others (office I	nour, etc.))						
Check KUL	ASIS/O	ffice Hour	s						
*Please visi	t KULA	SIS to find	l out about offi	ce hours.					

Target year pair year success of allow runnber of creates 2 year/period 2019/Firs Day/period Thu.2 Class style Lecture Language Japanese [Outline and Purpose of the Course] This course focuses on the mathematical and numerical methods for numerical computation. We the mathematical methods to solve mathematical and physical problems by using computers. We the programming language and practice programming to learn and experience the process of how to program to solve problems, write programs, and analyze the results, and also understand the accur characteristics of the numerical methods. Image: Course and Contents] Understand and learn the basic knowledge, method and skill of mathematical solution for comput planning the numerical method, programming, and analyze the results. Image: Course Co
Day/period Thu.2 Class style Lecture Language Japanese [Outline and Purpose of the Course] This course focuses on the mathematical and numerical methods for numerical computation. We the mathematical methods to solve mathematical and physical problems by using computers. We the programming language and practice programming to learn and experience the process of how to program to solve problems, write programs, and analyze the results, and also understand the accur characteristics of the numerical methods. ICourse Goals Understand and learn the basic knowledge, method and skill of mathematical solution for compute planning the numerical method, programming, and analyze the results. ICourse Schedule and Contents ICourse Schedule and Contents Mathematics for numerical simulation (3) Learn the principle of computation and the mathematical method, and understand the error appear computation. Orientation and operating the terminal (1) Access to the computer in the satellite seminar room and how to use the editor, and compile and r program. Basic programming (2) Learn the basic statements and structure of programming (input, output, loop, parameters, array, s function at 0 or computer
[Outline and Purpose of the Course] This course focuses on the mathematical and numerical methods for numerical computation. We the mathematical methods to solve mathematical and physical problems by using computers. We the programing language and practice programming to learn and experience the process of how to program to solve problems, write programs, and analyze the results, and also understand the accur characteristics of the numerical methods. [Course Goals] Understand and learn the basic knowledge, method and skill of mathematical solution for compute planning the numerical method, programming, and analyze the results. [Course Schedule and Contents] Mathematics for numerical simulation (3) Learn the principle of computation and the mathematical method, and understand the error appear computation. Orientation and operating the terminal (1) Access to the computer in the satellite seminar room and how to use the editor, and compile and r program. Basic programming (2) Learn the basic statements and structure of programming (input, output, loop, parameters, array, s function et a)
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characteristics of the numerical methods. [Course Goals] Understand and learn the basic knowledge, method and skill of mathematical solution for comput planning the numerical method, programming, and analyze the results. [Course Schedule and Contents] Mathematics for numerical simulation (3) Learn the principle of computation and the mathematical method, and understand the error appear computation. Orientation and operating the terminal (1) Access to the computer in the satellite seminar room and how to use the editor, and compile and r program. Basic programming (2) Learn the basic statements and structure of programming (input, output, loop, parameters, array, s function et a)
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Orientation and operating the terminal (1) Access to the computer in the satellite seminar room and how to use the editor, and compile and r program. Basic programming (2) Learn the basic statements and structure of programming (input, output, loop, parameters, array, s function etc.)
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Learn the basic statements and structure of programming (input, output, loop, parameters, array, s function, etc.)
function etc.)
function, etc.)
Applied and practical problems (5)
We will learn the fundamental method and programming of various numerical methods: solution
(Bisection method, Newton's method), numerical integration (Simpson 's method), simultaneous
(Gaussian elimination), differential equation (Runge-Kutta method), data analysis (least-square m
Advanced programming (2)
Auvanced programming (5) I earn the mathematical method and programming for advanced problems including physical phe
Zean are manenation method and programming for advanced problems including physical pho
Confirmation of learning attainment. (1)

Class requirement]	
tudents are recommended to have completed Information Processing Basics and Exercise	es in Information
rocessing Basics.	
Method Daint of view and Attainment levels of Evolution	
final examination will be held. In class reports will be featured in for maximum 40%	
iniai examination will be neid. m-class reports will be factored in for maximum 40%.	
Textbook]	
lot used	
Reference books, etc.]	
(Reference books)	
Regarding studies out of class (preparation and review)]	
tudy and practice the basics of programming (grammar, flowchart, compile, edit, etc).	
Others (office hour, etc.)	
he order of classes listed above and their timing may differ depending on the year.	
Please visit KULASIS to find out about office hours.	

Course title 校 <english> M</english>	料力学1(lechanics of M	機宇:学番奇数) Aaterials 1	de Jo	partment	, Gr me ^{Pro}	aduate Scho ofessor,HOU	ol of Engineering JIYOU MASAKI
Target year	2nd year studer	ts or above Number	of credits	2	Cours year/p	e offered eriod	2019/First semeste
Day/period	Wed.1	Class style	Lecture			Language	Japanese
[Outline and	l Purpose o	f the Course]					
[Course Go	als]						
[Course Sch	nedule and	Contents]					
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[Class requi	irement1						
None	· ·						
[Method, Po	int of view,	and Attainment	levels of	Evaluat	ion]		
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[Regarding (Others (of *Please visit K	fice hour, e TULASIS to f	tc.)) ind out about office	e hours.			-	

Numbering	code										
Course title English> Course title 計算機数学(機:8 · 10 · 12組) Affiliated department, Job title,Name Graduate School of Engineering Professor,MATSUBARA ATSUSH Associate Professor,KOUNO DAISUF Graduate School of Informatics Associate Professor,SAURAMA KAZUNC Course of frand											
Target yea	ar 2nd y	ear students o	r above	Number	of cred	its	2	Cou yea	rse offered /period	2019/First semester	
Day/period Mon.2 Class style Lecture Language Japanese Ionation Burnaces of the Courses Cours											
[Outline ar	nd Purp	pose of t	he Co	ourse]							
[Course G	oals]										
[Course So	chedul	e and Co	nten	ts]							
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[Class req	uireme	ent]									
None											
[Method, P	oint of	f view. ai	nd At	tainment	levels	of E	valuat	ionl			
<u> </u>								-			
[Textbook]											
[Reference	book	s, etc.]									
(Referen	ice boo	oks)									
[Regarding	a studi	es out of	clas	s (prepar	ation a	nd I	review)1			
				<u>.</u>				/4			
(Others (c	office h	our, etc.))	_							
*Please visit	KULAS	SIS to find	l out a	bout office	e hours.			-			

Numbering	g code										
Course title <english></english>	材料力 Mechan	学1(機 iics of Ma	宇:≒ terials	学番偶数) 1		Aff dep Job	iliated partment p title,Na	, me	Gra Pro Gra Pro	duate Scho fessor,KIT duate Scho fessor,HIR	ol of Engineering AMURA TAKAYUKI ol of Engineering AKATA HIROYUKI
Target ye	arget year 2nd year students or above Number of credits 2 Course offered year/period 2019/First semes										2019/First semester
Day/perio	d Wed	.1	Cla	ss style	Lecture	e				Language	Japanese
Outline a	nd Pur	pose of t	he Co	ourse]							
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Others (office h	our, etc.))								
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Numbering of	ode:											
Course title <english> M</english>	す料力: lechan	学1(材 ics of Mat	エネ原 terials	〔:学番奇 1	数)	Aff dej Jol	iliated partment p title,Na	, me	Grad Profe	luate Scho essor,IMA	ol of Energy Scienc TANI SHIYOUJI	ce
Target year	· 2nd y	ear students o	or above	Number	of cred	its	2	Coi yea	urse ar/pei	offered riod	2019/First semest	ter
Day/period	Wed.	.1	Clas	s style	Lecture	e			L	anguage	Japanese	
[Outline and	l Purp	pose of t	he Co	urse]								
[Course Go	als]											
[Course Scl	nedul	e and Co	ontent	s]								
Subjects on Si Strain Energy, Bending of Be Complex bean ,1time,	mple S 2times ams,5 ns,2tin	Stress Stat s, times, nes,	es,3tim	nes,								
[Class requ	ireme	nt]										
Fundamentals	of Ma	thematics	and Pl	nysics								
[Method, Po	oint of	i view, ar	nd Att	ainment	levels	of E	Valuat	ion]]			
[Textbook]												
ISBN:4-563-0 (Zairyo Rikig	3465-7 aku no	7 o Kiso, Shi	ibata, C	Dhtani, Ko	mai, Inc	oue,	Baifuka	ın) is	sbn{}	{4563034	1657}	
[Reference	book	s, etc.]										
(Referenc	e boo	oks)										
[Regarding	studi	es out of	f class	s (prepar	ation a	nd	review)]				
(Others (of	fice h	our, etc.))									
*Please visit k	ULAS	SIS to find	l out al	out office	hours.							

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Numbering	g code						
Course title <english></english>	材料力学1(材 Mechanics of Ma	エネ原:学番偶 terials 1	数)	Affiliated department Job title,Na	, Gra me Pro	aduate Scho ofessor,HOS	ol of Energy Science SHIDE TOSHIHIKO
Target ye	ar 2nd year students of	or above Number (of cred	lits 2	Cours year/p	e offered eriod	2019/First semester
Day/perio	d Wed.1	Class style	Lectur	e		Language	Japanese
[Outline a	nd Purpose of t	he Course]					
[Course G	ioals]						
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,3times,							
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[Class red	uirement]						
None	· · ·						
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[Textbook]						
Reference	e books, etc 1						
(Referen	ce books)						
	ice books)						
[Regardin	g studies out of	f class (prepara	ation a	nd review)]		
(Others (office hour, etc.	.))					
*Please visit	KULASIS to find	1 out about office	hours.				

Course title <english></english>	材料力 Mecha]学2(機 nics of Ma	: 7,8,9,10組) terials 2	A di Ji	ffiliated epartment, ob title,Nar	Gradu Associ	ate Scho ate Professo	ool of Engineerin or,NISHIKAWA M
Target ye	ear 2nd	year students of	or above Number	of credits	2	Course o year/per	offered iod	2019/Second s
Day/perio	d Fri.	2	Class style	Lecture		L	anguage	Japanese
[Outline a	nd Pu	rpose of t	he Course]					
omplex tw various stru	o- or the ctural n	ree-dimension ree-dimens nembers are	al treatments lect ional problems. A e lectured includi	Analytical in Me Analytical ing the com	nethods f	or the def	ormation	and the stresses
[Course 0	ioals]							
The emphas	is is to	understand	the fundamental	concepts a	nd metho	ds for the	stress/str	rain analysis of v
structures o	r struict	ural memb	ers, by advancing	g the basic	principles	given in	Mechanic	cs of Materials 1
[Course S	ichedu	le and Co	ontents]					
constants Forsion,2tir Axially sym lesign	nes,Tor metric	sion of circ problems,1	ular bars; coil sp time,Buckling of	rings; Con f column; i	bination stability;	of bendin of bendin	g and tors support c	on between elast sion conditions; buckl
constants Torsion,2tir Axially sym design Axially sym circular plat Assessment Feedback,10 * The order [Class rec	nes,Tor imetric es; Cyli ,1time,4 ime and the quirem	sion of circ problems, 1 problems a ndrical ber Academic a hours (we:	ular bars; coil sp time,Buckling of nd bending of pla iding, bending ri ichievement asse	orings; Corr f column; in ates,2times gidity; ssment em are poss	bination nstability; ,Circular	of bendin, effect of cylinders: ect to cha	g and tors support c ; spherica nge.	on between elast sion conditions; buckl il shells; rotating
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ļ	Textbook]
1	'. Shibata et al. [@] Fundamentals of Strength of Materials (Zairyo-Rikigaku no Kiso) a (Baifu-ka 563034657
ļ	Reference books, etc.]
1	(Reference books) o be referred to during the course
ļ	Regarding studies out of class (preparation and review)]
	is highly recommended to make the preparation and review with the specified textbook. Homewore ports: about three times) will be assigned.
Ī	(Others (office hour, etc.))

Numberin	g code	e										
Course title <english></english>	材料; Mech	力鸟 nani	学2(横 ics of M	覧:11, aterials	12組、宇) 2)	Aff dep Job	iliated partment p title,Na	t, me	Gra Asso	duate Scho ociate Profess	ol of Engineering sor,HAYASHI TAKAHIRO
Target ye	ear 21	nd ye	ear students	s or above	Number	of cred	its	2	Co yea	ourse ar/pe	offered eriod	2019/Second semester
Day/perio	od Fri	i.2		Cla	ss style	Lecture					Language	Japanese
[Outline a	nd Pu	urp	ose of	the C	ourse]		_		_	_		
The simplific complex two various strue	ed one o- or tl ctural	e-di hre me	imension e-dimen mbers av	nal trea sional re lectu	tments lect problems. A red includi	tured in M Analytica ng the co	Mec al m omb	hanics of ethods i ined str	of M for t ress	fateri the de state	ials 1 are ex eformation s.	ctended to include more and the stresses in
[Course G	oals]	Ī										
The emphas structures or	is is to r struic) ur	iderstan	d the fu bers, by	undamental y advancing	concept g the basi	s an ic pi	d methorinciples	ods i s giv	for th ven i	1e stress/str n Mechanic	ain analysis of various as of Materials 1.
[Course S	ched	ule	and C	onten	its]	_	_		_			
Week3-5. C Week6-9. B Week10,11. Week12. Bu Week13,14. Week15. Ex	omple asic th Tortic Ickling Axisy camina	x b neon on g ymr atio	eam pro ry of Ela metric pr	oblem isticity roblem	, Deflectior	n of plate	es					
[Class red	quirer	ne	nt]			_				_		
Mechanics of bodies.	of Mat	eria	als 1, an	d other	subjects su	ich as ca	lcul	us, linea	ar al	lgebr	a, mechani	cs of particles and rigid
[Method,	Point	of	view, a	and At	tainment	levels of	of E	valuat	ion	n]		
Grading is b or reports.	based of	on t	he mid-	term ar	nd the final	examina	tion	is, possi	bly	with	considerat	ions of class-room tests
[Textbook	<]											
T. Shibata e 4563034657 Fundamenta 4563034657	t al. ⁶ 7 1ls of S 7}.	⁷ Fu Stre	indamen	tals of Materi	Strength of als (Zairyo-	f Materia -Rikigak	uls (2	Zairyo-l o Kiso)	Riki (T. 1	igaku Shiba	ı no Kiso) <u>.</u> ata et al.), E	g (Baifu-kan) ISBN: 3aifu-kan isbn{ }{
[Referenc	e boo	oks	s, etc.]									
(Referent Introduced of	nce b luring	oo cla	ks) 188									
[Regardin	ig stu	die	es out o	of clas	s (prepar	ation a	nd I	review)]			
(Others (office	e he	our, etc	:.))								
The order an	nd the	hoi	urs (wei	ghts) fo	or each item	n are pos	sibl	y subjec	ct to	o char	nge.	

*Please visit KULASIS to find out about office hours.

Numbering c	ode							
Course title 熱 <english> Th</english>	力学 2 (機宇 hermodynamics	:学番奇数 2	牧)	Aff dej Jol	iliated partment b title,Na	t, ime	Graduate Scho Professor,NAF Graduate Scho Associate Profe	ol of Engineering (ABE KAZUYOSHI ol of Engineering ssor,TATSUMI KAZUYA
Target year	2nd year students	or above Nun	nber of cre	dits	2	Co yea	urse offered ar/period	2019/Second semester
Day/period	Tue.1	Class st	tyle Lectur	re			Language	Japanese
[Outline and	Purpose of t	the Course	e]					
[Course Goa	als]							
[Course Sch	edule and Co	ontents]						
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,2times,								
,2times,								
,6times,								
,2times,								
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, rume,								
[Class requi	rementl							
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rtone								
[Method, Po	int of view, a	nd Attainn	ment levels	of E	Evaluat	ion		
[Textbook]								
[Reference b	ooks, etc.]							-
(Reference	e books)							
[Regarding s	studies out o	f class (pr	reparation	and	review)]		
(Others (off	ice hour, etc.	.))						
*Please visit K	ULASIS to find	d out about	office hours.					

Numberin	g code										
Course title <english></english>	材料力 Mechar	学2(材 nics of Ma	エネ原 terials	R) 2		Aff dep Job	iliated partment p title,Na	t, ime	Gra Ass	aduate Scho ociate Professo	ol of Energy Science r,KINOSHITA KATSUYUKI
Target ye	ear 2nd	year students (or above	Number	of cred	lits	2	Co ye	ours ar/p	e offered eriod	2019/Second semester
Day/perio	d Fri.2		Clas	ss style	Lecture	e				Language	Japanese
[Outline a	nd Pur	pose of t	he Co	ourse]							
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[Course S	Schedu	e and Co	ontent	ts]							
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[Regardin	ig studi	es out o	f clas	s (prepar	ation a	nd	review)]			
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*Please visi	t KULA	SIS to find	l out a	bout office	hours.						
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Numbering	code										
Course title <english></english>	熱力学 Thermo	2 (機宇 dynamics	: 学習 2	昏偶数)		Aff dep Job	iliated partment b title,Na	, me	Gra Pro Gra Ass	duate Scho fessor, YOS duate Scho sociate Profe	ol of Engineering HIDA HIDEO ol of Engineering essor,IWAI HIROSHI
Target yea	ar 2nd y	ear students o	or above	Number	of cred	its	2	Co yea	urse ar/p	e offered eriod	2019/Second semester
Day/period	d Tue.1	l	Clas	ss style	Lecture	e				Language	Japanese
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None											
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[Textbook]	1										
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[Reference	books	s, etc.]									
(Keleren		KS)									
[Regarding	g studi	es out of	f clas	s (prepar	ation a	nd	review)]			
(Others (c	office h	our, etc.))								
Please visit	KULAS	SIS to find	l out a	bout office	e hours.						

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Numbering c	ode										
Course title 熱力学2(エネ原) Affiliated department, Job title,Name Gradu Profe										nool o HIYA	of Energy Science MA TAKUJI
Target year	2nd ye	ear students o	r above N	lumber	of cred	lits	2	Coi yea	Irse offered r/period	2	019/Second semester
Day/period	Fri.1		Class	s style	Lecture	e			Languag	e Ja	ipanese
[Outline and	Purp	ose of t	he Cou	urse]							
[Course Goa	als]										
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[Textbook]					_	_				_	
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Regarding	studie	es out of	class	(prepar	ation a	nd	review)1			
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Numbering	cod	de				_						
Course title <english></english>	才料 Fun	科基礎学 1 (damentals of	機宇 Mater	: 学番奇数 ials 1)	Aff dej Jol	iliated partment b title,Na	:, me	Gra Pro	duate Scho fessor,TOM	ol of Engineering IITA NAOHIDE	
Target yea	r	3rd year students (or above	Number	of cred	lits	2	Co yea	ours ar/p	e offered eriod	2019/First semester	
Day/period	F	ri.1	Cla	ss style	Lectur	e				Language	Japanese	
[Outline an	d F	Purpose of t	he C	ourse]								
Introductory of	clas	ss to teach fun	dame	ntals for Ma	aterial S	cien	ice.					
[Course Go	al	s]										
[Course Sc	[Course Schedule and Contents]											
Bonding and etc.: 3times	stru	cture of mate	rials:	Crystal stru	cture, d	efec	ts in cry	/stal	ls, st	ructure and	properties of polymers	
Plastic deform	nati	ion and fractu	re: Cr	ystal defect	and fra	ctur	e etc.: 3	time	es			
Phase diagrar	n: 1	The phase rule	e, bina	ry system d	liagram,	teri	nary pha	ise d	liagı	am etc. ,2ti	mes	
Solidification	an	d phase transf	orma	tion, deposi	tion etc.	: 2ti	mes					
Processing: H	lot :	and cold proc	essing	, recrystalli	zation e	etc. 1	1-2times	8				
Steel: Steel p	oc	essing, materi	al, he	at treatment	, transfo	orma	ation etc	:: 2·	-3tin	nes		
feedback less	on:	0-1 time										
Confirmation	of	learning achie	eveme	ent: by repo	rts and a	ı tes	t					
[Class requ	iire	ement]										
None												
[Method, P	oin	nt of view, a	nd At	tainment	levels	of E	Evaluat	ion]			
reports and a	test	t										
[Textbook]												
isbn:4901381008 be sold at 日本材料学会事務所 (http://www.jsms.jp/index.html)												
[Reference books, etc.]												
(Referen	ce	books)										
Continue to 材料基礎学1(機字:学香奇数)(2)												

材料基礎学1(機宇:学番奇数)(2) -----[Regarding studies out of class (preparation and review)] Read the textbooks before each class, and ascertain the knowledge after the class. (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

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Numbering	g code											
Course title <english></english>	材料基 Fundar	礎学1(nentals of]	機宇:学番偶数 Materials 1	:)	Aff de Jo	filiated partment b title,Na	t, ime	Gra Pro Gra Asso	duate Scho fessor,HIR duate Scho ociate Profess	ol of Engineering AKATA HIROYUKI ol of Engineering sor,SHIMADA TAKAHIRO		
Target ye	ar Brd	year students o	or above Number	of cred	its	2	Cοι yea	urse ir/pe	e offered eriod	2019/First semester		
Day/perio	d Fri.1	1	Class style	Lecture	e				Language	Japanese		
[Outline and Purpose of the Course]												
Introductory	class to	o teach fun	damentals for Ma	aterial S	cier	nce.						
[Course Goals]												
[Course S	chedu	le and Co	ontents]									
detection. Intrusion De based IDS b issued from Intrusion De traffic by ma Presentation machine lea	Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection. Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by signature- based IDS by studying open source signature-based IDS and attacks, such as correspondence between alarms issued from IDS and communications, and adding signatures to detect attacks. Intrusion Detection by Machine Learning,7times,Learn the method of classifying normal and malicious traffic by machine learning algorithms and public dataset for benchmarking intrusion detection performance. Presentation, Itime,Based on the exercise, students presents their methods of intrusion detection using machine learning, and discuss it with other students and instructors.											
[Class red	luirem	ent]										
None												
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reports and	a test											
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isbn:490138	1008 be	e sold at ⊟	本材料学会事務	所(ht	tp://	/www.js	ms.jp	p/in	dex.html)			
[Referenc	e book	(s, etc.]										
(Refere	nce bo	oks)										
[Regarding studies out of class (preparation and review)]												
(Others (office I	hour, etc.))			_						

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Course title 材 <english> Fu</english>	料基礎学 1 (ndamentals of	エネ店 Materia	ē) als 1		Affiliated departme Job title,I	nt, Name ^{Ga}	raduate Scho ofessor,TAK	ol of Engineering AGI IKUJI			
Target year	2nd year students	or above	Number	of credi	ts 2	Cour year/	se offered period	2019/Second semester	r Cours	se title lish>	計測学 Scientif
Day/period	Wed.1	Clas	s style	Lecture			Language	Japanese			
[Outline and	Purpose of	the Co	ourse]								
In this course, information for	we discuss the understanding	propert g these J	ies that are properties,	e importa focusing	nt in sele on meta	cting an l.	d using mater	rials, as well as basic	Tar	get ye	ear 2ndy
[Course Goa	ıls]								Day	/perio	d Fri.3
The goal of the	course is for s	tudents	to acquire	e the basi	c knowle	dge they	need to purs	ue further studies in	[Out	line a	nd Pur
materials scien	ce and gain the	e ability	to investi	gate appr	opriate n	naterials	in experimen	tation and design.	Basic	s of sci	ientific i
Course Sch	edule and C	ontent	sl						[Cou	urse G	ioals1
(1) Structure of	matter 4 clas	ses: Exi		ize of the	atoms th	at are th	e basis of ma	tter and their electron	Unde	rstandi	ng of the
configuration, t	ypes of bonds	betwee	n atoms, t	he positio	ons of ele	ctrons in	solid matter	, density and thermal	[Col	irse S	chedul
expansion, and	so on.								Units	and St	andards
(2) Production	of materials, 3	classes	: Explain	redox and	the coa	gulation	of melts, pha	se equilibrium of	Meas	uremer	nt uncert
materials comp	rised of two of	r more c	chemical e	lements,	and othe	r informa	ation concern	ing the composition of	Data	process	sing and
materials.		,	F 1 '			a .			Electr	rical an	id tempe
(3) Mechanical	properties, 2 c	classes:	Explain p	roperties	related to	the stru	ctural materi	als used to support	Radia	ation ar	nd mater
loads such as e	lastic deformat	tion and	plastic de	eformatio	n, yield s	trength,	creep, and so	on.	Mech	anical	measure
(4) Change in p materials such	as addition of o	chemica	al element	s, anneali	ng, norr	ange in i nalizing,	quenching, a	al properties of and so on, as well as the	level	of attai	inment,1
reasons for the	se factors.	1	E-shi d					le south as a sector de settere	[Cla	ss rec	uireme
(5) Functions of	r materials, 2 c	a boot	Explain tr	ne main n	mognot	properti	es or materia	is such as conduction	None		
(6) Pasouroos	nd roovaling	1 alace:	Discuss in	of or motion	, magnet	sin, and	so on.	lonmont such as	rtone		
abundance and	reserves of ch	omical	alemente :	recycling	of mater	iale and	so on	iopinent suen as	[Met	hod, F	Point of
(7) Confirmation	on of learning a	attainme	ent. 1 class	s: Post ex	planation	and rev	iew of exami	nation questions on	Exam	inatior	1. Report
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vone									IRef	erenc	e hook
[Method, Poi	int of view, a	nd Att	ainment	levels o	of Evalu	ation]			(R	eferer	nce boo
Grading metho	od]										
Grade is based	on one written	examii	nation.								
Evaluation sta	ndard]								IRec	nardin	a studi
Must score at le	east 60 out of 1	100 on t	he written	examina	tion				Ince	, ai ai li	9 0.441
50 or above: pa	ISS										
59 or below: fa	11										
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				. – – -	· – – -		ontinue to 材料		*Plea	se visit	t KULA
							Similar to 19141	金麗子 (二年版) (4)			

材料基礎学1(エネ原)(2)

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

(Others (office hour, etc.))

[Textbook] In addition, printouts will be distributed in class.

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

*Please visit KULASIS to find out about office hours.

Practice problems and their solutions will be discussed in class, so please review after class.

Course title <english></english>	計測学 Scientif	:(機工ネ) fic Measure	亰:≐ ement	学番奇数) t		Affi dep Job	iliated partment, p title,Nar	ne G A G A G A G A A G A	raduate Scho ssociate Profess raduate Scho ssociate Profess raduate Scho ssociate Profess raduate Scho ssociate Professo raduate Scho	ATA OSAMU ol of Engineering or,TSUCHIYA TOSHIYUKI ol of Engineering sor,YOKOKAWA RYUUJI ol of Energy Science r,KINOSHITA KATSUYUKI ol of Energy Science essor,MIYAKE MASAO
Target ye	ar 2nd	year students o	or above	Number	of cred	its	2	Cour year/	se offered period	2019/First semester
Day/perio	d Fri.3	3	Cla	ss style	Lecture	•			Language	Japanese
[Outline a	nd Pur	pose of t	he C	ourse]						
Basics of sci	ientific i	insturmenta	aion i	s covered.						
[Course G	ioals]	a basics of	coior	tifia instru	nontotio	n in	anginag	ring	hucios	
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Course title <english> Target yee Day/perior [Outline a Basics of sci [Course G Understandi [Course S Guidance,2t Basic knowl detection. Intrusion De based IDS b based IDS b based IDS b based IDS b traffic by mar Presentation machine lear</english>	計測学 ar 2nd d Fri.3.3 nd Pur ientific i ioals] ng of th chedulu studyi y studyi UDS and tection tection tection tion areas	e (機工ネ) fic Measure year students o pose of t insturmenta e basics of le and Co jidance on t the role of by Signatu ing open so 1 communi by Machin earning alg Based on th nd discuss	原: ^d emen r above Cla ion i scien how t f IDS re-Ba ource cation e Lea cation ie exe ii witt	学番偶数) t Number ss style ourse] s covered. titific instrum tis] this class is in network ased IDS.5ti signature-b ns, and addi rming.7tims ms and pub review, stude h other stude	of cred Lecture operated security mes,Lecan sased ID ss,Learn ic datas	Affi dep Job	iliated partment, p title,Nar 2 enginee ad how t he mech d attack s to det method or bench their m tructors.	ering p anisnisni s, succet atti of classical anisni anisn	raduate Scho rofessor, TAB raduate Scho ssociate Profess raduate Scho ssociate Profess raduate Scho ssociate Professo ssociate Professo aduate Scho ssociate Professo ssociate Professo aduate Scho ssociate Professo aduate Scho scho scho scho scho scho scho scho s	ol of Engineering ATA OSAMU ol of Engineering ol of Engineering or, TSUCHIYA TOSHIYUK ol of Engineering sor, YOKOKAWA RYUU ol of Energy Science r, KINOSHITA KATSUYUK ol of Energy Science 2019/First semester Japanese Japanese sor, MIYAKE MASAC 2019/First semester Japanese detection by signature- ndence between alarms nal and malicious letection performance. detection using

[Method, Point of view, and Attainment levels of Evaluation] Examination. Reports are considered also.

[Textbook]

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[Reference	books, etc.]				
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(Others (o	ffice hour. etc.))			
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固体物埋字	(材エネ原宇)(2	2)
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[Regarding studies out of class (preparation and review)]

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Knowledge on quantum mechanics and statistical mechanics is highly helpful.

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

Numberin	g code										
Course title <english></english>	固体物 Solid St	理学(材 ate Physic	エネ原う s	≡)		Affi dep Job	iliated partment p title,Na	ne	Graduate S Professor,]	cho NAF	ol of Engineering XAMURA HIROYUKI
Target ye	ear 2nd y	ear students o	r above N	umber	of cred	its	2	Co yea	urse offer ar/period	ed	2019/Second semester
Day/peric	d Thu.	1	Class	style	Lecture	e			Langu	age	Japanese
[Outline a	nd Pur	pose of t	he Cou	rse]							
Introduction	n to micro	oscopic so	lid state	physics							
[Course G	Goals]										
Gateway to	atomic a	nd electro	nic theor	ies for n	neterials						
[Course S	Schedul	e and Co	ontents]						_		
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Regardin	g st	udies out o	i clas	s (prepar	ation a	nd re	eview)]		
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Day/period	Tue.1	Class style	Lecture	e			Language	Japanese		
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[Course Goa	als]									
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Guidance,2tim Basic knowled, detection. Intrusion Detec based IDS by s issued from ID Intrusion Detec traffic by mach Presentation, It machine learni [Class requi None [Method, Po	es,Guidance on ge on the role o ction by Signatu tudying open sy S and commun ction by Machii nine learning alg ime,Based on t ng, and discuss rement] int of view, a	how this class is f IDS in network are-Based IDS,5ti ource signature-b ications, and addi te Learning,7time gorithms and public exercise, stude it with other stud	e operate security imes,Lea ased ID2 ing signa es,Learn lic datas ents pres dents and	d, and arn th S and atures the n et for ents t 1 instr of Ex	I how the how the how mean of the how mean of the horizontal structure of the horizont	o use achin aanisr s, succet at of cla mark ethod	computing fa en learning ca n of intrusion th as correspo tacks. assifying norr ing intrusion is of intrusion	acility for this class.\\ n help the intrusion detection by signature- ndence between alarms nal and malicious detection performance. detection using		
[Taythook]										
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[Regarding s	studies out o	f class (prepara	ation a	nd re	eview)]				
(Others (office hour, etc.))										
*Please visit K	ULASIS to find	d out about office	e hours.							

Numboring	odo									<u>/</u> *	
Numbering C Course title <english> A</english>	5 田電磁 第 pplied El	気学(エネ ectromagne	原) tism		Affi dep Job	liated artment title,Na	, me	Gradu Associ	ate Scho ate Profe	ol of Engineering ssor,SAITOU MA	NAB
Target year	3rd year	students or abov	Number	of cred	its	2	Co yea	urse o ar/perio	ffered od	2019/First seme	ster
Day/period	Tue.1	Cla	iss style	Lecture	•			La	nguage	Japanese	
Outline and	I Purpo	se of the C	ourse]								
Course Go	als]										
Course Sch	nedule a	nd Conter	nts]								
asie kilowied	ge on the	role of IDS	in network	security	and and	how n	nach	se com ine lea	puting fa rning ca	help the intrusio	s.\\ n
active and where the effection. Intrusion Deternation of the effective of	ge on the ction by 3 studying 5 S and co ction by 1 nine learr rime,Base ng, and co rement int of vi	e role of IDS Signature-B oppen source mmunicatio Machine Le ing algorith ed on the ex liscuss it wi	i in network ased IDS,5ti signature-b ns, and addi arning,7time ms and pub ercise, stude th other stude that the stude the stude th	security imes,Lea ased IDS ing signa es,Learn lic datass ents prese lents and	arn tl arn tl S and ature the : et fo ents l inst	d how f how m he mech d attack s to det method r bench their m rructors valuat	hanis s, su ect a of c umar etho	se comp ine lear sm of i uch as c attacks. classify king in ods of in	puting fa rning ca ntrusion correspo ring norr atrusion ntrusion	detection by sign: ndence between al nal and malicious detection perform detection using	n ature ature ance
terection. ntrusion Dete ased IDS by a ssued from ID ntrusion Dete raffic by macl resentation, I achine learni Class requi Jone Method, Pc Textbook]	ge on the ction by \$ studying \$ S and co ction by 1 ine learn ime,Bass ng, and c rement	e role of IDS Signature-B open source mmunicatic Machine Le ing algorith d on the ex liscuss it wi	i in network ased IDS,5ti signature-b ns, and addi ms and pub ercise, stude th other stuc ttainment	security imes,Lea ased IDS ing signa es,Learn lic datase lic datase lents and	arn the standard st	d how f how m he mech d attack s to det method r bench their m tructors valuat	hanis s, su ect a l of c umar etho	se comp ine lear sm of i ach as c attacks. classify king in ods of in	puting fa rning ca ntrusion correspo ing norr ntrusion ntrusion	detection by sign: ndence between al nal and malicious letection perform: detection using	s.\\ n larm ance
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Identification of the second s	ge on the extion by ! IS and coo IS and coo Is and coo Inine learn ime, Basad inine learn Inine learn Ininine learn Ininine learn Inine learn Inine learn Inine learn In	<pre>role of IDS Signature-B open source mmunicatio Machine Le ing algorith ed on the ex- liscuss it wi eew, and A eew, and A etc.]) out of cla ur, etc))</pre>	i in network ased IDS,5ti signature-b ns, and addi arning,7time ms and pub ercise, stude th other stude ttainment ttainment	security ased IDS ased IDS signal signal signal signal signal signal datasets signal signal lie datasets signal signal lie datasets lie	v and arn tl S and ature the s et fo ents I inst Of E	d how m how m ne mecl d attack s to det method tr bench their m ructors valuat	ion in ach hanists, su ect a lo f commar etho ion ion ion ion ion ion ion ion ion io	se comp ine lear sm of i chas c lassify king in dds of ir	puting framework of the second	detection by sign: ndence between al nal and malicious letection perform detection using	s. \\ n ature larm ance

Course title <english></english>	原: Atc	子物理学(7 omic Physics	オエネル	原宇)		Aff dep Job	iliated partment p title,Na	, P me A	Graduate Scho Trofessor, KAN Graduate Scho	ol of Engineering INO IKUO ol of Engineering ssor,MAJIMA TAKU
Target ye	ear	2nd year studen	ts or above	Number	of cred	its	2	Cou year	rse offered /period	2019/Second seme
Day/perio	bd	Fri.3	Cla	ss style	Lecture				Language	Japanese
量々力 [Course G 子 丸現へのの を 一、 一、 一、 一、 に て で 、 に て の で 、 に 、 に で 、 に 、 に 、 に で 、 に 、 に の 、 の 、 の 、 の 、 の に 、 に の い の い の い の い の い の い の い た い こ で の い の い の い た い こ で の い た い こ で の い た い こ で の い た い こ で の い た い こ で の い た い こ で の い た い こ で の に た い こ で の に た い こ で の に た い こ で の に た い こ で し に し に し に し に し に し に 、 の い た い こ に の に の に の に の い た い う の い こ に い こ に し に う の い て い こ に し に し に し に し に し に こ で こ に の こ で い こ に う こ で こ こ で い こ で う い こ で こ 、 こ で い こ 、 こ こ い こ 、 こ こ こ い こ 、 こ こ こ つ 、 、 こ で 、 、 こ で 、 、 つ 、 の 、 、 、 、 、 、 、 、 、 、 、 、 、	Det Control	見につちらず、 につちらず、 は記述できて、 は記述できて、 は記述できて、 のしていたできて、 にのしていた。 にのしていた。 にのしていた。 にのした。 にのした。 にのした。 にのした。 にのした。 にのした。 にのした。 にのした。 にのした。 にのし、 にのし、 にのし、 にのし、 にのし、 にのし、 にのし、 にのし、	5 もの はい (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	現象の 現象の にの な 取 ま 歴 世 期 ま し た と て 子 和 明 の に の 一 の に の 、 の に し 、 か の に の の 、 の 、 の に う れ の の の の の の の の 、 の 、 う れ の の の の の の の の の の の の の	を て 、 る ・ ま す 二 論 ・ 、 、 て る ・ ま す 二 論 ・ 、 、 、 、 、 、 、 、 、 、 、 、 、	、体 たる 子 運 stと発 いうロ er中達 が的 厚こ と 動 ここれ うの度	に な な の で か に た 原 も た の の の の の の の の の の の の の	子交 子標 、本 点ギタ 原チ質 解水をやえ にと 原 仮 の量粒 子(1), ,素行	分子などの すす すす 子 定 、	微視的世界における うやすく概観し、量 見的世界における論 こ素粒子,現在の更 正力と温度,物質の 加の変位則,古典論 の粒子性,光電効 fordの原子模型(原 素子の波動性 系,Schr{\ourl}dir ↓障壁の反射と透過
LCIass red 古典力学,	quir 電码	ementj 磁気学,熱)	力学							
[Method, 成绩迹(声)	Poi	nt of view, ォニトス =	and At ま占プ⁼	tainment 亚価する	levels	of E	Evaluat	ion]		

原子物理学	(材エネ原宇) (2)

[Textbook] Not used

[Reference books, etc.] (Reference books) 原子物理学(菊池,共立出版) isbn{}{4320030478}, 原子物理学(シュポルスキー,東京図書) isbn{}{4489001452}など

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

講義に関連した啓蒙書などを読み、歴史の中で生まれた物理学を理解することが望ましい。

(Others (office hour, etc.))

											*
Numbering c	ode										
Course title 量 <english> Qu</english>	子物 lantur	理学1(n Physics	機:≜ 1	学番奇数)		Aff de Jol	filiated partment b title,Na	:, me	Gra Prof	duate Scho fessor,SUZ	ol of Engineering UKI MOTOFUMI
Target year	3rd y	ear students o	or above	Number	of cred	lits	2	Cou yea	ırse r/pe	e offered eriod	2019/Second semester
Day/period	Fri.3		Cla	ss style	Lectur	e				Language	Japanese
[Outline and	Purp	oose of t	he C	ourse]							
[Course Goa	ıls]										
[Course Sch	edul	e and Co	onten	its]							
Fundamentals (Particles motio Harmonic osciil Atomic structu Assessment of [Class requi None [Method, Po examination an	reme	ntum mec ne dimens 2~3times, vement,1t nt]	thanic sion,2 ime,	xs,4times, ~3times,	levels	of E	Ēvaluat	ion]		_	
[Textbook]											
[Reference b	ooks	s, etc.]									
(Reference	e boc	oks)									
[Regarding s	studi	es out of	f clas	s (prepara	ation a	nd	review)]			
(Others (off *Please visit K	ice h ULAS	our, etc. SIS to find)) l out a	about office	hours.						

Numberin	g code						
Course title <english></english>	量子物 Quantur	理学 1(n Physics	機:学番偶 1]数)	Affiliated departmen Job title,Na	t, Ime Graduate Scl Associate Pro	nool of Engineering fessor,NAKAJIMA KAORU
Target ye	ear 3rd y	ear students of	or above Num	ber of cre	dits 2	Course offered year/period	2019/Second semester
Day/perio	od Fri.3		Class sty	le Lectur	e	Languag	e Japanese
[Outline a	and Purp	pose of t	he Course	•]			
[Course C	Goals]						
[Course S	Schedul	e and Co	ontents]				
0							
[Class red	quireme	ent]					
None							
[Method,	Point of	f view, a	nd Attainm	nent levels	of Evalua	tion]	
examination	n and hor	nework					
[Textbool	k]						
[Reference	e book	s, etc.]					
(Refere	nce boo	oks)					
[Regardir	ng studi	es out o	f class (pre	eparation a	and review)]	
(Others ((office h	our, etc.	.))	<i>cc</i> 1			
*Please visi	t KULAS	SIS to find	1 out about o	office hours.			

mester	Target ye	ar 3rd year studen	ts or above Number	of credits 2	Cour year/	se offered /period	2019/First semest
	Day/perio	d Fri.2	Class style	Lecture		Language	Japanese
	[Outline a	nd Purpose o	f the Course]				
	Quantum th which can n the fundame	eory is the most ever been under ental mathematic	succesful theory in stood in the classic al structure of the	the modern phy al theory. An im quantum theory.	sics. It ex portant pu	plains a lot o arpose of this	f peculiar phenomer course is to underst
	[Course 0	Goals]					
	An importan theory. Base quantum me	nt purpose of this ed on this structu echanical particle	s course is to under re, one is hoped to e on one-dimensior	stand the fundate become capable al space.	nental ma e to calcul	thematical sti ate some basi	ucture of the quant c properties of a
	[Course S	chedule and (Contents]				
	 Mathema Mathema Mathema Mathema One parti Potential Potential Potential Square v Box pot Square vi Harmon Harmon Learnin 	tical structure of tical structure of tical structure of cle on one-dimen problem (1) Ger well potential ental ag theory ic oscillator (1) ic oscillator (2) g achievement ev quirement]	quantum theory (2 quantum theory (2 quantum theory (3 quantum theory (3 nsional space (1) cl nsional space (2) C teral theory teral theory and its) Jilibert space) operators and) Schroedinger assical theory a CR and Roberts mathematical ad	and state v observabl equation a nd its quar on's uncer idendum	vectors. es ind time evolu ntization rtainty relatio	n
	Classical m	echanics, Linear	algebra				
	[Method,	Point of view,	and Attainment	levels of Eva	uation]		
	examination	. (100)			(Continue to 量子物:	

量子物理学1	(材原宇)	情報	(2)

[Textbook]

Not used

[Reference books, etc.] (Reference books) Modern Quantum Mechanics (J.J.Sakurai) isbn{}{9780805382914} isbn{}{9781292024103} Lectures on Quantum Theory (C.J. Isham) isbn{}{1860940013}

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

Clarify what you have learnt and what you do not understand. Solve a problem set which will be distributed.

(Others (office hour, etc.))

											*
Numbering	code										
Course title <english></english>	量子物 Quantu	理学 2 (m Physics	機) 2			Aff dej Jol	iliated partment b title,Na	, me	Gradi Profe	uate Scho essor,HAS	ol of Engineering UO MASAHIRO
Target yea	ar 4th y	year students o	or above	Number	of cred	its	2	Cou yea	urse (ar/per	offered riod	2019/First semester
Day/perio	d Wed	l.1	Clas	s style	Lecture				L	.anguage	Japanese
[Outline an	nd Pur	pose of t	he Co	ourse]							
[Course G	oals]										
[Course So	chedu	le and Co	ontent	s]							
,3times,											
3times,											
1?2times, 1?2times											
2times.											
3times,											
,1time,											
[Class req	uireme	ent]									
None											
[Mothod P	loint o	f viour o	ad A#	ainmont	lovela	of E	Voluet	ionl	1		
[Internou, P	onit o	i view, ai		annient	levels		valual				
[Textbook]											
[Reference	book	s, etc.]			_						
(Referen	ce bo	oks)									
[Regarding	g studi	ies out of	f class	s (prepar	ation a	nd	review)]			
(Others (c	office I	nour, etc.))								
*Please visit	KULA	SIS to find	l out al	bout office	hours.						

Numbering	code										
Course title <english></english>	量子物 Quant	」 勿理学 2 (um Physics	材原5 2	F) 情報	ł	Affilia depart Job tit	ted tment, tle,Name	Gr. Ass	aduate Scho ociate Profess	ol of Engineering or,MIYADERA TAKAY	UKI
Target ye	ar 3ro	d year students o	or above	Number	of cred	its 2	C y	ours ear/p	e offered eriod	2019/Second seme	ster
Day/perio	d Tue	e.1	Clas	ss style	Lecture	;			Language	Japanese	
[Outline a	nd Pu	rpose of t	he Co	ourse]							
Quantum the	eory is	an astonish	ing the	eory. It des	cribes pe	erfectly	y a lot o	of phe	enomena ins	pite of its peculiar	
mathematica	l form	ulation.		Sector and the		c	.1		. 1		
An importan	t purp	ose or this c	course	is to under	stand the	e iorm	nation	and t	o become ca	ipable to manipulate	11.
[Course G	oals]										
To understar	id the	fundamenta	l struc	ture of qua	ntum the	eory.					
To be able to	o calcu	ilate some p	ropert	ies of quan	tum mec	chanica	al partic	le in	three dimen	isional space.	
[Course S	chedi	ule and Co	onten	tsl	_		_				_
1. Fundamer	ntal fra	mework									
 Angular n 	nomen	tum (1)									
Angular n	nomen	tum (2) gen	erator	of space re	otation						
 Eigenvalu 	e of A	.ngular mon	nentun	n operator.	SU(2) a	nd SO	(3)				
5. Spin		1									
 Central pc Hydrogen 	atom	1									
8. perturbatio	on the	ory (1)									
9. perturbatio	on the	ory (2)									
10. Heisenbe	erg equ	uation									
11. Interaction	on pict	ure									
12. Bell's ine	equalit	y									
 Mixed st 	ate										
14. Many pa	rticle a	and Qunatur	m field	1							
15. Learning	, acme	vement eva	iuatioi	1							
[Class req	uirem	nent]									
Quantum Ph	ysics 1	1									
[Method, F	oint	of view, a	nd At	tainment	levels o	of Eva	luatio	n]			
exam											
								Co	ntinue to 量子物	理学2(材原宇)情報(2)	

量子物理学2(材原宇) 情報 (2)

_ _ _ _ _ _ _ _ [Textbook]

Not used

[Reference books, etc.]

(Reference books) Modern Quantum Mechanics (J.J.Sakurai) isbn{}{9780805382914} isbn{}{9781292024103} Lectures on Quantum Theory (C.J. Isham) isbn{}{1860940013}

[Regarding studies out of class (preparation and review)] Solve a distributed problem set.

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

Numbering	g co	de										
Course title <english></english>	連約 Cor	売体 ntinuu	り学(エ um Mech	ネ) anics	-		Aff dej Jol	iliated partment p title,Na	, me	Gra Pro	aduate Scho fessor,IMA	ol of Energy Science TANI SHIYOUJI
Target ye	ar	3rd ye	ar students (or above	Number	of cred	lits	2	Co yea	urs ar/p	e offered eriod	2019/First semester
Day/perio	d	Fri.3		Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd	Purp	ose of t	he C	ourse]							
[Course G	ioal	s]										
[Course S	che	dule	and Co	onten	its]							
Basic assum Vectors and Fundamenta Constitutive Potential the Wave motio Stabilities,2t Examination [Class rec None	ptio tens 1 lav fran corie ns,2 time a,1 t	ns,1 sors,2 ws,2 t newc s,2tin ttimes s, imes, eme	times, times, imes, ork,3time nes, s, nt]	s,								
[Mothod]	Doir	at of	viow a	nd At	tainmont	lovole	of F	valuat	ion	1		
[method, i	-											
Textbook	1											
[Referenc	e b	ooks	, etc.]									
(Referei	nce	boo	ks)									
[Regardin	g si	tudie	es out o	f clas	s (prepara	ation a	nd	review)]	_		
(Others (offi	ce h	our, etc.	.))								
*Please visit	KU	ILAS	IS to find	d out a	about office	hours.						

Numbering	g cod	le				_					
Course title <english></english>	連続 Cont	体力学(機 tinuum Mech) anics			Aff dej Jol	iliated partment b title,Na	me ^{In}	nsti Pro	tute for Fronti fessor,ADA	ier Life and Medical Sciences ACHI TAIJI
Target ye	ar	3rd year students o	or above	Number	of credi	its	2	Cou year	rse r/p	e offered eriod	2019/Second semester
Day/perio	d T	ue.3	Cla	ss style	Lecture					Language	Japanese
Outline a	nd P	urpose of t	he C	ourse]							
his lecture	prov	ides an introd	luction	to the the	ory of co	ntir	nuum me	echar	nics	s for its app	lication to the fields of
loengmeen	ing ai	id biomedica	rengi	lieering.							
[Course G	ioals	5]									
tudents wil	l be a	able to unders	stand 1	ensor analy	sis and c	con	tinuum 1	nech	ani	ics, and to a	pply them in modeling
i nving use	acs a	ind cents.									
Course S	cher	dule and Co	nten	tsl					_		
1) Introdu	ction	to continuun	n mec	hanics							
2) Mather Aatrix algeb	natica ora. Ii	al preliminari ndex notation	es . Sum	mation con	vention.	Eis	zenvalue	s and	d ei	igenvectors	
2 , 3) Ve Cartesian ter perator, Di	ectors nsors verge	s and tensors , Scalar and v ence theorem	vector	products, E	Dyadic pr	odı	uct, Coo	rdina	ite	transformat	ion,Invariants, Nabla
4,5) Ki Bodies and o	inema config	atics gurations, Di	splace	ment, Strai	n tensor,	Co	mpatibi	lity, l	Ma	terial time of	derivative
5,7)St Force and st	ress a ress,	and equilibriu Stress tensor	m , Trac	tion, Cauch	y stress,	Pri	ncipal st	resse	es, I	Equation of	equilibrium
8,9)Co Aass conser	onser vatio	vation Laws	and go I angu	overning eq lar moment	uations tum, The	fir	st law of	ther	ma	odynamics f	for continua
10,11 Constitutive ymmetry, F) Co equa Biolog	onstitutive mo ttions, Stress- gical tissues	odels strain	relationshi	p, Linear	ela	asticity,	Newt	ton	ian viscous	fluids,Material
12,13 Differential) Bo equat	oundary value tions with a s	e prob et of l	lems oundary co	onditions	, N	avier-St	okes	equ	uation, Nav	ier's equation
14,15 Application) Su of co	immary intinuum mec	hanic	s to the ana	lyses of l	bio	logical t	issue	s, I	ntroduction	to biomechanics

建続体力学(機)(2)
[Class requirement]
None
[Method, Point of view, and Attainment levels of Evaluation]
Exam 100 (+ Reports max 10)
[Textbook]
Instructed during class
[Reference books, etc.]
(Reference books)
Introduced during class
[Regarding studies out of class (preparation and review)]
.
(Others (office hour, etc.))
*Please visit KULASIS to find out about office hours.

_____Continue to 連続体力学(機)(2)

Course title <english></english>	エネ Ener	ミルギー rgy Conv	変換工学 /ersion	(機エネ)	At de Jo	filiated epartment, ob title,Nar	ne Gr Pr Gr Pr	raduate Scho ofessor,NAk raduate Scho ofessor,ISHI	ol of Engineering KABE KAZUYOS ol of Energy Scier YAMA TAKUJI
Target ye	ear	3rd year stu	dents or abov	e Number	of credits	2	Cour: year/	se offered period	2019/First semes
Day/perio	od F	ri.2	Cla	ass style	Lecture			Language	Japanese
[Outline a	nd F	urpose	of the C	Course]					
Various ene conversion	rgy s proce	ources a sses and	nd energy thermody	conversion namics trea	systems wi tments for	ll be outli he effecti	ned. A	Also, basic m e of energy w	atters on energy vill be lectured.
[Course 0	Soals	5]							
From this cl put in the cu system, env	lass, f irrent ironn	undame situatio nental m	ntal issues n of energ easures ar	s related to e y resources, re comprehe	nergy conv latest tech nsible.	ersion en nologies o	gineer of ene	ing are learn rgy conserva	ed, as well as a tar tion and new energ
[Course S	Sche	dule an	d Conte	nts]					
,5:4umes,									
[Class red	quire	ermodyr	amics is t	equired					
[Class red Knowledge	quire of th	e ment] ermodyr	namics is r	required.					
[Class red Knowledge [Method,	quire of the Poin	ermodyr t of vie	namics is r w, and A	required.	levels of	Evaluati	on]		
[Class red Knowledge [Method, Achievemen	quire of the Poin nt wil	ermodyr t of vie l be synt	namics is r w, and A thetically	required.	levels of	Evaluati	on] t and	final examina	ation.
[Class red Knowledge [Method, Achievemen [Textbool	of the Poin nt wil	ermodyr t of vie l be synt	namics is r w, and A thetically	required. Attainment evaluated fre	levels of	Evaluati Ice, repor	on] t and	final examina	ation.
[Class red Knowledge [Method, Achievemen [Textbool Nothing. Pr	Poin nt wil	ermodyr t of vie l be synt	namics is r w, and A hetically properly	required. Attainment evaluated fro distributed.	levels of Dom attendat	Evaluati	on] t and	final examina	ation.
[Class red Knowledge [Method, Achievemen [Textbool Nothing, Pr [Referenc	quire of the Poin nt will sint m ce bo	t of vie t of vie l be synt aterial is	amics is r w, and A thetically properly c.]	required. ttainment evaluated fro distributed.	levels of	Evaluati	on] t and	final examina	ation.
[Class red Knowledge [Method, Achievemen [Textbool Nothing. Pr [Referenc (Refere It will be in	Poin Poin nt wil	t of vie l be synt aterial is oks, et books) ced, if no	w, and A w, and A thetically properly c.]	required. stainment evaluated fro distributed.	levels of	Evaluati nce, repor	on] t and	final examina	ation.
[Class ret Knowledge [Method, Achievemen [Textbool Nothing, Pr [Reference (Refere It will be in [Regardin	quire of the Poin nt will int m int m	t of vie t of vie l be synt aterial is boks, et books, et books) ced, if ne udies o	w, and A thetically properly c.] ecessary. ut of cla	required. Attainment evaluated frr distributed. SS (prepar	levels of om attendar ation and	Evaluati ice, repor	on] t and	final examina	ation.
[Class ret Knowledge [Method, Achievemen [Textbool Nothing. Pr (Reference (Refere It will be in [Regardin (Others (quire of the Poin nt will (] () () () () () () () () () () () () ()	ermodyr t of vie l be synt aterial is books, et books, et books) ced, if n udies o	w, and A w, and A hetically properly c.] eccessary. ut of cla , etc.))	required. ttainment evaluated frr distributed. ss (prepar	levels of om attendar ation and	Evaluati nce, repor	on] t and	Final examina	ation.
[Class ret Knowledge [Method, Achievemen [Textbool Nothing. Pr [Referenc (Refere It will be in [Regardin (Others (*Please visi	Poin nt wil int m ce bc nce l trodu g st offic t KU	ment] t of vie l be synt aterial is ooks, et oooks) ced, if no udies o e hour, LASIS t	mamics is r w, and A hetically properly c.] eccessary. ut of cla etc.)) o find out	required. ttainment evaluated fr distributed. ss (prepar about office	levels of om attendat ation and phours.	Evaluati nce, repor	on] t and	Final examina	ation.

							*
Numbering c	ode						
Course title I <english> Er</english>	ネルギー変換 hergy Conversio	工学(原) on	A di Ji	ffiliated epartmen ob title,Na	t, ime F	Graduate Scho Senior Lecturer Graduate Scho Professor, YOK	ol of Engineering ;,KAWARA ZENSAKU ol of Engineering ;OMINE TAKEHIKO
Target year	3rd year students	or above Number	of credits	5 2	Cou year	rse offered /period	2019/First semester
Day/period	Mon.1	Class style	Lecture			Language	Japanese
[Outline and	Purpose of	the Course]					
[Course Goa	als]						
[Course Sch	edule and Co	ontents]					
,2times,							
,4times,							
,2times, 3times							
3times							
,1time,							
[Class requi	rement]						
None							
[Method, Po	int of view, a	nd Attainment	levels of	Evaluat	tion]		
[Textbook]							
[Reference I	books, etc.]						
(Reference	e books)						
[Regarding	studies out o	f class (prepar	ation and	I review)]		
(Others (off	fice hour, etc	.))					
*Please visit K	ULASIS to fine	d out about office	e hours.				

											*
Numbering	cod	le									
Course title <english></english>	振動 Vibr]工学(機) ation Engine	ering			Affili depa Job	iated artment, title,Nar	ne I	Graduate S Senior Lec Graduate S Professor, J Graduate S Professor, J	Scho turer, Scho KON Scho MAT	ol of Engineering NAKANISHI HIROAKI ol of Engineering IORI MASAHARU ol of Engineering TSUBARA ATSUSHI
Target yea	ar	3rd year students	or above	Number	of cred	lits 2	2	Cou yea	rse offer /period	ed	2019/Second semester
Day/perio	d W	/ed.1	Cla	ss style	Lecture	e			Langu	age	Japanese
[Outline ar	nd P	urpose of	the C	ourse]							
[Course G	oals	5]									
[Course So	che	dule and Co	onten	its]							
,3times, ,1time, ,4times, ,3times, ,1time,											
[Class req	uire	ment]									
None											
[Method, P	Poin	t of view, a	nd At	tainment	levels	of E	/aluati	on]			
[Textbook]]										
[Reference	e bo	oks, etc.]									
(Referen	ice I	books)									
[Regarding	g sti	udies out o	f clas	s (prepar	ation a	nd re	eview)]			
(Others (c	offic	e hour, etc	.))								
*Please visit	KU	LASIS to fin	d out a	about office	hours.						

												*
Numberin	g cod	le										
Course title <english></english>	制御 Con	I⊥≛ trol	学1(機 Engineer	エネ/ ing 1	亰 : 学番奇	·数)	Aff dej Jol	iliated partment p title,Na	, me	Gra Pro Gra Sen	duate Scho fessor,MAT duate Scho ior Lecturer,	ol of Engineering ISUNO FUMITOSHI ol of Engineering FUKUSHIMA HIROAK
Target ye	ear	3rd ye	ear students o	or above	Number	of crec	lits	2	Co yea	urs ar/p	e offered eriod	2019/First semester
Day/perio	d T	'hu. 1	l	Cla	ss style	Lectur	e				Language	Japanese
[Outline a	nd F	Purp	oose of t	he C	ourse]							
[Course G	oals	5]										
10		de el c			· - 1			_				
Limo	cne	aule	e and Co	onter	itsj							
,3times,												
,2times,												
,2-3times,												
,3times,												
,2-3times,												
,Itime,												
							_		_	_		
None	quire	me	ntj									
rtone												
[Method,	Poin	t of	view, a	nd A	tainment	levels	of E	Valuat	ion]		
Taythaal	-1	_					_		_	_		
Liextbook	4											
[Referenc	e bo	oks	s, etc.]									
(Refere	nce	boo	ks)									
[Regardin	g st	udie	es out o	f clas	s (prepar	ation a	nd	review)]			
(Others (offic	e h	our, etc.	.))								
*Please visi	t KU	LAS	SIS to find	d out a	about office	hours.						

Numbering c	ode										
Course title <english> Vi</english>	動工: bratic	学(宇) on Engine	ering	-		Aff de Jo	filiated partment b title,Na	t, ime	Gra Sei Gra Pro	aduate Scho nior Lecture aduate Scho fessor,SEN	ol of Engineering r,AOI SHINYA ol of Engineering DA KEI
Target year	2nd y	ear students	or above	Number	of cred	its	2	Co ye	ours ar/p	e offered eriod	2019/Second semester
Day/period	Wed.	.1	Cla	ss style	Lecture	•				Language	Japanese
[Outline and	Purp	pose of t	he C	ourse]							
[Course Goa	als1					_		_			
-	-										
[Course Sch	edul	e and Co	onten	its]							
,1time,											
,2times, 2times											
,2times,											
,2times,											
,3times,											
,3times,											
[0]											
Loass requi	reme	entj									
None											
[Method, Po	int of	f view, a	nd Af	ttainment	levels	of E	Evaluat	tion]		
[Textbook]						_		_	_		
[Textbook]											
[Reference b	ook	s, etc.]									
(Reference	e boc	oks)									
[Regarding s	studi	es out o	f clas	ss (prepar	ration a	nd	review)]			
(Others (off	ice h	our, etc	.))								
*Please visit K	ULAS	SIS to fine	l out a	about office	e hours.						

											*
Numbering	g coc	le									
Course title <english></english>	制御 Con	『工学1(機 trol Engineeri	エネ原 ng l	亰:学番 偶	数)	Aff dej Jol	iliated partment p title,Na	t, ime A	Gradua Profess Gradua Associat	ate Schoo sor,OOT ate Schoo te Professo	ol of Informatics SUKA TOSHIYUKI ol of Informatics r,SAKURAMA KAZUNORI
Target ye	ar	3rd year students o	r above	Number	of cred	its	2	Cou year	rse of /peric	ffered od	2019/First semester
Day/perio	d T	'hu.1	Cla	ss style	Lecture	e			Lai	nguage	Japanese
[Outline a	nd P	Purpose of t	he C	ourse]							
Control Eng systematic w class describ	ineer /ay. 1 /es th	ring provides Its major part le fundamenta	a met consi ils of	hodology of sts of both (Classical Co	f control Classica ontrol T	lling l Co heo	y variou: ontrol Tl ry.	s syst heory	ems in and N	ncluding Modern C	mechanical ones in a Control Theory. This
[Course G	oals	5]									
The course g frequency re	goal i spon	is to understant uses and stabil	nd the ity.	basic conce	epts of C	Clas	sical Co	ontrol	Theor	ry such a	s transfer functions,
[Course S	che	dule and Co	onten	ts]							
(Representation of the concept of th	of Tr on is of dy tests of fee ems a respo The s ontro Lag,	or dynamical i ansfer Functi shown. namical syste dback system and Root Loci unses,3-4time; tability test o of systems,2ti and PID com	ms,3t ms,3t d. s,2-3t is are s,The f feed mes,B pensa	introduced imes,Time imes,Basic explained. concept of l back system asic compo- tion are des	propert: Frequen ns based cribed.	nation L es or ies s cy r l on ? cla	f linear such as s esponse the free ssical co	riptio Fransf syster steady es, Bo juency ontrol	n or sy form, a ms are y state de dia y resp ller de	e shown. characte agrams, V oonses is esign met	aevenped first. Then, k diagram Stability of systems ristics of feedback /ector locus are explained. hods such as Phase
[Class req	uire	ment]									
Elementary	know	vledge of Lap	lace T	ransform is	require	d.					
[Method, F	Poin	t of view, a	nd At	tainment	levels	of E	Valuat	ion]			
Scores of qu	izzes	s, reports and	the re	gular exam	ination a	are t	aken in	to acc	count.		
[Textbook]										
T. Sugie, M.	Fuji	ta: Introducti	on of	Feedback C	Control.	Cor	ona Pub	olishin	ng Co.	. Ltd. isbi	n{}{9784339033038}
[Reference	e bo	oks, etc.]									
(Referer T. Sugie, H. 9784339033	ice Kaji 069}	books) wara: Exercis	es in	System Cor	ntrol En	gine	ering. C	Coron:	a Publ	lishing C	o. Ltd. isbn{}{
									Continue	ie to 制御工学	1 (機工ネ原:字番偶数)(2)

制御工学1(機エネ原:学番偶数)(2)

(Related URLs)

(none)

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

(Others (office hour, etc.))

Some parts of the above contents may be skipped/added depending on the course schedule of the year.

*Please visit KULASIS to find out about office hours.

制御工学1(宇)**(2)**

[Textbook] T. Sugie and M. Fujita [#]Introduction to feedback control₄ (Corona Publisher) ISBN:4339033030 (in Japanese)

[Reference books, etc.]

(Reference books) Introduced during class

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

To read through textbooks as the lecture progresses. Also, review the parts of the textbook instructed according to the achievement level of the assignments.

(Others (office hour, etc.))

Feedback on lecture understanding is made from time to time according to the degree of achievement of the assignments.

*Please visit KULASIS to find out about office hours.

Numbering	cod	e								
Course title <english></english>	制御 Conti	工学1(宇 rol Engineer) ing 1			Aff de Joi	filiated partment b title,Na	t, ime	Graduate Scho Associate Profe	ol of Engineering ssor,MARUTA ICHIRO
Target yea	ar 3	rd year students (or above	Number	of crea	lits	2	Co yea	ourse offered ar/period	2019/First semester
Day/perio	d M	on.3	Cla	ss style	Lectur	e			Language	Japanese
[Outline an	nd Pi	urpose of t	he C	ourse]						
Control engi control theor	neerii y to c	ng consists o lesign feedb	of theo ack co	ory and met ontrol system	hodolog ms base	gy to d on	design transfe	cont r fui	trol systems. It i nctions and freq	ncludes the classical uency response.
[Course G	oals]								
The goal of t feedback cor	his co trol s	ourse is to un systems base	nderst d on t	and the clas ransfer fun	ssical co ctions a	ntro nd fi	l theory	y and y res	the related met sponse.	hodologies to design
[Course Se	ched	lule and Co	onter	nts]						
1. Introduction	on									
History and	i bac	kground of c	ontro	l engineerir	ıg					
2-5. Dynami Bacia know	cal sy	stems and ti	col cu	r functions	nory dif	fara	ntial act	notic	ne transfor fun	ations and block
diagrams	leug	e on uynann	cai sy	stems, ordi	nary un	iere	nuai equ	uauo	ons, transfer fun	ctions and block
6-8. Transit i	espo	nse and stab	ility							
Stability of	dyna	amical system	ms, tra	ansit respon	ise, stea	dy re	esponse	and	Routh-Hurwitz	stability criteria
9-10. Freque	ncy r	esponse				2				,
Basic know	ledg	e on frequen	cy res	sponse usin	g Bode	plots	s and ve	ctor	locus	
11-13. Chara	cteris	stic of feedb	ack co	ontrol system	ms					
Performan	ce cri	teria of feed	back of	control syst	ems usi	ng N	yquist's	s sta	bility criteria an	d the root locus method
How to dee	n of 1	eedback con	trol s	ystem,	nhaca	heal	compar	neati	on phase lead	lag compensation and
PID control	ign i	eeuback con	uoi s	ystem using	; phase-	icau	comper	isati	on, phase-lead-	ag compensation and
i ib tonuoi										
[Class req	uirer	nent]								
Complex fun	ction	theory, Ord	inary	differential	equation	on th	eory			
[Method, F	oint	of view, a	nd A	ttainment	levels	of E	Evaluat	tion]	
Evaluation w	ill be	e based on th	e fina	l examinati	on whic	h de	etermine	es th	e degree of com	prehension of the basic
concepts and	the c	lesign theory	y of fe	edback sys	tems.					
Also, the rep	orts a	and assignme	ents w	ill be added	d up to o	one t	hird of	the p	points lost in the	final examination.
									Continue to 市	」御⊥子□(于)(2)

Numbering co	de						
Course title <english> Cor</english>	卸工学2(機 ntrol Engineeri) ing 2		Affiliated department, Job title,Nar	me Gra	aduate Schoo ofessor,MAT aduate Schoo nior Lecturer,I	ol of Engineering SUNO FUMITOSHI ol of Engineering FUKUSHIMA HIROAKI
Target year	3rd year students of	or above Numbe	r of credit	t s 2	Cours year/p	e offered eriod	2019/Second semester
Day/period	Wed.3	Class style	Lecture			Language	Japanese
[Outline and	Purpose of t	he Course]					
[Course Goal	s]						
[Course Sche	edule and Co	ontents]					
,1time, ,2times, ,2times, ,2times, ,1time, ,2times, ,2times, ,2times, ,1time, [Class requir None [Method, Poin	ement] nt of view, al	nd Attainmer	it levels of	f Evaluati	ion]		
[lextbook]							
[Reference b	ooks, etc.]						
(Reference	books)						
[Regarding s	tudies out of	f class (prepa	aration an	d review)	0		
(Others (offi	ce hour, etc.	.))					
*Please visit KU	JLASIS to find	d out about offi	ce hours.				

Numbering	g code									
Course title <english></english>	制御工 Contro	学2(宇 I Engineeri) ng 2			Aff de Joi	filiated partment b title,Na	, me	Graduate Sch Professor,FU	ool of Engineering IIMOTO KENJI
Target ye	ar 3rd	year students o	or above	Number	of cred	its	2	Co yea	urse offered ar/period	2019/Second semeste
Day/perio	d Mor	1.3	Cla	ss style	Lecture	e			Language	Japanese
[Outline a	nd Pur	pose of t	he C	ourse]						
This course modeling, ar	treats m nalysis a	odern cont and synthes	trol th sis me	eory based ethods of fe	on state edback o	-spa cont	rol syste	els c ems.	of dynamical s	ystems. It includes
[Course G	oals]									
Students wil	l learn s	state-space	equa	tions, stabil	ity analy	/sis,	feedbac	ck c	ontroller synth	esis and observer desig
[Course S	chedu	le and Co	onten	tsl	_					
The basic sc	hedule	of the cour	se is a	as follows.						
1. Introducti	ons differen	tial equativ	one or	d state_sna	ce equat	ion				
2. Orumary (3. Figenvalu	es eige	nvectors a	nd sv	stems	ce equai	ions	`			
4. Solutions	of state	-space equ	ations	3101113						
5. Stability		1								
6. Transfer f	unction	s and realize	zatior	theory						
Controllat	oility									
Observabi	lity									
 Coordinat 	e transf	ormation a	nd ca	nonical dec	composit	ion				
10. Controlla	ability c	anonical fo	orm							
11. Observal	oility ca	nonical for	rm							
12. State ree	ODUCK C	ontroi	foodb	ack control	1					
14 Optimal	control	and Kalm	an filt	ers	1					
15. Summar	y y	and Ramin		015						
[Class reg	uirem	ent]						_		
Students are	require	d to take b	asic k	nowledge (of linear	alge	ebra and	dif	ferential equat	ion theory. Lis also
preferable to	take C	ontrol Eng	ineeri	ng 1.	or micui	ung.	oora ana	un	foronitiai oquat	
[Method, F	Point o	f view, ar	nd At	tainment	levels	of E	Evaluat	ion]	
The points w may adds au acquire the a	vill be e xiliary bility to	valuated ba points. The o design the	ased o goal e con	on the score of this cou trol system.	e of the p rse is to	ape und	r test. T lerstand	he r	eport assignme outline of the 1	ent and attendance point nodern control and to
[Textbook]		_		_					
Not used										
								_	Continue to	制御工学2(宇) (2)

间御工学2(宇) (2)	
Defense to the state	
(Reference books, etc.)	
(Reference books)	
Regarding studies out of class (preparation and review)]	
Ve will give a report for each unit. Review is necessary after every lecture.	
Others (office hour, etc.)	
Please visit KULASIS to find out about office hours.	

Target year ard year students or above Number of credits 2 Course offered year/period 2019/Second is Day/period Wed.2 Class style Lecture Language Japanese [Outline and Purpose of the Course] This course deals with how to construct and operate a manufacturing system of a mechanical product. [Course Goals] The goal is to understand the concept of a manufacturing system, and to become able to handle related decision-making problems. [Course Schedule and Contents] Introduction, 1time, The overall concept of a manufacturing system is given. Industrial Economics, 2times, After introducing the concept of the manufacturing cost and cash flow, h make decisions using the concept (for example, the DCF method for investment decisions) is addresse Production amp Operations Management, 2times, Demand forecasting, production planning, inventory management, MRP, JIT, etc. are covered. "3times, Production Scheduling, 2times, Basic approaches for single machine scheduling, flow shop scheduling, shop scheduling, and project scheduling are introduced. Plant layout and line balancing are introducing the principles of motion economy, the approaches for analysis, human-machine analysis, Therblig analysis, standard time setting, etc. are addressed. [Itime, [Class requirement] None [Reference books, etc.] [Reference books, etc.] [Reference books, etc.] [Reference books, etc.] [Reference books of class (preparation and review)] </th <th><english> PI</english></th> <th>:産工学(機) roduction Engi</th> <th>) neering</th> <th>Af de Jo</th> <th>filiated partment, b title,Nam</th> <th>Graduate Scho Associate Prof</th> <th>ol of Engineering essor,IZUI KAZU</th>	<english> PI</english>	:産工学(機) roduction Engi) neering	Af de Jo	filiated partment, b title,Nam	Graduate Scho Associate Prof	ol of Engineering essor,IZUI KAZU
Day/period Wed.2 Class style Lecture Language Japanese [Outline and Purpose of the Course] This course deals with how to construct and operate a manufacturing system of a mechanical product. [Course deals It is to understand the concept of a manufacturing system, and to become able to handle related decision-making problems. [Course Schedule and Contents] Introduction, Itime, The overall concept of a manufacturing system is given. Industrial Economics, 2times, After introducing the concept of the manufacturing cost and cash flow, h make decisions using the concept (for example, the DCF method for investment decisions) is addressed Production amp Operations Management, Ztimes, Demand forecasting, production planning, inventory management, MRP, JIT, etc. are covered. .3times, Production Scheduling, 2times, Basic approaches for single machine scheduling, flow shop scheduling, shop scheduling, and project scheduling are introduced. Plant Layout amp Line Blancing, 2times, Basic approaches for plant layout and line balancing are introducing the principles of motion economy, the approaches for analysis, human-machine analysis, Therblig analysis, standard time setting, etc. are addressed. (Inter, Image ImageImage Image Image Image Image Image Image Image Image I	Target year	3rd year students	s or above Number	of credits	2	Course offered /ear/period	2019/Second ser
[Outline and Purpose of the Course] This course deals with how to construct and operate a manufacturing system of a mechanical product. [Course Goals] The goal is to understand the concept of a manufacturing system, and to become able to handle related decision-making problems. [Course Schedule and Contents] Introduction, Itime, The overall concept of a manufacturing system is given. Industrial Economics, 2times, After introducing the concept of the manufacturing cost and cash flow, h make decisions using the concept (for example, the DCF method for investment decisions) is addresse Production amp Operations Management, 2times, Demand forecasting, production planning, inventory management, MRP, JIT, etc. are covered. "3times, Production Scheduling, 2times, Basic approaches for single machine scheduling, flow shop scheduling, and project scheduling are introduced. Plant Layout amp Line Blancing, 2times, Basic approaches for plant layout and line balancing are introducting the principles of motion economy, the approaches for analysis, human-machine analysis, Therblig analysis, standard time setting, etc. are addressed. Itime, [Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] The regular examination, in-class examinations and reports are taken into account. [Reference books, etc.] (Reference books, etc.] [Regarding studies out of class (preparation and review)] <	Day/period	Wed.2	Class style	Lecture		Language	Japanese
This course deals with how to construct and operate a manufacturing system of a mechanical product. [Course Goals] The goal is to understand the concept of a manufacturing system, and to become able to handle related decision-making problems. [Course Schedule and Contents] Introduction, Itime, The overall concept of a manufacturing system is given. Industrial Economics, 2times, After introducing the concept of the manufacturing cost and cash flow, h make decisions using the concept (for example, the DCF method for investment decisions) is addresse Production amp Operations Management, 2times, Demand forecasting, production planning, inventory management, MRP, JIT, etc. are covered. 3times, Production Scheduling, 2times, Basic approaches for single machine scheduling, flow shop scheduling, shop scheduling, and project scheduling are introduced. Plant Layout amp Line Blancing, 2times, Basic approaches for plant layout and line balancing are intro Industrial Engineering, 2times, After introducing the principles of motion economy, the approaches for analysis, human-machine analysis, Therblig analysis, standard time setting, etc. are addressed. 1 time, [Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] The regular examination, in-class examinations and reports are taken into account. [Fextbook] Not used [Reference books, etc.] (Reference books, etc.] [Regarding studies out of class (preparation and review)] Homework problems are assigned. (Others (office hour, etc.))	[Outline and	Purpose of	the Course]	_			
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None [Method, Point of view, and Attainment levels of Evaluation] The regular examination, in-class examinations and reports are taken into account. [Textbook] Not used [Reference books, etc.] (Reference books, etc.] [Regarding studies out of class (preparation and review)] Homework problems are assigned. (Others (office hour, etc.))	[Class requi	irement]					
[Method, Point of view, and Attainment levels of Evaluation] The regular examination, in-class examinations and reports are taken into account. [Textbook] Not used [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] Homework problems are assigned. (Others (office hour, etc.))	-						
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[Textbook] Not used [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] Homework problems are assigned. (Others (office hour, etc.))	None [Method, Po	int of view, a	and Attainment	levels of	Evaluatio	on]	
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*Please visit KULASIS to find out about office hours.

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

Numbering	j co	de									
Course title <english></english>	結 Phy	晶物性学(材 sics of Crystal P	エネ) roperti) ies and Imper	rfections	Aff dep Job	iliated partment b title,Na	, me	Gra Pro Gra Asso	duate Schoo fessor,INUI duate Schoo ociate Professo	ol of Engineering HARUYUKI ol of Engineering or,KISHIDA KIYOUSUKE
Target ye	ar	3rd year students of	or above	Number	of cred	lits	2	Co yea	urse ar/pe	e offered eriod	2019/First semester
Day/perio	d	Fri.1	Cla	ss style	Lecture	е				Language	Japanese
[Outline a	nd	Purpose of t	he C	ourse]							
Dislocations mechanical as basics of	are prop elas	the most impo perties of cryst ticity will be le	ortant alline ecture	lattice defe materials. I d.	cts that In this c	stroi ours	ngly aff e, funda	ect v umen	vario ntal j	us propietie properties o	es, especially f dislocations as well
[Course G	oal	s]									
This class ai ways to und	ms ersta	to help student and mechanica	s to a l prop	cquire fund erties of cr	amental ystalline	und e ma	lerstand terials b	ings basec	of c d on	lislocations dislocation	and also to acquire theory.
[Course S	che	edule and Co	onten	ts]							
 (1) Infocate (2) Basics of (3) Elastic p (4) Motion c (5) Force on (6) Feedbach 	f ela rope of di dis c [1	sticity theory erties of disloc slocations [2 w locations [4 w weeks]	[5 wee ations veeks] eeks]	ks] [2 weeks]							
[Class req	uir	ement]									
None											
[Method, I	Poi	nt of view, a	nd At	tainment	levels	of E	valuat	ion]]		
Evaluation v considered i	vill n gr	be based on or ading determin	ie (or nation	two) writte	n exami	nati	on(s). A	tten	danc	e and daily	reports may be
[Textbook]										
Hand out ma	teri	als will be pro	vided	during the	lecture.						
[Referenc	e b	ooks, etc.]									
(Referen 鈴木秀次「 J.P. Hirth an J.P. Hirth an 幸田成康「 柴田俊忍[la	nce d J. d J. f 金 た	books) 位論入門』(Lothe『Theo Lothe『Theo 属物理学序論 洪著『材料:	アグ: ry of i』(: 力学の	ネ) ISBN:4 Dislocation Dislocation コロナ) IS)基礎』(4750702 ns』(M ns, 2nd e SBN:978 培風館	2315 IcGi :d. a 3433) IS	raw-Hill (Wile 904287 BN:456	1) 19 9y) 1 0 5303	SBN ISBI 3465	:TY862997 N:04710912 7	'77 25
IRegardin	g s	tudies out of	clas	s (prepar	ation a	nd	review)]			
To review c	onto	nts covered in	the pr	covious lect	11170						

Numbering	g cod	e										
Course title <english></english>	材料 Phys	物理化学(ical Chemist	原) ry of N	faterials		Aff dej Joi	iliated partment b title,Na	, me	Grad Profe Grad Asso	luate Scho essor,TAK luate Scho ciate Profes	ol of Engineer AGI IKUJI ol of Engineer sor,TAISHI KO	ring ring DBAYASHI
Target ye	ar	Brd year students	or above	Number	of credi	its	2	Coi yea	urse ar/pe	offered riod	2019/Second	l semester
Day/perio	d W	/ed.2	Clas	ss style	Lecture				L	anguage	Japanese	
[Outline a	nd P	urpose of	he Co	ourse]								
This course and soundne	deals ess of	with physics materials, ex	ochemi aminii	cal inform ng their pri	ation on inciples a	nuc ind	clear ene practica	ergy l exa	mate ampl	erials such es.	as production	of fuel
[Course G	ioals	;]				_		_				
The goal of	the co	ourse is to stu	ıdy fis	sion reacto	rs and nu	ıcle	ar fusio	n rea	actor	s in terms	of physical ch	emistry,
for instance	thern	nodynamics,	reactio	on velocity	, and mas	ss ti	ransfer.					
[Course S	cheo	dule and Co	onten	ts]								
(1) Overview	v of 1	nuclear energ	y mate	rials, 1 cla	ISS							
Provide an o	overvi	iew of nuclea	ar energ	gy materia	ls and the	e va	rious st	eps o	of the	e nuclear f	uel cycle (min	ing and
refinement o	of nuc	ent and disp	ources,	productio	n and bui	rnır	ig of nuc	clear	r fuel	, storage a	nd reprocessir	ng of
(2) Isotone s	enara	ation and cor	central	tion. 2 clas	ses							
Explain the	princ	iples (gaseou	s diffu	sion proce	ss, centri	fug	al separ	atio	n pro	cess) and	nethods (sepa	rative
work units,	enricl	iment cascad	le) of is	sotopes su	ch as urai	niu	m.					
(3) Reaction	kine	tics, 2 classe	s									
Provide an o	overv	the de along	odynar	nics and re	eaction ki	net	ics and	expl	laın o	rder of rea	ction and rate	constant
(4) Soundne	ss of	atomic react	or mate	erials 2 cl	e or temp	pera	ature.					
Outline the	struct	ure of atomic	reacto	ors from th	e perspec	ctiv	es of ma	ateri	als a	nd cross-se	ections and ex	plain the
influence of	radia	tion injury a	nd cori	osion on t	he sound	nes	s of mat	erial	ls, as	well as th	e causes of an	d
strategies fo	r deal	ling with the	se pher	nomena.								
(5) Nuclear	fusio	n reactor fue	and m	naterials, 3	classes				c			
explain the	struct	ction and ne	ir rusic	n reactors	of the hy	e pe idre	rspectiv	es oi	r mai	t fuel nucl	cross-sections	s and
well as the r	adioa	ctivation of	structu	ral materia	l.	art	-501 ISU	ope	,o uid		iusion icat	
(6) Material	s and	radiation, 2	classes									
Discuss the	radia	tion effect as	a prob	lem comm	ion to all	nu	clear en	ergy	mate	erials and e	explain the inf	luence of
material pro	pertie	es and radiati	on.									
(/) Oxides a	nd at	omic fuel, 2	classes	nd ficaion	products		roooter	mai	na c.	waan note	ntial and nhaa	
diagrams	oenav	nor or atomi	L Tuel a	uid 115510ft	products	5 111	reactors	usli	ng os	vygen pote	nuai anu phas	c
(8) Confirm	ation	of learning a	ttainm	ent, 1 class	8							
Post explana	tion	and review o	f exam	ination qu	estions to	δK	ULASIS	5.				
				-								
									Con	tinue to 材	料物理化学(原) (2)

材料物理化学(原)**(2)**

[Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] [Grading method] Grade is based on one written examination.

[Grading criterion] Must score 60 or above out of 100 on the written examination 60 or above: pass

59 or below: fail

[Textbook]

No additional. Materials will be distributed in class.

[Reference books, etc.]

(Reference books) M. Benedict, T. H. Pigford and H. W. Levi ^PNuclear Chemical Engineering, 2nd Ed. (McGraw-Hill) ISBN-007045313

Atkins『アトキンス物理化学 第10版』(東京化学同人)ISBN:9784807909087

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

As needed, practice exercises will be conducted in class, so please review after class.

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

Lecture is given in Japanese.

*Please visit KULASIS to find out about office hours.

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Course title 材 <english> Ph</english>	料物理 ysical (化学(Chemist	エネ〕 ry of l) Materials		Affi dep Job	liated artment title,Na	t, me	dradu rofes	ate Scho ssor,HIR	ool of Energy ATOU TETS
Target year	3rd yea	r students o	or above	Number	of cred	its	2	Cou year	rse c /peri	offered od	2019/Secon
Day/period	Wed.2		Cla	ss style	Lecture	,			La	inguage	Japanese
[Outline and	Purpo	ose of t	he C	ourse]		1			-		
This course dis- lectures focus of for material pro-	cusses j on therm oduction	physical nodynan n, functi	chem nics, s onal n	istry in re solution ch naterials p	lation to r emistry, rocesses,	mate elect recy	trochen cling,	nd raw nistry corros	the store a	erials pro sciences ind corro	ocessing. To that serve as sion protection
[Course Goa	ıls]										
 Depict log a- 3. Read log a-p 4. Express simp constant from e 5. Determine ac 6. Consider elee 7. Consider cor 8. Consider cor 	pH dia H diagi ple reac experim ctivatio ctrode l rosion rosion	grams and rams and tion rate ent resu n energy kinetics in light o in light o	nd phas d phas e equa lts. / in re using of equ	ase-pH diag se-pH diag itions in di elation to re the Butler iilibrium the etic theory	grams. rams. fferential eaction ra -Volmer neory (Po	and te te equa tenti	integra mperat tion. al-pH o am, mi	ıl forr ure dı liagra xed p	n, and pend m). otent	d determ lence fro ial mode	ine the reacti om an Arrhen 21).
					(ing.					·
[Course Sch	edule	and Co	onten	its]	(liugi					
[Course Sch Fundamentals of Confirmation is will serve as the	edule of chem s made e found	and Co nical then of the ba lation for	rmody asic it r this	nts] ynamics (2 ems of Gil course.	classes)	y, cł	nemical	l pote	ntial a	and activ	vity, etc., all o
[Course Sch Fundamentals of Confirmation is will serve as the Equilibrium the Lectures discus serve as the fou prevention.	edule of chem s made e found eory of s acid-l indation	and Co nical ther of the ba lation for aqueous base read n for ma	rmody asic it r this solut ctions terials	ats] ynamics (2 ems of Gil course. tion reaction s, oxidation s processes	classes) bbs energ ons (6 cla n-reductions s using aq	y, ch sses) on re jueoi	nemical) actions us solut	l pote	ntial a equil and fo	and activ ibrium e or corros	/ity, etc., all c
[Course Sch Fundamentals of Confirmation is will serve as the Equilibrium the Lectures discuss serve as the fou prevention. Reaction rate fu Explanation is n serve as the fou prevention.	edule of chem s made e found eory of ss acid-l indation undame made o indation	and Cc nical there of the ba lation for aqueous base read n for ma entals (3 f chemic n for ma	rmody asic it r this solut ctions terials classe cal rea terials	ynamics (2 ems of Gil course. ion reactio s, oxidation s processes es) action rate, s processes	classes) bbs energ ons (6 cla n-reduction s using aq dynamics s using aq	y, ch sses) on re- jueou e elecciueou	nemical) actions us solut ctroche us solut	, and tions a mistr	ntial a equil and fo , and fo	and activ ibrium e or corros l solid su or corros	vity, etc., all c dectrochemiss sion and corro
[Course Sch Fundamentals of Confirmation is will serve as the Equilibrium the Lectures discus serve as the fou prevention. Reaction rate fu Explanation is fou prevention. Corrosion (3 cl. Lectures will di	edule of chem s made e found eory of ss acid-l indation undame made o indation asses) iscuss e	and Cc ical their of the ba- lation for aqueous base reach a for ma- entals (3 f chemic a for ma- equilibrit	onten rmody asic it r this s solut ctions terials classe cal rea terials	tts] vnamics (2 ems of Gil course. ion reaction s, oxidation s processes es) action rate, s processes eory and k	classes) bbs energ ons (6 cla n-reductions s using ac dynamics s using ac inetics of	y, ch sses) on re- ueou ueou	nemical) actions us solut ctroche us solut tal corr	, and tions a mistry tions a	ntial : equil and fo and fo	and activ ibrium e or corros d solid su or corros	/ity, etc., all c lectrochemisi ion and corro
[Course Sch Fundamentals of Confirmation is will serve as the Lequilibrium the Lectures discus serve as the fou prevention. Reaction rate ft Explanation is is serve as the fou prevention. Corrosion (3 cl: Lectures will di Feedback class Via questions a	edule of chem s made e found eory of ss acid-l indation undame made o indation asses) iscuss e (1 class of this	and CC inical there of the ba- lation for aqueous base reach a for ma- entals (3 f chemic a for ma- equilibriu s) wer usin course.	onten rmody asic it r this s solut ctions terials cal rea terials um the g the s	tts] ynamics (2 ems of Gil course. ion reaction s processes es) action rate, s processes eory and k study supp	classes) bbs energ ons (6 cla 1-reduction s using action of the second dynamic s using action of the second inetics of the service	y, ch sses) on re- ueou elect ueou	nemical) actions us solut ctroche us solut tal corre PandA),	, and tions a mistry osion.	ntial a equil and fo und fo ents v	and activ ibrium e or corros d solid su or corros	/ity, etc., all c lectrochemisi sion and corro urface process ion and corro a deeper und

材料物理化学(エネ)**(2)**

[Class requirement]

Students are recommended to have finished the course Energy and Material Thermochemistry I.

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

Grading will be performed in principle using scores on regular tests. Consideration may also be given to exercises, quizzes, and reports assigned in classes.

[Textbook]

Materials will be distributed during class or using the student support service (PandA).

[Reference books, etc.]

(Reference books) 『アトキンス物理化学』(東京化学同人)

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

Notification will be made via the study support service (PandA). For each week 's class, class contents and quiz answers will be posted on the study support service (PandA). Students are requested to review and gain a sufficient understanding of these before each next class period.

(Others (office hour, etc.))

Problem-solving type assignments will be designated as necessary using practice exercises as well as the study support service (PandA). Please note also that a portion of course contents may be omitted, or additional content may be added,

depending on the progress of the course during each specific academic year.

Numberin	g code											~	
Course title <english></english>	熱及び Heat an	物質移動 d Mass Ti	(材) ransfer			Af de Jo	filiated partment b title,Na	:, me	Gra Pro	aduate Scho ofessor,KAV	ol of En VAI JIY	gineerin UN	ıg
Target ye	ear Brdy	ear students	or above	Number	of cred	lits	2	Co yea	urs ar/p	e offered eriod	2019/F	irst sen	nester
Day/perio	od Mon	.2	Clas	s style	Lecture	e				Language	Japane	se	
[Outline a	nd Pur	pose of t	the Co	urse]									
The fundam are given.	entals of	f transport	pheno	mena for t	he engir	neer	s and/or	rese	earc	hers related	to physi	cal eng	ineering
[Course C	Goals]												
To be able t phenomena	o apply	the fundar	nental o	equations	of therm	al a	and mass	s trai	nspo	ort studied i	n the cla	ss to rea	ıl
[Course S	chedu	e and Co	ontent	s]		_		_	_				
One dimens mass, and n Non-steady Conservatic Molecular k Heat condud 2 dimensior Green funct Hydrodynau Boundary la Electromag Achievemen [Class ree None [Method,	ional hero omentur heat tran tethod. tinetics,1 ction of c ial heat c ion,2tim mics,2tim yer,1tim netic rad at check, quirement	at conduci m transfer ssfer,2time time,Fout time,Max sylhider at oonductior es,Green 1 nes,Navie: e, iation,1tim 1time,Lea ent] f view, a	ion,2tin s. Four es,Diffu rier#03! well#0. nd sphe a,1time function r Stoke ne, urning h	tes,Differ ier#039s 1 ision equa 0s law, Str 39s theorr re,1time,I 2 dimensi 1. Relation is equation iow to sol	ence bet aw, Stea ation, sol eady hea Heat tran ional Lap n betwee ve the pr	wee idy i lved it co isfer placen S robl	en heat a heat con l by Fou onductio r of cylin ce equati chroedin ems thro Evaluat	nd t duct rier n. ndrid on. nger	emption exp cal a equ	and sperical aution and d	nilarity a lace tran coordin iffusion :ises.	attes.	n.
Assignment	and wri	tten exam	ination										
Textbool	d												
 河合著:「\$	<u>-</u> 勿理工学	・化学工	学を学	きぶための	D熱・物	質	移動の基	基礎	ţ.	見善(2005)	sbn{}{4	621076	086}
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Course title <english></english>	熱及 Heat	び物質移動 and Mass Tr	(エオ ansfer	ኦ) :		Affiliated departme Job title,	nt, Iame	Graduate Scho Associate Profess Graduate Scho Professor,SAG	ol of Energy Science or,OKUMURA HIDEYU ol of Energy Science AWA TAKASHI
Target ye	ear 3	rd year students o	r above	Number	of cred	its 2	Co ye	ourse offered ar/period	2019/First semester
Day/peric	d M	ion.2	Clas	ss style	Lecture			Language	Japanese
[Outline a	nd P	urpose of t	he Co	ourse]					
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A及び物質移動(材) (2)	
Reference books, etc.]	
(Reference books)	
(Related URLS)	
(J0570) http://www.process.nni.kyoto-u.ac.jp/)	
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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Numbering	g cod	le								
course title	プラ Plası	ズマ物理学 ma Physics	(原	宇)		Aff dej Jol	iliated partment b title,Na	, me	Graduate Scho Professor,MUF	ol of Engineering RAKAMI SADAYOSHI
Target ye	ar	3rd year students o	or above	Number	of cred	its	2	Cou yea	rse offered r/period	2019/Second semester
Day/perio	d T	ue.2	Cla	ss style	Lecture				Language	Japanese
Outline a	nd P	urpose of t	he C	ourse]						
undamenta lasma, mag	l proj gnetol	perties of pla hydrodynami	sma a cs, pla	s a universa asma waves	l state o and tra	f hi nspo	gh-temp ort phen	eratı omei	ire matters, bas na are explaine	sic equation describing d.
Course G	ioals	5]								
understan	d bas	ic properties	of pla	smas and le	earn fun	dam	nental m	etho	d of analysis	
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Iotion of cl oulomb co asic equati quilibrium lasma waw /ave-partic ransport pl asa discharg uclear fusi onfirmatio Class rec asic knowl Method, I mester-ene	harge barge ons,2 and s es,2ti le int nenom ge,1ti n of a uire hedge: Point d exa	d particles,2t n,1times, stability,1tim mes, reraction,1tim nena,1time, me, achievement, ment] s of electrom t of view, an mination and	imes, e, ne, 1time agneti nd At	, ism, statistic t tainment ts	cal phys	ics, of E	fluid dy Evaluat	nam	ics and atomic	physics are expected.
Textbook	4]									
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Numbering	code										
Course title <english></english>	量子反 ^F undar	応基礎論 nentals of	i (原 Partic) le Interactio	ons	Aff dej Jol	iliated partment b title,Na	, me	Gra Ass	duate Schoo ociate Profe	ol of Engineering ssor,SAITOU MANABU
Target yea	r 3rd	year students	or above	Number	of cred	its	2	Co ye	ourse ar/pe	e offered eriod	2019/Second semester
Day/period	Fri.3	3	Cla	ss style	Lecture	e				Language	Japanese
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Course title <english></english>	熱紙 Ther	語十ナ mod	J学(宇 ynamics) and St	atistical Me	echanics	Affi dep Job	liated artment title,Na	, me	Gradua Profess	te Scho or,ERI	ol of Engineering GUCHI KOUJI
Target ye	ear	3rd ye	ar students	or above	Number	of cred	lits	2	Co yea	ourse of ar/perio	fered d	2019/First semester
Day/perio	od T	ue.3		Cla	ss style	Lectur	e			Lar	iguage	Japanese
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ICourse S	Sche	dule	and Co	onten	ts]							
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Numbering co	ode									
Course title <english> Ga</english>	体力的 sdyna	学(宇) umics		-		Aff de Jo	filiated partment b title,Na	t, ime	Graduate Scho Professor,TAF	ool of Engineering KATA SHIGERU
Target year	3rd ye	ear students o	or above	Number	of cred	lits	2	Co yea	urse offered ar/period	2019/First semester
Day/period	Tue.2		Cla	ss style	Lecture	e			Language	Japanese
Dynamics of hi In this course, typical phenome	gh spe one-di ena co	eed gas fl imension oming fro	ows is al and m the	s treated on l quasi one- e fluid comp	the basi dimensi pressibili	is of onal ity.	f the flui l flows a	id dy are r	namics for cor nainly discusse	npressible inviscid fluid. d, in order to show
[Course Goa	ls]									
To learn/unders	tand f	fundamen	tal iss	sues specifi	c to com	pre	ssible fl	uid	flows	
[Course Sch	edule	and Co	onten	its]						
5. Standing Sho 6. Shock tube p 7. From one-dir [Class requir Eluid dynamics	robler nensio	ave (1 time m (3 time onal to tw	ies)) R vo-din	Rankine-H iemann pro nensional fl	Lugoniot blem, R low (3 ti	rela efle mes	ation, et ction an i) Obl	c. d de ique	eflection of way	/es I-Meyer fan, etc.
[Method Poi	nt of	view a		ttainment	levels	of F	-valuat	ion	1	
By the final exa	um., in	principle	e.				_ varua		1	
[Textbook]										
H. M. Liepman	n and	A. Roshl	ko ₿1	Elements of	Gasdyn	ami	ics』(Dov	er Publications) ISBN:0486419630
[Reference b	ooks	s, etc.]								
(Reference J. D. Anderson,	boo Jr. 『	ks) 'Modern	Comp	pressible Fl	ow (2nd	ed.))a (M	cGr	aw-Hill) ISBN	1:0071006656
[Regarding s	tudie	es out of	f clas	ss (prepar	ation a	nd	review)]		
Students are exp	pected	to read t	he ter	xtbook by t	hemselv	es ii	n accord	lanc	e with the prog	ress of the class.
(Others (offi	ice h	our, etc.))							
Actual times an topics might be	d orde shifte	er of topic ed to the c	es ma class c	y change, d of Aerodyna	ependin amics.	g or	1 the cla	ss a	ttendants or oth	er reasons. A part of
*Please visit KU	ULAS	SIS to find	l out a	about office	hours.					

Numbering code Affiliated Course title 空気力学(宇) Graduate School of Engineering Professor, TAKATA SHIGERU departme <English> Aerodynamics Job title.Nam Course offered year/period Target year Brd year students or above Number of credits 2 2019/Second semester Day/period Fri.1 Class style Lecture Language Japanese [Outline and Purpose of the Course] This is the continuation of the class "Gasdynamics (50450)." Mainly treated are two-dimensional inviscid compressible fluid flows and aerodynamic forces acting on the bodies in such flows. A modern approach to gas flows based on the kinetic theory of gases is introduced as well. [Course Goals] To learn/ understand the fundamental issues of two-dimensional compressible gas flows related to high speed flight. [Course Schedule and Contents] Review of Gasdynamics (2times) - Shock wave, Mach line, Prandtl-Meyer fan Shock--Expansion wave theory and Interaction of oblique shocks (2times) Snock-Expansion wave theory and interaction of ondue shocks (Linnes) Non-isentropic flow and Mrocco's theorem (1time) -- Bow shock, Shock-Expansion wave interaction, etc. Small perturbation theory (3times) -- Potential flow, Similarity rules, etc. Steady two-dimensional flow and the method of characteristics (3times) Kinetic theory of gases (4times) -- velocity distribution function, Boltzmann equation, etc. [Class requirement] Fluid dynamics 1,2, Gasdynamics, Elemental Calculus (A,B, I,II), Linear Algebra (A,B) [Method, Point of view, and Attainment levels of Evaluation] By the final exam., in principle. [Textbook] H. M. Liepmann and A. Roshko ^PElements of Gasdynamics (Dover Publications) ISBN:0486419630 [Reference books, etc.] (Reference books) J. D. Anderson, Jr. [®]Modern Compressible Flow (2nd ed.)_a (McGraw-Hill) ISBN:0071006656 [Regarding studies out of class (preparation and review)] Students are expected to read the textbook by themselves in accordance with the progress of the class. (Others (office hour, etc.)) Actual times and order of topics may change, depending on the class attendants or other reasons.

Numberin	g cod	le										*	
Course title <english></english>	- 推進 Fund	基礎論(宇 Jamentals of J) Aeroa	pace Propu	lsion	Aff de Joi	filiated partment b title,Na	:, me	Gra Proi	duate Sch fessor,ER	ool of En GUCHI	gineering KOUJI	
Target ye	ear	3rd year students o	r above	Number	of cred	lits	2	Co yea	urse ar/pe	e offered eriod	2019/5	Second semest	er
Day/peric	od M	fon.1	Cla	ss style	Lectur	e				Language	Japane	se	
[Outline a	nd P	urpose of t	he C	ourse]									
[Course G	Boals	\$]											
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[Course S	iched	dule and Co	onten	ts]									
Propulsion I .3times.	Funda	amentals, I tim	e,										
Ionized Gas	es,1ti	ime,											
Electromagi	netics	,2times,											
Equation of	Ioniz	ed Gases,1tir	ne,										
Atomic and	Mole	cular Collisio	ons,2t	imes,									
Diffusion at		ansport of 101	izeu v	Jases, I unik	з,								
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ltime,	P	,,											
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Fluid Dynar	juire nics	Gas Dynamic	s Th	ermodynan	nics Ele	ctro	magnet	ics					_
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[Referenc	e bo	oks, etc.]											
R.W. Humb	le, G.	.N. Henry, an	d W.J	. Larson, S	pace Pro	opul	sion An	alys	is ar	nd Design	(McGraw	v-Hill, New	
1 ork, 1995) G.P. Sutton) and C	D. Biblarz. Re	cket	Propulsion	Elemen	ts, 8	th ed. (J	ohn	Wil	ley amp S	ons, Hobo	oken, 2010)	
isbn{}{9780	04700)80245};		r		, 0	(.			.,p.o	.,	.,)	
G.P. Sutton	and C	D. Biblarz, Ro	cket	Propulsion	Elemen	ts, 7	th ed. (Wile	y, <u>N</u>	ew York,	2001) isb	m{}{	_
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Target year	3rd year students	or above	Number	of credit	s 2	Cours year/p	se offered	2019/Secon
Day/period	Mon.2	Clas	s style	Lecture			Language	Japanese
[Outline and	Purpose of	the Co	urse]					
Flight dynamics	s of aerospace	vehicles	s.					
10	-1							
[Course Goa	IS		1.0	1.1			1.1	
To understand a	inalytical mec	hanics t	hrough fli	ght dynar	nics of aei	rospace	vehicles.	
[Course Sch	edule and C	ontent	sl					
Analytical mech	nanics, 7 times	s	-					
- introduction								
 coordinates 								
 principle of vi 	rtual work							
 d'Alembert pri 	nciple							
 potential 								
 Lagrange equa 	ation of motion	n						
- conservation l	aw							
- Lagrange mult	iplier							
 Euler-Lagrang Disid hody line 	e equation							
- Fuler angles	matics, 5 time	es						
- angular rate								
- pseudo coordi	nates							
Rigid body dyn	amics, 3 times	\$						
 kinetic energy 	of rigid body							
- linear and ang	ular momentu	m						
 inertia tensor 								
- Euler equation	of motion							
Dynamics of sp	ace vehicle, 2	times						
- topics of attitu	de dynamics of	of space	vehicles					
Achievement co	onfirmation, 1	ume	un loval a	fundarst	ndina			
- achievement c	onfirmation to	o cneck	up ievei o	i understa	nding			
[Class requir	ement]							
Foundation of n	nechanics and	mathem	natics					

推進基礎論(宇)(2)

0471326429]; M. Mitchner and Ch.H. Kruger, Jr., Partially Ionized Gases (Wiley, New York, 1973) isbn{}(0471611727}; F.F. Chen, Introduction to Plasma Physics and Controlled Fusion, 3rd ed. (Springer International Publishing

Switzerland, Cham, 2016) isbn{}{9783319223087}; F.F. Chen, Introduction to Plasma Physics and Controlled Fusion, Vol. 1, Plasma Physics, 2nd ed. (Plenum,

New York, 1984) isbn{}{9780306413322}; L.M. Biberman, V.S. Vorobev, and I.T. Yakubov, Kinetics of Nonequilibrium Low-Temperature Plasmas

(Consultants Bureau, New York, 1987);

R.O. Dendy ed., Plasma Physics: An Introductory Course (Cambridge University Press, London, 1993) isbn{} {0521433096}, (同, 1995) isbn{}{0521484529}; M.A. Lieberman and A.J. Lichtenberg, Principles of Plasma Discharges and Materials Processing (Wiley-

M.A. Lieberman and A.J. Lichtenberg, Principles of Plasma Discharges and Materials Processing (Wile Interscience, Hoboken, 2005) isbn{}{0171720011}.

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

航空宇宙機力学(宇)(2)

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

Evaluation depends on marks of examination and exercises.

[Textbook]

Instructed during class

[Reference books, etc.]

(Reference books) L. D. Landau and E. M. Lifshitz [#]Mechanics, Volume 1 (Course of Theoretical Physics) a (Elsevier) ISBN 0750620960

ISBN:0750628960 Herbert Goldstein [®]Classical Mechanics (Addison-Wesley) ISBN:0201657023 (international ed. ISBN 0321188977) Toda [®]Introductory course of physics 1 Mechanics (Iwanami Shoten) ISBN:4000076418 (in Japanese)

Koide ^PIntroductory course of physics 2 Analytical Mechanics a (Iwanami Shoten) ISBN:4000076426 (

Wadachi [®]Introductory course of physics 10 Mathematics for physics a (Iwanami Shoten) ISBN: 4000076507 (in Japanese)

[Regarding studies out of class (preparation and review)] Learn the basic mechanics and mathematics for analytical mechanics.

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

Numbering	code										
Course title <english></english>	国体力的 lechan	学(宇) ics of Sol	ids			Aff de Jo	filiated partment b title,Na	i, me	Gra Pro	duate Scho fessor,BIW	ol of Engineering A SHIROU
Target yea	r 3rd y	ear students o	or above	Number	of cred	its	2	Co ye	ourse ar/pe	e offered eriod	2019/First semester
Day/period	Mon.	.1	Cla	ss style	Lecture	•				Language	Japanese
[Outline an	d Purp	oose of t	he C	ourse]							
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[Course Go	aisj										
This course a of deformatio approximate t	ms to e n analy heories	stablish t sis of soli given in	he und ids and the "N	derstanding d structures Aechanics o	of rigor . It is als of Mater	ous so tl ials	he aim o course	sion of th s fro	s of s is co om a	stress and s ourse to re-e rigorous vi	rain and fundamentals xamine the value of iewpoint.
[Course Sc	hedul	e and Co	onten	ts]							
Week 1 [Preli Infinitesimal Weeks 2-3 [E Cauchy's law: Week 6 [Stre: Weeks 7-8 [F Compatibility Weeks 7-8 [F Compatibility Weeks 7-8 [F Compatibility Weeks 12-13 Weeks 14 [Pr potential ener Week 15 [Fin Week 16 [Fee	minaria eforma strain; 7 ress] S s of mo s-strain undama relatio Fwo-di on in po [Applid inciple gy al exan dback]	28] Basis v tition and s Fransform tress vector tion; Equit n relations ental equa n for strait mensiona olar coord cations of of virtual nination/le	vecotr strain] nation tor, Eu ilibriu s] Hoc titions in ll prob inates elasti work earnin	s; Kroneck Descriptio of strain cc uler's laws c m equation oke's law; E of elasticity lems of ela ; Two-dime city] Aniso] Virtual di g achieven	er's delta n of moro omponer of motion sis; Princi (lastic m y] Navie estic defe ensional tropic el splacem nent eval	a; A tion nts; T pal odu r's e orma elas lasti ent; uati	Iternatii (; Materi Principa Cauchy's stresses di; Voig equation ations] 1 stostatic city; In- ; Princip ion]	ng s al ti l sti law and t ex s; P Airy pro plai ele o	ymbo ime c rains y; Tra d stre press lane 's str blen ne el:	of; Summat derivative; (ansformatio ess invarian sion stress and p ress function ns; Stress co astic proper tual work; 1	ion convention Green-Lagrange strain; n of stress components; ts vlane strain; r; Biharmonic equation; oncentration around a ty of laminated plates rrinciple of stationary
[Class requ	ireme	nt]									
The enrolling understanding	studen of cale	ts are exp culus, line	ected ear alg	to have kno ebra (eigen	owledge ivalue pi	in t obl	he Mecl ems) an	hani d ve	ics of	f Materials analysis is	courses. Good preferable.
[Method, P	oint of	view, a	nd At	tainment	levels	of E	Evaluat	ion]		
Grading is ma	de bas	ed on the	exami	ination (859	%) and t	he r	eports (15%	5). Tl	he total sco	re of the examination
					· – – ·			-		ntinue to	国体力学(字)(2)
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Course title 常 <english> E</english>	D理工学演習 í xercise on Eng	1 (エネ) ineering Science 1	L	Affiliated department Job title,Na	, me	Graduate So Professor,IS	hool of Energ HIYAMA TA
Target year	 3rd year students 	s or above Number	of credi	its 1	Co yea	urse offere ir/period	a 2019/Firs
Day/period	Mon.4	Class style	Semina	r		Langua	ge Japanese
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[Course Go	als]						
[Course Scl	nedule and C	Contents]					
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固体力学(宇) (2)	
nd the reports is evaluated between 0 and 100 points (the pass mark is 60)	- 1
na ne reports is evaluated between o and 100 points (the pass mark is 00).	
Textbook	
Control of the second of the leature is given in the blockboard style	-
extoooks are not assigned. The recture is given in the blackboard style.	
Reference books. etc.]	
(Reference books)	
[Inoue "Fundamentals of elasticity" (Nikkan Kogyo)	
Kobavashi and K. Kondo. "Elasticity" (Baihu-kan)	
or references written in English, students are advised to contact the instructor directly.	
Regarding studies out of class (preparation and review)]	
Homeworks (reports) will be assigned to review the lectures.	
(Others (office hour, etc.))	
The order and hours (weights) of each item are subject to possible change.	
Please visit KULASIS to find out about office nours.	

Numbering	g code	٤							
Course title <english></english>	物理] Exerc	工学演習 1 fise on Engin	(原) neering Scie	nce 1	Af de Jo	iliated partment b title,Na	, me G As	raduate Scho ssistant Profe raduate Scho ssociate Professo	ol of Engineering ssor,OGURE KENZOU ol of Engineering r,MIYADERA TAKAYUKI
Target ye	ar βι	d year students o	r above Num	ber of o	credits	1	Cour year/	se offered period	2019/First semester
Day/perio	d Tu	e.3,4	Class sty	/le Se	minar			Language	Japanese
[Outline a	nd Pı	irpose of t	he Course						
[Course G	ioals]								
[Course S	ched	ule and Co	ontents]						
Linear algeb	ora,5tii	nes,							
Linear diffei Laplace tran	rential	Atimes	times,						
Confirmatio	n of a	,4unies, chievement i	n study.1tir	ne.					
				,					
[Class req	luirer	nent]							
differential a	and in	egral, linear	algebra						
[Method, I	Point	of view, ar	nd Attainm	ent lev	els of l	Evaluat	ion]		
exercises an	d repo	rts							
[Textbook	(]								
Prints are di	stribut	ed in the cla	SS.						
[Referenc	e boc	oks, etc.]							
(Referen	nce b	ooks)							
[Regardin	g stu	dies out of	f class (pro	eparatio	on and	review)]		
(Others (office	hour, etc.))						
*Please visit	t KUL	ASIS to find	l out about o	office ho	urs.				

												*
Numbering	g code											
Course title 物理工学演習 <english> Exercise on Er</english>			1 (宇) jineering Science 1			Aff de Joi	Affiliated department, Job title,Name			t-time Lecture	r,TAKAHAS	HI KENICH
								Co	Par	t-time Lecti e offered	irer,	
Target ye	ar Brdy	year students (or above	Number	of cred	lits	1	yea	ar/p	eriod	2019/First	semester
Day/perio	d Thu.	3,4	Cla	ss style	Semina	ar				Language	Japanese	
[Outline a	nd Pur	pose of t	he C	ourse]								
[Course G	ioals]											
[Course S	chedu	le and Co	onten	its]								
,5?6times, ,5?6times, ,2times, ,1time,												
[Class req	luireme	ent]										
None												
[Method, I	Point o	f view, a	nd At	tainment	levels	of E	Evaluat	ion]			
[Textbook]											
[Referenc	e book	s, etc.]										
(Referer	nce bo	oks)										
[Regardin	g studi	ies out o	f clas	s (prepar	ation a	nd	review)]				
(Others (office h	nour, etc))				_					
*Please visit	KULA	SIS to find	l out a	about office	e hours.							

Numbering	g code											
Course title <english></english>	物理工学演習 2 (エネ) Exercise on Engineering Science 2						iliated partment b title,Nar	me A	Graduate School of Energy Science Professor, ISHIHARA KEIICHI Graduate School of Energy Science Professor, ISHIYAMA TAKUJI Graduate School of Energy Science Professor, KAWANABE HIROSHI Graduate School of Energy Science Associate Professor, KASHIWAYA YOSHIAKI Graduate School of Energy Science Professor, IMATANI SHIYOUJI Graduate School of Energy Science			
Target ye	ar 3rd y	ear students o	r above	Number	of cred	its	1	Cou year	se offer period	red	2019/Second semester	
Day/perio	d Tue.	2	Cla	ss style	Semina	ır			Langu	lage	Japanese	
[Course Goals] This class aims to help students to learn fundamental matters in the field of energy science acquire by solving exercises. [Course Schedule and Contents] Thermal engineering, 3 weeks Hydrodynamics, 3 weeks Mydrodynamics, 2 weeks Thermodynamics, 2 we												
IClass red	uireme	ntl	_			_		_		_		
It is desirabl	e that st	udents lear	ned t	he basis of	each top	oic.						
[Method, I	Point o	f view, ar	nd At	tainment	levels	of E	Evaluat	ion]				
Evaluation v	vill be b	ased on ac	tive p	articipation	and ass	igni	ments.			- Aler T		
									Continue 1	to 物理	瞿工学演習2(エネ) (2)	

物理工学演習2(エネ)(2)

[Textbook] Handout will be provided in each topic.

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

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

Students are supposed to study the contents of each topic before the course.

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

														*
Numbering	g cod	le												
Course title <english> 物理工学演習 2 (原) Exercise on Engineering Science 2</english>				Aff dej Jol	Affiliated department, Job title,Name			Graduate School of Engineering ALL STAFF Graduate School of Engineering Professor, YOKOMINE TAKEHIKO Graduate School of Engineering Assistant Professor OCIUEF KENZO						
Target ye	ar	Brd ye	ar students	or above	Number	of cred	lits	1	Co yea	urse ar/p	e offered eriod	2019	/Secon	nd semester
Day/perio	d T	ue.4,	,5	Cla	ss style	Semina	ır				Language	Japar	nese	
[Outline a	nd P	urp	ose of	the C	ourse]									
[Course G	ioals	;]												
[Course S	cheo	dule	and C	onten	ts]									
,4times,														
,5times,														
,5times,														
, runic,														
[Class req	luire	mer	nt]											
None														
[Method, I	Point	t of	view, a	nd At	tainment	levels	of E	Evaluat	ion	1				
[Textbook]													
[Referenc	e bo	oks	, etc.]											
(Referei	nce k	oool	ks)											
[Regardin	g stı	udie	s out o	of clas	s (prepar	ation a	nd	review)]					
(Others (offic	e ho	our, etc	:.))			_							
*Please visit	KUI	LAS	IS to fir	d out a	bout office	hours.								

Numbering c	ode										
Course title 物理工学演習 2 (字) <english> Exercise on Engineering Science 2</english>							Affiliated department, Job title,Name		Grad ALL Part	duate Scho STAFF -time Lectu	ol of Engineering Irer,YAGI DAISUKE
Target year	3rd y	ear students of	or above	Number	of cred	lits	1	Cou yea	ırse r/pe	offered eriod	2019/Second semester
Day/period	Fri.3	,4	Cla	ss style	Semina	ar				Language	Japanese
[Outline and	Pur	oose of t	he C	ourse]						I	
Conduct lectur	e and	exercise of	on aire	craft and spa	acecraft	desi	ign.				
[Course Goa	als]										
Understand the	basis	of aircrat	ft/spa	cecraft syste	ems, and	l flig	ght dyna	mics	i.		
[Course Sch	edul	e and Co	onter	nts]							
Alistory of s History of s Summary of Summary of Summary of Summary of Summary of Summary of Summary of Aspaceraft - Transter of d Spaceraft - Transt and e Specific imp Ideal velocit Multi-stage Required ve S. Spaceraft - Exercise on 6. Aircraft - St Airplane sth Airplane sth A	sacecr Summ satell rocke propu Orbit Princi oroket Polo Posi princi oroket Posi princi oroket Posi princi oroket Posi producti Posi Posi Posi Posi Posi Posi Posi Pos	aft develop art develop art develop its system its system ilsion sys of satellit incremen inc	tern o tellite tern o e [1 v kket p t velo npone t e [1 o speci ance s ance [s lane ontrol	f spacecraft and rocket f spacecraft veek] ropulsion [1 city nt r 2 weeks] fication r 2 weeks] 2 or 3 week ontrollabilit lability	or 2 we ek] [s]	n s [1 - eeks]				
Center of gr	avity l	imits							Cor	ntinue to 物理	型工学演習 2 (宇) (2)

Numbering	g code	9									
Course title <english></english>	機械 Mecha	システム工 nical and Syst	学実 Seem Eng) (機) (機) (機) (人 人 人 人 人 人 人 人 人 人 人 人 人 人 人 人 人 人	oratory 1	Affiliated departme Job title,f	nt, Name	Gra Sen Gra Asss Asss Asss Ass Ass Ass Ass Ass Ass	duate Scho iior Lecturer duduet Scho ocoiate Profess duate Scho ociate Profess duate Scho ociate Profess duate Scho ociate Profess duate Scho ociate Profess duate Scho fessor,INO duate Scho ociate Professor duate Scho istant Profess duate Scho sistant Profess duate Scho sistant Profess duate Scho sistant Professor duate Scho sistant Profess duate Scho sistant Profess duate Scho sistant Profess duate Scho sistant Profess duate Scho sistant Profess duate Scho sistant Profess duate Scho	ol of Engin NAKANIS ol of Engin sor,NAKAJ ol of Engin sor,NAKAJ ol of Engin sor,SAITOU ol of Engin or,SHIMAD. ol of Engin sor,KOUM Ol of Engin UE YASUF ol of Engin UE YASUF ol of Engin Sor,KURIY. ol of Engin sor,KURIY.	eering HI HIROAK eering MA KAORI eering A TOSHIYUK eering MOTOHIRC eering A TAKAHIRC eering TAKAYUK eering HIRO eering MA REIKC eering MA REIKC eering MA REIKC
Target ye	ar βι	d year students (or above	Number	of cred	lits 1	C₀ y€	ours ear/p	e offered eriod	2019/Firs	t semester
Day/perio		ed.4,5		ss style	Experi	ment			Language	Japanese	
[Course G	ioals]		_				_	_			
[Course S	ched	ule and Co	onten	ts]					_	_	
,1time, ,2times, ,2times, ,2times, ,2times, ,2times, ,1time, ,1time, ,2times,											
								- Co	ntinue to 機械シ	ステム工学実験	1(機) (2)

物理工学演習 2 (宇) (2) Lateral and directional stability and controllability Crosswind landing Trim at engine failure 9. Aircraft - Airplane airworthiness [1 week] Regulation of airplane airworthiness Lessons learned from accidents 10. Aircraft - Design exercise [1 or 2 weeks] Exercise on flight test of airplane [Class requirement] Assumes students understand the fundamentals of dynamics. [Method, Point of view, and Attainment levels of Evaluation] Evaluation will be based on, submission status and contents of the report to be imposed during this class, and efforts toward the exercise, taking into account the attendance of class. [Textbook] Handouts will be distributed. [Reference books, etc.] (Reference books) Introduced during class [Regarding studies out of class (preparation and review)] Students are likely to make reports outside of class time, which will be imposed during class (Others (office hour, etc.)) The contents and number of classes are subject to change depending on the situation. *Please visit KULASIS to find out about office hours.

###>ステム工学実験1(機)(2)
[Class requirement]
None
[Method, Point of view, and Attainment levels of Evaluation]
[Textbook]
[Textbook]
[Reference books, etc.]
(Reference books)
[Regarding studies out of class (preparation and review)]
(Others (office hour, etc.))
*Please visit KULASIS to find out about office hours.

Numbering	code								
Course title ≮ ≺English> M	機械システム工 Wechanical and Syste	学実験1(機) em Engineering Lab	Affiliated departmer Job title,N	ıt, ame	Graduate School of Engineering Senior Lecturer,NAKANISHI HIROAKI Graduate School of Engineering Associate Professor,NAKAIIMA KAORU Graduate School of Engineering Associate Professor,SUCHIYA TOSHIYUKI Graduate School of Engineering Associate Professor,SHANDA TAKAHRO Graduate School of Engineering Associate Professor,SHMADA TAKAHRO Graduate School of Engineering Assistant Professor,KURIYAMA REIKO Graduate School of Engineering Assistant Professor,KURIYAMA REIKO Graduate School of Engineering Assistant Professor,KURIYAMA REIKO Graduate School of Engineering Assistant Professor, FUNITYANA REIKO Graduate School of Engineering Assistant Professor, IUI KEISUKE				
Target yea	ar 3rd year students of	or above Number	of cred	its 1	Co yea	urse offered ar/period	2019/Second semester		
Day/period	1 Mon.4,5	Class style	Experin	ment		Language	Japanese		
[Outline an	d Purpose of t	he Course]							
[Course Go	oals]								
[Course Sc	hedule and Co	ontents]							
Guidance,2tir	nes,Guidance on	how this class is	operate	d, and how	to us	e computing fa	cility for this class.\\		
Basic knowle detection.	dge on the role o	t IDS in network	security	and how	mach	ine learning car	help the intrusion		
Intrusion Det	ection by Signatu	are-Based IDS,5ti	imes,Lea	arn the mee	chanis	sm of intrusion	detection by signature-		
based IDS by	studying open so	ource signature-b	ased IDS	S and attac	ks, su	ich as correspor	idence between alarms		
Intrusion Dete	ection by Machin	te Learning,7time	ing signa es,Learn	the metho	d of c	lacks. lassifying norm	al and malicious		
traffic by mac	chine learning alg	gorithms and pub	lic datas	et for benc	hmar	king intrusion c	etection performance.		
Descentation	1time,Based on th	he exercise, stude	ents pres	ents their 1	netho	ds of intrusion	detection using		
riesentation,		it with other stud	ients and	I instructor	s.				
machine learr	ning, and discuss								
machine learr	ning, and discuss				_				
Class required	ning, and discuss								
[Class required None	ning, and discuss Jirement]								
Internation, 1 machine learr [Class requ None	ning, and discuss								
Internation, I machine learr [Class requination] None	ning, and discuss								

機械システム工学実験1(機) (2)	1
Method, Point of view, and Attainment levels of Evaluation]	
Textbook]	
Reference books, etc.]	
Regarding studies out of class (preparation and review)]	
Others (office hour, etc.))	
Please visit KULASIS to find out about office hours.	
	1

Numberin	g cod	de								
Course title <english></english>	機柄 Mech	見システム工 aanical and Syste	学実馬 em Eng	検2(機) jineering Lab	oratory 2	Affil depa Job	iated artment title,Na	, A A C C A A C A A C C A A L In A A C C A A A C C A A C C A A C C A A C C A A A C C A A A C C A A A C C A A A C A C A C A C A C A A A C C C A A A C C C A A A C C C A A A C C C A A A C C C A A A C C C A A A C C C A A A C C C A A A C C C A A A C C C A A A C C C A A A C C C C A A A C C C A A A C C C A A A C C C A A A C C C A A A A A A A A A C C C A A A A A A A C C C A A A A A C C C A A A A A A A C C C A	Traduate Scho ienior Lecturer Graduate Scho sssistan Profesor Traduate Scho Associate Profeso Traduate Scho Assistant Profesor Traduate Scho Assistant Profesor Traduate Scho Sciate Professor, nstitute for Fronti Sasistant Profesor Traduate Scho Professor, INO Traduate Scho Professor, INO Traduate Scho Staduate Scho Staduate Scho Staduate Scho Staduate Scho Staduate Scho Staduate Scho Staduate Scho	ol of Engineering NAKANISHI HIROAKI ol of Engineering WAKABAYASHI HIDENOBU ol of Engineering ssor,NAKAJIMA KAORU ol of Engineering ssor,OKINO SHINYA ol of Engineering ssor,OKINO SHINYA ol of Engineering ENDO TAKAHIRO ol of Engineering ENDO TAKAHIRO ol of Engineering UE YASUHIRO ol of Engineering UE YASUHIRO ol of Engineering Ssor,KOMEO YOSHITAKA
Target ye	ar	3rd year students o	r above	Number	of cred	lits	I	Cou year	rse offered /period	2019/First semester
Day/peric	d T	'hu.4,5	Cla	ss style	Experi	ment			Language	Japanese
[Course G	Soals	š]	_		-	_		_	_	
[Course S	iche	dule and Co	onten	ts]						
,1time, ,2times, ,2times, ,2times, ,2times, ,1time, ,1time, ,2times,										
									Continue to 機械ジ	ステム工学実験2(機) (2)

機械システム	学実験2(機)	(2)		
[Class requir	ement]			
None				
[Method, Poi	nt of view, and A	Attainment level	s of Evaluation]	
[lextbook]				

(Reference books)

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

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

Numbering c Course title <english> M</english>	ode 桃被システム工 echanical and Syste	学実験2(機) m Engineering Lab	oratory 2	Affi dep Job	iliated partment o title,Na	Gr Ser Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Gr Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Ass Gr Gr Ass Gr Gr Ass Gr Gr Ass Gr Gr Ass Gr Gr Ass Gr Gr Ass Gr Gr Ass Gr Gr Ass Gr Gr Ass Gr Gr Gr Ass Gr Gr Gr Ass Gr Gr Ass Gr Ass Gr Ass Ass Gr Ass Gr Ass Gr Gr Ass Gr Gr Ass Gr Gr Ass Ass Gr Ass Ass Gr Ass Ass Ass Ass Ass Ass Ass Ass Ass As	aduate Scho nior Lecturer aduate Scho sisant Professor, aduate Scho sociate Profess aduate Scho osciate Professa aduate Scho sistant Profes aduate Scho ociate Professa aduate Scho osciate Professa aduate Scho sociate Professa aduate Scho osciate Professa	ol of Engineering NAKANISHI HIROAKI ol of Engineering WAKABAYASHI HIDONOBU ol of Engineering sor,NAKAJIMA KAORU ol of Engineering sor,OKINO SHINYA ol of Engineering ssor,OKINO SHINYA ol of Engineering ssor,hirai yoshikazu ol of Engineering SSOR,HAGU YOSHITAKA ol of Engineering ssor,KOUNO DAISUKE ol of Engineering SSOR,KOUNO DAISUKE ol of Engineering MATSUMOTO MITSUHIRO
Target year	3rd year students of	or above Number (of cred	its	1	Cours year/p	e offered period	2019/Second semester
Day/period	Thu.1,2	Class style	Experi	men	t		Language	Japanese
LOutline and	Purpose of t	ne Coursej						

Numbering	g co	de								
Course title <english></english>	機柄 Mecl	或システム工: hanical and Syste	oratory 3	Affiliated departmen Job title,Na	Affiliated Graduate School of Eng Senior Lecturer,NAKAN Graduate School of Eng Associate Professor,NAK/ Graduate School of Eng Associate Professor,TSUCHI Graduate School of Eng Associate Professor,TSUCHI Graduate School of Eng Assistant Professor,HARI Graduate School of Eng Assistant Professor,NAWU Graduate School of Eng Assistant Professor,NAWU Graduate School of Eng Assistant Professor,NAWU			I of Engineering sor,NONAKA TETSUYA J of Engineering NAKANISHI HIROAKI J of Engineering sor,NAKAJIMA KAORU ol of Engineering sor,HORIGUCHI YUKIO J of Engineering sor,HORIGUCHI YUKIO J of Engineering sor,MATSUDA NAOKI ol of Engineering NAMURA KYOKO ol of Engineering Sor,KURIYAMA REIKO		
Target ye	rget year 3rd year students or above Number of cre					lits 1	Cor yea	urse off ar/period	ered 1	2019/First semester
Day/perio	d F	³ ri.4,5	Cla	ss style	Experi	ment		Lang	guage	Japanese
[Outline a	nd F	Purpose of t	he Co	ourse]						
[Course G	ioal	s]								
[Course S	che	dule and Co	onten	ts]						
,1time, ,14times,										
[Class red	lnite	ement								

Continue to 概械システム工学実験 3(種)(2)

*

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

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

[Course Goals]

[Course Schedule and Contents]

detection. Intrusion Detection by Signature-Based IDS, 5times, Learn the mechanism of intrusion detection by signaturebased IDS by studying open source signature-based IDS and attacks, such as correspondence between alarms issued from IDS and communications, and adding signatures to detect attacks. Intrusion Detection by Machine Learning,7times,Learn the method of classifying normal and malicious

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

*

機械システム工学実験 2 (機) (2)
[Class requirement]
None
[Method, Point of view, and Attainment levels of Evaluation]
[Textbook]
[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.

機械システム工学実験3(機)(2)

[Textbook]

[Reference books, etc.]

None

(Reference books)

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

(Others (office hour, etc.))

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Numbering	g co	de								
Course title <english></english>	機和	戒システム工 chanical and Syste	学実 em Eng	贪 3 (機) gineering Labo	oratory 3	Aff dej Jol	illiated partment b title,Na	GI As GI Se GI As GI As GI As GI As GI As GI GI As	raduate Scho sisistant Profes raduate Scho nior Lecturer raduate Scho sociate Profess raduate Scho sisitant Profess raduate Scho sisistant Professor raduate Scho sisistant Professor raduate Scho sisistant Professor	ol of Engineering sor,NONAKA TETSUYA ol of Engineering NAKANISHI HIROAKI ol of Engineering sor,NAKAJIMA KAORU ol of Engineering sor,HORIGUCHI YUKIO ol of Engineering sor,HORIGUCHI YUKIO ol of Engineering NAMU RA KYOKO ol of Engineering NAMU RA KYOKO ol of Engineering Sor,KURIYAMA REIKO
Target ye	ar	3rd year students of	or above	Number of	of cred	its	1	Cours year/p	se offered period	2019/Second semester
Day/perio	d	Thu.4,5	Cla	ss style	Experi	men	ıt		Language	Japanese
[Outline a	[Outline and Purpose of the Course]									

[Course Goals]

[Course Schedule and Contents]

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

detection. Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by signature-based IDS by studying open source signature-based IDS and attacks, such as correspondence between alarms issued from IDS and communications, and adding signatures to detect attacks. Intrusion Detection by Machine Learning,7times,Learn the method of classifying normal and malicious traffic by machine learning algorithms and public dataset for benchmarking intrusion detection using machine learning, attacks, students presents their methods of intrusion detection using machine learning, and discuss it with other students and instructors.

[Class requirement] None

- -

機械システム工学実験3(機) (2)	
[Method, Point of view, and Attainment levels of Evaluation]	
· · · · · · · · · · · · · · · · · · ·	
[Textback]	
[Reference books, etc.]	
(Reference books)	
[Regarding studies out of class (preparation and review)]	
(Others (office hour, etc.))	
*Please visit KULASIS to find out about office hours.	

Numbering	code									
Course title <english></english>	機械設 Exercise	計演習 1 e of Machi	(機) ne Design 1		Affilia depar Job ti	ated rtment, itle,Nam	Gra Pro Gra Ass Gra Ass Par	Graduate School of Engineering Professor,NISHIWAKI SHINJI Graduate School of Engineering Associate Professor,NAKAJIMA KAORU Graduate School of Engineering Associate Professor,YOKOKAWA RYUUJI Part time Lecturer KANEDA SHUICHI		
Target yea	ar Brd y	ear students o	r above Number	r of cred	lits 2	(Cours /ear/p	e offered eriod	2019/First semester	
Day/period	d Mon.	4,5,Fri.4,5	Class style	Semin	ar			Language	Japanese	
[Outline ar	d Pur	oose of t	he Course]							
[Course G	oals]									
	hodul	e and Co	ntontel							
4times	neuui		mennaj							
3times,										
-times,										
21times,										
21times,										
2times.										
	liromo	ntl								
Vono	unenne	ang								
							-			
[Method, P	oint o	f view, an	nd Attainmen	t levels	of Eva	aluatio	on]			
[Textbook]										
Reference	hook	s oto 1								
[Reference	book	s, etc.]								
[Reference (Referen	book ce boo	s, etc.] oks)								
[Reference (Referen	book ce boo	s, etc.] oks)								
[Reference (Referen	book ce boo	s, etc.] oks) es out of	class (prepa	ration a	nd re	view)]				
[Reference (Referen [Regarding	book ce boo studi	s, etc.] oks) es out of	class (prepa	ration a	nd re	view)]				
[Reference (Referen [Regarding	book ce boo studi	s, etc.] oks) es out of	class (prepa	ration a	nd re	view)]				
[Reference (Referen [Regarding (Others (c	book ce boo studi	s, etc.] oks) es out of our, etc.]	class (prepa	ration a	nd re	view)]				
[Reference (Referen [Regarding (Others (c	booki ce boo y studi office h KULA:	s, etc.] oks) es out of our, etc.] SIS to find	class (prepa	ration a	nd re	view)]				
[Reference (Referen [Regarding (Others (c	book ce boo studi ffice h KULA	s, etc.] oks) es out of our, etc.] SIS to find	class (prepa)) out about offic	ration a	nd re	view)]				

									*		
Numbering	g code										
Course title 機械設計演習1(機) <english> Exercise of Machine Design 1</english>						iliated partment p title,Na	, me	Graduate School of Engineering Professor, NISHIWAKI SHINJI Graduate School of Engineering Associate Professor, SHIKAMA TAIICH Graduate School of Engineering Associate Professor, TATSUMI KAZUYA Part-time Lecturer, YAMANAKA KOUSUKI			
Target ye	ear Bro	l year students or above	Number	of cred	lits	2	Col yea	Irse offered r/period	2019/First semester		
Day/perio	d Tue	4,5,Thu.4,5 Cla	ss style	Semina	ar		-	Language	Japanese		
[Outline a	nd Pu	rpose of the C	ourse]								
Guidance,2t Basic knowl detection. Intrusion De based IDS b issued from Intrusion De traffic by ma	imes,G ledge o etection y study IDS an etection achine	iudance on how n the role of IDS by Signature-Ba ving open source d communication by Machine Lea learning algorith	this class is in network used IDS,5t signature-b ns, and add urning,7time ms and pub	a operate security imes,Lea based ID: ing signa es,Learn lic datas	d, and arn ti S and ature the set fo	nd how n l how n he mecl d attack es to det method or bench	to us nachi nanis s, su ect a of c umarl	e computing fa ne learning car m of intrusion ch as correspon ttacks. lassifying norn cing intrusion of	cility for this class.\\ help the intrusion detection by signature- ndence between alarms nal and malicious letection performance.		
Presentation machine lea	,1time, rning, a	Based on the exe and discuss it wit	ercise, stude h other stud	ents pres dents and	ents d ins	their m tructors	etho	ds of intrusion	detection using		
[Class rec	quirem	ient]									
None											
[Method,	Point	of view, and A	ttainment	levels	of E	valuat	ion]				
[Textbook	(]			_	_	_					
	-										
[Referenc	e boo	ks, etc.]									
(Refere	nce bo	ooks)									
						·		Continue to 機材			

Regarding st	udies out of cl	ass (prepara	tion and revie	ew)]	
		u u		/-	
Others (offic	e hour, etc.))	it about office h	ours		
rease visit ite	Li tolo to lind ot	a about office i	iours.		

Numbering code

機械設計演習1(機)

Exercise of Machine Design 1

Course title <English>

											*
Numbering	code										
Course title ≮English> I	幾械設 Exercis	:計演習 2 se of Mach	(機 iine D) Pesign 2		Aff dej Jol	iliated partment b title,Na	r, ime	Gra Pro Gra Pro Gra Gra Sen Part	duate Schoo fessor,KOM duate Schoo fessor,HIR duate Schoo ociate Profe duate Schoo ior Lecturer t-time Lectu	ol of Engineering 40RI MASAHARU ol of Engineering 4YAMA TOMOKO ol of Engineering ssor.KOUNO DAISUKE ol of Engineering NAKANISHI HIROAK rer,KANEDA SHUICH
Target yea	ar Brd y	year students	or above	Number	of cred	lits	2	Co yea	urse ar/pe	e offered eriod	2019/Second semester
Day/period	Mon	1.1,2,3,4	Cla	iss style	Semin	ar				Language	Japanese
[Outline an	d Pur	pose of f	he C	ourse]							
Course G	oals]	_	_								
1000.00	,a.oj										
[Course Sc	hedu	le and Co	onter	nts]							
,1time,											
[Class requ	Jireme	ent]									
None											
[Method, P	oint o	of view, a	nd A	ttainment	levels	of E	valuat	ion]		
[Textbook]											
[Reference	book	(s, etc.]							_		
(Referen	ce boo	oks)									
[Regarding	stud	ies out o	f clas	ss (prepar	ration a	ind	review)]	_		
(Others (o	ffice I	hour, etc	.))					_			
*Please visit	KULA	SIS to fin	d out :	about office	e hours.						

Target year	3rd year students o	or above Number	of credits 2	Course year/pe	e offered eriod	2019/First semester					
Day/period W	ed.4,5,Fri.4,5	Class style	Seminar	Japanese							
[Outline and F	urpose of t	he Course]									
[Course Goals	[Course Goals]										
1											
[Course Schedule and Contents]											
- Guidance,2times	Guidance on	how this class is	operated, and how	to use co	omputing fa	cility for this class.					
Basic knowledge	on the role of	f IDS in network	security and how n	nachine l	earning car	1 help the intrusion					
detection.											
Intrusion Detecti	on by Signatu	re-Based IDS,5ti	mes,Learn the mec	hanism o	of intrusion	detection by signature-					
issued from IDS	and communi	outions and add	ased IDS and attack	toot attaa	is correspondent	idence between alarms					
Intrusion Detecti	on by Machin	e Learning 7time	and signatures to de	t of class	ifving norn	nal and malicious					
traffic by machin	e learning alg	orithms and pub	lic dataset for bench	hmarking	intrusion of	detection performance.					
Presentation,1tin	ne,Based on th	ie exercise, stude	ents presents their m	nethods o	of intrusion	detection using					
machine learning	, and discuss	it with other stud	lents and instructors	s.		ç					
[Class require	ment]										
None											

∆ffiliated

department, Job title,Name

Textbook	1			
LIEVIDOOK	1			
[Referenc	e books, etc.]			
(Referen	nce books)			
[Regardin	g studies out of o	lass (preparatio	n and review)]	
	-			
(Others (office hour etc.)	1		
	VIII A SIS to find a) ut chout office how	-0	
Please visit	KULASIS to find o	out about office noui	rs.	

機械設計演習1(機)**(2)**

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

*

Graduate School of Engineering Professor,NISHIWAKI SHINJI Graduate School of Engineering Associate Professor,SUMIGAWA TAKASHI Graduate School of Engineering Associate Professor,MATSUMOTO MITSUHIRO

Part-time Lecturer, YAMANE MASAHIRO

Part-time Lecturer, MATSUI SATOSHI

Part-time Lecturer, Part-time Lecturer,

											*
Numbering	g co	de									
Course title <english></english>	機 Exe	戒製作実習(ercise for Mac	e	Affiliated department, Job title,Name			Graduate School of Engineering Professor,MATSUBARA ATSUSHI Graduate School of Engineering Associate Professor,KOUNO DAISUKE Graduate School of Engineering Professor,NAKABE KAZUYOSHI Graduate School of Engineering Professor,NISHIWAKI SHINJI Part-time Lecturer,Part-time Lecturer				
Target ye	ar	2nd year students	or above	Number	of cred	its	ts 1 Course offered year/period 2019/Second				2019/Second semester
Day/perio	Day/period Wed.5 Class style Practi					al tr	aining			Language	Japanese
[Outline and Purpose of the Course]											
This course consists of two parts: machine shop training and special lectures by visiting lecturers. The machine shop training will be offered for a week in August or September (during summer break). Students will learn the operation of various machine tools, e.g. a lathe, a milling machine, and a drilling machine, to make a stirline enzine. whose performance will be tested at the end of the course. Hands-on training of											

disassembly and re-assembly of a commercial diesel engine (or a gasoline engine) will be also offered to learn actual engine mechanism.

The seminar series will be offered in the 2nd semester. Professional engineers from various companies will be invited to give a lecture on real-world experience on production design, manufacturing, or management.

[Course Goals]

To experience turning, milling and drilling operations and other basic machining operations. To obtain basic knowledge and experience on machine tools, cutting tools, measurement, and machining accuracy by handson training.

[Course Schedule and Contents]

Lectures on principle of engines, ltime, Students will learn basic knowledge on the priciple of a stirling engine and a diesel (gasoline) engine.

Lectures on machine tools ,1time,Students will learn basic knowledge on machine tools that they will use in machine shop training.

Machine shop training (making a stirling engine).4times,Turning operation for cylindrical parts (2 classes), milling and drilling operations (2 classes), assembly and evaluation (1 class). A group of two students will make one stirling engine.

Disassembly of an engine, 1time, Assebly and disassembly of a commercial diesel (or gasoline) engine. Lectures on safety, 1time, A special lecture on safety issues in manufacturing process and product design by a visiting lecturer.

Special seminars,7times,Special seminars by visiting lecturers. Lectures may be subject to change each year. Examples of past lectures:\\ quotTo future Edison -- save the world by good idea and engineering,quot\\ quotDevelopment of compressors to meet market#039s needs -- role of mechanical engineers,quot\\ quotDapanese machine tools for the world#039s manufacturing - key technologies,quot\\ quotEngineer#039s life in companies.quot

Factory tour, 1 time, One-day trip to a factory in Kansai area.

______Continue to 機械製作実習 (機) (2)

機械製作実習(機)(2) [Class requirement] [Method, Point of view, and Attainment levels of Evaluation] For the credit, students are in principle required to participate in all the classes, and to submit all the reports [Textbook] A textbook will be handed out in class [Reference books, etc.] (Reference books) (Related URLs) (None.) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) The class overview will be presented in a guidance class for 2nd year students in Undergraduate Course Program of Mechanical and Systems Engineering in April. Detailed schedule will be given then. Please be aware -- a large part of this class will be offered during the summer break. A class guidance will be given typically in July. Its announcement will be posted in the 1st floor of the building of Dept. of Engineering Science. All the students who want to take this class must come to this guidance *Please visit KULASIS to find out about office hours

Numbering code Graduate School of Engineering Affiliated 材料科学実験および演習1(材) ALL STAFF Course title department, Job title,Name Graduate School of Engineering Associate Professor, YUGE KORETAKA <English> Materials Science Laboratory and Exercise Course offered Target year Brd year students or above Number of credits 2019/First semester year/period Day/period Wed.3,4,Thu.3,4 Class style Semina Language Japanese [Outline and Purpose of the Course] [Course Goals] [Course Schedule and Contents] 6times .6times. 6times, ,6times, [Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] [Textbook] [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours

Numbering	g code									
Course title <english></english>	材料科 Material	学実験お ls Science	よび演 Labora	観習2(枕 tory and E:	才) xercise 2	Afi de Jo	filiated partment b title,Na	ł, ime	Graduate Scho ALL STAFF Graduate Scho Associate Profe	ool of Engineering ool of Engineering essor, YUGE KORETAKA
Target ye	ar Brd y	/ear students (or above	Number	of cred	lits	3	Co ye	urse offered ar/period	2019/Second semester
Day/perio	d Wed.?	3,4,Thu.3,4	Clas	ss style	Semina	ar		_	Language	Japanese
[Outline a	nd Pur	pose of t	he Co	ourse]						
[Course G	ioals]									
[Course S	chedul	e and Co	ontent	ts]						
,6times, ,6times, ,6times, ,6times,										
[Class red	uireme	ent]								
None										
[Method, I	Point of	f view, a	nd Att	tainment	levels	of F	Evaluat	tion	ı]	
[Textbook	.]									
[Referenc	e book	s, etc.]								
(Referer	ice boo	oks)								
[Regardin	g studi	es out o	f class	s (prepar	ration a	nd	review)]		
(Others (office h	our, etc.	.))							
*Please visit	KULA	SIS to find	1 out al	bout office	e hours.					

Numbering	y code												
Course title <english></english>	航空宇 Engineerin	宙工学実! 1g Laboratory i	験 1 in Aero	(宇) nautics and Astr	onautics 1	Aff dep Job	Affiliated department, Job title,Name			Graduate School of Engineering Professor,ERIGUCHI KOUJI Graduate School of Engineering Assistant Professor,SUGIYAMA FUMIKO Graduate School of Engineering Senior Lecturer,SUGIMOTO HIROSHI Graduate School of Engineering Assistant Professor,HATTORI MASANARI			
Target ye	ar Brd y	/ear students o	n above	Number	of cred	lits	1	Co yea	urs ar/p	e offered eriod	2019/First semester		
Day/perio	d Fri.3	,4	Cla	ss style	Experi	men	it			Language	Japanese		
[Outline a	nd Purp	pose of t	he C	ourse]									
										_			
[Course G	oals]												
[Course S	chedul	e and Co	nten	its]									
,1time, ,4times, ,4times, ,4times,	I time, Atimes, Atimes, Atimes,												
[Class req	uireme	ent]					_						
None													
[Method, F	Point of	f view, ar	nd At	ttainment	levels	of E	valuat	ion]				
[Textbook	1												
[Reference	e book	s, etc.]											
(Referer	ice boo) oks											
[Regardin	g studi	es out of	clas	ss (prepar	ation a	ind i	review)]					
(Others (office h	iour, etc.))										
*Please visit	KULAS	SIS to find	l out a	about office	hours.								

											~
Numbering	g code										
Course title <english></english>	ourse title English> 前空宇宙工学実験2(字) Engineering Laboratory in Aeronautics and Astronautics Target year 3rd year students or above Number of cree							, me	Gra Pro Gra Pro Gra Sen Gra Ass Gra Ass Gra Ass Gra Ass	duate Scho fessor,ERIC duate Scho duate Scho ior Lecture duate Scho istant Profes duate Scho ociate Profes duate Scho ociate Profes duate Scho stant Profes	ol of Engineering GUCHI KOUJI Jol of Engineering DA KEI ol of Engineering r,AOI SHINYA ol of Engineering sor, URABE KEIICHRO ol of Engineering MOTO KENJI ol of Engineering sor, MARUTA ICHIROU ol of Engineering or, SUGIYAMA FUMIKO
Target ye	rear 3rd year students or above Number of credits 1 Course offered year/period 2019/									2019/Second semester	
Day/perio	ay/period Tue.3,4 Class style Experiment									Language	Japanese
[Outline a	nd Pur	pose of t	he C	ourse]							
[Course G	ioals]										
[Course S	chedu	le and Co	onten	ts]							
,1time, ,4times, ,4times, ,4times,											
[Class rec	uirem	ent]									
None											
[Method, I	Point c	f view, a	nd At	tainment	levels	of E	valuat	ion]		
[Textbook]										
[Referenc	e book	s, etc.]			_						
(Refere	nce bo	oks)									
[·									Co	ntinue to 航空	宇宙工学実験2(宇) (2)

航空宇宙工学実験2(宇)(2)

*

[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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Numbering	g co	de									
Course title <english></english>	金厚 Stru	【材料学(材 actural Metalic) : Mate	erials		Aff dep Job	iliated partment p title,Na	, me	Grac Prof	luate Scho essor,TSU	ol of Engineering JI NOBUHIRO
Target ye	ar	3rd year students o	ır above	Number	of cred	its	2	Cou yea	urse ar/pe	offered riod	2019/Second semester
Day/perio	d 1	'hu.2	Cla	ss style	Lecture	•			I	Language	Japanese
[Outline a	nd F	Purpose of t	he Co	ourse]							
10						_					
[Course G	ioai	5]									
[Course S	che	dule and Co	onten	ts]					_		
Microstructu Deformation ,3times, Heat Treatm Summary,1t	ure E n, Re nent i time,	volution in Ca covery, Recry in Steels,5time	ast Al stalliz es,	loys,2times zation and C	, Grain Gr	owt	h,3time	s,			
[Class rec	quire	ement]			_		_			_	
None											
[Method,	Poir	nt of view, ar	nd At	tainment	levels	of E	valuat	ion]]		
Attendance,	exei	cises, home-w	vorks	and exam.							
[Textbook	(]										
[Referenc	e bo	ooks, etc.]									
(Refere	nce	books)									
(Related	1 UR	Ls)									
(http://www	v.tsu	jilab.mtl.kyoto)-u.ac	.jp/01Tsujil	Lab/Edu	cati	on/Strue	ctMe	etalM	fater/)	
[Regardin	g st	udies out of	clas	s (prepara	ation a	nd	review)]			
(Others (offic	e hour, etc.))								
*Please visi	t KU	LASIS to find	l out a	bout office	hours.						

Numbering	g co	de										
Course title <english></english>	材料 Phy	¥強 sics	<mark>度物性(</mark> of Streng	材) th of 1	Materials		Aff dej Jol	iliated partment b title,Na	, me	Gra Pro	aduate Scho fessor,INU	ol of Engineering I HARUYUKI
Target ye	ar	3rd y	ear students (or above	Number	of cred	lits	2	Co yea	urs ar/p	e offered eriod	2019/Second semester
Day/perio	dI	Fri.1		Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd	Purp	oose of t	the C	ourse]							
This course deformation grain bound:	expl of c aries	aine: rysta s, bas	s fundam als, yieldi sed on dis	entals ng, wo slocati	of crystal p ork-hardeni on theory.	lasticity ng, solu	and tion	l strengt hardeni	th of ing,	f ma prec	terials inclu cipitation ha	iding plastic irdening, properties of
[Course G	ioal	s]										
This class ai acquire way	ms t s to	o he inter	lp studen pret stren	ts to a gth of	cquire fund crystalline	amental materia	s of ls ba	deform ased on	atio disl	n of ocat	crystalline ion theory.	materials and also to
[Course S	che	dule	e and Co	onten	ts]							
 (2) Work ha (3) Strength (4) Dislocati (5) Dislocati (6) Grain bo (7) Feedbacl 	rder and ons on 1 und c [1	ing, toug in cr notic aies a weel	solution l shness of systalline ons and th and crysta k]	harder comp mater nermal al plas	and pre- posites [1 we ials [6 week activation ticity of pol	ecipitatio ek] cs] processo lycrysta	on h es [1 ls [1	ardening week] week]	g [3	wee	eks]	
[Class req	uir	eme	nt]									
Physics of C	ryst	al Pr	operties a	and In	perfections	;						
[Method, I	Poir	nt of	view, a	nd At	tainment	levels	of E	Evaluat	ion]		
Evaluation v grading dete	vill rmii	be ba natio	ised on a n.	writte	n examinati	ion. Atte	enda	ince and	dai	ly re	eports may l	be considered in
[Textbook]											
Hand out ma	ateri	als w	vill be pro	ovided	during the	lecture.						
[Referenc	e bo	ooks	s, etc.]									
 (Reference books) 鈴木秀次 『転位論入門』(アグネ)ISBN:4750702315 J.P. Hirth and J. Lothe 『Theory of Dislocations』(McGraw-Hill)ISBN:TY86299777 J.P. Hirth and J. Lothe 『Theory of Dislocations, 2nd ed.』(Wiley)ISBN:047109125 角野浩二(編) 『結晶の塑性』(丸書)ISBN:TW86162567 日本金属学会 『材料強度の原子論』(日本金属学会)ISBN:4889030220 竹内 伸 『結晶塑性論』(内田老鶴圖)ISBN:978-4-7536-5090-3 												
[Regardin	g si	tudie	es out o	f clas	s (prepara	ation a	nd	review)]			
To review co	onte	nts c	overed in	the p	revious lect	ure.						
(Others (offi	ce h	our, etc	.))								
*Please visit	KU	LAS	SIS to find	d out a	bout office	hours.						

Course title <english></english>	統計 Stati	│熱力学 istical Thern	nodyna	mics		Aff de Jo	iliated partmen b title,Na	t, ime	Gra Asso	aduate Scho ociate Professo	ool of Engineering r,MATSUMOTO MITSUHIRO
Target ye	ar	4th year students	or above	Number	of cred	lits	2	Co yea	urs ar/p	e offered eriod	2019/First semester
Day/perio	d N	fon.1	Cla	ss style	Lectur	e				Language	Japanese
[Outline a	nd P	Purpose of	the C	ourse]							
Statistical m mechanics t mechanics,	echa hroug solid	nics provide gh several ba state physic	s a firr sic exa s, heat	n foundatio amples in va transfer eng	n for the arious fi gineerin	ermo ields g, ai	odynam of scie nd infor	ics.] nce : mati	['ll g and on t	give a stand engineering technology.	ard course of statistical g, including quantum
[Course G	ioals	5]			-						
 Understand Scientific 	ling view	the relation of various p	oetwee ohenon	n macrosco 1ena in scie	pic vari nce and	able eng	s and m ineering	icro g bas	scoj sed (pic states. on statistics	·.
[Course S	che	dule and C	onter	its]							
4th-6th week 7th-9th week 10th-11th w 12th week: 1 13th week: 1 14th week: 1 15th week: 1	ks: V ks: Q eeks: Photo Appli Exam Feedt	arious enser Juantum stati Introductio ons and Phor ication to Int hination back class	nbles a stics (l n to so ions formati	nd Free end Bose-Einste lid state phy ics	ergies ein vs. F ysics	erm	i-Dirac)	I			
[Class red	luire	ement]									
Basic knowl useful.	edge	of thermod	ynamic	s, calculus,	statistic	cs, a	nalytica	l me	cha	nics, and q	uantum physics will be
[Method,	Poin	t of view, a	and A	ttainment	levels	of E	Evalua	tion]		
- Written ex - Paper assig	amin gnme	ation nt									
[Textbook]										
Lecture note	s wil	ll be provide	d.								
[Referenc	e bo	oks, etc.]									
(Referent Introduced of	nce I luring	books) g class									
[Regardin	g sti	udies out o	of clas	ss (prepar	ation a	nd	review)]		_	
Since this cl students of v	ass c ariou	overs basics us research f	in phy ields a	sics with m re welcome	any exa	mpl	es enco	unte	red	in science a	and engineering,
(Others (offic	e hour, et	:))								

*Please visit KULASIS to find out about office hours.

								*				
Numbering c	ode											
Course title 固 <english> P}</english>	体物性学(機 nysics of Solids)		A D J	offiliated lepartment ob title,Na	, me	Graduate Scho Associate Profe	ool of Engineering ssor,NAKAJIMA KAORU				
Target year	4th year students of	or above Num	nber o	of credit	s 2	Cou yea	rse offered r/period	2019/First semester				
Day/period	Tue.2	Class sty	yle	Lecture			Language	Japanese				
[Outline and	I Purpose of t	he Course	9]									
[Course Goa	als]											
[Course Sch	edule and Co	ontents]										
Crystal structure,1time,												
Diffraction of waves by crystals,3~4times, Vibrations of crystals,3~4times												
vibrations of crystals, 5~41mes, Thermal properties of crystals, 2times,												
Electronic dructures of crystals,3~4times,												
Assessment of	achievement,1t	ime,										
[Class requi	rement]											
None												
[Method, Po	int of view, a	nd Attainm	nent l	evels of	Evaluat	ion]						
[Textbook]												
[Reference]	hooks atc.l											
(Reference	e books)											
quotIntroduction }{0471680575	on to solid state	physicsquo	t by C	harles Ki	tel isbn{	{978	80471415268	}, international ed. isbn{				
[Regarding	studies out of	f class (pr	epara	ation and	d review)]						
(Others (of	fice hour, etc.)										
*Please visit K	ULASIS to find	l out about o	office	hours.								

Numbering c	ode						~				
Course title 統 <english> St</english>	計熱力学(材 atistical Therm	エネ) odynamics	filiated epartment ob title,Na	, Gr me As	aduate Scho sociate Profe	ol of Energy Science essor,MIYAKE MASAO					
Target year	3rd year students of	or above Number	of credits	2	Cours year/p	2019/Second semester					
Day/period	Tue.3	Class style	Lecture			Language	Japanese				
[Outline and	Purpose of t	he Course]									
In this lecture, fundamental ideas of Statistical Thermodynamics which is effective to microscopic understanding of macroscopic systems and some typical applications to condensed matter physics are presentaed.											
[Course Goa	als]										
The goals of this lecture are both to understand fundamental idead of Statistical Thermodynamics and to study typical applications to condensed matter physics.											
[Course Schedule and Contents]											
Outlines, Itime, Basic ideas of Statistical Thermodynamics, thermal equilibrium, fundamentals of Statistics, means of measuremnts, ergodic theory. Themodynamic functions, Itime, Thermodynamic laws, thermodynamic functions, Legendre transform, Maxwell relations, Gibbs-Helmholtz equation, thermodynamic variation, phase equilibrium. Ideal systems, 4times, Phase space of movement, Liouville#039s theorem, micro canonical ensemble, Partition function, relation between Helmholtz free energy and Partition function, Principle of Boltzmann, simple applications of microcanonical ensamble (ideal gas, elastic of gum) , Itime, Canonical ensemble, 2times, Distribution with the maximum probability, Partition function, the 3rd law of thermodynamics, Gibbs#039s paradox, grand canonical ensamble. Quantum statistics, 2times, Grad canonical ensamble of quatum statistics, Fermion and Boson, Bose-Einstein statistics, Fermi-Dirac statistics, ideal Fermi gas, electron specific heat, ideal Bose gas, Bose-Einstein condensation. Typical applications, 4times, Systems with two levels, Schottly type specific heat, Statistics of photons, Planck#039s equation, one dimansional harmonic oscillation, Einstein model and specific heat of solid states. Evaluation od goals, Itime, Understanging of typical applications of statistic themodynamics and submission											
[Class requi	rement]										
Students are ro mechanics, the	ughly expected rmodynamics a	to have mastered nd statistics.	basics of 1	nathema	tics, dy	namics, eler	nentary quantum				
[Method, Po	int of view, a	nd Attainment	levels of	Evaluat	ion]						
Situation of vo	luntary submiss	sion of some repo	rts and sco	re of exa	m are to	otally evaluated	nted.				

- -

Continue to 統計熱力学(材工ネ)(2)

Textbook] The textbook is not appointed. Writing on the blackboard is performed in every lecture. Reference books, etc.] (Reference books) 1. 原局 鲜: 「熟力学・統計力学」培風館, isbn[]{9784563021399} 2. N.スミス (小林宏・岩橋横夫訳): 「統計熱力学入門 - 演習によるアプローチ - 」東京化学同 (, isbn[]{4807903225} 3. 市村 浩: 「統計力学」業華房, isbn[]{4785321342} 1. 市村 浩: 「統計力学」業華房, isbn[]{4785321350}
Textbook] he textbook is not appointed. Writing on the blackboard is performed in every lecture. Reference books, etc.] (Reference books) .原局 鲜:「熱力学・統計力学」培風館, isbn{}{9784563021399} .Nスミス(小林宏・岩橋槇夫訳):「統計熱力学入門 - 演習によるアプローチ - 」東京化学同 ., isbn{}{4807903225} .市村 浩:「統計力学」業單房, isbn{}{4785321342} .市村 浩:「統計力学」業單房, isbn{}{4785321342} .市村 浩:「魏計力学」業單房, isbn{}{4785321350}
he textbook is not appointed. Writing on the blackboard is performed in every lecture. Reference books, etc.] (Reference books) . 原島 鲜:「熟力学・統計力学」培風館, isbn{}{9784563021399} : ハスミス(小林宏・岩橋槇夫訳):「統計熱力学入門 - 演習によるアプローチ - 」東京化学同 ., isbn{}{4807903225} : 市村 浩:「統計力学」業華房, isbn{}{4785321342} 古村 浩:「魏計刀学」業華房, isbn{}{4785321342}
Reference books, etc.] (Reference books) .原島 鮮:「熟力学・統計力学」培風館, isbn{}{9784563021399} と、Nスミス(小林宏・岩橋横夫訳):「統計熱力学入門 - 演習によるアプローチ - 」東京化学同 、, isbn{}{4807903225} 3.市村 浩:「統計力学」業華房, isbn{}{4785321342} - 市村 浩:「魏計刀学」業華房, isbn{}{4785321342}
Reference books, etc.] (Reference books) .原島 鮮:「熱力学・統計力学」培風館, isbn{}{9784563021399} と、Nスミス(小林宏・岩橋横夫訳):「統計熱力学入門 - 演習によるアプローチ - 」東京化学同 、, isbn{}{4807903225} 3.市村 浩:「統計力学」業華房, isbn{}{4785321342} - 市村 浩:「魏計力学」業華房, isbn{}{4785321342}
 (Reference books) . 原島 鮮:「熱力学・統計力学」培風館, isbn{}{9784563021399} 2. N、スミス(小林宏・岩橋槇夫訳):「統計熱力学入門-演習によるアプローチ-」東京化学同 、 isbn{}{4807903225} 3. 市村 浩:「統計力学」裳華房, isbn{}{4785321342} 1. 市村 浩:「統計力学」裳華房, isbn{}{4785321342}
- Jong Fr. ポインチ Will 10/+1-140846, 15001(19764-303021397) 2. N.スミス (小林宏・岩橋横夫訳):「統計熱力学入門 - 演習によるアプローチ - 」東京化学同 (、isbn{}{4807903225} 3. 市村 浩:「統計力学」裳華房, isbn{}{4785321342} 1. 市村 浩:「魏計の学」裳華房, isbn{}{4785321350}
、, isbn{}{4807903225} 3. 市村 浩:「統計力学」裳華房, isbn{}{4785321342} 1. 市村 浩:「魏計力学」裳華房, isbn{}{4785321342}
3 . 市村 浩: '統計刀字」
5.キッテル:「熱物理学」丸善, isbn{}{9784621027271}
6 . 沼居貴陽:「熱物理学・統計物理学演習」丸善, isbn{}{4621048570} 7 . W グライナー - エナイゼ, U シュラッカー (伊藤伊寿, ――――――――――――――――――――――――――――――――――――
/ * W.ウノイリー, L.フィビ, H.フュノッカー(伊藤仲泰, 肖木王子訳) . * 熱力子・統計力子」 ンュプリンガー, isbn{}{9784431100577}
8 . 久保亮五:「ゴム弾性」裳華房 isbn{}{478532807X}
Regarding studies out of class (preparation and review)]
(Others (office hour, etc.))
and year students may undestand this lecture if they catch on basics of physics.
Place visit VIII ASIS to find out about office hours
rease visit KOLASIS to find out about office nours.

Numbering	g cod	le								
Course title <english></english>	生物 Mole	n物理学 ecular Biophy	vsics		Graduate School of Biostudies Professor, MATSUMOTO TOMOHIRO nsitue for Integrated Radiation and Nuclear Science Associate Professor, SAKURAI YOSHINORI Graduate School of Biostudies Professor, TAKATA MINORU Graduate School of Biostudies Professor, HARADA HIROSHI					
Target ye	ar	3rd year students o	r above	Number	of cred	its	2	Cours year/p	e offered eriod	2019/First semester
Day/perio	d M	lon.2	Cla	ss style	Lecture	e			Language	Japanese
[Outline a	nd P	urpose of t	he C	ourse]						
		_								
[Course G	ioals	5]								
			_							
[Course S	cheo	dule and Co	onten	itsj						
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[Class red	uire	ment]								
None										
[Method.]	Poin	t of view. a	າd At	tainment	levels	of E	Evaluat	ion]		
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Numbering	a co	de									
Course title <english></english>	品 Qu	質管理 ality Control				Aff dep Job	iliated partment p title,Na	t, ime	Gra Pro Gra Ass	aduate Scho ofessor,NISI aduate Scho sociate Prof	ol of Engineering HWAKI SHINJI ol of Engineering essor,IZUI KAZUHIRO
Target ye	ar	4th year students	or above	Number	of cred	lits	2	Co yea	ours ar/p	e offered eriod	2019/First semester
Day/perio	d	Wed.4	Cla	ss style	Lecture	е				Language	Japanese
[Outline a	nd	Purpose of	he C	ourse]							
This course	deal	ls with the bas	ics of	quality con	trol met	hod	ologies	and	reli	ability engir	neering techniques.
[Course G	ioal	ls]									
The goal is t	o u	nderstand the	concep	ot of numeri	ical and	stra	tegic ap	pro	ache	es of quality	control techniques.
[Course S	che	edule and Co	onten	its]				-			
Introduction Statistics an Statistical pr Design of ex Analysis of Application Reliability,4	,1tin d hy roce (per vari of c tim	me, pothesis testii ss control,2tim iments,2times ance,2times, lesign of exper- es, ement]	ng,2tir nes, riment	nes, 18,2times,							
None											
[Method]	Poi	nt of view a	nd At	tainment	levels	of F	valuat	ion	1		
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rne regului	erta.	initiation, in c			, und rep	0110	uro uut				
[Textbook]										
Not used											
[Referenc	e b	ooks, etc.]			_		_				
(Refere	nce	books)									
[Regardin	g s	tudies out o	f clas	s (prepar	ation a	nd	review)]			
Homework	prot	plems are assig	ned.								
(Others (offi	ce hour, etc	.))								
*Please visit	K	JLASIS to fin	d out a	about office	hours.						

Textbook1				
Textbook				
[Reference	ooks etc.]			
(Reference	books)			
[Regarding :	tudies out of class	(preparation a	nd review)]	
(Others (off	ico hour oto))			
Please visit K	ULASIS to find out ab	out office hours.		

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Numbering	g code										
Course title <english></english>	精密加] Precisio	工学(機 n Machin) ing		Affiliated department, Job title,Name Senior Lectur			choc MAT choc rofes choc	chool of Engineering IATSUBARA ATSUSHI chool of Engineering rofessor,KOUNO DAISUKE chool of Engineering BEAUCAMP, Anthony Tadeus Herve		
Target ye	e ar 4th y	ear students of	or above Number	r of crec	lits 2	Co ye	ourse offere ar/period	ed	2019/First semester		
Day/perio	d Tue.	1	Class style	Lectur	e		Langua	age	Japanese		
[Outline a	nd Purp	pose of t	he Course]								
[Course G	ioals]										
[Course S	chedul	e and Co	ontents]								
,2times,											
,3times,											
.2times.											
,2times,											
,1time,											
,1time,											
,1time,											
[Class red	quireme	ent]									
None											
[Method, I	Point of	f view, a	nd Attainmen	t levels	of Eval	uation	1]				
[Textbook	d]										
[Referenc	e book	s, etc.]									
(Refere	nce boo	oks)									
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Inegarum	y studi	es out o	i ciass (piepa			ew)]					
(Others (office h		1)				_				
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1 10450 1151	I KULA	515 10 1110		a nours.							

Numbering	g co	de								
Course title <english></english>	材料 Ele	科電気化学(ctrochemistry	材) of Ma	aterials Proc	cessing	Aff de Joi	iliated partment b title,Na	t, me	Graduate Scho Professor, MUF Graduate Scho Associate Profes	ol of Engineering RASE KUNIAKI ol of Engineering sor,FUKAMI KAZUHIRO
Target ye	ar	3rd year students of	or above	Number	of cred	lits	2	Co yea	ourse offered ar/period	2019/First semester
Day/perio	d	Wed.1	Cla	ss style	Lectur	е			Language	Japanese
[Outline a	nd	Purpose of t	he C	ourse]						
This course which becor anticorrosio	serv ne t n, ai	ves the fundam he basis of we nd functional e	entals t proc lectro	related to s essing such deposition.	solution as elect	che roly	mistry o tic refir	of el ing	ectrolytes and e , electrowinning	lectrode reactions, , corrosion,
[Course G	ioal	ls]								
In this cours necessary to electrochem	e st stu istry	udents learn ba dy materials so y, to take subse	isic te cience quen	chnical terr and engine t advanced	ns and b eering fr courses	om om on r	c concep the view naterial:	ots o vpoi s sci	of physical cheme nts of solution c ience and engine	histry, which are chemistry and cering.
[Course S	che	edule and Co	onten	its]						
Overview 1	tim	e								
Solution che	emis	stry of electroly	ytes, 2	times, acio	l-base re	eacti	ons, red	lox 1	reactions, equili	brium of them.
Introduction electrode su and Nernst's	of rfac equ	electrode poter e as an interfac ation.	itial a ce for	nd its relati exchange t	on to ch he carrie	emi er, e	cal ther xplanati	mod on c	lynamics, 4 time of the concept of	es, explanation of f electrode potential
Electrolysis, electrodes).	1 ti	ime, explanatio	on on	the importa	ince of t	hree	electro	de s	etup (working, o	counter and reference
Electrode re surface towa potential, ov	acti ard u erp	ons, 4 times, e understanding otential, diffus	xplan of bat ion-li	ation on the teries and c mitation of	e fundan orrosior reactant	nent 1, ex 1s.	als of el planatio	ectr on o	ochemical react n the relation be	ion rate on a electrode etween current and
Transfer of i and liquid ju	ions	, 2 times, expl ion potential.	anatio	on on the tra	insfer of	ion	s in solı	itior	n for understand	ing diffusion potential
Summary, 1	tim	æ.								
[Class red	Juir	ement]								
Knowledge	give	en in Thermod	ynam	ics of Mater	rials 2 (t	oy P	rof. Uda	a) is	preferable.	
-										
L										
									Continue to 材	料電気化学(材) (2)

材料電気化学(材)(2) [Method, Point of view, and Attainment levels of Evaluation] (1) Class participation, (2) take-home assignments, and (3) exams. Students will sign a roll sheet every class. Supplementary examination to bail out low-performing students will not be given for any reason. [Textbook] A course booklet written in Japanese will be given out at the first lecture. [Reference books, etc.] (Reference books of class (preparation and review)] Reports given in the lectures will return after checking. Brush up according to the reports returned. (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

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Numbering c	ode								
Course title 原 <english> Ba</english>	urse title nglish> Basic Nuclear Reactor Exercise and Experimen arget year 4th year students or above Number of cr				t, ime	Institute for Integrated Radiation and Nuclear Scien Professor, UNESAKI HIRONOBU Institute for Integrated Radiation and Nuclear Scien Professor, MISAWA TSUVOSHI Institute for Integrated Radiation and Nuclear Scien Professor, NAKAJIMA KEN Graduate School of Energy Science Associate Professor, PIYON CHIYORUH			
Target year	4th year students of	or above Number	of cred	lits 2	Co yea	urse offered ar/period	2019/First semester		
Day/period	Mon.3,4	Class style	Semina	ar		Language	Japanese		
[Outline and	Purpose of t	he Course]							
[Course Goa	als]	toristics and safet	w evetor	n of nuclear		tor through roo	ator physics		
experiments	nuclear charact	eristics and safet	iy system	n or nuclear	reac	tor through rea	ctor physics		
[Course Sch	edule and Co	ontents]							
Experiment, 1ti week. 1) guida measurement e	me,Experiment nce 2) criticality experiment 5) op rement]	s are performed a y approarch expe peration of nuclea	at Resea eriment 3 ar reacto	rch Reactor 3) control ro or	Inst d ca	itute (Kumatori ribration experi	-cho, Osaka) for 1 ment 4) neutron flux		
Basic knowled	ge about reacto	r physic							
[Method, Po	int of view, a	nd Attainment	levels	of Evaluat	tion]				
reports before	and after experi	ments							
[Textbook]									
Download from	n Web site (Jap	anese, English ar	nd Korea	in versions	are a	vailable)			
[Reference I	books, etc.]								
(Reference	e books)								
[Regarding	studies out o	f class (prepar	ation a	nd review)]				
(Others (off	lice hour, etc.))							
1) Registration	to workers for	radioactive mate	rial treat	ment is req	uired	l before experin	nent.		
2) English cot	ise for this exp	eriment is opened	u.						

Numberin	g co	de							
Course title <english></english>	物 Intr	里工学総論 A oduction to Er	(7• nginee	8・9組) rring Scienc	e A	Affiliated department Job title,Na	G P P G G P P G G P P G G P P A A A A A	raduate Scho rofessor, HIR. rraduate Scho rofessor, KAN rraduate Scho rofessor, KON rofessor, TAB rraduate Scho rofessor, TAB rraduate Scho rofessor, HAN raduate Scho ssociate Profess rraduate Scho ssociate Profess rraduate Scho ssociate Profess rraduate Scho rofessor, INA raduate Scho rofessor, INA	ol of Engineering AKATA HIROYUKI ol of Informatics IOU MANABU ol of Engineering AGRI MASAHARU ol of Engineering ATA OSAMU ol of Engineering HIDA HIDEO ol of Engineering MIDA TAKAHIRO ol of Engineering or,SHIMADA TAKAHIRO ol of Engineering sor,NAKAJIMA KAORU ol of Engineering sor,SHIKAMA TAIICHI ol of Engineering MURO TAKAJI Ol of Engineering MURO TAKAJI ol of Engineering D of Engineering D of Engineering MURO TAKAJI
Target ye	ear	1st year students o	ır above	Number	of cred	lits 2	Cour year/	se offered period	2019/First semester
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[Outline a	nd I	Purpose of t	he C	ourse]					
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[Course S	Sche	dule and Co	onten	its]					
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[Class red	quire	ement]			_	_			
None									
[Method,	Poir	nt of view, a	nd At	tainment	levels	of Evaluat	ion]		
								Continue to 物理工	学総論A(7・8・9組)(2)

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Numbering	000	de										
Course title <english></english>	物理工学総論A(9・10・11・12組) Introduction to Engineering Science A				2組) ee A	Affiliated department, Job title,Name			Graduate School of Engineering Professor, HIRAKATA HIROYUKI Graduate School of Informatics Professor, KANOU MANABU Graduate School of Engineering Professor, TABATA OSAMU Graduate School of Engineering Professor, TABATA OSAMU Graduate School of Engineering Professor, HANAZAKI HIDEO Graduate School of Engineering Associate Professor, SIMADA TAKAHIRO Graduate School of Engineering Associate Professor, NAKAJIMA TAKAHIRO Graduate School of Engineering Associate Professor, NAKAJIMA KAORI Graduate School of Engineering Associate Professor, NAKAJIMA KAORI Graduate School of Engineering Associate Professor, SHIKAMA TAIICH Graduate School of Engineering Professor, INAMURO TAKAJI Graduate School of Engineering Professor, JNAMURO TAKAJI Graduate School of Engineering Professor, JNAMURO TAKAJI			
Target yea	ar	1st year students o	r above	Number	of cred	its	2	Co yea	urs ar/p	e offered eriod	2019/First semester	
Day/perio	d V	Ved.2	Cla	ss style	Lecture	ire Language Japanese					Japanese	
[Outline ar	nd F	urpose of t	he Co	ourse]								
[Course G	[Course Goals]											

[Course Schedule and Contents]

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

detection. Intrusion Detection by Signature-Based IDS, 5times, Learn the mechanism of intrusion detection by signature-based IDS by studying open source signature-based IDS and attacks, such as correspondence between alarms issued from IDS and communications, and adding signatures to detect attacks. Intrusion Detection by Machine Learning,7times, Learn the method of classifying normal and malicious traffic by machine learning algorithms and public dataset for benchmarking intrusion detection performance. Presentation,1time,Based on the exercise, students presents their methods of intrusion detection using machine learning, and discuss it with other students and instructors.

_____Continue to 物理工学胞論A(9・10・11・12組)(2)

物理工学総論A(7・8・9 組) (2)		物理工学総
		[Class r
[Textbook]		None
		[Method
		Incuroa
[Reference books, etc.]		
(Reference books)		[Textbo
[Regarding studies out of class (preparation and review)]		[Referen
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(Others (office hour, etc.))		
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総論A(9・10・11・12組)(2) equirement] I, Point of view, and Attainment levels of Evaluation] ok] nce books, etc.] ence books) ing studies out of class (preparation and review)]

s (office hour, etc.)) isit KULASIS to find out about office hours.

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Numbering	g cod	e									
Course title <english></english>	物理 Intro	工学総論 B duction to E	二学総論 B(7・8・9組) action to Engineering Science B year students or above Number of cred				Affiliated department, Job title,Name Course offered Associate School of Engineerin Professor,UDA TETSUYA Graduate School of Engineerin Associate Professor,FUROKAWA. Graduate School of Engineerin Associate Professor,SEKO AT Graduate School of Engineerin Professor,HIRATOU TETSUJJ Graduate School of Engineerin Professor,IMATANI SHYOU Graduate School of Engineerin Professor,MATANI SHYOU Graduate School of Engineerin Professor,KATNO IKUO Graduate School of Engineerin Professor,KATNO IKUO Graduate School of Engineerin Professor,KATANI SADA Graduate School of Engineerin Professor,TURAKAMI SADA Graduate School of Engineerin Professor,TURAKAMI SADA Graduate School of Engineerin				
Target ye	ear	st year students	or above	Number	of cred	lits 2		Cours year/p	e offered eriod	2019/Second semester	
Day/perio	od W	ed.2	Cla	ss style	Lectur	e			Language	Japanese	
[Outline a	ind P	urpose of	the C	ourse]	-				· · · · · ·		
[Course G	Goals]									
[Course S	Scheo	dule and C	onten	nts]							
,1time, ,5times, ,4times, ,4times, ,1time,											
[Class red	quire	ment]									
None									ntinue to 物理工	学經論日 (7・8・9組)(2) — -	

物理工学総論 B(7・8・9 組) (2)
[Method, Point of view, and Attainment levels of Evaluation]
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[Reference books, etc.]
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ID a mode on a table of a loss (many and an invited)
[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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Numbering	g coc	le											
Course title <english></english>	物理工学総論 B(9・10・11・12組) Introduction to Engineering Science B					Aff de Jo	filiated partment b title,Na	, me	Graduate School of Engineering Professor, UDA TETSUYA Graduate School of Engineering Professor, TSUJI NOBUHIRO Graduate School of Engineering Associate Professor, KUKOKAWA SHIYUU Graduate School of Engineering Associate Professor, FUKAMI KAZUHIRO Graduate School of Engineering Associate Professor, SEKO ATSUTO Graduate School of Engineering Professor, TAIAGIWARA RIKA Graduate School of Engineering Professor, TAKAGI IKUJI Graduate School of Engineering Professor, TAKAGI IKUJI Graduate School of Engineering Professor, KANNO IKUO Graduate School of Engineering Professor, KANNO IKUO Graduate School of Engineering Professor, MAXAMI SADAYOSHI Graduate School of Engineering				
Target ye	ar	1st year students o	r above	Number	of cred	its	2	Cou yea	urs ir/p	e offered eriod	2019/Second semester		
Day/perio	d W	Ved.2	Cla	ss style	Lecture	•				Language	Japanese		
[Outline a	nd P	Purpose of t	he C	ourse]									
[Course G	ioals	s]											

[Course Schedule and Contents]

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

Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection. Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by signature-based IDS by studying open source signature-based IDS and attacks, such as correspondence between alarms issued from IDS and communications, and adding signatures to detect attacks. Intrusion Detection by Machine Learning,7times,Learn the method of classifying normal and malicious traffic by machine learning algorithms and public dataset for benchmarking intrusion detection performance. Percentration Using Research on the averaging public methods of intrusion detection using traffic by machine learning algorithms and public dataset for benchmarking intrusion detection performance.

Presentation, Itime, Based on the exercise, students presents their methods of intrusion detection using machine learning, and discuss it with other students and instructors.

Continue to 物理工学総論 B(9・10・11・12組)[2)

[Class requir	ement]				
None					
[Method, Poi	nt of view, and	d Attainmen	levels of Eval	uation]	
[Textbook]					
[Textbook]					
[Textbook]					
[Textbook] [Reference b	ooks, etc.]				
[Textbook] [Reference b	ooks, etc.]				
[Textbook] [Reference b (Reference	ooks, etc.] books)				
[Textbook] [Reference b (Reference	ooks, etc.] books)				

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

Numbering	g code												
Course title <english></english>	核物理 Fundar	基 nen	礎論(」 Itals of 1	原) Nuclea	r Physics		Aff de Joi	iliated partment b title,Na	, me A	Fradua Assista Fradua Associate	te Schoo nt Profe te Schoo e Professo	ol of Engineering ssor,OGURE KENZOU ol of Engineering r,MIYADERA TAKAYUKI	
Target ye	ar 4th	year	students o	or above	Number of	of cred	its	2	Cour year	rse of /perio	fered d	2019/First semester	
Day/perio	d Thu	.2		Clas	ss style	Lecture	e			Lan	iguage	Japanese	
[Outline a	nd Pu	rpo	se of t	he Co	ourse]								
Basics of nu	clear st	ruc	ture wil	l be ex	plained.								
[Course G	ioals]												
To understand nuclear structure by using quantum theory.													
[Course S	chedu	le a	and Co	onten	ts]								
Structure of Alpha decays Beta decays, Isospin, 2tin Relativistic p Pion field, 1 Confirmatio [Class req Quantum ph [Method, I exam	nuclei,: s and fi 1 time, nes particle field, 2t time n of acl uirem ysics 1	2tin issio , 1ti time hiev ent and	nes, on,2time ime es vement i 1 2 iew, ar	es, in stud	y,1time,	levels	of E	Evaluat	ion]	_			
[Textbook]												
Not used													
[Reference	e bool	ĸs,	etc.]										
(Referen	nce bo	ok	s)										
[Regardin	g stud	lies	out of	f clas	s (prepara	ation a	nd	review)]				
solve proble	ms pres	sent	ed in th	e lectu	ires.								
(Others (office	hou	ur, etc.))	_						_		
*Please visit	KULA	SIS	S to find	l out a	bout office	hours.							

Numbering	g code									
Course title <english></english>	放射化 Radioc	学(エネ hemistry	原)			Aff dej Jol	iliated partment b title,Na	, me	Graduate Scho Professor,SAS Graduate Scho Associate Profes	ol of Engineering AKI TAKAYUKI ol of Engineering sor,TAISHI KOBAYASHI
Target ye	ar Brd	year students o	or above	Number	of crec	lits	2	Co yea	urse offered ar/period	2019/Second semester
Day/perio	d Mor	1.1	Cla	ss style	Lectur	e			Language	Japanese
[Outline a	nd Pur	pose of t	he C	ourse]						
Course C	eals1		_			_		_		
[Course d	ioaisj									
[Course S	chedu	le and Co	onter	its]						
,4times, ,1time, ,2times, ,4times, ,3times, ,1time,										
[Class rec	luireme	ent]								
None										
[Method,	Point o	f view, a	nd At	ttainment	levels	of E	Valuat	ion]	
[Textbook	(]									
[Referenc	e book	s, etc.]								
(Refere	nce bo	oks)								
[Regardin	g stud	ies out of	f clas	s (prepa	ration a	nd	review)]		
(Others (office I	nour, etc.))		_					
*Please visi	t KULA	SIS to find	l out a	about office	e hours.					

Numbering c	ode						
Course title 加 <english> Pa</english>	速器工学(原 article Accelera	ā) ators		Affiliated department Job title,Na	, Gra me ^{Asso}	duate Scho ociate Professo	ol of Engineering r,TSUCHIDA HIDETSUGU
Target year	3rd year students	s or above Number	of cred	lits 2	Course year/p	e offered eriod	2019/First semester
Day/period	Wed.1	Class style	Lecture	e		Language	Japanese
[Outline and	Purpose of	the Course]					
[Course Goa	als]						
[Course Sch	edule and C	ontents]					
,2times, ,2times, ,2times, ,2times, ,2times, ,1time, IClass requi None IMethod, Po	rement] int of view, a	and Attainment	levels	of Evaluat	ion]		
Track a shi							
[Textbook]							
[Reference b	oooks, etc.]						
(Reference	e books)						
[Regarding s	studies out o	of class (prepar	ration a	nd review)]		
(Others (off	ice hour, etc	:.))					
*Please visit K	ULASIS to fir	nd out about office	e hours.				

Numberin	g code												
Course title <english></english>	エネル Thermocl	ギー・材 hemistry for I	料熱化 Energy ar	学1(材 nd Materials	エネ) Science 1	Aff dej Jol	iliated partmen p title,Na	t, ame	Gra Pro Gra Asso	duate Sofessor,H duate Sociate Profes	choc IIRA choc essor,	ol of Energy Science ATOU TETSUJI ol of Energy Science HASEGAWA MASAKAT	SU
Target ye	ear βrd	year students o	or above	Number	of cred	lits	2	Co yea	urs ar/p	e offere eriod	d	2019/First semester	
Day/perio	d Mon	3	Clas	s style	Lecture	е				Langua	ge	Japanese	
[Outline a	nd Pur	pose of t	the Co	urse]									
This course environmen	will pro tal-frien	vide funda dly materi	amental als proc	s of therm duction / r	iochemi ecycling	stry, g pro	which cesses.	will	be 1	necessar	y to	think about	
[Course G	Goals]												
Students wi use phase di	ll be able iagrams.	e to calcula	ate ther	mochemic	cal prop	ertie	s of pu	re su	bsta	nces, m	ixtu	res and solutions, and	I
[Course S	Schedu	le and Co	ontent	s]									
Ellingham d Activity in b Phase diagra Standard sta Review(1 w Feedback(1	liagram a binary so am of bi ate of act veek) week)	and equilib blution(2 w nary syster ivity(2 we	brium in veeks) m(3 we eeks)	n gas phas æks)	e(3 wee	ks)							
[Class red	quireme	ent]											_
None													_
[Method,	Point o	f view, aı	nd Att	ainment	levels	of E	valua	tion]	I				
Results are However, th	evaluate here are o	d by a tern cases wher	n-end e re the re	xaminatio	on. ne quizz	es ir	the lec	ctures	s are	e conside	ered	•	
[Textbook	<]												
Instructed d	uring cla	155											
[Referenc	e book	s, etc.]											
(Refere David R. Ga Seshadri Se 9780080969	nce boo askell 『 etharama 9862	oks) Introduction an ed. [®] T	on to n reatise	netallurgic on proces	al therm s metall	nody urgy	namics , vol.1	а (Proc	Scr ess	ipta Pub fundame). Co ental) ISBN:007022945 ls a (Elsevier) ISB	7 N:
(Related	d URLs)											-
http://www.	lupin.m	l.kyoto-u.a	ac.jp/cl	ass.html									-
[Regardin	ig studi	ies out of	f class	(prepar	ation a	nd	review)]					
In order to b	e useful	for review	v, quizz	zes submit	ted will	be 1	eturnec	l afte	r ch	ecking.			
(Others (office h	nour, etc.	.))					_					
Please bring	g a scient	tific calcul	lator an	d a ruler.									_
*Please visi	t KULA	SIS to find	d out ab	out office	hours								

										*
Numbering code				Numbering c	ode					
Course title <english> Thermochemistry for Energy and Materials Scie</english>	Affiliated department, Job title,Name	Graduate Schoo Professor,HIRA Graduate Schoo Associate Professor,	ol of Energy Science ATOU TETSUJI ol of Energy Science HASEGAWA MASAKATSU	Course title <english> A</english>	料分析化学 nalytical Scie	(材) ences	Af de Jo	ffiliated epartment, ob title,Name	Graduate Scho Professor,KAV	ol of Engineering VAI JIYUN
Target year Brd year students or above Number of o	credits 2 Course	ırse offered r/period	2019/Second semester	Target year	· 3rd year studer	nts or above Number	of credits	2 Co	urse offered r/period	2019/Second seme
Day/period Mon.2 Class style Le	cture	Language	Japanese	Day/period	Wed.2	Class style	Lecture		Language	Japanese
[Outline and Purpose of the Course]				[Outline and	Purpose o	of the Course]				
This course will provide fundamentals of thermoch environmental-friendly materials production / recy	emistry, which will t cling processes.	be necessary to	think about	Quantum spect spectrometries	trochemistry, which are us	which is a basis of ed in materials ana	spectrocher spectr	mical analysi so be explain	s, will be lectur ed.	ed. Various kinds of
[Course Coole]				[Course Goa	aisj					
Students will be able to calculate thermochemical puse phase diagrams.	properties of pure sub	ostances, mixtu	res and solutions, and	The goal of the electrons, spin, forth, which ar	e course is to , principles of re necessary f	obtain knowledges f spectrometers, qu or spectrochemical	about quant antum mech analysis.	tum chemisti nanical calcul	y, interaction b ations related to	etween photons and o spectroscopy, and
[Course Schedule and Contents]				1 Quantization	1 time Brag	diffraction equati	on deduced	from Bohr-S	ommerferd aug	ntization Compton
Regular solution model() weeks) Gibbs-Duhem equation() weeks) Henrian activity(1 week) Gibbs phase rule(3 weeks) Phase diagram of ternary system(4 weeks) Nernst equation(1 week) Review(1 week) Feedback(1 week) [Class requirement] None [Method, Point of view, and Attainment lev Results are evaluated by a term-end examination. However, there are cases where the results of the q	els of Evaluation]	are considered		 Principle of helicity of pho Maessbauer sp Matrix mech spectra. Perturbation Optical transitic Harmonic os Electron spe interaction. Symmetry, 1 Interaction bi Angular mi Check of a 	least action,2 ton. Polarizat eetroscopy. 2 nanics,1time, theory,2times, n. scillator,1tim ectroscopy,1ti time,Symme between elect omentum and chievement,1	A from both wave times,Refraction o ion of light. Inertia Zeeman effect. Scheroedinger equi- es,Time independer Blackbody radiatic e,Harmonic oscilla me,Photoelectron : try of molecules. C rons and photons,2 l spin,1time,Angul time,	ation. Matrix ation. Matrix at perturbation. Time dep tor. WKB ap spectroscopy froup theory times,IR and ar momentum	eam. Phase v gravitational x mechanics. on theory appendent pertu pproximation y of transition y. Projection of d Smekal-Ra m and spin. S	elocity and groi mass of photon Role of harmon blied to ionic cr rbation. Tsallis h. Field quantiza in metal compou operator. man spectrosco Spin-orbital inte	IP velocity. Spin and and its relation to nic oscillator in aton ystal. entropy. Electric ation. Inds. Configuration Py. eraction.
[Textbook]				[Class requi	irement]					
Instructed during class				None						
				[Method, Po	int of view,	and Attainment	levels of l	Evaluation		
				Checked only	by exam.					
		Continue to エネルギ	- ・材料熱化学2(材エネ) (2)						Continue to 材	料分析化学(材) (2)

エネルギー・材料熱化学2(材エネ)(2)

[Reference books, etc.]

(Reference books)

Bavid R. Gaskell [®]Introduction to metallurgical thermodynamics_a (Scripta Pub. Co) ISBN:0070229457 Seshadri Seetharaman ed. [®]Treatise on process metallurgy, vol.1 Process fundamentals_a (Elsevier) ISBN: 9780080969862

(Related URLs)

http://www.lupin.mtl.kyoto-u.ac.jp/class.html

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

In order to be useful for review, quizzes submitted will be returned after checking.

(Others (office hour, etc.))

Please bring a scientific calculator and a ruler.

*Please visit KULASIS to find out about office hours.

Target yez Day/perioc Outline an Juantum spe pectrometric Course Gc Course Gc Idectrons, spi orth, which a Course Sc Quantizatic attering equ Principle o elicity of ph Iaessbauer s Matrix men sectra. Perturbatio	ar βrd year students or d Wed.2 ad Purpose of th ctrochemistry, whi s s which are used in pals pe course is to obta n, principles of spe re necessary for sp pedule and Cor nation explained from fleast action,2time of n. Polarization epetroscopy. Zeem pectroscopy. Zeem	above Number Class style the Course] tich is a basis of a materials analy- tin knowledges ectrometers, qua pectrochemical a tents] Traction equatio om both wave a s.Refraction of f light. Inertial an effect.	of credits Lecture spectroche ysis will al about quar intum mecl analysis. on deduced ind particle electron b mass and	ts 2 memical ar also be ex intum che chanical c d from Be le views.	Cour year/ nalysis, xplainec emistry, calculat ohr-Sor	se offered period Language will be lectur interaction b ions related t	2019/Second st Japanese red. Various kind retween photons o spectroscopy, s intization. Comp
Day/period Outline an Quantum spee ectrometrie Course Go he goal of ti lectrons, spi orth, which a Course So Quantizati cattering equ . Principle o elicity of ph faessbauer s . Matrix men gectra. . Perturbatio	Wed.2 d Purpose of th ctrochemistry, whi s which are used in als] te course is to obta n, principles of spe are necessary for sp checkle and Cor on, Itime,Bragg dif tation explained frr f least action,2time oton. Polarization pectroscopy. Zeen hanics,Itime,Sche	Class style te Course] tich is a basis of n materials analy in knowledges ctrometers, qua pectrochemical a ttents] Traction equatio om both wave a ss,Refraction of of light. Inertial an effect.	Lecture spectroche ysis will al about quar intum mecl analysis. on deduced ind particle electron b	nemical ar also be ex untum che chanical c d from Be le views. beam. Ph	nalysis, xplainec emistry, calculat ohr-Sor	Language will be lecture interaction be ions related t	Japanese red. Various kinc between photons o spectroscopy, a untization. Comp
Outline an Quantum spe pectrometrie Course Go The goal of the lectrons, spi orth, which a Course Sc Quantizatic autering equ Principle o elicity of ph laessbauer s Matrix men sectra. Perturbatio	d Purpose of th ctrochemistry, whi is which are used in pals] the course is to obta n, principles of spe re necessary for sp hedule and Corr n, 1time,Bragg dif ation explained fro f least action,2time oton. Polarization pectroscopy. Zeen hanics, 1time,Sche	e Course] ich is a basis of n materials anal in knowledges a cetrometers, qua pectrochemical a itents] Traction equatio om both wave a s.Refraction of of light. Inertial an effect.	spectroche ysis will al about quar intum mecl analysis. on deduced ind particle electron b	antum che antum che chanical c d from Bo le views. beam. Ph	nalysis, xplainec emistry, calculat ohr-Sor	will be lectur l. interaction b ions related t nmerferd qua	red. Various kinc etween photons o spectroscopy, a untization. Comp
Quantum spe pectrometric Course Ge The goal of the lectrons, spi orth, which a Course Sc Quantizatic cattering equ . Principle o elicity of ph faessbauer s . Matrix me sectra. . Perturbatio	ctrochemistry, whi es which are used in pals] he course is to obta n, principles of spe re necessary for sp hedule and Cor n, ltime,Bragg dif ation explained fro f least action,2time oton. Polarization pectroscopy. Zeen hanics, ltime,Sche	ich is a basis of n materials anal in knowledges a ectrometers, qua pectrochemical a itents] Traction equatio om both wave a s.Refraction of of light. Inertial an effect.	spectroche ysis will al about quar untum mecl analysis. on deduced ind particle celectron b	antum che chanical d d from Bo le views. beam. Ph	nalysis, xplainec emistry, calculat ohr-Sor	will be lecture interaction be ions related t nmerferd qua	red. Various kind etween photons o spectroscopy, a intization. Comp
Course Go he goal of the lectrons, spii orth, which a Course So Quantizatic cattering equ Principle o elicity of phe faessbauers . Matrix met pectra.	he course is to obta n, principles of spe re necessary for sp hedule and Cor n, 1time,Bragg dif ation explained fr f least action,2time oton. Polarization pectroscopy. Zeen hanics, 1time,Sche	iin knowledges of the sectrometers, qua pectrochemical a sector s	about quar intum mecl analysis. on deduced ind particle relectron b	antum che chanical o d from Be le views. beam. Ph	emistry, calculat ohr-Sor	interaction b ions related t nmerferd qua	etween photons o spectroscopy, a untization. Comp
he goal of the lectrons, spiorth, which a Course Sc Quantizatic cattering equ. Principle o elicity of phetaessbauer s . Matrix meda pectra.	he course is to obta n, principles of spe- tre necessary for sp hedule and Cor on, Itime, Bragg dif- nation explained fre f least action, 2time oton. Polarization pectroscopy. Zeem hanics, Itime, Sche	in knowledges : cctrometers, qua pectrochemical a itents] fraction equatio om both wave a es,Refraction of of light. Inertial an effect.	about quar intum mecl analysis. on deduced ind particle f electron b mass and	d from Be le views. beam. Ph	emistry, calculat ohr-Sor	interaction b ions related t nmerferd qua	o spectroscopy, a
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. Quantization cattering equ . Principle o elicity of ph faessbauer s . Matrix mean pectra. . Perturbation	on,1time,Bragg dif nation explained fro f least action,2time oton. Polarization pectroscopy. Zeem chanics,1time,Sche	fraction equatio om both wave a es,Refraction of of light. Inertial nan effect.	on deduced and particle electron b mass and	d from Bo le views. beam. Ph	ohr-Sor	nmerferd qua	antization. Comp
. Optical transit ipole transit . Harmonic (. Electron sp iteraction. . Symmetry, . Interaction 0. Angular r 1. Check of	n theory,2times,Tii nsition,2times,Blac ion. oscillator,1time,Ha ectroscopy,1time,J .1time,Symmetry o between electrons nomentum and spi achievement,1time	ime independent skbody radiatior urmonic oscillato Photoelectron sp of molecules. Gr and photons,2t n,1time,Angula e,	t perturbati n. Time de or. WKB a pectroscop roup theory imes,IR an r momentu	approxim approxim py of tran ry. Projec and Smeka tum and s	ry appli perturb nation. l nsition r ction op- al-Ram spin. Sp	ed to ionic ci ation. Tsallis Field quantiz netal compos erator. an spectrosco in-orbital inte	ystal. ; entropy. Electric ation. .nds. Configurati opy. eraction.
Class rog	viromont						
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one							
Method, P	oint of view and	d Attainment	lovala of				
	onit of view, and		levels of	f Evalua	ation]		

材料分析化学(材)**(2)**

[Textbook]

J. Kawai, quotQuantum Spectrochemistryquot, 2nd Edition, AGNE Gijutsu Center, Tokyo (2015).(ISBN: 9784901496759) isbn{}{9784901496759}

[Reference books, etc.]

(Reference books)

(Related URLs)

(http://www.process.mtl.kyoto-u.ac.jp/)

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

(Others (office hour, etc.))

											*
Numbering	y cod	le									
Course title <english></english>	固体 Elec	、電子論(材 cton Theory of) f Solie	ds		Aff dej Jol	iliated partment p title,Na	, me	Graduate S Associate Pr	Schoo ofess	ol of Engineering or,KUROKAWA SHIYUU
Target ye	ar	3rd year students o	or above	Number	of cred	its	2	Co yea	urse offere ar/period	ed	2019/First semester
Day/perio	d T	'ue.1	Cla	ss style	Lecture				Langu	age	Japanese
[Outline a	nd F	urpose of t	he C	ourse]							
[Course G	ioals	5]									
[Course S	che	dule and Co	onten	its]							
Band Theory	y for	Solids,4times	ί,								
Fermi surfac	e of	metals, stimes	i, nduct	ors 4times							
Electronic st	ructu	ure of surface	s and	interfaces,3	stimes,						
Recent topic	s in s	solid state phy	sics a	and surface	science,	1tin	ne,				
[Class req	luire	ement]									
None											
[Method, F	Poin	t of view, a	nd At	tainment	levels of	of E	Evaluat	ion]		
Textbook	1				_						
Trexibeen						_		_		_	
[Reference	e bo	oks, etc.]									
(Referer	nce	books)									
[Regardin	g st	udies out of	clas	ss (prepar	ation a	nd	review)]			
(Others (offic	e hour, etc.))								
*Please visit	KU	LASIS to find	l out a	about office	hours.						

Course title <english></english>	イン Inter	ターンシッ nship	プ (🥼	原)		Affiliated department Job title,Na	t, ime	Graduate Sch Assistant Pro	nool of Engineering fessor,OGURE KENZ
Target yea	ar	Brd year students	or above	Number	of credi	its 2	Co yea	urse offered ar/period	2019/Intensive, Second semester
Day/perio	d I	ntensive	Cla	ss style	Semina	r		Languag	e Japanese
[Outline ar	nd P	urpose of	he C	ourse]					
[Course G	oals	;]							
	chor		nton	-					
[Course 30	cned			401					
		dule and Co	Jillen	its]					
, ,		dule and Co	Jillen	its]					
, ,		dule and Co	Jillen	its]					
, ,		dule and Co	Jillen	its]					
,		dule and Co	Jillen	its]					
, , [Class reg	uire	ment1		its]					
, , [Class req None	uire	ment]	Jinen	ts]					
, , [Class req None	uire	ment]	Jinen	ts]					
, , [Class req None	uire	ment]		tainmont		of Evoluat			
, , [Class req None [Method, F	uire Point	ment] t of view, a	nd At	ts] tainment	levels c	of Evaluat	iion]	
, [Class req None [Method, F	uire	ment] t of view, a	nd At	tainment	levels c	of Evaluat	lion]	
, , [Class req None [Method, F	uire ?oint	ment] t of view, a	nd At	tainment	levels c	of Evaluat	iion	1	
, , , None [Method, F	uire Point	ment] t of view, a	nd At	ts]	levels c	of Evaluat	iion	1	
, , None [Method, F [Textbook]	uire °oint	ment]	nd At	ts]	levels c	of Evaluat	ilon	1	
, , None [Method, F	uire Point	ment]	nd At	ts]	levels c	of Evaluat	lion	1	
, , None [Method, F [Textbook]	uire ?oint]	ment] t of view, a	nd At	tainment	levels c	of Evaluat	iion		
, None [Method, F [Textbook] [Reference (Referen	uire Point	ment] t of view, a oks, etc.] pooks)	nd At	tainment	levels c	of Evaluat	iion	1	
, , None [Method, F [Textbook] [Reference (Reference (Reference	uire Point]]]]]]]]]]	ment] t of view, a oks, etc.] pooks) udies out o	nd At	ts] tainment	levels o	of Evaluat	:ion)]	

*Please visit KULASIS to find out about office hours.

Numbering co	ode									7 [
Course title イ <english> Int</english>	ンター ternship	-ンシッ p	プ (様	送)		Affiliated departme Job title,	nt, Iame	Graduate Sch Professor,HA Graduate Sch Professor,KU	ool of Engineering SUO MASAHIRO ool of Engineering ROSE RYOUICHI	
Target year	3rd yea	ar students o	or above	Number	of credi	ts 2	Co ye	ourse offered ar/period	2019/Intensive, Second semester	
Day/period	Intens	sive	Clas	ss style	Semina	r		Language	Japanese	
[Outline and	Purp	ose of t	he Co	ourse]						
The aim of the designing and r On-site learnin	interns researcl ig of th	ship is ex h of indu e import	perien strial ance c	cing on-si goods at a of teamwor	te activiti factory o rk and pro	es involv r a resear oduction	ed pr ch lal proce	oduction, man poratory of Jap sses in manufa	ufacturing, developmer panese leading compani acturing is also the aim.	ıt, ies.
[Course Goa	ıls]									- t
The goal of the Engineering. Fu	interns urthern	ship is to nore, by	maste	er a genera ng the rela	l method tionship b	of thinki etween a	ng an hum	d methodolog an and machir	y at Mechanical les at an industry,	
ICourse Sch	If to stu edule	and Co	nten	tsl	s career de	evelopme	nt.			- I
As a general ru	le the	internshi	n shoi	uld meet th	e above r	ournose.	The d	uration should	be not less than two	, i
IClass require None	l affair remen	s office o	of the	Engineerii	ng Science	e office (Butsu	ri Kyoumu).		
[Method Poi	int of	view ar	nd At	tainment	levels o	of Evalu	ation	1		_ [
Credits (2) are activities.	approv	ed based	l on th	e summar	y report (5	50%) and	prese	entation (50%)	about the internship	
[Textbook]										
Not used										
[Reference b	ooks,	, etc.]								-
(Reference	e book	(S)								
[Regarding s	studie	s out of	i clas	s (prepa	ration ar	nd revie	w)]			-
Consult with th	e inter	nship ho	st loca	tion.						
(Others (off	ice ho	our, etc.))							
Pre-registration	at the	educatio	nal af	fairs office	e of the E	ngineerin	g Sci	ence (Butsuri	Kyoumu) is required.	3
*Please visit K	ULASI	IS to find	l out a	bout offic	e hours.					

											*
Numbering	g code	е									
Course title <english></english>	物理 Engli	工学英語() ish for Engin	原) eerinş	3 Science		Affi dep Job	iliated partment p title,Na	í, Ime	Grac Assi	duate Scho istant Profe	ol of Engineering ssor,OGURE KENZOU
Target ye	ar 4	th year students o	or above	Number	of credi	its	2	Co yea	urse ar/pe	offered eriod	2019/Intensive, First semester
Day/perio	d In	ntensive	Cla	ss style	Lecture	,				Language	Japanese and English
[Outline a	nd P	urpose of t	he C	ourse]							
[Course G	ioals]	1									
[Course S	ched	lule and Co	nten	ts]							
14times,											
1time,											
[Class req	quirer	ment]									
None											
[Method, I	Point	of view, an	nd At	tainment	levels c	of E	valuat	ion	1		
_	_		_			-	_	_	_	_	
[Textbook	(]										
[Referenc	e boc	oks, etc.]									
(Referen	nce b	ooks)									
[Regardin	g stu	idies out of	clas	s (prepara	ation ar	nd I	review)]			
(Others (office	e hour, etc.))								
Please visit	t KUL	ASIS to find	l out a	bout office	hours.		-				

Numberin	g code										
Course title <english></english>	機械設 Design	計製作(and Manu	機工 factur	、字) ing Proces	ses	Affili depa Job	iated artment title,Na	, me	Grad Profe Grad Profe	luate Scho essor,MAT luate Scho essor,NISF	ol of Engineering SUBARA ATSUSHI ol of Engineering HWAKI SHINJI
Target ye	ear 2nd y	ear students o	or above	Number	of cred	lits 2	2	Co yea	ourse ar/pei	offered riod	2019/First semester
Day/perio	od Mon	3	Cla	ss style	Lecture	•			L	anguage	Japanese
[Outline a	Ind Purp	pose of t	he Co	ourse]							
[Course C	Goals]										
[Course S	Schedul	e and Co	onten	ts]							
,3times, ,4times, ,7times, ,4times, ,1time,											
[Class red	quireme	nt]									
None											
[Method,	Point of	view, a	nd At	tainment	levels	of Ev	/aluat	ion	n]		
[Textbool	<]										
[Reference	e book	s, etc.]									
(Refere	nce boc	iks)									
[Regardin	ng studi	es out of	f clas	s (prepar	ation a	nd re	eview)]			
(Others	office h	our, etc.))								
*Please visi	t KULAS	SIS to find	l out a	bout office	e hours.						

Numbering	code									
Course title <english></english>	システ System	ム工学(s Engineer	エネ原) ing		Affili depa Job t	ated irtment title,Na	me G	raduate Scho rofessor,KAV	ol of Energy Science VANABE HIROSHI	
Target yea	ar 3rd y	year students o	r above Number	of cred	its 2	2	Cour year/	se offered period	2019/Second semester	
Day/perio	1 Wed	l.1	Class style	Lecture	;			Language	Japanese	
[Outline ar	d Pur	pose of t	he Course]							
Systems engi method of a s are offered. A	neering system, Also, en	g is basic io function a hergy syste	lea about a syste nalysis, economi m as one of appli	m assem ical evalu ication c	bled uation ases;	with so n, optin a therr	ome e nizati nal ar	lements. In the on method ar ad power plar	e course, modeling d reliability analysis t is lectured.	
[Course G	oals]									
 To understa 	nd a va	ariety of m	ethod and charac	teristics	of sy	stem a	nalysi	s.		
- To acquire	the basi	ic knowled	lge to optimize th	ne energy	y syst	ems.				
[Course Schedule and Contents]										
 Introduction 	on of sy	stems eng	ineering(2): Lec	tures on	defin	ition a	nd str	ucture of a sy	stem and basic	
1. Introduction of systems engineering(2): Lectures on definition and structure of a system and basic performance of a system. Also, lecture the basics of systems engineerings.										
 Schedule p Evaluation and 	olanning 1d Revi	g method(2 iew Techni	2): Lectures on th ique" and "Critica	ne metho al Path N	d of a Aetho	a progr od" are	am fo lectu	r work proce ed.	sses. "Program	
 Linear pro example, ana 	gramm lysis of	ing(5): Leo f energy sy	ctures on LP met stem is also offer	hod for t red.	he op	otimiza	tion o	f a system. F	or the application	
 Decision-r optimization. 	naking	problem(2): Lectures on a r	modeling	g of d	lecisio	n-mak	ing process a	nd method for	
5. System rel	iability	analysis(2	e): Lectures on a	system d	lesigr	n and n	eliabil	ity analysis r	nethod.	
Applicatio	n for a	energy sys	tem(2): Systems	enginee	ring 1	method	l is ap	plied to thern	nal and power plants.	
[Class req	uireme	ent]								
None										
[Method, P	oint o	f view, ar	nd Attainment	levels of	of Ev	/aluat	ion1			
Evaluate by 1	eport(s) and exan	nination.		-					
	1 .	·								
	· – –						,	Continue to シス	テム工学(エネ原)(2)	

システム工学(エネ原)**(2)**

[Textbook]

Instructed during class

*

[Reference books, etc.]

(Reference books) Introduced during class

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

Numbering code Graduate School of Engineering Associate Professor, NOSE YOSHITAROU Affiliated Course title 構造物性学(材) department, Job title,Name <English> Structural Properties of Materials Graduate School of Engineering Associate Professor, SHIBATA AKINOBU Course offered year/period Target year Brd year students or above Number of credits 2 2019/First semester Day/period Tue.3 Class style Lecture Language Japanese [Outline and Purpose of the Course] The properties of metals and alloys strongly depend on thier microstructures, which are controlled by processing. In this lecture, we talk on formation mechanism on micro- and nano-structures in metals and alloys from the atomistic viewpoints, and on their properties. Through the lecture, how to control or utilize practical materials are studied. [Course Goals] To study relationship between microstructures and properties in metals and alloys. To understand formation mechanism of microstructures through each phase transformation and its control. [Course Schedule and Contents] Thermodynamics, phase diagram and atomic diffusion [2-3 weeks]
 Phase transformation through diffusion [4-5 weeks]
 Diffusionless phase transformation [3-4 weeks]
 Recrystallization and recovery [3-4 weeks]
 Feedback [1 week] [Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] Evaluation will be based on a written examination In some cases, reports and attend are considered. [Textbook] Utilizing resumes provided in the lecture. [Reference books, etc.] (Reference books) ntroduced during class [Regarding studies out of class (preparation and review)] To review contents in the last time before the lecture (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours

Numbering co	ode							
Course title 統 <english> Sta</english>	計力学(原) atistical Mecha	nics			Affiliated department Job title,Na	ne G	iraduate Schoo ssociate Profe	ol of Engineering essor,TASAKI SEIJI
Target year	3rd year students	or above N	umber o	of credi	its 2	Cour year/	se offered /period	2019/First semester
Day/period	Fri.3	Class	style	Lecture			Language	Japanese
[Outline and	Purpose of	the Cou	rse]					
Course Goz	le]					_		
Loouise 90a								
[Course Sch	edule and C	ontents]						
,3times,								
,5times, 2times								
.2times,								
,2times,								
,1time,								
[Class require	rement]							
None								
[Method, Poi	int of view, a	nd Attai	inment le	evels o	of Evaluat	ion]		
[Textbook]								
[Reference b	ooks, etc.]							
(Reference	books)							
[Regarding s	studies out o	f class ((prepara	tion ar	nd review)]		
(Others (off	ice hour, etc	.))						
*Please visit K	ULASIS to fin	d out abo	ut office l	hours.				

												*
Numberin	g cod	le										
Course title <english></english>	機械 Exerc	シフ cise o	ステム学 n Mechar	演習 nical and	(機) d System Eng	gineering	Affi dep Job	liated artment title,Na	:, me	Gra Sen Gra Ass Gra Asso	duate Scho ior Lecturer duate Scho ociate Profe duate Scho ociate Profess	ol of Engineering NAKANISHI HIROAK ol of Engineering essor,IZUI KAZUHIR(ol of Engineering sor,YOKOKAWA RYUU.
Target ye	ear	3rd ye	ar students	or above	Number	of cred	lits	1	Co yea	ourse ar/pe	e offered eriod	2019/Intensive, Second semester
Day/perio	d I	nten	sive	Cla	ss style	Semina	ar				Language	Japanese
[Outline a	nd P	urp	ose of	the C	ourse]							
This semina advance (in	r prov July).	vide:	s exercis	e on v	arious topic	es in me	chan	ical eng	gine	ering	g. Students	should register in
[Course G	Boals	5]										
[Course S	Sched	dule	and C	onten	its]							
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"												
[Class red	quire	mei	nt]									
None												
[Method,	Point	t of	view, a	nd At	tainment	levels	of E	valuat	ion]		
Depends on	topic	s.										
										COL	ntinue to 懱薇	ンステム子演省 (

機械システム学演習(機)**(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.

Numbering code Affiliated Course title 物質科学基礎(材) Graduate School of Engineering Professor, MURASE KUNIAKI departm <English> Fundamentals of Materials Science Job title.Nam Course offered year/period Target year 2nd year students or above Number of credits 2 2019/First semester Day/period Fri.3 Language Japanese Class style Lecture [Outline and Purpose of the Course] Based primarily on the solid-state chemistry, this course serves the outline of notation (descriptive method) and analytical techniques for solid substances, which become the basis of materials science and materials engineering. [Course Goals] Basic knowledges of physics, chemistry, mathematics, etc. are requires to learn materials science and materials engineering. In this course students learn basic technical terms and develop fundamental concepts of solid-state materials chemistry, to take subsequent advanced courses on materials science and materials engineering. [Course Schedule and Contents] Substances and materials, 1 time, Three states of matter; Amorphous and glasses; Liquid crystal; Materials structures and properties in our surrounding living environment. Fundamentals of crystal structures, 3 times, Close packing and holes; Crystal structure of metals; Point symmetry and space symmetry; Lattice and unit structure; Crystal system and Bravais lattice; Depiction of lattice plane and lattice direction; Fractional coordinates. Fundamentals of chemical bond theory, 2 times, Electronic configuration and shielding; Size of atoms and ions; Covalency and ionicity; Definition of electronegativity. Inorganic solid-state materials, 3 times, Structure of important ionic crystals; Stoichiometry and lattice defects; Ionic conduction and solid electrolytes; Crystal field and optical properties of d-block elements. Fundamentals of diffraction crystallography, 5 times, Generation and properties of X-ray; Fundamentals of Afray, Fundamentals of X-ray scattering and diffraction (Bragg condition, structure factor, extinction rule); Powder X-ray diffractometry: Laue method Self-assessment of achievement, 1 time, Review of the course contents [Class requirement] Knowledge of physics and chemistry for the entrance examination of Kyoto University. [Method, Point of view, and Attainment levels of Evaluation] (1) Class participation, (2) take-home assignments (approx. 50% in total), and (3) exams (approx. 50%). Students will sign a roll sheet every class. Ten written take-home assignments are due throughout the semester. Supplementary examination to bail out low-performing students will not be given for any reason.

物質科学基礎(材)(2) [Textbook] No textbook is required for this course. A course booklet will be given out at the first lecture. [Reference books, etc.] (Reference books) B. D. Cullity, S.R. Stock [®]Elements of X-Ray Diffraction (3rd ed.)_d (Prentice Hall) ISBN: 9780201610918 L. Smart, E. Moore Solid State Chemistry: An Introduction (4th ed.) (CRC Press) ISBN: 9781439847909 A. R. West Solid State Chemistry and Its Applications (2nd ed.) a (Wiley) ISBN:9781119942948 (Related URLs) (Not available) [Regarding studies out of class (preparation and review)] The take-home assignments and their suggested answers should effectively be used for preparation and review (Others (office hour, etc.)) Not available *Please visit KULASIS to find out about office hours.

* Numbering code Graduate School of Engineering 材料統計物理学(材) Associate Professor TABATA YOSHIKAZI Course title departm Statistical Physics of Materials Graduate School of Engineering Associate Professor, YUGE KORETAK <English> Job title Nam Course offered Target year 2nd year students or above Number of credits 2 2019/Second semeste riod Day/period Tue.2 Class style Japanese Language [Outline and Purpose of the Course] [Course Goals] [Course Schedule and Contents] First and second law of thermodynamics, Irreversible process,2times, Thermodynamic functions, Phase Equilibrium and Phase Transition,2times, Analytical mechanics and concept of statistical mechanics,3times, Basic of classical statistical thermodynamics,2times, .3times Quantum statistical thermodynamics,3times, Check of acquisition, 1 time, [Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] [Textbook] [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours

Numbering code Graduate School of Engineering Associate Professor, KISHIDA KIYOUSUKE Affiliated 材料科学基礎1(材) Course title department, Job title,Name <English> Fundamentals of Materials Science I Graduate School of Engineering Associate Professor.NOSE YOSHITAROU Course offered Target year 2nd year students or above Number of credits 2019/Second semester year/period Day/period Wed.1 Class style Lecture Language Japanese [Outline and Purpose of the Course] To understand structures in solids, mainly metal crystals, from the viewpoint of atomic interaction, Based on the knowledge, to study fundamental characteristics of lattice defects and properties in crystalline solid materials controlled by it, in particular diffusion and mechanical strength. [Course Goals] The aim of this lecture is to learn a way of considering to understand diffusion and mechanical properties in addition to fundamental studies on crystals and lattice defects. [Course Schedule and Contents] (1) Structure of solids [1 week] (2) Lattice defects [1 week] (3) Diffusion in solids [5 weeks] (4) Deformation of crystalline materials [2 weeks] (5) Plastic deformation of single crystals of metallic materials [2 weeks] (6) Plastic deformation of polycrystalline metals [2 weeks] (7) Deformation twinning and creep deformation [1 week] (8) Feedback [1 week] [Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] A end-term examination will be a main part of grading determination. Attendance and daily reports may be considered in grading determination. [Textbook] Utilizing resumes provided in the lecture. [Reference books, etc.] (Reference books) Introduced during class [Regarding studies out of class (preparation and review)] To review contents in the last time before the lecture (Others (office hour, etc.)) A part of themes will be added or omitted depending on a number of classes in the term.

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Numbering	g code								-		
Course title <english></english>	材料利 Funda	斗学基礎 2 mentals of ∃	(材: Mater	エネ) ials Science	e II	Affi dep Job	iliated partment p title,Na	, me	Graduate Associate Graduate Graduate Associate	e Scho te Profe e Scho e Profes e Scho e Profes	ol of Engineering essor,ICHII TAKASH ol of Engineering sor,SHIBATA AKINOB ol of Engineering sor,FUKAMI KAZUHIR
Target ye	ar 2n	d year students o	or above	Number	of cred	lits	2	Co yea	urse offe ar/perioc	ered I	2019/Second semest
Day/perio	d Thu	1.2	Cla	ss style	Lectur	e			Lang	guage	Japanese
[Outline a	nd Pu	rpose of t	he C	oursel							
This lecture	focuse	s on symme	etry, t	ensor and e	lastodyr	ami	cs that a	ire c	of import	ance fo	or materials science.
[Course G	ioals]										
To understar	nd the	role of sym	metry	, tensor and	l elastod	ynar	nics on	mat	erials sci	ence.	
[Course S	chedu	ule and Co	onter	its]							
[Class req Fundamenta	juiren ls of th	n ent] nermodynan	nics								
[Method, I	Point	of view, a	nd At	ttainment	levels	of E	valuat	ion]		
Grading is d	ue to t	he term-end	exan	nination. Th	e record	l of a	attendar	ice i	may be ta	aken in	to account.
[Textbook]										
Handouts wi	ill be g	iven in lect	ures.								
[Reference	e boo	ks, etc.]									
(Referer	nce bo	ooks)									
[Regardin	g stud	dies out of	f clas	ss (prepar	ation a	nd r	review)]			
(Other= (have at-	• •			_		_			
*Diagona visit	UTICE	nour, etc.		hout off	hour						
"Piease visit	KUL	ASIS to find	1 out a	about office	nours.						

Numbering	1 0 0	1e									*
ourse title English>	エネ Ener	マリット マ chemistry	1 (1 1	 Eネ原)		Aff de Joi	filiated partment b title,Na	:, me	Gra Pro	aduate Scho fessor,HAC	ol of Energy Science GIWARA RIKA
Target ye	ar	3rd year students o	or above	Number	of cred	lits	2	Co yea	urse ar/p	e offered eriod	2019/First semester
Day/perio	d T	ue.2	Cla	ss style	Lecture	e				Language	Japanese
Outline a	nd F	Purpose of t	he C	ourse]							
indamenta escribed in onding and	l che this stru	emistry such a course for dee ctures and the	s quai eper u ir ene	ntum chemi nderstandin rgetics will	stry, sol ig of ene be disci	lid s ergy usse	tate che conver ed in thi	mist sion s cou	ry, j and urse	physical che l application	emistry will be ns. Especially chemical
Course G	ioals	s]									
eeper unde	erstar	nding of energ	y con	version and	l applica	atio	ns from	the v	view	point of ch	emistry
Course S	che	dule and Co	onten	tsl							
ystal, close times, The e described times, Cher eory, mole dii, bond e times, Sym o molecular times, Con- fects will b	e pac facto facto mica cula nerg metr corbi cepts be de	king structure ors such as ior ermochemistr I bonding thee r geometry am y will be desc y operation au itals, molecula a and theory o escribed. Lear	e, met nic rac y of so ory an od VSI cribed nd syn ar vibu f Brou ning a	als, alloys, i lii, coordina olid compou d energetics EPR theory, nmetry elem ration, vibra usted acids a achievement	intermet ation nuu unds wil s such a , hybridi nents, n ttional s and base t evaluat	tallie mbe ll be izati nole pect es, I tion	c compo er, lattice e discuss ewis stru- ion orbi cular po troscopi _ewis ac will be	ound e ene sed. ictur tal, r oint g es w cids a mad	s, io ergy re, re nole grou vill b and le in	onic crystals affecting the esonance st ecular orbita ups will be c bases, their a the last cla	a and covalent crystals he crystal structure will ructure, valence bond al, bond length, bonding lescribed. Applications I. reactions, solvent iss.
one	1411 6					_		_	_		
Method. I	Poin	t of view. a	nd At	tainment	levels	of E	Evaluat	ion	1		
verall eval	uatic	on of the activ	ity in	the class, he	omewor	rk, a	nd term	-end	l exa	am	
Textbook]										
nriver amp	Atk	ins#039 Inorg	anic (Chemistry, t	he 6th e	ed., (Oxford	Univ	versi	ity Press.	
Referenc	e bo	oks, etc.]									
(Referen	nce	books)									
									Col	ntinue to エネル	レギー化学1(エネ原)(2)

エネルギー化学1(エネ原) (2)	
[Regarding studies out of class (prepa	aration and review)]
(Others (office hour, etc.))	
Homeworks will be occasionally assigned as schedule may be partially changed. Homewo www.echem.energy.kyoto-u.ac.jp The text bo	supplementary exercises. Depending on the progress in the class, rks and supplementary materials are provided at URL:http:// ok will be used in Energy chemistry II held in fall semester.
Please visit KULASIS to find out about office	ce hours.

Course title <english></english>	I En	ネルギー化学 ergy chemistry	2 (3	エネ原)		de Jo	partment b title,Na	, (me	Gradua Associate	ate Schoo e Professor	ol of Energy Scie MATSUMOTO KAZ
Target ye	ar	3rd year students of	or above	Number	of cred	lits	2	Cou yea	irse of r/peric	ffered od	2019/Second set
Day/perio	d	Fri.4	Cla	ss style	Lectur	e			La	nguage	Japanese
[Outline a	nd	Purpose of t	he C	ourse]							
The lecturer particular, R electrochem	tea edc ical	ches fundamen ox reactions, an energy conver	ntal m nalytic rsion	atters in inc al methods devices will	organic o , molecu l be lecti	hen lar red	nistry re geometr	lated ies, a	to ene and coo	ergy conv ordinatio	version and storaş n chemistry as w
[Course G	oa	ls]									
Understandi	ng i	fundamental m	atters	on energy	convers	ion a	and utili	zatio	n relat	ed inorga	anic chemistry as
as their relat	ion	s to daily life a	nd sta	te-of-the-a	rt resear	ches					
[Course S	ch	edule and Co	onter	Itsl							
reduction po elements 2. Molecular an introducti representatic 3. An introducti language of complex forn 4. Physical t diffraction n analysis, ma 5. Periodic trop periodic properiodic pro- periodic pro- periodic pro- periodic pro- periodic pro- periodic pro- periodic pro- boron, alumi (carbonaceo 7. Exercises an 8. Summary	ten sy ons uction tech eth gne tech 14 niu us r and d c on	tials, redox stal mmetry, 2time to symmetry a ion to coordina ordination chen ion niques in inorg nods, absorptio tometry, electri ds, Hydrogen, i- ties, periodic cl oics related to e i, 15, and 16 eli m, carbon, sili naterials, solar d comments, 3 omments on that	bility. s, nalysi tion c nistry. ganic - n spee Group haracconergy ement con, r c cells times te topi	diagramma s, application hemistry, 2 constitution chemistry, 2 ctroscopy, r mical technin o 1 and 2 ele- eristics of c chemistry s, 1 time itrogen, an energy ress cs in this le	atic pres ons of s times n and g 2 times esonanc iques, m ements, compour (hydrog d chalce ources) ecture	enta ymn eom e te icro 1 tin ds, en e	tion of j netry, sy etry, iso chnique: sope tec ne hydroge nergy sy compos	vmme vmme s, ion chniq en, all ysten unds,	ttial da etries o sm and aization ues kali m n, seco topics	tta, chem of molecu d chirality n-based t etal, and ndary ba s related t	ical extraction of ılar orbitals, y, thermodynami echniques, chem alkali earth meta ttteries) to energy chemis
Students are	su	pposed to unde	rstand	the lecture	e "Energ	y C	nemistry	/ 1".			
									Continu	ie to エネル	ギー化学2(エネ原)
									Jonuliu		n 10+∠(⊥↑

Additional

エネルギー化学2(エネ原)(2)

[Method, Point of view, and Attainment levels of Evaluation] Evaluation will be based on assignments and exercises (40 %) and final examination (60%).

[Textbook]

Numbering code

Shriver & Atkins; Inorganic Chemistry (6th Ed.) ISBN 9784807908981 which is used in Energy Chemistry 1. isbn{}{9784807908981}

[Reference books, etc.] (Reference books)

[Regarding studies out of class (preparation and review)] Reading the textbook and reviewing the assignments are recommended.

(Others (office hour, etc.))

Assignments are given every week to support understanding of the lecture.

Numbering	code										
Course title <english></english>	中性子 ³ Neutron	理工学(Physics:	原) and Er	ngineering		Aff dep Job	iliated partment p title,Na	, me	Gra Ass	duate Scho sociate Prof	ol of Engineering essor,TASAKI SEIJI
Target yea	ar 3rd y	ear students	or above	Number	of cred	lits	2	Co ye	ourse ar/p	e offered eriod	2019/Second semester
Day/perio	d Tue.	3	Cla	ss style	Lecture	e				Language	Japanese
[Outline and	nd Purp	oose of t	he C	ourse]							
[Course G	oals]										
[Course Se	chedul	e and Co	onten	its]			_			_	
,1time,											
,1time,											
,1time,											
,4times,											
,2times,											
,3times,											
,2times,											
,Itime,											
[Class req	uireme	ent]									
None		_		_						_	
[Method, F	oint of	i view, a	nd At	tainment	levels	of E	valuat	ion	1]		
[Textbook]	1										
[Reference	book	s, etc.]									
(Referen	ce boo	oks)									
[Regarding	g studi	es out o	f clas	s (prepar	ration a	nd I	review)]			
(Others (o	office h	our, etc	.))								
*Please visit	KULAS	SIS to fine	d out a	about office	e hours.						

Course title <english></english>	流体 Flui	、力学 d Dyn	1 (⊥ amics1	ネ原目	₹)		Affiliated departm Job title	d ent, ,Nam	e Gra	duate Scho fessor,INA	ol of Engine MURO TAF	ering KAJI
Target ye	ear	2nd year	students	or above	Number	of cred	lits 2	C y	Course /ear/p	e offered eriod	2019/Seco	nd semeste
Day/perio	od T	ue.2		Cla	ss style	Lecture	e			Language	Japanese	
[Outline a	nd F	Purpo	se of	the Co	ourse]							
[Course 0	Soals	5]										
[Course S	che	dule :	and Co	onten	ts]	_	_		_			_
Guidance.2	times	,Guida	ance or	how t	his class is	s operate	d, and ho	ow to	use co	omputing fa	cility for thi	is class.\\
Basic know	ledge	on th	e role o	of IDS	in network	k security	and how	v ma	chine	learning car	n help the in	trusion
detection.												
		1.	o:	P				1.			descention 1	
Intrusion De	etecti	on by	Signat	ure-Ba	sed IDS,5t	times,Le	arn the m	echa	nism o	of intrusion	detection by	y signature
based IDS t issued from	etecti y stu IDS	on by dying and co	Signati open s	ure-Ba ource : icatior	sed IDS,5t signature-t	times,Lea based ID ling sign:	arn the m S and att atures to	echa acks, detec	nism o , such a	of intrusion as correspondences	detection by ndence betw	y signature een alarm
based IDS b issued from Intrusion De	etecti by stu IDS etecti	on by dying and co on by	Signati open s ommun Machin	ure-Ba ource s icatior ne Lea	sed IDS,5t signature-b is, and add rning,7tim	times,Lea based ID ling signa les,Learn	arn the m S and att atures to the meth	echa acks, detec 10d 0	nism o , such a ct attac of class	of intrusion as correspon cks. sifying norm	detection by ndence betw nal and mali	y signature een alarms cious
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lob title N	it, Gra	duate Schoo ociate Professo duate Schoo	ol of Engineering r,TSUCHIYA TOSHIYUKI ol of Engineering	Course title 固 <english> Co</english>	体物性論(材 ondensed Matter	エネ) Physics	A	ffiliated epartment	Gr Pro Gr	aduate Scho ofessor,NAk aduate Scho	ol of Engineering AMURA HIROYUKI ol of Engineering
ts 2	Course	ociate Profess e offered eriod	or,YOKOKAWA RYUUJI 2019/First semester	Target year	3rd year students or	r above Number	of credits	2	Cours	sociate Profess	or, TABATA YOSHIKAZU 2019/Second semester
	yeanp		Jananese	Day/period	Fri 3	Class style	Lecture		yean		Iananese
		Language	supunese	Outline and	Purpose of th	he Coursel	Lecture			Language	supunese
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				[Course Goa	alsi						
				Understanding	of basic concept	t of optical, may	metic and s	upercond	ucting	properties o	f matters.
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f Evalua	tion]			[Method, Po	int of view, an	nd Attainment	levels of	Evaluat	ion]		
				Evaluation will	be based on a f	inal examinatio	n.				
				[Textbook] Not used							
				[Reference b	oooks, etc.]						
				[Reference I (Reference S. Blundel [®] N ISBN:0198505 C. Kittel [®] Intr	books, etc.] e books) fagnetism in Co 914 roduction to Soli	ondensed Matter id State Physics	(Oxford M a (Wiley	aster Seri) ISBN:9	es in P 978047	hysics)』(1415268	Oxford University Pres
d reviev	v)]			[Reference I (Reference S. Blundel [®] M ISBN:0198505 C. Kittel [®] Intr	pooks, etc.] e books) 4agnetism in Co 914 roduction to Soli studies out of	ondensed Matter id State Physics	(Oxford M a (Wiley	aster Seri) ISBN:9	es in P 078047 1	'hysics)』 (1415268	Oxford University Pre
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Course title <english></english>	マイクロ加 Microfabric	コ工学(機 ation	エネ)		Aff dej Joi	iliated partment b title,Na	t, ime As As As	raduate Scho sociate Profess raduate Scho sociate Profes	ol of Engineering or,TSUCHIYA TOSHIYU ol of Engineering sor,YOKOKAWA RYUU
Target ye	ar 4th year st	tudents or above	Number	of cred	lits	2	Cours year/	se offered period	2019/First semester
Day/perio	d Mon.3	Cla	ss style	Lecture	e			Language	Japanese
[Outline a	nd Purpos	e of the C	ourse]						
This course	covers micro	ofabrication	technology	for ME	EMS	as well	l as sen	niconducors.	
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2times,									
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2times,									
2times,									
2times,									
1time,									
[Class red	uirement]								
None									
[Method,	Point of vie	ew, and At	ttainment	levels	of E	Evaluat	tion]		
[Textbook	(]								
[Referenc	e books, e	tc.]							
(Refere	nce books)							
[Regardin	g studies o	out of clas	ss (prepar	ation a	nd	review)]		
(Others (office hour	r, etc.))							
*Please visi	t KULASIS	to find out a	about office	hours.					

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Numbering	code								
Course title <english></english>	量子物 Introd	の性基礎論 uction to So	(原) olid State Physics	i	Aff de Joi	iliated partment p title,Na	:, me	Graduate Sch Associate Pro Graduate Sch Senior Lectur	ool of Engineering fessor,MATSUO JIROU ool of Engineering er,SEKI TOSHIO
Target yea	ar Brd	l year students o	or above Number	of cred	lits	2	Co yea	urse offered ar/period	2019/Second semester
Day/period	Fri.	1	Class style	Lectur	e			Language	Japanese
[Outline an	d Pu	rpose of t	the Course]						-
Gain working properties, su solid state pro	g unde ch as opertie	rstanding o electrically es on a micr	of periodicity in so magnetically and roscopic and mac	olids and 1 mecha roscopio	d ho nica c sca	w this p lly. To ile.	erio desc	dicity and bor ribe how quar	iding governs solid itum mechanics defines
[Course Go	oals]								
To further de on a microsco	velop opic so	the underst cale.	anding of interac	tions be	twe	en solid	stat	e and phonons	, electrons and particles
[Course So	hedu	Ile and Co	ontents]						
Band structur Defects and c Optical prope Semiconduct Junction theo Final examin subjects leane [Class requ None	e,3tin lisloca erty,2t or,1tin ry,1tin ation a ed in t	nes,Blochrs titions,2time imes,Kram- ne,Band ga me,p-n junc and report,2 his course.	quos theory, Bril es,Vacancy, diffu ers-Kronig relatic p, electrons and l etions, metal-sem 2times,Evaluation	louin zo sion, co on, Druč noles, H iconduc a will be	ne, inc. lor c le th omo tor j giv	Laue lav eenter eory, el- geneou unction en by th	w, d ectro s ser , het ie co	iffraction and on gas, Plasm miconductor, o tero-junction ontents of the r	structural factor n loping eports and quizzes of the
[Method, P	oint	of view, a	nd Attainment	levels	of E	valuat	ion]	
Coursework	will be	evaluated	with attendance a	and repo	ло	n subjec	:18.		
[Textbook]									
[Reference	boo	ks, etc.]							
(Referen C. Kittel, Intr	ce bo oduct	ooks) ion to Solid	1 State Physics 8t	h editio	n (W	/iley) is	bn{	}{9780471415	268}
[Regarding	l stud	lies out o	f class (prepara	ation a	nd	review)]		
(Others (o	ffice	hour, etc.	.))						
*Please visit	KULA	ASIS to find	d out about office	hours.					

Course title <english></english>	原子 Intr	子核工学序論 oduction to N	篇2(原) Nuclear Engineeri	ng 2	Affiliated departmen Job title,Na	t, ime P	raduate Scho LL STAFF raduate Scho rofessor,SAS	ol of Engineering ol of Engineering AKI TAKAYUKI
Target ye	ar	2nd year students	or above Number	of cred	its 2	Cour year/	se offered period	2019/Second ser
Day/perio	d	Mon.2	Class style	Lecture	e		Language	Japanese
[Outline a	nd I	Purpose of	the Course]					
[Course G	ioal	s						
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None								
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[Textbook	1							
	e bo	ooks, etc.]						
[Referenc	nce	books)						
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Numbering c	ode										
Course title 原 <english> In</english>	子核 troduo	工学序論 ction to N	1 () uclear	亰) Engineeri	ng 1	Aff dej Jol	iliated partment b title,Na	t, ime	Graduate ALL STA Graduate Professor	Schoo FF Schoo SAS	ol of Engineering ol of Engineering AKI TAKAYUKI
Target year	2nd y	ear students	or above	Number	of cred	lits	2	Co ye	ourse offe ar/period	red	2019/First semester
Day/period	Mon	.2	Cla	ss style	Lectur	e			Lang	uage	Japanese
[Outline and	Pur	pose of t	he C	ourse]							
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[Regarding	studi	es out o	f clas	s (prepa	ration a	nd	review)]			
(Others (off	ice h	our, etc	.))								
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	9 000	de								
Course title <english></english>	流体 Flui	、熱工学(d Flow and	原) i Heat Ti	ransfer		Affi dep Job	liated artment title,Na	, me	Graduate Scho Professor, YOI	ool of Engineering KOMINE TAKEHIK
Target ye	ear	3rd year stude	nts or above	Number	of cred	lits	2	Co yea	urse offered ar/period	2019/Second semes
Day/perio	d N	Ion.2	Cla	ss style	Lecture	e			Language	Japanese
[Outline a	nd F	Purpose o	of the C	ourse]						
and turbulen are to unders through the reactor as a	nt cor stand unde typic	the state to rective he the basic rstandings al energy of	eat transf theory of of the m conversio	f fluid dyna echanisms on system v	nange ph mics, the of heat t vill be di	ermo ransi	nena (t odynam fer; esp sed inc	ics, ecia ludii	ng and condens heat transfer at lly thermal hyd ng a safety eng	sation). The main goa nd their allocation draulics in a nuclear ineering point of view
[Course G	Goals	s]								
In order to u thermodyna	inder mics,	stand the r , heat trans	elation b fer and t	etween hea heir allocat	t and flu ion. It is	id ba very	ased on y impor	the tant	basic theory of to	f fluid dynamics,
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Target yea	r 3rd	year students o	r above	Number	of cred	its	2	Co yea	urs ar/p	e offered eriod	2019/Second semest
Day/period	Fri.	1	Cla	ss style	Lecture	•				Language	Japanese
[Outline an	d Pu	rpose of t	he C	ourse]							
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Provide basic heat transfer,	know therm	ledge and o al radiation	leepe).	n understan	ding of	heat	transfe	r ph	eno	mena (heat	conduction, convective
[Course Sc	hedu	le and Co	onten	ts]							
General inform insulation tecl engineering a (2-4) Heat conducti conductivity a basic case exa resistance in f (5) Basic informa Explain dimeu and Rayleigh transfer. (6-9) Convective ha as well as gen boundary laye transfer, expla plate. (10, 11) Convective ha boiling curve and the effect transfer. With and film cond	nation nnique and the on: E: nnd Fc mples lat pla titon c nsionl numb eat tra eral in r flow in hes eat tra in po s of v respe ensati	1: Based on ess, and terr basic mecl xplain the burier 's la s. Explain t ites, pipes, on convecti- ess number er. Derive t nsfer witho formation, over a fla at transfer of nsfer accon ol boiling a arious factor of to conde on, phenom	a mult perat hanisi wasics w, an herma etc., t ve hea s such the mo- ut ph As e t plate of flow npany und nu ors tha nsatic	iple examp ure control ns of heat con d the derive l contact re he theory o at transfer: I a se Prandtl omentum at ase change: xamples of e accompan vs within tu ing phase c cucleate boili t affect nuc on heat tran n condensa	les of en of equip ransfer 1 viduction sistance f extend Formula numbes of extend Formula numbes extend setten	erg ome obher phe the o e of s rize c, N c, y eo flo stitic illin olain erfac	y conver- nt, expl nomena enomena: eady hee- eady hee- uurfaces the goo usselt n quations eccific es wheat the spo- the	rsion ain t a, sp at co (fin verni umb s for camp trans Also nature ect to ng, f fere: the	n rec he i ecif heat ondu s), a ing o er, s ing o ing	quiring heat mportance of ically heat ff conduction ctoin, and h and so on. equations of Stanton num boundary la of forced cc explain lan an example convection a illing heat tri boiling heat md methods between dr sselt solution Datione to f	ing, cooling, and of heat transfer lux, thermal , with reference to heat conduction f flow in heat transfer. ober, Grashof number, ayer flow and heat onvective heat transfer inar and turbulent of internal flow heat along a vertical heated ansfer, explain the transfer mechanisms, to enhance heat powise condensation n in vertical plate film 云勲工学 (機) (2)
伝熱工学(根 condensation. (12-14) Radiation hea s displacemen in actual surfa (15) Confirmation [Class requ Students are r Fluid Dynami	t trans t law, cces, a of lea irem equire cs 2.) sfer: Discus Stefan-Bo nd the prop rning attair ent] ed to have c	ss blac ltzma perties nment	k bodies ar nn ' s law, o of radiatio eted Therm	nd gray radiatio n in gas	oodi n tra es.	ies, Kiro insfer b		off ' een l	s law, Plan black body s mics 2, Flui	ck ' s law, and Wien ' surfaces and radiation d Dynamics 1, and
[Method, P	oint c	of view, an	nd At	tainment	levels	of E	Evaluat	ion]		
A final exami	natior	will be he	ld. In	class quizz	es and r	epo	rts, whe	n ca	rrie	d out, will b	e factored in.

[Textbook] Not used

[Reference books, etc.]

(Reference books)

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

Students are required to have completed Thermodynamics 1, Thermodynamics 2, Fluid Dynamics 1, and Fluid Dynamics 2.

(**Others (office hour, etc.)**) The order of classes listed above and their timing may differ depending on the year.

<pre>Course title <english></english></pre>	材料 Fund	基礎 damer	学2(ntals of	エネ〕 Mater) ials 2		Aff dep	iliated partment	t,	Graduate Scho Associate Profess	ol of Energy Scienc or,OKUMURA HIDE
Target ve	ar	and year	r etudonte	or above	Number	of cred	lite	2	Co	ourse offered	2010/Eirst som ost
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 *Please visit KULASIS to find out about office hours.

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(Others (*Please visit *Please visit Course title <english> Target yee Day/perio [Outline a [Course G Direction of Chemical po Chemical po</english>	g stur office KUL g code 材料料 Them ar 内 u d Tu nd Pu coals] ched d l of th syster totential	dies out o hour, etc ASIS to fin ASIS to fin () () () () () () () () () (f class f class f class f of Mate of Mate class cla	erials 2 Number s style urse] s] nes,Intern and intens	of cred	Affiliated departmen Job title,N its 2 ,enthalpy, able,chemi Jution,Her	heat cal print	Graduate Scho Professor, UDA urse offered ar/period Language capacity\\Entro potential\\Compstandard state,	X Solution-dG diagram activity
IRegardin (Others (*Please visit *Please visit Unumbering Course title English> Target ye Day/perio [Outline a [Course G [Co	g stu office a KUL g code 材料料 Therm ar p d Tu nd PL ched l of th syster tential tential	dies out o hour, etc ASIS to find 執力学 2 (nodynamics d year students- e.3 rrpose of find ule and Cc ermodynam n change ule charde character ine,Relatio for electrode e electrode e electrode e electrode	f class))) d out ab d out ab of Mata or above N Class Cl	erials 2 Number s style urse] s] s] nes,Intern and intens quilibria' etween ph n,2times, Chemical	of cred al energy sive vari- \\ldeal sc Belectrod potential	Affiliated departmen Job title,N its 2 ,,enthalpy, able,chemi Jution,Her ram and G e potential, diagrams	heat cal prina ibbs , elect	Graduate Scho Professor,UDA urse offered ar/period Language capacity\\Entro otential\\Comp standard state, energy\\Invaria :tromotive force emary systems\	X Solution of Engineering A TETSUYA 2019/First semes Japanese Japanese py and second law osition-dG diagram activity nt reaction in bina NyStandard state fo (Electrode potentia)

[Class requirement] The fundamental calculus as taught by the Institute of Liberal Arts and Science is a prerequisite for this course. [Method, Point of view, and Attainment levels of Evaluation] Written examination [Textbook] Not used [Reference books, etc.] (Reference books) Thermodynamics and statistical mechanics (A. Harajima, Baifukan) (in Japanese). isbn{}{9784563021399} [Regarding studies out of class (preparation and review)] After each class, students should spend time to review the equations and its derivations and understand the neaning. (Others (office hour, etc.)) Depending on the number of course classes scheduled for each school year and other factors, a portion of the Syllabus may be omitted, or additions may be made thereto. *Please visit KULASIS to find out about office hours.

熱力学1(エネ原)(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.

		_							*
Numbering	g cod	e							
Course title <english></english>	量子 Electi	無機材料学 ronic Structure	1 (材) es of Inorganic Ma	terials 1	Affiliated departmen Job title,Na	t, ame	Grac Prof	duate Scho Sessor,TAN	ol of Engineering IAKA ISAO
Target ye	ar 3	rd year students o	or above Number	of cred	lits 2	Coi yea	urse ar/pe	e offered eriod	2019/First semester
Day/perio	d Ti	nu.2	Class style	Lectur	e			Language	Japanese
[Outline a	nd P	urpose of t	the Course]						
Electron the structure and introduction in general.	ory is 1 cher to the	essential for nical compose basic electr	r fundamental und sition in wide var ron theory to be u	lerstand iety of i sed to d	ling of the r norganic cr escribe the	elatio ystal elect	onshi ls. Th ronic	ip among p his course p c structures	properties, crystal provides an s of inorganic materials
[Course G	ioals]							
This course structures of	provi inorg	des an introd ganic materia	luction to the basi als in general.	c electr	on theory to	be u	ised	to describe	the electronic
[Course S	chec	lule and Co	ontents]						
self-consiste Electronic si molecules, c Electronic si 1D chain of Application materials sci Assessment [Class rec Understandi	ent me tructu chemi- tructu hydro to ma ience of ma juire ng of	thod, electro re of simple cal bondings res of crystal ogen atoms, H tterials science astery of the of ment] contents for	n spin molecules, 3times ls, 4times, electron Bloch theorem, bz ce, 1 time, Density course content, 1 ti Basic Phys. Cher	s,molecu ic struc and calc function ime,Ass nistry(q	ular orbital a ture of mon culations nal theory c sessment of quantum the	methological oator alcul mast ory)	od, h mic o atior tery o is pr	nomo/heter crystals and ns and their of the cour referred.	o nuclear diatomic d binary compounds, r application to se content
[Method, I	Point	of view, a	nd Attainment	levels	of Evalua	tion]]		
Final exam. Some quiz- count as a p	sheets	are distributed of the cumu	ted at the lecture allative grade.	whose a	answers sho	uld b	be su	bmitted on	site. Their scores may
[Textbook									
The textboo	k for	this lecture (i	in Japanese) can b	be purch	nased at a b	ookst	tore.	isbn{}{97 tinue to 量子	84753655595} 無機材科学1 (材)(2)

Numbering	j code										
Course title <english></english>	量子無 Electron	機材料学 ic Structure	2(es of I	材) norganic Ma	aterials 2	Aff dej Jol	iliated partment b title,Na	t, me	Graduate S Associate P	cho Prof	ol of Engineering essor,SEKO ATSUT
Target ye	ar Brd y	ear students o	r above	Number	of crea	lits	2	Cou year	rse offere /period	d	2019/Second seme
Day/perio	d Tue.2	2	Cla	iss style	Lectur	e			Langua	ge	Japanese
[Outline ar	nd Purp	oose of t	he C	ourse]							
It is importai material func chemistry an functions is a	nt to und ctions. T id band t also disc	his lecture his lecture heory. Th cussed.	e ele e give e rela	etronic stru es the funda ationship be	cture of imentals tween th	mat of e he el	erials be lectroni ectronic	ecause ic stru c strue	e of its dete icture calcu cture of inc	erm ilati orga	inantal impacts on ions based on quant nic materials and th
[Course G	oals]										
Learning the materials sci	fundam ence.	entals of	quant	um chemist	try and t	band	theory,	and t	heir applic	atio	ons to the issues in
[Course S	chedul	e and Co	onter	nts]							
wavefunction Theory, appr method. Theory, appr approximatic Electronic ba Electronic st chemical bon Assessment of	ns, total roximation roximations in quand struct and structure a anding of of maste	energy, and n ons, and n nantum ch cture calcu ture calcu and chemi molecule ery of the o	nd on netho emist ilation cal bo s and course	e-electron e ds in quant ry. n,2times,De n. onding of m solids. e content,1t	energy. um cher um cher ensity fu nolecule time,The	nistr nistr ncti s an e ma	y (1),4ti y (2),3ti onal the d solids, stery of	imes, imes, ory, p ,2time the c	Variational Hartree and oseudopote es,The elec ourse conte	l me d H ntia troi	ethod and perturbation artree-Fock al and basis set in nic structure and is assessed.
[Class req	uireme	nt]									
None											
[Method, F	Point of	f view, ar	nd At	ttainment	levels	of E	Evaluat	ion]			
Evaluations	are made	e based or	the e	examination	1. The re	esult	s of quiz	zzes a	and reports	ma	y be considered.
[Textbook]										
[Reference	e books	s, etc.]									
(Referen	nce boo	oks)									

______Continue to 量子無機材料学2〔材〕(2)

量子無機材料学1(材)**(2)**

[Reference books, etc.]

(Reference books) Standard textbooks for elementary quantum physics, quantum chemistry and solid state theory may be used.

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

Support materials are available on KULASIS. Password is given in the lecture room. They may be used for reviewing.

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

量子無機材料学2(材)(2)

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

(Others (office hour, etc.))

Numbering	code									
Course title <english></english>	機械シ. Seminar	ステム学 on Mechan	セミフ ical and	ナー (機) d System Eng	gineering	Aff de Jo	filiated partment b title,Na	, me A	iraduate Scho enior Lectures iraduate Scho ssociate Prof iraduate Scho ssociate Profes	ol of Engineering NAKANISHI HIROAKI ol of Engineering essor,IZUI KAZUHIRO ol of Engineering sor,YOKOKAWA RYUUJI
Target yea	ar 3rd y	ear students o	or above	Number	of cred	lits	2	Cour year	se offered /period	2019/Intensive, Second semester
Day/period	d Inter	nsive	Cla	ss style	Semina	ar			Language	Japanese
[Outline ar	d Purp	pose of t	he C	ourse]						
[Course G	oals]									
[Course Sc	hodul	a and Co	nton	tel		_				
"	neuur		Jillen	13]						
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[Mothod B	oint of	view e	nd At	tainmant	lovele	<u> </u>	Typlust	ionl		
[wethod, P		view, a		lanneni	levels		zvalual	ionj		
L]
								(Continue to 機械シ	ィステム学セミナー(機)(2)

										*
Numbering	g code									
Course title <english></english>	マイク Fabrica	ロ材料の tion and ar	加工 nalysis	・評価の基 s of microm	礎 aterials	Aff de Jo	iliated partment b title,Na	t, ime	Graduate Scho Professor,TAB Graduate Scho Associate Professo Graduate Scho Professor,SUZ Graduate Scho Associate Profess	ol of Engineering ATA OSAMU ol of Engineering or,TSUCHIVA TOSHIYUK ol of Engineering UKI MOTOFUMI ol of Engineering sor,YOKOKAWA RYUUJ
Target ye	ar 4th	year students of	or above	Number	of cred	lits	2	Cou yea	r/period	2019/Intensive, Second semester
Day/perio	d Inte	nsive	Cla	ss style	Semina	ır			Language	Japanese
Outline a	nd Pur	pose of t	he C	ourse]						
Course G	oals]									
[Course S	chedu	le and Co	onten	its]						
1time,										
Itime,										
Itime,										
1 time,										
itimes										
Stimes,										
1time										
2times										
1time.										
,										
[Class req	uireme	ent]								
None										
[Method, F	Point o	f view, a	nd At	tainment	levels	of E	Evaluat	ion]		
[Textbook]									
[Reference	e book	s, etc.]							_	
(Referen	nce bo	oks)								
									Continue to マイク	ロ材料の加工・評価の基礎(2)

幾械システム学	セミナー(機)(2)		
[Textbook]			
•			
Boforonoo h	aka ata 1		
(Reference	books)		
(neichende			
Regarding st	udies out of class (prepar	ation and review)]	
Others (offi	e hour etc.))		
Please visit KU	LASIS to find out about office	hours.	

マイクロ材料の加工・評価の基礎(2) [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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Numbering c	ode						
Course title 知 <english></english>	能システム工	学(機)	Af de Jo	filiated partment b title,Na	, G me S	raduate Scho rofessor,SAW raduate Scho enior Lecturer,	ol of Engineering /ARAGI TETSUO ol of Engineering NAKANISHI HIROAKI
Target year	4th year students	or above Number	of credits	2	Cour year/	se offered period	2019/First semester
Day/period	Wed.2	Class style	Lecture			Language	Japanese
[Outline and	Purpose of t	the Course]					
[Course Goa	als]						
[Course Sch	edule and Co	ontents]					
,2times,							
,2times,							
,2times,							
,2times,							
,2times,							
,2times,							
,2-3times,							
[Class requi	rement]						
None							
[Method, Po	int of view, a	nd Attainment	levels of I	Evaluat	ion]		
-							
[Textbook]							
[Reference I	oooks, etc.]						
(Reference	e books)						
[Regarding	studies out o	f class (prepar	ation and	review)]		
(Others (off	ice hour, etc	.))					
*Please visit K	ULASIS to fine	d out about office	hours.				

											~
Numbering	g code										
Course title <english></english>	材料科 Funda	- 中学基礎 3 mentals of	Mater	rials Science	e III	Aff dej Joi	iliated partment p title,Na	:, me	Gra Ass	aduate Scho ociate Profes	ol of Engineering sor,TOYOURA KAZUAKI
Target ye	ear 2nd	l year students	or above	Number	of cred	lits	2	Cc ye	ours ar/p	e offered eriod	2019/Second semester
Day/perio	od Fri.	1	Cla	iss style	Lectur	e				Language	Japanese
[Outline a	nd Pu	rpose of	the C	ourse]							
[Course G	Goals]										
[Course S	Schedu	le and C	onter	nts]							
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,1time,											
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,stimes,											
,4times,											
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[Class red	quirem	ent]									
None											
[Method,	Point	of view, a	and A	ttainment	levels	of E	valuat	ion]		
[Textbook	<]										
isbn{}{9784	425424	0184}									
[Referenc	e bool	ks, etc.]									
(Refere	nce bo	oks)									
isbn{}{9784 D.A.Porter	456306 and K.I	7120} isbı E.Easterlir	1{}{97 19: Pha	845630671 (1880) 845630671 (1890) 1897 1897 1897 1897 1897 1897 1897 1897	.37} rmations	in 1	Metals a	nd	Alle	ovs isbn{}{(0412450305}
[Regardin	g stud	lies out d	of clas	ss (prepar	ation a	nd	review)1		<i></i>	,
	-										
(Others (office	hour, etc	:.))								
*Please visi	t KULA	ASIS to fir	id out a	about office	e hours.						

Course title <english></english>	材料組織学 Fundamentals of 1	Microstructure of M	Materials Jo	filiated partment, b title,Nam	e Graduate Scho Professor,HID	ol of Engineering EYUKI YASUDA
Target ye	ar 3rd year students	s or above Number	of credits	2	Course offered /ear/period	2019/Second sem
Day/perio	d Mon.1	Class style	Lecture		Language	Japanese
[Outline a	nd Purpose of	the Course]				
Properties of lecture, micr thermodynar microstructu	materials depen ostructure evolut nics and kinetics re selection, equ	d on not only latti tion during phase s. Students study n ilibrium / non-equ	ce structure transformati nicrostructur illibrium pro	and comp on (i.e. so re evolution cesses).	position but also n blidification) will on (nucleation, gro	nicrostructure. In the explained by us owth, solute partiti
[Course G	oals]					
1. To unders	tand relationship	between microstr	ucture evolu	ution and	thermodynamics /	/ kinetics.
2. To be able	to use thermody	ynamics and kinet	ics for under	rstanding	microstructure in	various materials.
[Course S	chedule and C	Contents	_	_		
1.Introductic	on (1):fundament	als of thermodyna	mics and ki	netics, wh	nich are required f	or understanding th
class		Sr thermouyna			are required i	
2.Nucleation	and curvature e	ffect (1): classical	nucleation	theory, cu	rvature effect	
3.Interface n	orphology (1): i	nterface morpholo	ogy (atomic	scale), m	acroscopic interfa	ce shape
4.Growing in	terface (2-3): lo	cal equilibrium at	interface, so	olute parti	tion, stability of in	nterface
5.Dendritic g	growth (1-2): me	chanism of dendri	tic growth,	selection		
Solute part	ition and segrega	ation (1): solute pa	artition at in	terface, se	gregation (non-u	niform distribution
solutes)						
7.Eutectic gr	owth (1-2): coop	perative growth of	multiple ph	ases, sele	ction of microstru	cture
8.Non-equili	brium phase tran	sformation (1-2):	rapid solidi	fication, r	on-equilibrium a	nd metastable phase
9. Microstru	cture and phase I	Diagram, selection	n rules			
10. Final exa	mination / Learn	ning achievement	evaluation, a	and feeba	ck	
 Feedback 	ζ.					
[Class req	uirement]					
Fundamenta	ls of Microstruct	ure of Materials 1	,2 and 3			
[Method, F	oint of view, a	and Attainment	levels of l	Evaluatio	on]	
[Method, F Evaluation n	Point of view, a nethod: Evaluation	and Attainment on will be based or	levels of I n one writte	Evaluation n examination	on] ation.	
[Method, F Evaluation n Evaluation s	Point of view, a nethod: Evaluatio tandard: The resu	and Attainment on will be based or ult of a written exa	levels of I n one writte amination sh	Evaluation n examination nould be 6	on] ation. 0 and above out c	of 100. (60 and abov
[Method, F Evaluation n Evaluation s Passed, 59 at	Point of view, a nethod: Evaluation tandard: The resund ad below: Failed	and Attainment on will be based or ult of a written exa	levels of E n one writte amination sh	Evaluation n examination nould be 6	on] ation. 0 and above out o	of 100. (60 and abo
[Method, F Evaluation n Evaluation s Passed, 59 an Evaluation n	Point of view, a nethod: Evaluatio tandard: The resu nd below: Failed	and Attainment on will be based or ult of a written exa)) rt reports	levels of length of the second	Evaluation n examination nould be 6	on] ation. 0 and above out o	of 100. (60 and abo
[Method, F Evaluation n Evaluation s Passed, 59 at Evaluation n	Point of view, a nethod: Evaluatio tandard: The resund below: Failed nay includes shore	and Attainment on will be based or ult of a written exa) rt reports.	levels of f n one writte amination sh	Evaluation n examination nould be 6	on] ation. 0 and above out c	of 100. (60 and abov
[Method, F Evaluation n Evaluation s Passed, 59 an Evaluation n [Textbook	Point of view, a nethod: Evaluatio tandard: The resu nd below: Failed nay includes shor	and Attainment on will be based or ult of a written exa) rt reports.	levels of I n one writte amination sh	Evaluation n examination nould be 6	on] ation. 0 and above out c	of 100. (60 and abov
[Method, F Evaluation n Evaluation s Passed, 59 a Evaluation n [Textbook 松原英一郎	Point of view, ; nethod: Evaluati tandard: The resu nd below: Failed nay includes shor 1 他『金属材料編	and Attainment on will be based o ult of a written exa)) rt reports. 祖織学』(朝倉書	levels of I n one writte amination sh 昏店) ISBN	Evaluation n examination nould be 6	on] ation. 0 and above out c 240184	of 100. (60 and abo
[Method, F Evaluation n Evaluation s Passed, 59 a Evaluation n [Textbook 松原英一郎	Point of view, a nethod: Evaluatio tandard: The resu nd below: Failed nay includes shor] 他『金属材料約	and Attainment on will be based o ult of a written exa)) rt reports. 祖織学』(朝倉書	levels of I n one writte amination sh 冒店) ISBN	Evaluation n examination nould be 6 :9784254	on] attion. 0 and above out c 240184	of 100. (60 and abov

材料組織学(2)

[Reference books, etc.] (Reference books)

[Regarding studies out of class (preparation and review)] Students are required to carry out a review of class.

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

											*
Numbering	g code										
Course title <english></english>	高分子 Introdu	材料概論 ction to Pe	i(材 olyme) r Materials		Aff de Jo	iliated partment b title,Na	, me	Part	t-time Lectu	rer,FUKUDA TAKESH
Target ye	ear Brd y	year students	or above	Number	of cred	lits	2	Co ye	ourse ar/p	e offered eriod	2019/Second semester
Day/perio	d Fri.2	2	Cla	ss style	Lectur	е				Language	Japanese
[Outline a	nd Pur	pose of	the C	ourse]							
[Course G	Goals]										
[Course S	Schedul	le and Co	onten	its]							
,1time,											
,3times, Atimes											
4times											
2times											
,1time,											
[Class red	quireme	ent]									
None											
[Method,	Point o	f view, a	nd At	tainment	levels	of E	Evaluat	ion	n]		
[Textbook	<]										
[Referenc	e book	s, etc.]									
(Refere	nce bo	oks)									
Regardin	a studi	ies out o	f clas	s (prepar	ation a	nd	review)1			
Lugaran	. <u>.</u>							/1			
(Others (office h	nour, etc	.))		_					_	
*Please visi	t KULA	SIS to fin	d out a	about office	hours.						

Course title 結 <english> X</english>	晶回折学(材 ray Diffraction)	Af de Jo	filiated partment, b title,Nan	ne Gi	raduate Scho ofessor,MAT	ol of Engineerin ΓSUBARA EIIC
Target year	3rd year students	or above Number	of credits	2	Cours year/p	se offered period	2019/Second s
Day/period	Thu.1	Class style	Lecture			Language	Japanese
[Outline and	I Purpose of	the Course]					
Structural anal diffraction phe	yses by X-ray c nomena, crysta	liffraction method llography, and di	d will be giv ffraction by	ven. In the powder s	e lectu sample	re, the prope es will be lec	erties of X-rays, ctured.
[Course Go	alsl						
Students will le crystalline stru	earn the crystal ctures, diffracti	structure analyse ion conditions, an	es by X-rays id reciprocal	through l lattices.	the co	urse works o	of X-ray properti
[Course Sch	nedule and Co	ontents]					
projection	crystal plailes a	and directions, Ith	me,1. Descr	ipuon or	Iduice	pranes and o	unections//2. Ste
Calculation by Calculation of Diffraction by Structural anal Determination Reciprocal lattice	structure factor a powder samp yses of cubic sy of Bravais#039 ice and diffract \\3. Reciprocal	,1. Diffraction by s ole, 1 time, 1. Princi ystems, time, 1. De 9 lattice in cubic s ion condition, 3 tin lattice and diffrac	r crystalline iple of diffra etermination systems mes,1. Defin ction condit	lattice\\2. actometer a of a latti nition of r ion	. Brag \\2. X ce par recipro	g conditions -ray diffracti ameter in cu ocal lattices\\	and scattering and ion by powder sa bic systems\\2. 2. Reciprocal lat
Calculation of Diffraction by Structural anal Determination Reciprocal latt and real lattice [Class requi None	crystals, stimes structure factor a powder samp yses of cubic sy of Bravais#035 ice and diffract \\\3. Reciprocal	1. Diffraction by 's ole, 1 time, 1. Princi ystems, time, 1. De 1 attice in cubic s ion condition, 3 tir lattice and diffrac	r crystalline iple of diffra etermination systems mes,1. Defin ction condit	lattice\\2. actometer 1 of a latti nition of r ion	. Brag	g conditions -ray diffracti ameter in cu ocal lattices\\	and scattering a ion by powder sa ibic systems\\2. 2. Reciprocal lat
Calculation of Diffraction by Structural anal Determination Reciprocal latt and real lattice [Class requi None	crystals, stimes structure factor a powder samp yses of cubic sy of Bravais#035 ice and diffract: \\\3. Reciprocal irement]	1. Diffraction by 's ole, 1 time, 1. Princi ystems, time, 1. De Dattice in cubic s ion condition, 3 tin lattice and diffrac	r crystalline iple of diffra etermination systems mes,1. Defin ction conditi	lattice\\2. actometer of a latti nition of r ion	. Brag	g conditions -ray diffracti ameter in cu ocal lattices\\	and scattering a on by powder sa bic systems\\2. 2. Reciprocal lat
Calculation of Diffraction by Structural anal Determination Reciprocal latt and real lattice [Class requi None [Method, Po	crystals,stiffes structure factor a powder samp yses of cubic sy of Bravais#035 ice and diffract (\\3. Reciprocal irement]	,1. Diffraction by ⁵⁸ 16, 1time,1. Princi ystems,time,1. De D lattice in cubics 5 ion condition,3tin lattice and diffrac nd Attainment	r crystalline iple of diffra etermination systems mes, 1. Defin ction conditi	lattice\\2. actometer a of a latti nition of r ion Evaluati	. Brag \\2. X ce par ecipro on]	g conditions -ray diffracti ameter in cu acal lattices\\	and scattering a on by powder sa bic systems\\2. 2. Reciprocal lat
Calculation of Diffraction by Structural anal Determination Reciprocal latt and real lattice [Class requi None [Method, Pc The course wil	crystais,stimes structure factor a powder samp yses of cubic sy of Bravais#035 ice and diffract ice and diffract ice and diffract int of view, a libe evaluated f	1. Diffraction by 's 's ffraction by 's le, ltime, 1. Princi, systems, time, 1. De l lattice in cubic 's ion condition, 3tin lattice and diffract nd Attainment from the scores of	r crystalline iple of diffra stermination systems mes,1. Defin ction condition in condition i levels of l f a midterm	lattice\\2. actometer a of a latti hition of r ion Evaluati examinat	. Brag (\\2. X ce par ecipro on] tion (4	g conditions -ray diffracti ameter in cu scal lattices\\ 00%) and a fi	and scattering a on by powder sa bic systems\\2. 2. Reciprocal lat
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Target ye	ear 3rd y	ear students	or above Num l	ber of crea	lits 2	Cour year	rse offered /period	2019/First semester
Day/perio	d Fri.1		Class sty	le Lectur	e		Language	Japanese
[Outline a	nd Pur	pose of t	he Course]					
[Course G	ioals]							
[Course S	chedul	e and Co	ontents]					
,4times,								
,4times,								
,5times, 3times								
,1time,								
[Class red	quireme	ent]						
None								
[Method,	Point of	f view, a	nd Attainm	ent levels	of Evaluat	ion]		
[Textbook	4]							
[Referenc	e book	s, etc.]						
(Refere	nce boo	oks)						
[Regardin	g studi	es out o	f class (pre	paration a	nd review)]		
(Others (office h	our, etc	.))					
*Please visi	t KULA	SIS to find	d out about of	ffice hours.				

結晶回折学(材)**(2)**

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

Concentrate on a lecture, and review the contents which you got by a lecture by rearanging your lecture note and studying any questions of lecture contents for at least 4 hours in each lecture.

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

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Numbering of	code										
Course title I <english> In</english>	レクト itroduc	トロニクス ction to El	、入門 ectron	(機宇) iics	情報	Aff de Jo	iliated partment b title,Na	t, ime	Gra Pro	aduate Scho ofessor,MOI	ol of Informatics RIKURA MASAHIR
Target year	• 2nd y	ear students (r above	Number	of cred	lits	2	Co yea	ours ar/p	e offered eriod	2019/First semester
Day/period	Tue.5	5	Cla	ss style	Lectur	e				Language	Japanese
[Outline and	d Purp	pose of t	he Co	ourse]							
[Course Go	als]										
[Course Sch	nedul	e and Co	onten	ts]							
,2times,											
,5times, .2times.											
,5times,											
,1time,											
[Class requi	ireme	ent]									
None											
[Method, Po	oint of	f view, ai	nd At	tainment	levels	of E	Evaluat	ion]		
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[Textbook]											
[Reference	books	s, etc.]									
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[Regarding	studi	es out of	clas	s (prepar	ation a	nd	review)]			
(Others (of	fice h	our, etc.))								
*Please visit K	ULAS	SIS to find	l out a	bout office	e hours.						

Course title englishing 特別研究1(材) Graduate School of Engineering Professor,SUGIMURA HIROYI Job HileName Graduate School of Engineering Professor,SUGIMURA HIROYI Job Michanake, First st aparase Target year th year students or above Intensive Number of credits 4 Course of the gear/period Job Michanake, First st aparase Day/period Intensive Class style Seminar Language Japanese [Outline and Purpose of the Course] Seminar Language Japanese [Outline and Purpose of the Course] Seminar Course till (spannake, the parase) Affiliated gear/period Japanese [Outline and Purpose of the Course] Seminar Language Japanese [Outline and Purpose of the Course] Seminar Course till (spannake, the parase) Seminar Seminar [Course Goals] Tig aparase Seminar Seminar Seminar Seminar [Course Socie] Eagle aparase Seminar Seminar Seminar Seminar [Course Socie] Eagle aparase Seminar Seminar Seminar Seminar [Course Socie] Eagle aparase Seminar Seminar Seminar Seminar	Numbering c	ode U-EN	G25 45995 GJ77				
Target year th year students or above Number of credits 4 Course offered year/period Dot//Intensive, First state Day/period Intensive Class style Seminar Language Japanese [Outline and Purpose of the Course] Language Japanese 担当教員の指導のもと、材料科学に関する研究課題を設定し、その課題解決のための研究活動 体的に取り組む。この研究活動を通じて課題解決能力を習得する。 Go (Course Go (Course) Japanese [Course Goals] 課題設定、関連研究の調査、研究計画の立案、報告の作成などを通じて、研究活動について学 [Course Schedule and Contents] First state 1 ~ 4 回 mrs就題の設定 Som (Course) First state 1 ~ 4 回 mrs就題の設定 Som (Course) First state First state 1 ~ 4 回 mrs就画の設定 Som (Course) First state First state 1 ~ 4 回 mrs就画の設定 Som (Course) First state First state 1 ~ 1 回 Big 定課題の設定 First state First state First state 1 ~ 1 2 回 Big 定課題の設定 First state First state First state 1 ~ 2 回 Big 定課題の研究活動をするとともに、特別研究報告書の執筆指導などを行う。 First state First state First state	Course title 特 <english> G</english>	訊研究1(材 raduation Thesi) (s1	Af de Jo	filiated partment, b title,Name	Graduate Scho Professor,SUC	ool of Engineering GIMURA HIROYU
Day/periodIntensiveClass styleSeminarLanguageJapanese[Outline and Purpose of the Course]担当教員の指導のもと、材料科学に関する研究課題を設定し、その課題解決のための研究活動 体的に取り組む。この研究活動を通じて課題解決能力を習得する。得られた成果を関連研究とし、その意義や重要性等についてまとめる能力を奪う。[Course Goals]課題設定、開連研究の調査、研究計画の立案、報告の作成などを通じて、研究活動について学[Course Schedule and Contents]1 ~ 4回 研究課題の設定 5 ~ 9回 先行研究の調査、報告1 0 ~ 1 2回 設定課題の新規性、独創性等の検討 1 3 ~ 1 5回 研究計画の立案上記の研究活動を4単位分実施するとともに、特別研究報告書の執筆指導などを行う。[Class requirement]物理工学科材料科学コースが指定する入学年次の特別研究着手条件を満たしていること[Method, Point of view, and Attainment levels of Evaluation] 成績評価は一連の研究活動の実施状況、出席状況に基づいて行う。[Reference books.][Reference books.]	Target year	4th year students	or above Number	of credits	4 C y	ourse offered ear/period	2019/Intensive, First se
[Outline and Purpose of the Course] 担当教員の指導のもと、材料科学に関する研究課題を設定し、その課題解決のための研究活動 体的に取り組む。この研究活動を置して課題解決能力を習得する。得られた成果を関連研究とし、その意義や重要性等についてまとめる能力を養う。 [Course Goals] 課題設定、関連研究の調査、研究計画の立案、報告の作成などを通じて、研究活動について学 [Course Schedule and Contents] 1 ~ 4回 研究課題の設定 5 ~ 9回 先行研究の調査、報告 1 0 ~ 1 2回 設定課題の新規性、独創性等の検討 1 3 ~ 1 5回 研究計画の立案 上記の研究活動を4単位分実施するとともに、特別研究報告書の執筆指導などを行う。 [Class requirement] 物理工学科材料科学コースが指定する入学年次の特別研究着手条件を満たしていること [Method, Point of view, and Attainment levels of Evaluation] 成講評価は一連の研究活動の実施状況、出席状況に基づいて行う。 [Textbook] 指導教員が個別に指示する教科書等を利用する [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] 各指導教員の指示に従うこと	Day/period	Intensive	Class style	Seminar		Language	Japanese
担当教員の指導のもと、材料科学に関する研究課題を設定し、その課題解決のための研究活動 体的に取り組む。この研究活動を通じて課題解決能力を習得する。得られた成果を関連研究と し、その意義や重要性等についてまとめる能力を養う。 [Course Goals] 課題設定、関連研究の調査、研究計画の立案、報告の作成などを通じて、研究活動について学 [Course Schedule and Contents] 1 ~ 4回 研究課題の設定 5 ~ 9回 先行研究の調査、報告 1 0 ~ 1 2回 設定課題の新規性、独創性等の検討 1 3 ~ 1 5回 研究計画の立案 上記の研究活動を4単位分実施するとともに、特別研究報告書の執筆指導などを行う。 [Class requirement] 物理工学科材料科学コースが指定する人学年次の特別研究着手条件を満たしていること [Method, Point of view, and Attainment levels of Evaluation] 成績評価は一連の研究活動の実施状況、出席状況に基づいて行う。 [Textbook] 指導教員が個別に指示する教科書等を利用する [Reference books, etc.] (Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] 各指導教員の指示に従うこと	[Outline and	I Purpose of	the Course]				
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(例生上ライヤ科ヤヤキョコ へが追足する人子中人の名加加克音子宗中を過たしているとこ [Method, Point of view, and Attainment levels of Evaluation] 成績評価は一連の研究活動の実施状況、出席状況に基づいて行う。 [Textbook] 指導教員が個別に指示する教科書等を利用する [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] 各指導教員の指示に従うこと	13~15回 研究計画の立 上記の研究活 [Class requi	with、近期に 二案 i動を4単位分 irement]	実施するととも	に、特別で	开究報告書	春の執筆指導な。 	どを行う。
[Method, Point of view, and Attainment levels of Evaluation] 成績評価は一連の研究活動の実施状況、出席状況に基づいて行う。 [Textbook] 指導教員が個別に指示する教科書等を利用する [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] 各指導教員の指示に従うこと	10/41/17/17/10		13 BAC 9 87(7	-+//0/10/		- 永平を 周 た 0	
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Numbering	g code	U-EN	G25 4:	5995 GJ77								
Course title <english></english>	特別句 Gradu;	Ŧ究1(機 ation Thesi) s1			Aff dep Job	iliated partment p title,Na	t, ime	Gra Pro	aduate Sc fessor,H	hool OUJ	of Engineering IYOU MASAKI
Target ye	ear 4th	year students (or above	Number	of cred	its	4	Co yea	urs ar/p	e offerec eriod	1 2	019/Intensive, First semester
Day/peric	d Int	ensive	Cla	ss style	Semina	ır				Langua	ge J	lapanese
[Outline a	nd Pu	rpose of t	he Co	ourse]								
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[Course G	ioals]											
課題設定、	関連研	「究の調査	、研究	『計画の立	案、報	告の)作成な	にどる	を通	じて、る	开究	活動について学ぶ。
[Course S	chedu	le and Co	onten	ts]								
研究課題の 5~9回 先行研究の 10~12 設定課題の 13~15 研究計画の	設 調 回 新 回 気 関 の 新 回 文 案	報告 E、独創性	等の枝	韵								
[Class red 物理工学科 ること。	juirem 機械シ	ent] ·ステム学	3 - 2	、が指定す	る、人	学年	三次に対	応し	した	特別研究	究着:	手条件を満たしてい
[Method,	Point o	of view, a	nd At	tainment	levels	of E	valuat	ion]			
成績評価は	一連の)研究活動	の実施	も状況に基	づいて	行う) 。					
[Textbook	<]											
配属研究室	で指定	される。										
[Referenc	e bool	ks, etc.]										
(Refere 木下是雄	nce bo 『理科系	ioks) 系の作文技	術』	(中央公論	侖新社 (新	新書)) ISB	N:9	784	12100624	40	
[Regardin	g stud	lies out o	f clas	s (prepar	ation a	nd I	review)]				
各指導教員	の指示	に従うこ	と。									
(Others (office	hour, etc	.))									
*Please visi	t KULA	ASIS to fine	d out a	bout office	e hours.							

Numberin	g code	U-EN0	G25 45995 GJ77							
Course title <english></english>	特別研 Gradua	究1(エ tion Thesi	ネ) s1		Affilia depar Job t	ated rtment itle,Na	, me	Graduate S Professor,F	choo IAG	ol of Energy Science IWARA RIKA
Target ye	ear 4th	year students o	or above Number	of cred	its 4		Cou yea	urse offere r/period	d	2019/Intensive, First semester
Day/peric	d Inte	nsive	Class style	Semina	r			Langua	ige	Japanese
[Outline a	nd Pur	pose of t	he Course]							
担当教員の 究活動を主 研究と比較	指導の 体的に し、そ	もと、エー 取り組む。 の意義や	ネルギー応用工 。この研究活動 重要性等につい	学に関 を通じ てまと	する	开究課 夏解決 と力を	題を	E設定し、 Dを習得す o。	その る。)課題解決のための研 得られた成果を関連
[Course G	ioals]									
課題設定、	関連研	究の調査	、研究計画の立	案、報行	告の作	F成な	:どを	E通じて、	研究	『活動について学ぶ。
[Course S	ichedu	le and Co	ontents]							
1~4回 研究課題の 5~9回 先行研究の 10~12 設て課題の 13~15 研究計画の	設定 調回 新回 規 里 二 案	報告 、独創性 [:]	等の検討							
[Class red	quireme	ent]								
物理工学科	エネル	ギー応用	工学コースが指	定する,	入学年	F次の	特別	刂研究着手	条件	を満たしていること。
[Method,	Point o	f view, a	nd Attainment	levels of	of Ev	aluat	ion]			
一連の研究	活動の	実施状況	に基づいて行う	0						
[Textbook	<]									
Not used										
[Referenc	e book	s, etc.]								
(Refere	nce bo	oks)								
[Regardin	g stud	ies out of	f class (prepar	ation a	nd re	view)]			
各指導教員	の指示	に従うこ	٤.							
(Others (office I	nour, etc.))							
*Please visi	t KULA	SIS to find	l out about office	hours.						
I										

Numbering	g code	U-EN	G25 4	5995 GJ77						
Course title <english></english>	特別码 Gradu	研究1(原 uation Thesi) s1			Aff de Joi	filiated partment b title,Na	, me ^G	raduate Scho rofessor,YOF	ol of Engineering KOMINE TAKEHIKO
Target ye	ar 4tl	h year students o	or above	Number	of cred	its	4	Cour year/	se offered period	2019/Intensive, First semester
Day/perio	d In	tensive	Cla	ss style	Semina	ır			Language	Japanese
[Outline a	nd Pu	irpose of t	he C	ourse]						
担当教員の指導のもと、原子核工学に関する研究課題を設定し、その課題解決のための研究活動を 主体的に取り組む。この研究活動を通じて課題解決能力を習得する。得られた成果を関連研究と比 較し、その意義や重要性等についてまとめる能力を養う。										
[Course G	ioals]									
課題設定、	関連研	开究の調査	、研乳	『計画の立	案、報	告の	O作成な	:どをi	通じて、研 3	8活動について学ぶ。
[Course S	ched	ule and Co	onten	ts]						
1~4回 研究課題の設定 5~9回 先行研究の調査、報告 10~12回 設定課題の新規性、独創性等の検討 13~15回 研究計画の立案										
[Class req	luiren	nent]								
物理工学原	子核	[学コース	が指え	官する入学	年次の	特別	刂研究着	手条	牛を満たして	ていること
[Method, F	Point	of view, a	nd At	tainment	levels	of E	Evaluat	ion]		
成績評価は	一連0	の研究活動	の実防	施状況に基	づいて	行う	ò.			
[Textbook]									
Not used										
[Reference	e boo	ks, etc.]								
(Referer 各指導教員	ice b o が紹介	ooks) ↑する								
[Regardin	g stu	dies out o	f clas	s (prepara	ation a	nd	review)]		
各指導教員	の指え	示に従うこ	٤							
(Others (office	hour, etc.))							
*Please visit	KUL.	ASIS to find	d out a	bout office	hours.					

	_										
Numbering	g co	ode U-El	NG25 4	5995 GJ77							
Course title <english></english>	特) Gra	別研究1(札 aduation The	才) sis1			Aff de Jo	iliated partment b title,Na	t, ime	Gra Pro	duate Scho fessor,SUC	ool of Engineering GIMURA HIROYUK
Target ye	ar	4th year student	s or above	Number	of cred	lits	4	Co yea	urs ar/p	e offered eriod	2019/Intensive, Second semester
Day/perio	d	Intensive	Cla	ss style	Semina	ar				Language	Japanese
[Outline a	nd	Purpose of	the C	ourse]							
担当教員の 体的に取り し、その意	指語	導のもと、林む。この研究や重要性等に	オ料科学 記活動で こついう	学に関する を通じて課 てまとめる	研究課 題解決 能力を	題を 能力 養う	E設定し Jを習得 う。	/、 行 拝する	その る。	課題解決(得られた)	Dための研究活動を 成果を関連研究と比
[Course G	ioa	ls]									
課題設定、	関	連研究の調査	11、研究	記計画の立	案、報	告の	O作成な	にどを	を通	じて、研究	究活動について学ぶ
[Course S	ch	edule and C	Conter	ts]							
+ 0 - 1 2 設定課題の 1 3 ~ 1 5 研究計画の 上記の研究	回新回立 活	規性、独創性 案 動を 4 単位 5	主等の村	_{剣討}	に、特	別句	研究報告	書の	の執	筆指導なる	どを行う。
[Class req	lnii	rement]					·		_ ///		
物理工学科	材	料科学コース	くが指定	Eする入学	年次の	特別	山研究着	i手≉	条件	を満たして	ていること
[Method, I	Poi	nt of view,	and A	tainment	levels	of E	Evaluat	ion	1		
成績評価は	:—j	連の研究活動	か実施	も状況、出	席状況	に基	<u>ま</u> づいて	:行:	б.		
[Textbook	[]										
指導教員が	個	別に指示する	5教科書	書等を利用	する						
[Reference	e b	ooks, etc.]									
(Referer	nce	books)									
[Regardin	g s	tudies out	of clas	s (prepar	ation a	nd	review)]		_	
各指導教員	Ø	指示に従うこ	22								
(Others (offi	ice hour, et	c.))								
*Please visit	t KI	ULASIS to fi	nd out a	about office	hours.						

Numbering	code	U-EN	G25 4	5995 GJ77							
Course title <english></english>	特別研 Gradua	究1(宇 tion Thesi) s1			Aff de Joi	iliated partment b title,Na	t, me	Gra Pro	duate Scho fessor,ERI	ol of Engineering GUCHI KOUJI
Target ye	ar 4th y	ear students o	or above	Number	of cred	lits	4	Co ye	ourse ar/p	e offered eriod	2019/Intensive, First semester
Day/perio	d Inte	nsive	Cla	ss style	Semina	ar				Language	Japanese
[Outline a 担当教員の 学,制御工	nd Pur 指導の 学,機	pose of t もと,航 能構造力	he C 空宇で 学,2	ourse] 宙工学の関 分子流体力	連分野]学)に	() 関す	1空宇宙 「る研究] 力: 【課】	学, 題を	流体力学 設定し,そ	, 流体数理学 , 推進工 その課題解決のための
研究活動を 連研究と比	主体的 較し,	に取り組 その意義	む.; や重望	この研究活 要性等につ	動を通 いてま	じて とめ	:課題解 うる能力	決	能力 養う	を習得する ・	8.得られた成果を関
[Course G	oals]										
課題設定,	関連研	究の調査	,研	究計画の立	[案,報	告の	O作成な	ど	を通	じて,研3	究活動について学ぶ.
[Course S	chedu	e and Co	onter	its]							
1~4回 研究課題の 5~9回 先行研究の 10~課題 設定課題の 13~15 研究計画の	設 調回新回 新回 文 Wireman	報告 , 独創性 [:]	等の材	 							
物理工学科	宇宙基	礎工学コ	-27	が指定する	入学年	次の)特別研	穷	着手	条件を満た	こしていること .
	•										
[Method, I	oint o	f view, a	nd A	ttainment	levels	of E	Evaluat	ion]		
一連の研究	活動の	実施状況	に基づ	づいて行う).						
[Textbook]										
Not used											
[Reference	e book	s, etc.]									
(Referer 各担当教員	ice boo から研	oks) 究テーマ	に応	じて指示す	る.						
[Regardin	g studi	es out o	f clas	ss (prepar	ation a	nd	review)]			
指示された	参考書	および学	術論	文等を学期	をかけ	て訪	み進め	る	ะะ		
(Others (office h	our, etc.))								
*Please visit	KULA	SIS to find	l out a	about office	e hours.						

Numbering c	ode U-EN	G25 45995 GJ77					
Course title 特 <english> Gr</english>	別研究1(エ raduation Thes	ニネ) is1		Affiliated department Job title,Na	, Gra me ^{Pro}	aduate Scho fessor,HAC	ol of Energy Science JIWARA RIKA
Target year	4th year students	or above Number	of credi	its 4	Course year/p	e offered eriod	2019/Intensive, Second semester
Day/period	Intensive	Class style	Semina	r		Language	Japanese
[Outline and	Purpose of	the Course]					
担当教員の指 究活動を主体 研究と比較し	導のもと、エ 的に取り組む 、その意義や	ネルギー応用工 。この研究活動 重要性等につい	学に関す を通じて てまとめ	する研究課 て課題解決 める能力を	題を設 能力を 養う。	定し、そ0 習得する。	D課題解決のための研 得られた成果を関連
[Course Goa	als]						
課題設定、関	連研究の調査	、研究計画の立	案、報告	きの作成な	どを通	iじて、研究	『活動について学ぶ。
[Course Sch	edule and C	ontents]					
1~4回 研究課題の設 5~9回 先行研究の調 10~12回 設定課題の罰 13~15回 研究計画の立	定 査、報告 規性、独創性 案	等の検討					
[Class requi	rement]						
物理工学科工	ネルギー応用	工学コースが指	定する	\学年次の	特別研	究着手条件	‡を満たしていること。
[Method, Po	int of view, a	nd Attainment	levels c	of Evaluat	ion]		
一連の研究活	動の実施状況	に基づいて行う	•				
[Textbook]							
Not used							
[Reference b	books, etc.]						
(Reference	e books)						
[Regarding s	studies out o	f class (prepar	ation ar	nd review)]		
各指導教員の	指示に従うこ	٤.					
(Others (off	fice hour, etc	.)					
*Please visit K	ULASIS to fin	d out about office	hours.				

Numbering	code	U-ENC	G25 4	5995 GJ77								
Course title <english></english>	特別研究 Graduati	党1(原 ion Thesis)			Aff de Joi	filiated partment b title,Na	, me	Gra Pro	aduate Scho fessor,YOK	ol of Engineerin COMINE TAKE	ng EHIKO
Target yea	ar 4th ye	ear students or	r above	Number	of cred	lits	4	Соц уеа	ırs r/p	e offered eriod	2019/Intensive, See semester	cond
Day/period	I Inten	sive	Cla	ss style	Semina	ar				Language	Japanese	
[Outline an	d Purp	ose of th	he C	ourse]								
担当教員の打 主体的に取り 較し、その類	指導のも り組む。 意義や重	5と、原子 この研 重要性等に	子核] 究活動 こつし	E学に関す 動を通じて Aでまとめ	る研究 課題解 る能力	課題 決 倉 を 者	夏を設定 能力を習 衰う。	し、 得す	そる	の課題解決 。得られた	₹のための研究 □成果を関連研	活動を F究と比
[Course Go	oals]											
課題設定、開	関連研9	その調査、	研究	る計画の立	案、報	告の	り作成な	:どを	÷通	じて、研究	記動について	「学ぶ。
[Course Sc	thedule	and Co	nten	lts]								
1~4回 5~9回 10~12回 13~15回	研究課題 先行研究 回 設定 回 研究	夏の設定 その調査、 を課題の新 会計画の5	報 新規1 立案	与 生、独創性	等の検	討						
[Class requ	uireme	nt]										
物理工学科原	亰子核 ⊒	[学コース	スが打	旨定する入	学年次	の特	寺別研究	着手	条	件を満たし	っていること	
[Method, P	oint of	view, an	nd At	tainment	levels	of E	Evaluat	ion]				
成績評価は−	一連の	开究活動(の実放	も状況に基	づいて	行う	ò.					
[Textbook]												
Not used												
[Reference	books	s, etc.]										
(Referend 各指導教員 <i>f</i>	ce boo が紹介す	ks) する										
[Regarding	j studie	es out of	clas	s (prepar	ation a	nd	review))]				
各指導教員0	の指示に	こ従うこと	<u>-</u>									
(Others (o	ffice h	our, etc.)))									
*Please visit	KULAS	IS to find	out a	ibout office	hours.							

Numbering co	ode	U-ENO	G25 4	5998 GJ77								
Course title <english> Gr</english>	別研究 aduatio	〔2(材) on Thesis	\$2			Affi dep Job	liated artment title,Na	, me	Gra Proi	duate Scho fessor,SUG	ol of Engine IMURA HII	ering ROYUKI
Target year	4th yea	ar students o	r above	Number	of cred	its	6	Co yea	urse ar/pe	e offered eriod	2019/Intensive semester	, Second
Day/period	Intens	sive	Cla	iss style	Semina	ır				Language	Japanese	
[Outline and	Purp	ose of t	he C	ourse]								
担当教員の指導 体的に取り組織し、その意義	導のも む。こ や重要	らと、材料 この研究 そ 歴 等に「	料料	学に関する を通じて課 てまとめる	研究課 題解決 能力を ⁵	題を力	設定し を習得 。	, - する	その る。	課題解決の 得られた反	つための研究 成果を関連研	記活動を主 开究と比較
[Course Goa	ıls]											
課題設定、関語 まとめ、発表	連研究 するこ	この調査、 ことを通	、研究 じて、	究計画の立 研究活動	案、実 につい	験と て学	検証を ぶ。	行	Э.	これらの反	找果を特別 石	研究として
[Course Sch	edule	and Co	onter	nts]								
ロ 設定課題の新 2 ~ 7回 実験の実施、 3 ペ9回 4 の可 4 の回 4 前別研究1 3 他、 1 0 回 4 市別 1 1 ~ 1 3 他、 1 1 ~ 1 3 他、 1 1 ~ 1 3 他、 1 4 ~ 1 3 他、 1 4 ~ 1 5 告 1 特別 記 の 研究 名 情 上 記の研究 名 情 加 で 究 世 本 の の ま と の の ま と の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の ま の の こ と の の の ま の の こ の の ま の の こ と の の の ま の の の の ま の の の の の こ ま の の の の	規性、 発 結 書 動 remer 学	独創性 (1) (1) (1) (1) (1) (1) (1) (1)	等実た表実 実 が指え	専検証 計画の修正 の資料作成 計画の修正 するととも 定する入学	などに。 などに。 に、特)	より より 研 別	研究を 研究を 死報告 研究着	·遂 ·遂 · · · · · · · · · · · · ·	テ テ の 条件	筆指導なる	ざを行う。	
[Method, Poi	int of	view, ar	nd At	ttainment	levels	of E	valuat	ion	1			
成績評価は一 の内容に基づ	連の 研 い て 行	∓究活動(テう。	の実施	淹状況、出	席状況、	. 中	間発表	会	こお	ける発表の	的容、特別で	开究報告書

特別研究2(材)(2)

[Textbook] 指導教員が個別に指示する教科書等を利用する

[Reference books, etc.] (Reference books)

[Regarding studies out of class (preparation and review)] 各指導教員の指示に従うこと

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

Numbering co	de U-EN	G25 45998 GJ77					
Course title 特別 <english> Gra</english>	別研究2(機) duation Thesi	\$2	A d J	ffiliated epartment, ob title,Nam	Gra Pro	aduate Scho ofessor,HOU	ol of Engineering JJIYOU MASAKI
Target year	4th year students of	r above Number	of credits	6	Cours year/p	e offered eriod	2019/Intensive, Second semester
Day/period	Intensive	Class style	Seminar			Language	
[Outline and] 担当教員の指導 体的に取り組む し、その意義が [Course Goal 理題設定 問題	Purpose of t 尊のもと、機 〕。この研究 b重要性等に s]	he Course] 械工学に関する 活動を通じて 調 のいてまとめる 研究計画の立	の研究課題 課題解決能 の能力を養 家 実験	を設定し、 力を習得 ⁻ う。	そのする。)課題解決(得られた) これらの	のための研究活動を主 成果を関連研究と比較 1000000000000000000000000000000000000
味道設定、関連まとめ、発表す	「ることを通	して、研究活動	泉、美破したついて	こ 検証を1 学ぶ。	1.7°	C1150/	成未を特別研究として
1回 設定課題の新規 2~10回 実験または理理 11~13回 は4回 学士発色 特別研究報告書 [Class requirt 物理工学科機構 ること。また、 [Method, Poin	見性、独創性	等の再検証 、結果の考察、 告書の執筆、学 コースが指定す を履修済みであ nd Attainment	実験また	は理論検討 のためのう 年次に対J Evaluati	討の計 資料作	画の修正 た (特別研究)	などにより研究を遂行
成績評価は一連 づいて行う。	車の研究活動	の実施状況、学	生発表会	における	発表内	容、特別码	研究報告書の内容に基
[Textbook] 各研究室におい	て指定する。						
[Reference bo (Reference 木下是雄 『理科	ooks, etc.] books) 科系の作文技	術』(中央公詞	侖新社 (新	書)) ISBN	1:9784	121006240	
[Regarding st 各指導教員の指 (Others (offic *Please visit KU	t udies out o 旨示に従うこ ce hour, etc. JLASIS to find	f class (prepar と。)) l out about office	e hours.	I review)]			

Numbering	g co	de	U-EN0	G25 4	5998 GJ77							
Course title <english></english>	特別 Gra	り研习 duati	紀2(エオ ion Thesi	く) s2			Aff dej Jol	iliated partment p title,Na	, me	Gra Prof	duate Scho fessor,HAC	ol of Energy Science GIWARA RIKA
Target ye	ar	4th ye	ar students o	or above	Number	of cred	its	6	Cou year	ırse r/pe	e offered eriod	2019/Intensive, Second semester
Day/perio	d	Inten	sive	Cla	ss style	Semina	ır				Language	
[Outline a	nd l	Purp	ose of t	he C	ourse]							
担当教員の 究活動を主 研究と比較)指導 (体的 をし、	身のも りに耳 その	らと、エ 取り組む。 の意義や	ネル= 、この 重要!!	ギー応用工 の研究活動 性等につい	学に関 を通じ てまと	する て課	研究課 課題解決 の能力を	題を 能力 養う	設]を)。	定し、その 習得する。	D課題解決のための研 得られた成果を関連
[Course G	ioal	s]										
課題設定、 まとめ、発	関連 表す	∎研9 ⊨るこ	その調査、 ことを通	、研9 じて、	記計画の立 研究活動	案、実 につい	験と て学	:検証を ^全 ぶ。	行う) 。	これらの反	找果を特別研究として
[Course S	iche	dule	and Co	onten	ts]							
- 回 - 回 - 四 - 二 - 二 - 二 - 二 - 二 - 二 - 二 - 二	新 い 回め間回告 ロロエ Poir 動 紙 の の 子 間 の 活	健 生 果 の 和 e men か の 事 men か の す の う の す の う の す の す の う の す の す の す の う の う の う の う の の の つ の う の う の う の う の う の う の う の う の う の う の つ の う の の の う う の う う の う の う の う の う の う の う の う の う の う の う つ う う う の う う う の う う う う う う う う う う う う う	独創性 か か い か か か い か や で の 発 、 い い の 、 い い の 、 い の の 、 い の の の の 、 い の の の の の の の の の の の の の	等の 実験 ための	与検証 計画の修正 D資料作成 コースが指 tainment 掲発表会に	などに 定する. levels おける	より 入	り研究を ^全 年次の <mark>Evaluat</mark> 取容、	遂行		究着手条件 究報告書0	‡を満たしていること。 D内容に基づいて行う。
[Textbook	d]											
Not used												
[Referenc	e bo	ooks	s, etc.]									
(Refere	nce	boo	ks)									
[Regardin	g st	udie	es out of	f clas	s (prepara	ation a	nd	review)]			
各指導教員	の指	示に	こ従うこ	٤.								
(Others (offi	ce h	our, etc.))					_			
*Please visit	t KU	LAS	IS to find	l out a	bout office	hours.						

	ode	U-ENG	G25 4	5998 GJ77						
Course title 特 <english> G</english>	別研3 raduati	究2(宇) ion Thesi	s2			Affiliated departme Job title,	ent, Name	Graduate S Professor,E	choc ERIG	ol of Engineering SUCHI KOUJI
Target year	4th ye	ear students o	or above	Number	of cred	lits 6	Co ye	ourse offere ar/period	ed	2019/Intensive, Second semester
Day/period	Inten	sive	Cla	ss style	Semina	ar		Langua	ige	
[Outline and	Purp	ose of t	he C	ourse]						
担当教員の指 学,制御工学 研究活動を主 連研究と比較	導のも ,機能 体的に し,そ	5と,航 能構造力 こ取り組 その意義	空宇留学 , 分 ジ . こ や 重要	宙工学の関 分子流体力 この研究活 要性等につ	連分野 学)に 動を通 ま	(航空宇 関する研 じて課題 とめる能	宙力 究課 別 た	学 , 流体力 題を設定し 能力を習得 養う .	学, ,そ する	流体数理学,推進 の課題解決のため ,得られた成果を
[Course Goa	als]									
課題設定,関 らの成果を特	連研9 別研9	究の調査 究として	,研? まとめ	^究 計画の立 か,発表す	案 , 実 ること	験(シミ を通じて	ュレ ,研	ーション含 究活動につ	む) いて	と検証を行う.こ 学ぶ.
[Course Sch	edule	e and Co	onten	ts]	_					
実験の実施, 11~12回 成果のまとめ 13回~15 特別研究の発 [Class requi 物理工学科宇 を修得してい	結果の 、回表と幸 reme ること	D考察, 長のため 服告書の mt] 歴工学コ と・	実験 前 前 前 第 一 ス た 一 ス た	+画の修正 料作成 が指定する	などに 入学年	より研究 次の特別	を遂 研究	行 	満た	:し,特別研究1([:]
[Method, Po	int of	view, a	nd At	tainment	levels	of Evalu	ation]		
成績評価は一 て行う.	連のな	开究活動	の実放	笹状況,報	告会に	おける発	表内	容,特別研	究報	告書の内容に基づ
[Textbook]										
Not used										
Not used	oooks	s, etc.]								
Not used [Reference I (Reference 各担当教員か	pooks e boo ら研9	s, etc.] ks) ミテーマ	に応し	じて指示す	ā.			_		
Not used [Reference I (Reference 各担当教員か [Regarding s	oooks e boo ら研列 studie	s, etc.] ks) ミテーマ es out o	に応 l	じて指示す ss (prepar	ත . ation a	nd revie	w)]			
Not used [Reference I (Reference 各担当教員か [Regarding 指示された参	pooks e boo ら研究 studie 考書す	s,etc.] ks) ミテーマ esouto らよび学	に応し f clas 術論3	じて指示す s (prepar 文等を学期	る . ation a	nd revie て読み進	w)] める			
Not used [Reference I (Reference 各担当教員か [Regarding 指示された参 (Others (off	pooks e boo ら研究 studie 考書す	s, etc.] ks) でテーマ es out of らよび学 our, etc.	に応し f clas 術論3	じて指示す as (prepar 文等を学期	る. ation a をかけ	nd revie て読み進	w)] める	Ξ٤.		

Numbering co	de	U-EN0	G25 4	5998 GJ77						
Course title <english> Gra</english>	引研爭 aduati	铊2(原) ion Thesi	s2			Aff dep Job	iliated partment p title,Na	me Gr	aduate Scho ofessor,YOF	ol of Engineering KOMINE TAKEHIKO
Target year	4th ye	ar students o	or above	Number	of cred	lits	6	Cours year/p	se offered period	2019/Intensive, Second semester
Day/period	Inten	sive	Cla	ss style	Semina	ar			Language	
[Outline and	Purp	ose of t	he C	ourse]						
特別研究1の症 課題解決のため 得られた成果る	成果を めの研 を関連	を踏まえ、 研究活動 [:] 車研究と	、担当 を主作 比較し	当教員の指 本的に取り し、その意	導のも 組む。 義や重	と、 この 要性	原子核 の研究活 き等につ	工学に 動を 追 いてま	こ関する研究 通じて課題館 そとめる能力	쪿課題を設定し、その 解決能力を習得する。 ∫を養う。
[Course Goa	ls]									
- 課題設定、関i まとめ、発表す	 重研ヂ するこ	での調査、 ことを通	、研? じて、	^究 計画の立 研究活動	案、実 につい	験と て学	:検証を ^全 ぶ。	行う。	これらの府	找果を特別研究として
[Course Sche	edule	and Co	onten	its]						
2 ~ 1 0 回 1 1 回 成果(1 2 ~ 1 4 回 1 5 回 特別(実験の のまと の 時の た の た の た の の に の の の の の の の の の の の	D実施、 とめ 別研究報 [:] 服告会で	結果の 告書の の成り	D考察、実 D執筆 果発表(ポス	験計画 、ター発	の修 (表)	8正など	により)研究を遂行	,
[Class requir	emei	nt]								
物理工学科原于	子核日	[学コー	スが打	旨定する入	学年次	の特	閉研究	着手条	そ件を満たし	していること
[Method, Poi	nt of	view, a	nd At	tainment	levels	of E	valuat	ion]		
成績評価は一i おける発表内容	重の 弱に 碁	研究活動 まづいて	の実放行う。	拖状況、特	別研究	報告	書の内	 容、特	持別研究報 台	告会(ポスター発表)に
[Textbook]										
Not used										
[Reference b	ooks	s, etc.]								
(Reference Introduced durin	boo ng cla	ks) Iss								
[Regarding s	tudie	es out of	f clas	s (prepara	ation a	nd	review)]		
各指導教員の	皆示に	こ従うこ	٤							
(Others (offi	ce ho	our, etc.))							
*Please visit KU	JLAS	IS to find	l out a	about office	hours.					

Numbering c	ode U-ENG	G25 45998 GJ77						
Course title 特 <english> Gi</english>	別研究2(材 raduation Thesi) \$2		Affiliate departr Job title	ed nent, e,Name	Gra Prof	duate Schoo fessor,SUG	ol of Engineering IMURA HIROYUKI
Target year	4th year students of	or above Number	of cred	its 6	C ye	ourse ear/pe	e offered eriod	2019/Intensive, First semester
Day/period	Intensive	Class style	Semina	ır			Language	Japanese
[Outline and	Purpose of t	he Course]						
担当教員の指 体的に取り組 し、その意義	導のもと、材 む。この研究 や重要性等に	料科学に関する 活動を通じて課 ついてまとめる	研究課 題解決 能力を ⁹	題を設た 能力を 養う。	定し、 習得す	その	課題解決の 得られた成)ための研究活動を主 成果を関連研究と比較
[Course Goa	als]							
課題設定、関 まとめ、発表	連研究の調査 することを通	、研究計画の立 じて、研究活動	「案、実」 うについ	験と検 て学ぶ。	証を行 ,	ið.	これらの成	^{我果を特別研究として}
[Course Sch	edule and Co	ontents]						
- 回 記 記 記 記 記 2 ~ 70実 回 題 2 ~ 70実 回 8 ~ 70実 回 5 ~ 70実 の ま と め 1 10回 特別1 ~ 7130 に 第 5 ~ 70実 向 ま と め の ま に と の の 実 版 の の 実 版 の の 実 版 の の 実 の 、 の 実 版 の の ま の の 実 の 、 の 実 の 、 の 実 し に た の の 実 し の ま の の ま の の ま の の ま の の ま に め の ま し の た の の ま に め の ま の し の た の の ま の の ま の の ま し の た の の ま に の の ま の の ま の の ま の の ま の の ま の の ま の こ ろ に の つ ま の の ち つ に ろ の う ま の の ち こ の ち つ に ろ の つ ち ろ の ち つ の ち の つ ち つ の ま の つ ち の つ ま の つ ち つ ち つ の ち つ こ ろ の う の ま の つ ち の つ ま の つ ち ろ の ま の つ ち ろ の ち つ の ま の の ち ろ つ ち う の ち ろ こ ろ つ ち ろ の ま の ろ ろ ろ ち の ろ ろ の ち ろ の ち ろ の う の ち ろ ろ ろ ろ う ち ろ つ ち ろ の ち ろ の う の う ろ ろ の ち ろ の う つ ろ の う の う ろ ろ の う の う の う の う ろ の の つ ろ の ろ ろ の ろ の う ろ の ろ ろ の ろ ろ ろ ろ ろ の の う ろ の ろ の	規性、独創性 結果の考察、 、中間発表の 発表会での発 結果の考察、 書の執筆 動を6単位分 ? rement1	等の再検証 実験計画の修正 ための資料作成 表 実験計画の修正 実施するととも	などに、 などに、 らに、特別	より研 より研 別研究	究を遂 究を遂 暇――	2行 2行 第の執:	筆指導など	を行う。
し し 加 田 工 学 私 材	rementj 判利学コーフ	が指定する入学	ケンク	法미대	空差壬	冬件	を満たし7	いること
170*主工于作书的		11日1年93八子	-+/\0/	נ דערני ני ו	小日丁	जर।†		
[Method, Po 成績評価は一 の内容に基づ	int of view, ai 連の研究活動 いて行う。	nd Attainment の実施状況、出	levels(唐状況、	of Eval 、中間	uatio 発表会	n] まにお	ける発表内	9容、特別研究報告書
						- Co	ntinue to 特	別研究2(材) (2)

E.

特別研究2(材)(2)
[Taythook]
旧寺秋長が個別に追水する秋行自守で何用する
[Reference books, etc.]
(Reference books)
[Regarding studies out of class (preparation and review)]
各指導教員の指示に従うこと
(Others (office hour, etc.))
*Please visit KULASIS to find out about office hours.

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Course title 特别	別研究2(原)		d	epartment	t, C	Graduate Scho	ol of Engineering
<english> Gra</english>	aduation Thesi	s2		J	ob title,Na	me P	rofessor,YOK	COMINE TAKEHI
Target year	4th year students of	or above	Number	of credits	6	Cou	rse offered	2019/Intensive, First se
Day/pariod	Intensive	Class	o otulo	Cominor		year		Iononaca
Day/periou	Intensive	Clas	s style	Seminar			Language	Japanese
[Outline and	Purpose of t	ine Co	ursej					
特別研究1の周期のため	成果を踏まえ	、担当	教員の指	得のもと	、原子移	(上字)	に関する研究	1課題を設定し、
示 遮 解 次 の に の 。 に の 。 。 の に の 。 。 の に の 。 。 の 。 の	のの研究活動 を間連研究と	を土仲 比較し	いに取り その音	組む。こ	の研える	調を	囲し C 課題用 キとめ ろ能力	件状能力を首待9
	で則建制九て	LLŦX U	、この思	、我で主女		,,,,,	よこのる肥/	」を良り。
[Course Goa	ls]	TT also				. /= >		
課題設定、関連	連研究の調査 オスニレ友通	、研究 ビア	計画の立	系、実験	と検証を 学ぶ	行う	。これらの反	双果を特別研究と
まとの、先衣	りることを通		· 研九活動		子い。			
[Course Sch	edule and Co	ontent	s]					
1回 設定課題	題の新規性、	独創性	等の再検	証		•• ·		_
2~10回	実験の実施、	結果の	考察、実	験計画の	修正なと	によ	リ研究を遂行	1
	m + E m							
		# # @	±+ 55					
12~14回	ちょこの 特別研究報	告書の	執筆	75 25=				
12~14回 15回 特別研	のよこの 特別研究報 研究報告会で	告書の の成果	執筆 発表(ポス	スター発表	.)			
12~14回 15回 特別研	めるとの 特別研究報 研究報告会で	告書のの成果	執筆 発表(ポス	スター発表	:)			
1 2 ~ 1 4 回 1 5 回 特別 [Class requir	がなどの 特別研究報 研究報告会で rement]	告書のの成果	執筆 発表(ポス	スター発表	÷)			
1 2 ~ 1 4 回 1 5 回 特別 [Class requir 物理工学科原	特別研究報 研究報告会で rement] 子核工学コー	告書の の成果 スが指	執筆 発表(ポフ 	スター発表	詩別研究	『着手	条件を満たし	っていること
1 2 ~ 1 4回 1 5 回 特別 [Class requir 物理工学科原	特別研究報 研究報告会で rement] 子核工学コー	告書の の成果 スが指	執筆 発表(ポス 	スター発表) 持別研究	『着手	条件を満たし	っていること
12~14回 15回 特別 [Class requir 物理工学科原	特別研究報 研究報告会で rement] 子核工学コー	告書の の成果 スが指	執筆 発表(ポノ 定する入	スター発表 学年次の) 特別研究 Evaluat	記着手	条件を満たし	っていること
12~14回 15回 特別 [Class requir 物理工学科原 [Method, Poi	特別研究報 特別研究報告会で rement] 子核工学コー nt of view, a	告書のの成果 スが指 nd Atta	執筆 発表(ポス 定する入 ainment	スター発表 学年次の levels of) 特別研究 Evaluat	【着手 tion]	条件を満たし	っていること
1 2 ~ 1 4 回 1 5 回 特別 [Class requir 物理工学科原 [Method, Poi 成績評価は一〕 おける発表向	特別研究報 特別研究報告会で rement] 子核工学コー nt of view, a 連の研究活動 窓に基づいて	告書の の スが指 の 石 た に の の 行 の	執筆 発表(ポス 定する入 ainment 状況、特	スター発表 学年次の levels of 別研究報) 特別研究 Evaluat 告書の内	【着手 iion]]容、	条件を満たし	っていること 吉会(ポスター発表
12~14回 15回 特別引 [Class requir 物理工学科原 [Method, Poi 成績評価は一) おける発表内沿	特別研究報告会で rement] 子核工学コー nt of view, a 連の研究活動 容に基づいて	告書の スが指 nd Atta の行う。	執筆 発表(ポス 定する入 ainment 状況、特	スター発表 学年次の levels of 別研究報) 特別研究 Evaluat 告書の内	【着手 iion]]容、	条件を満たし	っていること 古会(ポスター発表
1 2 ~ 1 4 回 1 5 回 特別 [Class requir 物理工学科原 [Method, Poi 成績評価は一 おける発表内	特別研究報告会で rement] 子核工学コー nt of view, a 連の研究活動 容に基づいて	告書の の スが指 nd Att: の 行う。	執筆 発表(ポス 定する入 ainment 状況、特	スター発表 学年次の levels of 別研究報) 特別研究 Evaluat 告書の内	【着手 【ion]]容、	条件を満たし	っていること ち会(ポスター発表
1 2 ~ 1 4 回 1 5 回 特別 [Class requir 物理工学科原 [Method, Poi 成績評価は一 おける発表内容 [Textbook]	特別研究報 特別報告会で rement] 子核工学コー nt of view, a 連の研究活動 容に基づいて	告書の スが オ の 行う。	執筆 発表(ポフ 定する入 ainment 状況、特	スター発表 学年次の levels of 別研究報) 特別研究 Evaluat 告書の内	【着手 iion]]容、	条件を満たし 特別研究報告	っていること ち会(ポスター発表
1 2 ~ 1 4 回 1 5 回 特別 [Class requir 物理工学科原 [Method, Poi 成績評価は一 おける発表内 [Textbook] Not used	本日研究報 研究報告会で rement] 子核工学コー nt of view, a 連の研究活動 容に基づいて	告 書 の の て が れ て が の の 行 う 。	執筆 発表(ポフ 定する入 ainment 状況、特	スター発表 学年次の levels of 別研究報) 特別研究 Evaluat 告書の内	C着手 tion] 可容、	条件を満たし 特別研究報告	っていること 吉会(ポスター発表
1 2 ~ 1 4 回 1 5 回 特別 [Class requir 物理工学科原 [Method, Poi 成績評価は一 おける発表内 [Textbook] Not used	4日研究報 研究報告会で rement] 子核工学コー nt of view, a 連の研究活動 容に基づいて	告書の スが指 nd Atta の行う。	執筆 発表(ポフ 定する入 ainment 状況、特	スター発表 学年次の levels of 別研究報	前 時別研究 Evaluat 告書の内	【着手 【ion] 日容、	条件を満たし	っていること ち会(ポスター発表
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Numbering c	ode	U-ENO	G25 4	5998 GJ77							
Course title 特 <english> Gr</english>	Course title 特別研究2(エネ) Affiliated department, Job title,Name Graduate School of Energy Science Course title Fordsaute Professor,HAGIWARA RIKA								ol of Energy Science GIWARA RIKA		
Target year	get year 4th year students or above Number of credits 6 Course offered year/period 2019/Intensive, First s							2019/Intensive, First semester			
Day/period	Inter	nsive	Cla	ss style	Semina	aar Language Japanese					
[Outline and	Purp	pose of t	he C	ourse]							
担当教員の指導のもと、エネルギー応用工学に関する研究課題を設定し、その課題解決のための研 究活動を主体的に取り組む。この研究活動を通じて課題解決能力を習得する。得られた成果を関連 研究と比較し、その意義や重要性等についてまとめる能力を養う。											
[Course Goa	ıls]										
課題設定、関 まとめ、発表	連研? するこ	究の調査、 ことを通	、研ぎ じて、	究計画の立 研究活動	案、実につい	験と検証 て学ぶ。	を行	う。これらの店	找果を特別研究として		
[Course Sch	edul	e and Co	onter	nts]							
1回 設定課題の新 2~10前 実験の実にの実にの 加またの 11~0まとめ 11~0まとめ 11~0まとめ 11~12回 特別研究中5回告 「11~12回 「11~12」 「11〕 「11〕 「11〕 「11〕 「11〕 「11〕 「11〕 「11	規結、発書remee 第 で 前 れ の 3 1 1 1 1 1 1 1 1 1 1 1 1 1	独創性 か考察、 間 間 会 での 発 載 の 形 「 マ の 発 に の 発 表 の で の 発 表 の で の 発 表 の で の 発 表 の で の の ぞ に 。 の で の の ぞ 、 に の の で の の で の の で の の で	等 実 た あ 工 二 イ A れ 、 中 「	再検証 計画の修正 の資料作成 コースが指 ttainment 間発表会に	などに 定する levels おける	より研究 入学年次 of Evalu 発表内容	を 遂 の 特 atior 特	行 別研究着手条f 別 別研究報告書o	牛を満たしていること。 D内容に基づいて行う。		
[Reference b	ook	s, etc.]									
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[Regarding s	studi	es out of	f clas	ss (prepara	ation a	nd revie	w)]				
各指導教員の	指示I	こ従うこ	と。								
(Others (off	ice h	our, etc.))								
*Please visit K	ULAS	SIS to find	lout	about office	hours.						

Numbering code										
Course title 電 <english> Fu</english>	Course title 電気回路基礎論 Affiliated department, Job title,Name Graduate School of Engineering Associate Professor,HISAKADD TAKASHI									
Target year Ist year students or above Number of credits 2 Course offered year/period 2019/First semester										
Day/period	Tue.5	Class style Lecture Language Japanese								
[Outline and	[Outline and Purpose of the Course]									
The course introduces the fundamentals of the electric circuit. Topics covered include: resitive elemnts and networks; independent sources; switches and dynamics of first- and second-order networks; phasor analysis; 2-port circuits.										
[Course Goa	ls]									
Students are ex	pected to l	learn the	transient ana	lysis by	diff	erential	equ	ation and steady	/ state analysis by	
phasor.										
[Course Sch	edule an	d Conte	ents]							
DC circuit,3tin	nes,We intr	roduce K	Circhhoff#039	s curren	t lav	w and K	irch	hoff#039s volta	ge law, Ohm#039s law	
and independent sources. Differential equation of circuit, 5times, We introduce inductors and capacitors and explain the differential equation of circuit. AC circuit, 4times, We introduce phasor and explain the steady state analysis. two-port circuit, 2times, We extend one-port elements to two-port circuits. academic achievement test, 1time, The level of understanding on this lecture will be confirmed. [Class requirement]										
None [Method, Po	None [Method, Point of view, and Attainment levels of Evaluation]									
Reports and ex	aminations	s								
[Textbook]										
奥村浩士『エース電気回路理論入門』(朝倉書店)ISBN:4254227469										
[Reference b	ooks, etc	c.]								
(Reference books)										
[Regarding s	studies o	ut of cl	ass (prepar	ation a	nd	review)]			
After the lesson	n, solve pro	oblems in	n the text.							
(Others (off	ice hour,	, etc.))								
*Please visit K	ULASIS to	o find ou	it about office	e hours.						

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Numbering	g co	de										
Course title <english></english>	数值解析 Numerical Analysis					Aff dej Jol	iliated partment p title,Na	t, me	Graduate Scho Professor,NISI	duate School of Informatics Sessor,NISHIMURA NAOSHI		
Target ye	year 2nd year students or above Number of cre						2	Co ye	ourse offered ar/period	2019/Second semester		
Day/perio	d	Wed.3	Cla	ss style	Lecture	e Languag				Japanese		
[Outline a	nd	Purpose of	the C	ourse]								
[Course G	ioal	isl	_					_				
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[Course S	che	dule and C	onten	its]								
,1time,												
,6times,												
4times												
,1time,												
[Class rec	quir	ement]										
None	None											
[Method, I	Poi	nt of view, a	ind Af	tainment	levels	of E	valuat	ion	1]			
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(Reference books)												
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Course title <english></english>	数理 Anal	解析 ysis in Mathe	matical Sciences			Aff de Jo	filiated partment b title,Na	t, me	Gra Pro Gra Ass	aduate Scho ofessor,NIS aduate Scho ociate Profess	ol of Informatics HIMURA NAOSHI ol of Informatics or,YOSHIKAWA HITOSH	
Target ye	Target year 4th year students or above Number of credits 2 Course offered year/period								2019/First semester			
Day/perio	od T	hu.4	Cla	ss style	Lectur	e				Language	Japanese	
[Outline a	Ind P	urpose of t	he C	ourse]								
[Course C	Goals]										
[Course S	Schee	dule and Co	onten	its]								
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[Reference	e bo	oks, etc.]										
(Refere	nce l	books)										
[Regardin	ng stu	udies out of	f clas	s (prepar	ation a	nd	review)]				
(Others (offic	e hour, etc.))		_					_		
*Please visi	t KUI	LASIS to find	l out a	about office	hours.							