Course nu	ımbe	r	U-EN	G29 22	2050 LJ10	U-EN	G29 220	)50 I	_J55		
Course title (and course title in English)			ŹA 1 Mathema	atics A	.1		Instruct name, jo and dep of affilia	ob titl bartm			hool of Informatics ssor,SHIBAYAMA MITSURU
Target yea	r 2	2nd ye	ear students	or above	Number credits	r of	2		Year/	semesters	2025/Second semester
Days and periods	T	hu.2		Class	s style	Lecture (Face-t	co-face c	cours	e)	Language of instruction	Japanese
[Overview	and	l pu	rpose c	of the	course]						
-	ıl ana	lysis	s that inv	vestigat		•				1	e, is the branch of tudy the foundation and
[Course o	bjec	tive	s]								
To understant mathematics				omplex	functions	with a s	kill for	evalı	ation	of integrals a	appearing in applied
[Course s	chec	lule	and co	ntent	s]						
<ol> <li>Complex</li> <li>Holomorp</li> <li>Elementar</li> <li>Integrals if</li> <li>Cauchy's</li> <li>Power ser</li> <li>Taylor ser</li> <li>Isolated si</li> <li>Laurent ser</li> <li>Multival</li> <li>Analytic</li> <li>Residue</li> <li>Integrals</li> <li>Integrals</li> <li>Applicat</li> </ol>	hic f ry fur n the integ ies ies ingul eries ued f cont incluion to infini	unct actio con ral th aritic unct inua uding o im ty an	ns nplex pla heorem es ions tion g trigono proper i nd Riema	ometric	l						
[Course re Calculus, Li	-		_								
									C	ontinue to	工業数学A1 <b>(2)</b>

# 工業数学A1**(2)**

### [Evaluation methods and policy]

Evaluation depends mainly on marks of examination, but marks of exercises are taken into account when needed.

#### [Textbooks]

Not used

#### [References, etc.]

# (Reference books)

Lars V. Ahlfors Complex Analysis (McGraw-Hill Education) ISBN:978-0070006577

## (Related URLs)

(KULASIS)

# [Study outside of class (preparation and review)]

Students need to solve exercises.

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

Course nu	ımbe	er	U-EN	G25 22	2055 LJ75	U-EN	G25	22055	LJ55			
Course title (and course title in English)					ネ原:学番 or Engineer	-	nam and	uctor's e, job tit departm filiation	nent		hool of Engineering ssor,NISHIKAWA MASAAKI	
Target yea	r	2nd y	ear students of	or above	Number credits	r of		2	Year/	semesters	2025/Second semester	
Days and periods	Т	ue.3	3	Class	s style	Lecture (Face-t		ce cour	se)	Language of instruction	Japanese	
[Overview	and	d pu	irpose o	f the	course]							
[Introductio	n to	com	plex anal	ysis a	nd some ap	plication	1s]					
and science. applications	he objective is to explain the fundamentals of complex analysis, considering the application to engineering nd science. The differential and integral calculus of complex functions, the relevant basic ideas, and the oplications are introduced.											
[Course o	bjec	tive	es]									
[Course objectives] Understanding the basics of complex analysis and obtaining ability to practice it												
[Course s	che	dule	e and co	ntent	s]							
<ol> <li>Definition</li> <li>2-3. Differen</li> <li>4-5. Concep</li> <li>6. Line integ</li> <li>7-8. Cauchy</li> <li>9-10. Taylor</li> <li>11-12. Singu</li> <li>13. Applicat</li> <li>14. Concept</li> <li>15. Feedback</li> <li>Confirmatio</li> </ol>	ntial t and tral of s the and tlar p ion t of co k n of	of co l exa of co corer Lau coint o de confo learr	omplex fu amples of omplex fur m and into urent serie ts and res offinite inte ormal map	inction regula nction egral f idue th egral oping,	ns and Cauc ar functions formula neorem other topics	S			on			
[Course re	•		-									
Fundamenta	ls of	diff	erential a	nd inte	egral calcul	us						
[Evaluatio	n m	eth	ods and	polic	;y]							
In some case (In these case [Evaluation]	Evaluation method Evaluation will be mainly based on regular examination. In some cases, evaluation for homework (short reports: about four times) will be also considered. (In these cases, the ratio of the evaluations for regular examination and homework is about 9:1.) [Evaluation standard] [Evaluation will be based on class registration guideline.											
		-								ontinue to 工業数学	 - 1 (機材エネ原:学番奇数) <b>(2)</b>	

工業数学F1(機材エネ原:学番奇数)(2)

### [Textbooks]

A. Fujimoto <sup>©</sup> Outline of complex analysis (Fukuso-kaisekigaku Gaisetsu)<sup>1</sup> (Baifukan) ISBN:978-4563005719 (in Japanese, published in 1990.)

# [References, etc.]

## (Reference books)

To be referred to during the course

## [Study outside of class (preparation and review)]

Homework (short reports) for the problems stated in the textbooks will be assigned.

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

Course nu	umbo	er	U-EN	G25 2	2055 LJ75	U-EN	G25	22055	LJ55			
					ネ原:学番 or Engineer		nan and	tructor's ne, job tit I departm Iffiliation	nent	Part-time Le	cturer,	
Target yea	r	2nd y	ear students	or above	Number credits	<sup>r</sup> of		2	Year	/semesters	2025/Second semester	
Days and periods	Г	Tue.3	3	Clas	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese	
[Overview	ane	d pu	irpose o	of the	course]							
Introduction	to c	omp	lex analy	sis an	d some app	lications	5					
[Course objectives]												
Understandi	Understanding the basics of complex analysis and obtaining ability to practice it											
<b>[Course schedule and contents]</b> Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class.												
Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection. Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by 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.												
[Course re Fundamenta	-		-	nd int	egral calcul	115						
[Evaluatio												
Regular example				-	<b>, , , , , , , , , , , , , , , , , , , </b>							
[Textbook	sl		-									
_	To be referred to during the course (Nishikawa), Not used (Murakami)											
[Referenc	es,	etc.]										
-	( <b>Reference books</b> ) To be referred to during the course											
[Study ou	tsid	e of	class (p	orepa	ration and	d revie	w)]					
	_	_				_		_	_			
(Other in	forn	natio	on (offic	e hou	urs, etc.) )							

Course numbe		er U-ENG29 32060 LJ10 U-ENG					ENG29 32060 LJ54			54 U-ENG29 32060 LJ55		
			ŽA 2 Mathem	atics A	.2		nan and	ructor's ne, job tit departm ffiliation	nent		nool of Informatics JIWARA HIROSHI	
Target yeai	•	3rd ye	ear students	or above	Number credits	of		2	Year	/semesters	2025/First semester	
Days and periods	v	Ved.	1	Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese	
[Overview	and	d pu	rpose o	of the	course]							
であり,そ	れら	数值	直シミュ	レーシ	/ョン手法	の信頼	性に	t現代で	は数	学理論に則っ	諸遍的な手法のひとつ って論じられる.本講 文学的手法の枠組みも	
[Course o	bjec	tive	es]									
<b>[Course objectives]</b> 計算機による数値シミュレーション手法のアルゴリズムだけでなく,計算手法の信頼性を,線形代 数・微積分や関数解析等の数学的枠組みに則って理解する.												
[Course so	che	dule	and co	ontent	s]							
関数近似と 手法と誤差 Banach空間 的な数学的	数値 評価 とH 枠組	i積分 i等を ilber みを	ナ(3回程) E述べる t空間の E紹介す	度), ਭ · 基本的 る ·	多項式によ ]な性質(4[	:る近似 回程度)	,台 偏符	∃形則や 数分方科	PGauss 呈式の	<sup>s</sup> 型の数値積 数値解法等の	性質を述べる. 分則について,計算 D信頼性を調べる代表 F法の信頼性を述べる	
数値シミュ	レー	シ=	ョンの先	端的調	毛題(1回程	度) 請	ŧ美.	で紹介し	た手	法等がどの。	ように発展し応用さ	
れるか,紹	介す	る.								を調整しなか		
[Course re	equi	rem	ents]									
1回生で学	習す	る利	呈度の微	分積分	了,線形代	数.						
[Evaluatio	n m	etho	ods and	polic	;y]							
_ 講義中に課	すレ	·ポー -	-	%)と 	期末試験(	80%)			,	`ontinue to		

工業数学A2**(2)** 

# [Textbooks]

Not used

### [References, etc.]

(**Reference books**) 一松信『数値解析』(朝倉書店, 1982)

Rainer Kress 『Numerical Analysis』 (Springer, 1998) 黒田成俊 『関数解析』 (共立出版. 1980)

(Related URLs)

( )

## [Study outside of class (preparation and review)]

プログラミングは必須ではないが,講義で紹介する数値シミュレーション法を各自でプログラムを 作成して実行することで,講義内容の理解が促進される.

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

特に設定しないが,質問などは講義終了時など,随時受け付ける.

										未更新			
Course nu	ımbe	er U-EN	IG25 32	2065 LJ55	U-EN	G25	32065	LJ75					
Course title (and course title in English)		€数学F2( lied Mathem			ring F2	nan and	ructor's ne, job ti I departn Iffiliation	nent	Professor,KA Graduate Scl	nool of Informatics ANOU MANABU nool of Informatics HTSUKA TOSHIYUKI			
Target yea	r	3rd year students	or above	Number credits	r of		2	Year	/semesters	2025/First semester			
Days and periods	Т	ue.2	Class	style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese			
[Overview	and	d purpose	of the o	course]									
	Fourier analysis and its application will be described. The major part consists of Fourier series, Fourier ransform, and Laplace transform.												
[Course objectives]													
The goal is t	The goal is to understand the basics and applications of Fourier analysis.												
[Course schedule and contents]													
Fourier analy Fourier serie Complex Fo described. Characteristi Fourier trans Characteristi and its applie Linear system using Fourie explained. Summary of examination Parseval#03° and the relat described. Introduction Solutions of partial differ Fourier serie derived in the Introduction	ysis i es,1ti urier ics of form ics an catio ms,1 r ser the ionsl to p the v entia es for to L	is briefly rev me,Fourier s r series,1time f Fourier ser n,1time,In or nd applications, time,Linear ies expansio first half,1tin be given. quality and it hip between artial differe wave equations, r solving the rm of Fourie aplace trans	iewed. series ex e,Compl ies,1tim der to c ons of Fo systems n. In ad- ne,A su s applic impulse ntial equ on and th is solve wave ex r series form ,1t	e,Characte ope with a ourier trans is describe dition, imp mmary of ations,1tin responses uations,1tin heir physic ed and phys quation,1ti expansions ime,Lapla	f periodi series, eristics o periodic sform is ed. Solu oulse res Fourier ne,Parse and cro me,Basi cal interp sical interp sical interp s.	ac fu its d of Fo c fun exp tion pon serio val f oss-c c no preta erprot	nctions lifferent ourier se actions, 1 lained t s of line ses and F #039s ec correlations of ations, 1t etations	is desc ial and ries ar Fourie ogethe ear diff transfe Fourier quality on fun F partia ime,TI of its sions o	cribed. integral, and e described. r transform is r with the Par Ferential equa er functions o transform is , the Wienerm ctions in lines l differential he wave equa solutions are f solutions to	rseval#039s equation tions are given by f linear systems are provided, and an dashKhinchin theorem, ar systems are equations are described. tion, one of important discussed. the wave equation are			
Laplace tran	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, 1time, Ordinary differential equations are solved by applying Laplace transform and its inverse transform. Continue to 工業数学F 2 (機:学番奇数)(2)												

## 工業数学F2(機:学番奇数)**(2)**

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.

### [Course requirements]

None

### [Evaluation methods and policy]

The regular examination, assignments, and attitude in the class will be taken into account.

#### [Textbooks]

Shinichi Ohishi: Fourier Analysis, Iwanami-Shoten isbn{}{9784000077767}

#### [References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Course nu	ımbe	er	U-EN	G25 3	2065 LJ55	U-EN	G25	32065	LJ75		
Course title (and course title in English)			-		学番偶数) or Engineer	ing F2	nan and	ructor's ne, job tit I departm ffiliation	nent S		nool of Engineering rer,SENAMI MASATO
Target yea	r	3rd ye	ear students o	or above	Number credits	of		2	Year/s	semesters	2025/First semester
Days and periods	Т	ue.2	2	Class	s style	Lecture (Face-to	o-fa	ice cours	se)	Language of instruction	Japanese
[Overview	and	d pu	irpose o	f the	course]						
[Course o	bjec	ctive	es]								
[Course s	che	dule	e and co	ntent	s]						
,2times, ,2times, ,2times, ,2times, ,3times, ,3times, ,1time,											
[Course re	ani	rem	nentsl								
None											
[Evaluatio	n m	eth	ods and	polic	cv]						
					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
[Textbook	s]										
[Reference	es, e	etc.]	]								
(Referer	nce	boo	oks )								
[Study ou	tsid	e of	class (p	orepa	ration and	d review	w)]				
(Other in	orn	natio	on (offic	e hou	urs, etc.) )						
*Please visit	KU	LAS	SIS to find	l out a	bout office	hours.					

										未更新		
Course nu	umber	U-ENG	G25 32	2065 LJ55	U-EN	G25	5 32065	LJ75				
Course title (and course title in English)		数学F2( ied Mathema		or Engineer	ring F2	nan and	tructor's ne, job tit departm affiliation	tle, nent	Associate Pro Graduate Scl	hool of Engineering ofessor,ICHII TAKASHI hool of Engineering fessor,YUGE KORETAKA		
Target yea	<b>r</b> 3r	rd year students o	)r above	Number credits	of		2	Year	/semesters	2025/First semester		
Days and periods				s style	Lecture (Face-t		ace cours	se)	Language of instruction	Japanese		
[Overview	and	purpose o	f the	course]								
Fourier anal	ysis, L	_aplace trans	form,	Linear Alg	ebra an	d the	eir appli	cation	S			
[Course o	bject	ives]										
The final goal of this course is to understand basics of Fourier series expansion, Fourier transform, Laplace transform and Linear Algebra, and to learn to make full use of these mathematical tools in analyzing various physical phenomena and solving relevant differential equations. Particular emphasis is placed not on pursuing mathematical rigor but on developing skills to perceive different physical aspects of these tools and select the most appropriate one in practical problem solving.												
[Course s	ched	ule and co	ntent	s]								
complex ana and their app their Fourier transform (2 Fourier trans	alysis ( plication series -3 weat sform pplica	(1-2 weeks) onsDelta fun s expansion eks) -basics -linear respon ations of Lap	-comp nction -comp of Fou onse sy place tr	blex number (1 week)Fo blex Fourier urier transfo ystemLapla ransform to	ors and courier sectors are courier sectors of the sector sectors of the sectors	omp eries expa nvol sform syste	blex fund expansion -a lution an n and its emsLine	ctions ion (2- applica ad corre s applic ar Alge	-complex inte 3 weeks) -per tions of Four elation functi cations (2 we ebra (3-4 wee	mplex numbers and egrals, residue theorem, riodic functions and ier seriesFourier on -applications of eks) -basics of Laplace eks) - Vector space -		
[Course re	equire	ements]										
Prerequisite	subjec	cts: complex	numb	pers and bas	sic calcu	ılus.						
[Evaluatio	n me	thods and	polic	y]								
The grading	is ma	de based on	the reg	gular exam	ination.							
[Textbook	s]											
Lecture note	Lecture notes are distributed at the class.											
[Referenc	es, et	tc.]										
(Referer	າce b	ooks)										
					,			c	Continue to $\bot$			

工業数学F2(材)**(2)** 

[Study outside of class (preparation and review)]

- - -

(Other information (office hours, etc.))

											未更新		
Course nu	ımbe	er	U-EN	G25 3	2065 LJ55	U-EN	G25	32065	LJ75				
			≠F2 ( Mathema		京) or Engineer	ing F2	nan and	tructor's ne, job tit I departm affiliation	nent	Professor,IS Graduate Sc	hool of Energy Science HIZAWA AKIHIRO hool of Energy Science ofessor,IMADERA KEN.		
Target yea	r	3rd yea	ar students o	or above	Number credits	' of		2	Year	/semesters	2025/First semester		
Days and periods		Fri.4			s style	Lecture (Face-t		ace cour	se)	Language of instruction	Japanese		
[Overview	and	d pur	rpose o	of the	course]								
[Course o	bjec	ctive	s]										
[Course se	che	dule	and co	ntent	.s]								
, 9 times, 2 times													
, 3 times,	, 2 times, , 3 times,												
[Course re	equi	reme	ents]										
None													
[Evaluatio	n m	etho	ods and	polic	:y]								
[Textbook	s]												
[Reference		-											
(Referer	ıce	book	<b>KS</b> )										
[Study out	tsid	e of	class (j	prepa	ration and	d revie	w)]						
(Other inf	form	natio	n (offic	e hou	urs, etc.) )								
*Please visit	t KU	LASI	IS to find	d out a	bout office	hours.							

								未更新					
Course nu	umber	U-EN	G29 32070	LJ10 U-EI	NG29 3207	0 LJ55							
Course title (and course title in English)		マ学A 3 d Mathema	atics A3		Instructor name, job and depar of affiliatio	title, tment		nool of Informatics UJIMOTO SATOSHI					
Target yea	<b>r</b> 3rd	year students		mber of dits	2	Year	r/semesters	2025/First semester					
Days and periods	Mor	n.2	Class sty	le Lectur (Face	e -to-face cou	ırse)	Language of instruction	Japanese					
[Overview and purpose of the course]													
Fourier analysis originated in Fourier's work on thermal conduction and now becomes very important not only in mathematics but also in engineering, including applications in measurement technology. This course provides its theories and applications along with the Laplace transforms closely related to it. [Course objectives]													
- To understa	Course objectives] Counse objectives] Counse and the fundamental theories of Fourier analysis and Laplace transforms and develop an ability to pply them to concrete problems. [Course schedule and contents]												
[Course s	chedu	le and co	ontents]										
as computat Properties at Several prop processing a One-dimens The definition inversion fo Laplace tran Fundamenta Summary ar	on of Fo ion of F nd appli perties o ire discu ional Fo on of on rmula a asforms, il proper nd learn	Fourier serie Fourier coe ications of of Fourier s ussed. ourier trans ne-dimensi nd applica , 2-3times: rties of Laj ing achiev	es expansion fficients an Fourier ser series and th sform, 4-5 t onal Fourie tions to par place transf ement evalu	d convergence ies, 3-4 time heir application imes: r transforms tial different porms and the nation, 1 time	ce of Fourie s: ons to diffe is given, an ial equation fir application	r series rential a d their s are dis ons are	are discussed and difference fundamental p scussed. discussed.	undamental results such equations and signal properties such as the students is evaluated.					
[Course r	equire	ments]											
Calculus, Li	Calculus, Linear Algebra and Differential Equations												
[Evaluatio	on metl	hods and	l policy]										
Evaluation of	lepends	mainly or	n marks of r	nid-term exa	minations (		nd final one (8 Continue to	<sup>30%).</sup> 工業数学A 3 <b>(2)</b>					

# 工業数学A3**(2)**

## [Textbooks]

S. Nakamura Fourier Analysis (Asakura shoten, 2003) ISBN:9784254115741

### [References, etc.]

#### (Reference books)

H.Fukawa <sup>®</sup>Mathematics of control and vibration <sup>a</sup> (Korona-sha)

### [Study outside of class (preparation and review)]

Prepare and review the lectures and solving the problems given on KULASIS or PANDA to understand the contents of the textbook and lectures.

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

Course nu	ımbe	ər	U-EN	G25 3	2075 LJ55							
Course title (and course title in English)			学F3( Mathema		) or Engineer	ing F3	nan and	tructor's ne, job ti I departn offiliation	nent		nool of Engineering OUE YASUHIRO	
Target yea	r	3rd ye	ear students o	or above	Number credits	r of		2	Year/	semesters	2025/Second semester	
Days and periods	F	ri.2		Class	s style	Lecture (Face-1		ice cour	se)	Language of instruction	Japanese	
[Overview	and	d pu	irpose o	f the	course]							
Introduction	to s	pecia	al functio	ns and	l mathemat	ical met	hod	s for the	physic	al sciences.		
[Course objectives]												
Understanding special functions and mathematical methods for the physical sciences, and developing problem solving skills.												
[Course schedule and contents]												
Gamma and Bessel funct Generalized Green#039s Partial differ	Orthogonal polynominals,2times, Confluent hypergeometric function,1time, Gamma and Beta functions,2times, Bessel function,2times, Generalized function,2times, Green#039s function,1time, Partial differential equations for physical sciences,2times, Short Exam and Discussion,1time,											
[Course re	equi	rem	ents]									
Theories of	comp	plex	function	and di	fferential e	quation						
[Evaluatio	n m	eth	ods and	polic	¢y]							
The course g	grade	e wil	l be based	d on h	omework(3	0%) and	d qu	izzes(70	)%).			
[Textbook	s]											
[Referenc	es, e	etc.]										
( <b>Reference books</b> ) Mathematical Methods for Physicists, George B. Arfken and Hans J. Weber (Academic Press) isbn{}{ 9780123846549}												
[Study ou	tsid	e of	class (p	orepa	ration and	d revie	w)]					
( Other in	orm	natio	on (offic	e hoı	urs, etc.) )							
*Please visit	KU	LAS	SIS to find	l out a	bout office	hours.						

											未更新
Course nu	ımbe	er U-ENG	G25 3	2080 LJ52	U-EN	G25	5 32080	LJ71	U-ENG25 3	2080 LJ57	
		養力学A(機 ineering Mech				nan and	tructor's ne, job tit d departm affiliation	tle, nent	Graduate Scl Associate Profe Graduate Scl Professor,HA	essor,NISHIHA 1001 of Engil	ARA OSAMU neering
Target yea	r	3rd year students o	)r above	Number credits	r of		2	Year	/semesters	2025/First	semester
Days and periods				s style	Lecture (Face-t		ace cours	se)	Language of instruction	Japanese	
[Overview	and	d purpose o	f the	course]							
[Course o	bjec	tives]									
[Course se	che	dule and co	nten	ts]							
[Course re	equi	rements]									
None											
[Evaluatio	n m	ethods and	poli	cy]							
[Textbook	s]										
[Reference	-	-									
(Referer	nce	books)									
[Study out	tsid	e of class (p	orepa	ration and	d revie	w)]					
( Other inf	form	nation (offic	e ho	urs, etc.))							
*Please visit	KU	LASIS to find	l out a	bout office	hours.						

未更新

Course nu	ımbe	er	U-ENO	G25 3	2080 LJ52	U-EN	G25	32080	LJ71	U-ENG25 3	2080 LJ57
Course title (and course title in English)									nent		nool of Energy Science sor,KINOSHITA KATSUYUKI
Target yea	r	3rd ye	ear students c	or above	Number credits	of		2	Year	/semesters	2025/First semester
Days and periods	N	Ion.	1	Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese
[Overview	and	d pu	irpose o	f the	course]						
[Course o	bjec	tive	es]								
-	-		•								
[Course s	che	dule	and co	ntent	s]						
, 4 times,					-						
, 3 times,											
, 2 times, , 2 times,											
, 2 times, , 2 times,											
, 2 times,											
[Course re	qui	rem	ents]								
None											
[Evaluatio	n m	ethe	ods and	polic	;y]						
[Textbook	s]										
-	_										
[Reference	es, e	etc.]									
( Referer	nce	boo	oks )								
[Study out	tsid	e of	class (p	orepa	ration and	d revie	w)]				
( Other inf	form	natio	on (offic	e hou	ırs, etc.) )						
*Please visit	KU	LAS	SIS to find	l out a	bout office	hours.					

											天里新 天里新	
Course nu	ımb	er U-	-ENG2(	) 42	2105 LJ77							
Course title (and course title in English)		学倫理 ngineering Ethics					Instructor's name, job title, and department of affiliation			Professor,NIITSU KIICHI Graduate School of Engineering Professor,ISHIDA TAIICHIROU Graduate School of Engineering Professor,IMAHORI HIROSHI Graduate School of Engineering Professor,SUZUKI MOTOFUMI Part-time Lecturer,TATEBA TAKAFUMI Graduate School of Informatics Professor,UMENO KEN Graduate School of Engineering Professor,SUGIYASU KAZUNORI Graduate School of Engineering Professor,HANAZAKI HIDESHI Graduate School of Engineering Professor,KAWASE MOTOAKI Office of Institutional Advancement and Communications NAKAGAWA MASAYUKI Graduate School of Engineering Professor,KISHIDA KIYOUSUKE Graduate School of Engineering Professor,OONISHI MASAMITSU Graduate School of Engineering Professor,CONISHI MASAMITSU Graduate School of Engineering Professor,KANETA TAKASHI Graduate School of Engineering Professor,ITOH SADAHIKO Graduate School of Engineering		
Target yea	r	4th year stud	lents or ab	ove	Number credits	of		2	Yea	/semesters	2025/First semester	
Days and periods	]	Thu.3	Cla	ass	style	Lecture (Media	-bas	sed cour	se)	Language of instruction	Japanese	
[Overview	an	d purpos	se of tl	ne	course]							
Modern ethic Instructors fr			U	0	1		0		-	U	s and scientists.	
[Course o	bje	ctives]										
The goal of t you encount				tano	d engineeri	ng ethic	s, ai	nd to de	velop	the ability to	judge by yourself when	
[Course s	cho	dulo and	1 conto	nt	-1							

#### [Course schedule and contents]

Lectures on ethics in various fields of engineering will be given by faculty members of the Graduate School of Engineering or other graduate schools. (Details will be provided after they are determined.) This course is a media course in which all lectures will be given online via Zoom.

#### 工学倫理**(2)**

Lectures on ethics in various fields of engineering will be given by faculty members of the Graduate School of Engineering or other graduate schools. (Details will be provided after they are determined.)

#### [Course requirements]

None

### [Evaluation methods and policy]

Class participation and reports.

### [Textbooks]

Lecture materials will be distributed.

[References, etc.]

#### (Reference books)

<sup>®</sup>Omnibus Engineering Ethics <sup>」</sup> (Kyoritsu Shuppan Co., Ltd. ) ISBN:978-4320071964

<sup>®</sup> Practical Engineering Ethics - A Short Course, New Edition J (Kagaku-Dojin Publishing Company, INC) ISBN:9784759811551

<sup>©</sup> Engineering Ethics (Revised Edition)<sup>2</sup> (CORONA PUBLISHING CO.,LTD.) ISBN:978-4-339-07798-8

<sup>®</sup> World of Engineering Ethics (3rd Edition) <sup>a</sup> (Morikita Publishing Co., Ltd.) ISBN:978-4-627-97303-9

### [Study outside of class (preparation and review)]

The assignment of the report will be given for each lesson.

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

The class order is subject to change.

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

										未更新		
Course nu	umbe	r U-EN	G20 12	2108 LJ77								
Course title (and course title in English)	工学 Intro	序論 duction to E	nginee	ring		Instructor's name, job title, and department of affiliation			Graduate School of Management Professor, YAMAMOTO TAKASHI Graduate School of Engineering Professor, ARAKI YOSHIKAZU Graduate School of Engineering Professor, HANAZAKI HIDESHI Graduate School of Informatics Professor, NOMURA TAISHIN Graduate School of Engineering Professor, OGOSHI TOMOKI Graduate School of Informatics Professor, Takayuki ITO Office of Institutional Advancement and Communications Program-Specific Professor, KITANI TETSUO Graduate School of Engineering Senior Lecturer, ISHITSUKA KAZUYA			
Target yea	year1st year students or aboveNumber of credits1Year/semesters2025/Intensi									2025/Intensive, First semester		
Days and periods	Ind Intensive Class style (Face-to-face course) Language of instruction Japanese									Japanese		
[Overview	[Overview and purpose of the course]											
developmen First, we off expected to Then, we of future proble	Engineering is to inquire after truth, to develop useful technologies, and to establish ways how to give back development results of technology to the society. First, we offer special lectures regarding the basic knowledge that students in faculty of engineering are expected to have. Then, we offer a series of intensive lectures about how engineering can suggest solutions of current and future problems of our society, the value of technology, and the responsibilities that researchers and engineers are expected to fulfill.											
[Course o	bject	tives]										
social comm understandir	Students learn basic matters such as attitudes and responsibilities they are expected to take as a member of social community. They find value in studying engineering and become to consider what they do in future by understanding technology can suggest solutions of problems our society is facing, especially problems about safety and security.											
[Course s	ched	lule and co	ontent	s]								
role of engir Intensive lec and technolo reconfirming be opportuni content and	[Course schedule and contents] Special lectures, 1 time, About basic knowledge and attitude as students who start to learn engineering, and the role of engineering in society. Intensive lectures, 6 times, A series of lectures offered by special lecturers playing on global stages of science and technology. Lectures are for understanding the role that technology is playing in modern society, for reconfirming importance to study engineering and to work as a researcher and engineer in society, and are to be opportunities to consider own future path. Essays are assigned in every lecture to summarize the lecture content and opinions of other students. Schedule of the lectures are announced later.											

Continue to 工学序論(2)

# 工学序論**(2)**

# [Course requirements]

None

#### [Evaluation methods and policy]

Evaluation will be based on participation and essays assigned in every intensive lecture.

### [Textbooks]

Specify if necessary.

#### [References, etc.]

### (Reference books)

Specify if necessary.

# [Study outside of class (preparation and review)]

Specify if necessary.

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

Information about lecturers and contents of lectures are announced on electric bulletin boards. Please confirm to your department office that the credit of this course is admitted to graduation requirements.

Course nu	umber U-ENG20 32402 SE77											
	Oracuate School of Elignet										ONDA MITSURU hool of Engineering	
Target yea	Number of credits     1     Year/semesters     2025/Intensi								2025/Intensive, year-round			
Days and periods	]	Inter	ntensive <b>Class style</b> Seminar (Face-to-face course) Language							Language of instruction	Japanese and English	
[Overview	and	d pu	urpose o	f the	course]							
The internships and related training programs (lasting less than three months) offered through the Faculty of Engineering at Kyoto University, whether conducted overseas or domestically but expected to have a similar educational effect as internships abroad, are targeted. The aim is to cultivate independence, proactivity, internationality, and language skills by placing students in diverse environments, thereby contributing to their career development after graduation.												
[Course o	bjec	tive	es]									
The purpose is to enhance the expansion of international perspectives, the acquisition of international sensibilities, the improvement of foreign language proficiency (communication skills), and the enhancement of cultural receptiveness (cross-cultural adaptability) by experiencing internships in diverse environments such as overseas universities and companies.												
[Course s	che	dule	e and co	ntent	s]							
[Submission Complete an takes place a	d su	bmi	t the form	' Int	ernational I	Internsh	ip P	lan'at	least	one month be	efore the internship	
[Overseas in Participate in		-		oad.								
[Results deb Internship pa		-		on the	results of th	neir inte	rnsh	ip and c	liscuss	their finding	<b>5</b> .	
[Course re	equi	rem	nents]									
* Must have	Have sufficient language skills in the language(s) spoken at the internship site. * Must have purchased the prescribed overseas travel insurance before traveling to the internship site. * Have submitted an overseas travel registration form in advance.											
[Evaluatio	n m	eth	ods and	polic	ÿ]							
International Educational	<b>[Evaluation methods and policy]</b> After registering for the course, one month prior to participating in the internship, students must fill out the " International Internship Plan" on the designated form and submit it to the Undergraduate Student Section of Educational Affairs Division for prior review by the faculty members of the ER center. After completion of the internship, students will be awarded credits (100%) based on the submission of an											

Continue to 工学部国際インターンシップ1(2)

工学部国際インターンシップ1**(2)** 

internship report and the content of the presentation at the debriefing session.

It is also advisable to submit a certificate of completion from the institution hosting the internship.

The decision to grant credits for graduation will be made by each undergraduate school. If the credits are not approved as credits required for graduation, the ER center will make the decision. In this case, the credits will be treated as excess credits.

Whether the internship is approved as credit for "1" (1 credit) or "2" (2 credits) of the International Internship Program of the Faculty of Engineering is determined based on the duration of the internship and the content of the practical training during the internship period, but in the case of "2," overseas travel is required.

### [Textbooks]

Not used

### [References, etc.]

(Reference books)

None

### [Study outside of class (preparation and review)]

Please consult with your supervisor about your proposal before submitting it to us. Further instructions will be given as appropriate.

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

Before participating in an internship program, please inquire with the administrative office of your undergraduate school to determine whether or not the internship you wish to participate in will be approved as a credit toward completion of the program. For other information, please contact the ER center.

ER center Tel: 075-383-2048 Mail: 090aglobal mail2.adm.kyoto-u.ac.jp (Replace with @)

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

(1) Category

A course that includes off-campus training classes.

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

											未更新	
Course nu	ımbe	er U	U-ENC	G20 22	2403 SJ77							
Course title (and course title in English)	and course fitle in がローバル・リーダーシップセミナーI(企業調査研究) name, job title, Global Leadership Seminar I (Study for methodology in a company) and department Graduate School of Engineering Senior Lecturer, hirai yoshikazu											
Target yea	r	2nd year students or above     Number of credits     1     Year/semesters     2025/Intensive,								2025/Intensive, year-round		
Days and periods	Ι	ntensive	e	Class	s style	Semina (Face-t		ice cour	se)	Language of instruction	Japanese	
[Overview	and	d purpo	ose o	f the	course]							
The purpose of this course is to study about how worldwide leading company, institute, etc. make proposals and find solutions for expanding their own technologies to the international market. Throughout hands-on training on their laboratory, students investigate the methodology of team organization, proposal, market prediction and conception ability by group works. After the investigation, students are expected to improve their comprehension and explanation capability. As extended exersice subject of this course, the Global Leadership Seminar II is opened in the second semester.												
[Course objectives]												
	The goal of this course is to improve student's comprehension and explanation capability for processes of proposal and expansion on the international market invesitigating worldwide leading companies by group											
[Course s	che	dule ar	nd co	ntent	s]							
Week 1, Gui Week 2-13, Week 14, Pr Week 15, Fi	Hano e-pro	ds-on tra esentatio	on									
[Course re	equi	rement	ts]									
How to regist class.	ster v	will be a	innoun	iced la	ater. Studen	ts who	wan	t to join	this co	ourse is reque	ested to attend the first	
[Evaluatio	n m	ethods	s and	polic	cy]							
Students are	proł	nibited t	o skip	hand	s-on trainin	g. Evalu	atic	on will b	e base	d on presenta	tion.	
[Textbook	s]											
Not used												
[Reference	es, e	etc.]										
(Referer	nce	books	)									
			·						— — <sub>C</sub>	ontinue to グローバル・リ		

グローバル・リーダーシップセミナー I (企業調査研究) (2)

#### (Related URLs)

http://www.glc.t.kyoto-u.ac.jp/ugrad

#### [Study outside of class (preparation and review)]

Investigating companies in advance. Analyzing the result from hands-on training. Preparing presentation.

#### (Other information (office hours, 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.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course nu	umber U-ENG20 32502 SE77											
	工学部国際インターンシップ2 Faculty of Engineering International Internship 2 Instructor's name, job title, and department of affiliation Graduate School of Engineering Senior Lecturer, KOWHAKUL, W											
Target yea	r3rd year students or aboveNumber of credits2Year/semesters2025/Intensive, year									2025/Intensive, year-round		
Days and periods	]	Inten	nsive	Class	s style	Semina (Face-t		ce cours	se)	Language of instruction	Japanese and English	
[Overview	and	d pu	irpose o	f the	course]							
The internships and related training programs (lasting less than three months) offered through the Faculty of Engineering at Kyoto University, whether conducted overseas or domestically but expected to have a similar educational effect as internships abroad, are targeted. The aim is to cultivate independence, proactivity, internationality, and language skills by placing students in diverse environments, thereby contributing to their career development after graduation.												
[Course o	bjec	tive	es]									
The purpose is to enhance the expansion of international perspectives, the acquisition of international sensibilities, the improvement of foreign language proficiency (communication skills), and the enhancement of cultural receptiveness (cross-cultural adaptability) by experiencing internships in diverse environments such as overseas universities and companies.												
[Course se	che	dule	e and co	ntent	s]							
[Submission Complete an takes place a	d su	bmit	t the form	' Int	ernational I	Internsh	ip P	lan'at	t least	one month be	efore the internship	
[Overseas in Participate ii		-		oad.								
[Results deb Internship pa		<u> </u>	/ -	on the	results of th	neir inte	rnsh	ip and c	liscuss	their finding	<b>5</b> 5.	
[Course re	equi	rem	nents]									
* Must have	Have sufficient language skills in the language(s) spoken at the internship site. * Must have purchased the prescribed overseas travel insurance before traveling to the internship site. * Have submitted an overseas travel registration form in advance.											
[Evaluatio	n m	eth	ods and	polic	;y]							
International Educational	<b>[Evaluation methods and policy]</b> After registering for the course, one month prior to participating in the internship, students must fill out the " International Internship Plan" on the designated form and submit it to the Undergraduate Student Section of Educational Affairs Division for prior review by the faculty members of the ER center. After completion of the internship, students will be awarded credits (100%) based on the submission of an											

Continue to 工学部国際インターンシップ 2 (2)

工学部国際インターンシップ2**(2)** 

internship report and the content of the presentation at the debriefing session.

It is also advisable to submit a certificate of completion from the institution hosting the internship.

The decision to grant credits for graduation will be made by each undergraduate school. If the credits are not approved as credits required for graduation, the ER center will make the decision. In this case, the credits will be treated as excess credits.

Whether the internship is approved as credit for "1" (1 credit) or "2" (2 credits) of the International Internship Program of the Faculty of Engineering is determined based on the duration of the internship and the content of the practical training during the internship period, but in the case of "2," overseas travel is required.

### [Textbooks]

Not used

### [References, etc.]

(Reference books)

None

### [Study outside of class (preparation and review)]

Please consult with your supervisor about your proposal before submitting it to us. Further instructions will be given as appropriate.

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

Before participating in an internship program, please inquire with the administrative office of your undergraduate school to determine whether or not the internship you wish to participate in will be approved as a credit toward completion of the program. For other information, please contact the ER center.

ER center Tel: 075-383-2048 Mail: 090aglobal mail2.adm.kyoto-u.ac.jp (Replace with @)

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

(1) Category

A course that includes off-campus training classes.

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

Course num	umber U-ENG20 22503 SJ77												
	グローバル・リーダーシップセミナー II (イノベーションとその事業化) Global Leadership Seminar II (Innovation and its commercialization)												
Target year									2025/Intensive, Second semester				
Days and periods	Inter	nsive	Class	s style	Semina (Face-t		ice cour	se)	Japanese				
[Overview a	nd pı	urpose o	of the	course]									
The capabilities that society expects from Kyoto University students primarily include "deep knowledge in their respective fields of specialization" and the "ability to identify issues on their own and present a path to resolution." In this course, you will develop the latter capability, which is difficult to acquire through regular lectures and university life, by creating new business plans through group work. While individual activities are allowed, group activities are encouraged.													
<ul> <li>[Features of this Course]</li> <li>1. Distinguished Instructors: Under the mentoring of renowned innovators active in the business world, students will engage in setting challenges and planning solutions.</li> <li>2. Activity Budget: A budget will be provided for market research, prototype production, and software development necessary for developing project proposals.</li> <li>3. Presentation Opportunities: Outstanding proposals may be displayed at the Katsura Library, among other opportunities for commercialization.</li> </ul>													
Director of ES stabilization fo Order of the R https://hillslife - Seiichi Nishin Supports the do https://www.as - Kentaro Kane Director of RIt continuously in https://kaneko- https://kaneko- https://www.rit - Teppei Tsush business, wena https://www.so - Hideki Aoyar communication	opportunities for commercialization.												
								Co	ntinue to グローバル・リーダー	-シップセミナー॥(イノベーションとその事業化)(2)			

グローバル・リーダーシップセミナー II (イノベーションとその事業化) (2)

- Tsutomu Mukai, Senior Manager, Panasonic HD: Promotes open innovation with venture companies in Israel.

Professor Mitsuaki Oshima is one of Japan's "Top 10 Representative Inventors," known for inventing and developing fundamental patents in technologies such as camera image stabilization in iPhones and high-speed and ultra-low latency communication for 5G mobile phones. Additionally, he invented multi-disciplinary technologies like anti-piracy measures for Nintendo Wii software, digital TV broadcasting standards in Japan, the US, and Europe, and IoT home appliances. He is famous as a serial innovator. Professor Oshima will introduce how groundbreaking inventions that change society originate.

In addition to the mentors, you can learn about the support system for startups and patent strategies from the invited lecturers. For those considering starting a startup, there is information that can be immediately utilized, and for others, there are valuable lessons that will be beneficial when entering society.

More information can be found on the following page (in Japanese): https://www.erc.t.kyoto-u.ac.jp/ugrad

[Notes]

This seminar is intended for students in their second year of the Engineering Department or higher. The seminar is worth one credit, but whether it is recognized as a required credit for graduation depends on the undergraduate school. Please confirm with your undergraduate school office. Also, a camp is planned for December 6th and 7th, so it is necessary to be enrolled in the Personal Accident Insurance for Students Pursuing Education and Research( "Gakkensai"). Participation in the camp is recommended.

# [Course objectives]

Through group work, you can acquire the ability to plan and propose solutions, starting from identifying and setting challenges to envisioning the creation of social value.

### [Course schedule and contents]

The course will be conducted in person.

- [Orientation] (1 session): The overview and schedule of the course will be explained.

- [Lectures] (4 sessions): Special lectures by experts will be conducted.

- [Team Building (1 session): An exercise in team building, essential for group work, will be carried out.

- [Group Work] (7 sessions): Students will engage in setting challenges, problem identification, data collection, and group work. Through intensive group work discussions, they will plan and propose solutions to the identified issues, create a draft report, and conduct 2-3 presentations. Holding mini-lectures by special instructors will also be planned.

- [Camp] (1 session): An intensive session dedicated to project work in an environment exclusive to participants and mentors through overnight training camp.

- [Preliminary Review Session] (1 session): A class to practice presentations in preparation for the final presentation event.

- [Final Presentation Event] (1 session): The final presentations will take place, followed by submission of presentation materials.

Continue to グローバル・リーダーシップセミナー II (イノベーションとその事業化) (3)

グローバル・リーダーシップセミナー II (イノベーションとその事業化) (3)

# [Course requirements]

If the number of students enrolling in the course is large, the maximum number of students may be determined.

### [Evaluation methods and policy]

#### [Evaluation Method]

Grades will be based on regular participation (20%) and the presentation and submission of presentation materials at the final presentation event held during the last lecture session (80%). Regular participation evaluation will focus on the student's active participation in the lectures.

#### [Evaluation Policy]

We will comprehensively evaluate the ability to identify and set challenges through group discussions, as well as the ability to propose solutions towards achieving goals. Students are required to develop individual or group business plans through the challenges and group work, and to present them at the final presentation event.

Attendance in lectures per se is not a criterion for grade evaluation; however, as the course involves group work, regular attendance is strongly recommended.

#### [Textbooks]

We will let you know if necessary.

#### [References, etc.]

#### (Reference books)

III. Oreilly, Charles A. <sup>P</sup>Lead and Disrupt: How to Solve the Innovator's Dilemma (Stanford Business Books, 2021) ISBN:978-1503629523

We will let you know if necessary.

#### [Study outside of class (preparation and review)]

Please prepare and develop your own ideas in advance that you would like to work on throughout the course.

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

[Schedule for the 2024 Academic Year]

The classes will be conducted in person on Fridays during the 5th period in Lecture Room W3, Research Building 9.

\*Note: The 3rd lecture will be held in Lecture Room W301, Research Building 9 (subject to change in lecture room).

- Orientation: October 3

- Fundamentals of Group Work: October 17

- Special Lectures, In-Person Group Work: October 10, 24, 31; November 7, 14, 28; December 5, 12, 19, 26; January 9

- Camp: December 6 (Sat) 13:00 - December 7 (Sun) 13:00 @ AWL Keihoku (tentative)

- Preliminary Review Session: January 16

- Final Presentation: January 17 (Sat)

Continue to グローバル・リーダーシップセミナー II (イノベーションとその事業化) (4)

グローバル・リーダーシップセミナー II (イノベーションとその事業化) (4)

\*Please note that whether the credits earned are recognized as necessary for graduation depends on your undergraduate school. Refer to your undergraduate school course guide for more information. \*Registration for the course is not through KULASIS but via the following page. It is scheduled to open around September 2025:

https://www.t.kyoto-u.ac.jp/fs/erc/2025Fall\_GL\_seminar2

For details on office hours, please check KULASIS.

\*Please visit KULASIS to find out about office hours.

# [Courses delivered by instructors with practical work experience]

(1) Category

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

Course nu	Imbe	er	U-EN	G25 25	5003 LJ71	U-EN	G25	25003	LJ75	U-ENG25 25003 LJ54				
			数学(原 atics for (	-	itation		nan and	ructor's ne, job ti departn ffiliation	nent		hool of Engineering ırer,NARITA EMI			
Target yea	year 2nd year students or above Number of credits 2 Year/seme									/semesters	2025/First semester			
Days and periods	F	ri.2		Class	style	Lecture (Face-t		ce cour	se)	Language of instruction Japanese				
[Overview	anc	l pu	irpose o	f the	course]									
<b>[Overview and purpose of the course]</b> This course deals with computer-based numerical calculation methods. The goal is to learn a programming language in order to develop the ability to use a series of processing methods (such as planning processing methods), create programs, and analyze results.														
- Course objec	[Course objectives] Course objective: By the end of the course, students will be able to use a series of processing methods such as planning processing methods, creating programs, and analyzing results.													
[Course se	cheo	dule	e and co	ntent	s]									
Login metho (2) Learn the Understandir (3) Basic pro Acquisition sum-different (4) Application Differential so on. Acqui (5) Basic pro Acquire the nearest neigh programmin (6) Confirmation	[Course schedule and contents] (1) Orientation and terminal operation, 2 classes Login method of the terminal, how to operate the editor, etc. (2) Learn the mechanism of numerical calculation, 2 classes Understanding the principle of numerical calculation, representation of numbers, functions, and I/O (3) Basic programming with Fortran, 2 classes Acquisition of essential items for programming such as branch, repeat, variable, array, and subprogram. Task: sum-difference product quotient, sum of sequence (4) Applicative programming with Fortran, 4 classes Differential equation (Runge-Kutta method), simultaneous linear equation (Gauss elimination method), and so on. Acquire the basic idea of calculation methods and perform actual programming. (5) Basic programming with Python, 4 classes Acquire the basic programming skills in Python. Learn the basic idea of machine-learning algorithms like k- nearest neighbor algorithm, linear model, decision tree, and neural networks, and perform actual programming. (6) Confirmation of learning attainment, 1 class Post explanation discussion and review of examination questions to KULASIS.													
[Course re														
Recommend	taki	ng t	basic info	rmatio	n processi	ng and b	asic	inform	ation p	processing exe	ercises.			
[Evaluatio	n m	eth	ods and	polic	y]									
Grade is bas	[Grading method] Grade is based on reports (30%) and one written examination (70%). [Grading criterion]													
									(	Continue to ≣	↑算機数学(原) <b>(2)</b>			

#### 計算機数学(原)**(2)**

Must score 60 or above out of 100 on the reports and written examination 60 or above: pass 59 or below: fail

#### [Textbooks]

Not used

#### [References, etc.]

#### (Reference books)

戸川隼人『ザ・Fortran90/95』(サイエンス社)ISBN:4-7819-0913-2 富田博之,齋藤泰洋『Fortran 90/95プログラミング』(培風館)ISBN:978-4-563-01587-9 戸川隼人『演習と応用 FORTRAN77』(サイエンス社)ISBN:4781905110 坂本俊之『基礎からわかるPython』(C&R研究所)ISBN:978-4-86354-269-3

#### [Study outside of class (preparation and review)]

Students will answer the exercises and submit the solutions as a report.

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

Lecture is given in Japanese.

未更新

Course nu	number U-ENG25 25003 LJ71 U-ENG25 25003 LJ75 U-ENG25 25003 LJ54											
			数学(エ aatics for (		utation		Instructor's name, job title, and department of affiliation			Graduate School of Energy Science Associate Professor,HACHIYA KAN Graduate School of Energy Science Professor,Jun HAYASHI		
Target yea	r 2nd year students or above <b>Number of</b> credits							2	Year	/semesters	2025/First semester	
Days and periods	Г	Sue.1	L	Class	s style	Lecture (Face-t		face course) Language of inst			Japanese	
[Overview	and	d pı	urpose o	f the	course]	_						
[Overview and purpose of the course] To acquire the ability of basic computational programing and learn the basic mathematics underlying the computational programing.												
[Course o	bjec	ctive	es]									
To acquire the ability of basic computational programing and learn the basic mathematics underlying the computational programing.												
[Course s	che	dule	e and co	ntent	s]							
Orientation and Practice of terminal operation, 2times, Lecture on adjust login system of satellite lecture room; Lecture on the procedure to build up the computational environment Basics of the numerical computational language, 2times, Lecture on the basics of the numerical computation, 3times, Input/Output; Subroutine; etc.// Exercise of the arithmetic operations, Sequences, etc. Basic programing, 4times, Lecture on the basics of approximations of roots of the real-valued function (Newton's method), numerical integration (Simpson Method); Simultaneous equation (Gaussian elimination), etc. Advanced programing, 3times, Lecture on the procedure to built a structure of the complicated issues// Exercise of advanced programming. Summary and confirmation,1time,												
[Course re	ani	rom	nentel									
None	-qui											
[Evaluatio	n m	eth	ods and	polic	»y]							
Comprehens	ive	evalı	uation of a	attend	ance, exerci	ises and	exa	iminatio	n.			
[Textbook	s]											
Not used												
[Reference	es, (	etc.	]									
(Referer												
Introduced d	lurin	g cla	ass							=		
		_					_		C	ontinue to 計	算機数学(エネ)(2)	

計算機数学(エネ)**(2)** 

#### [Study outside of class (preparation and review)]

Learn the basics of FORTRAN and C. Try to understand the exercises in each lecture.

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

Check KULASIS/Office Hours

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

木史新
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Course nu	Course number         U-ENG25 25003 LJ71         U-ENG25 25003 LJ75         U-ENG25 25003 LJ54											
Course title (and course title in English)	nd course計算機数学(機:7・9・11組)name, job title, and departmentGraduate School of Engineering Senior Lecturer, hirai yoshikazu											
Target yea	r	2nd year	students o	or above	Number credits	of		2	Year	/semesters	2025/First semester	
Days and periods	Т	hu.2		Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese	
[Overview and purpose of the course]												
This course focuses on the mathematical and numerical methods for numerical computation. We will learn the mathematical methods to solve mathematical and physical problems by using computers. We will study the programing language and practice programming to learn and experience the process of how to use a program to solve problems, write programs, and analyze the results, and also understand the accuracy and characteristics of the numerical methods.												
[Course o	bjec	tives]	]									
Understand and learn the basic knowledge, method and skill of mathematical solution for computation, planning the numerical method, programming, and analyze the results.												
[Course s	che	dule a	and co	ntent	s]							
Mathematics Learn the pr computation	incip					hematic	al m	ethod, a	and und	derstand the e	error appearing in the	
Orientation a Access to the program.		-	-			room an	ıd ho	ow to us	e the e	ditor, and co	mpile and run a	
Basic progra Learn the ba function, etc	sic s			struc	ture of prog	grammir	ng (i	nput, ou	ıtput, le	oop, paramet	ers, array, sub routine,	
We will lear (Bisection m	Applied and practical problems (5) We will learn the fundamental method and programming of various numerical methods: solution of equation (Bisection method, Newton's method), numerical integration (Simpson 's method), simultaneous equation (Gaussian elimination), differential equation (Runge-Kutta method), data analysis (least-square method).											
-	Advanced programming (3) Learn the mathematical method and programming for advanced problems including physical phenomena.											
Confirmatio	n of	learnin	ng attair	nment	. (1)							
	- - - - - - - - - - - - - - - - - - -											

# 計算機数学(機:7・9・11組)(2)

# [Course requirements]

Students are recommended to have completed Information Processing Basics and Exercises in Information Processing Basics.

#### [Evaluation methods and policy]

A final examination will be held. In-class reports will be factored in for maximum 40%.

#### [Textbooks]

Not used

[References, etc.]

(Reference books)

# [Study outside of class (preparation and review)]

Study and practice the basics of programming (grammar, flowchart, compile, edit, etc).

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

The order of classes listed above and their timing may differ depending on the year.

										未更新
Course nu	umbe	er U-EN	G25 2	5003 LJ71	U-EN	G25	5 25003	LJ75	U-ENG25 2	5003 LJ54
Course title (and course title in English)       計算機数学(機:8・10・12組)       Instructor's name, job title, and department of affiliation       Instructor's Professor,MATSUBARA ATS Graduate School of Engineerin Associate Professor,KOUNO DA Graduate School of Informatic Senior Lecturer,EGUCHI KAN										nool of Engineering fessor,KOUNO DAISUKE nool of Informatics
Target yea	r	2nd year students of	or above	Number credits	r of		2	Yeai	/semesters	2025/First semester
Days and periods	N	Ion.2	Class	s style	Lecture (Face-t		ace cour	se)	Language of instruction	Japanese
[Overview	and	l purpose o	f the	course]						
[Course o	bjec	tives]								
[Course s	che	dule and co	ntent	s]						
,2times,										
,2times,										
,3times, ,4times,										
,3times,										
,1time,										
[Course re	equi	rements]								
None	•	•								
[Evaluatio	n m	ethods and	polic	≎y]						
[Textbook	s]									
·								(	 Continue to 計算機	数学(機:8・10・12組)(2)

計算機数学(機:8・10・12組)(2)

### [References, etc.]

(Reference books)

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

# [Courses delivered by instructors with practical work experience]

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

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

Course nu	umbe	er	U-EN	G25 2	5004 LJ71	U-EN	G25	25004	LJ75	U-ENG25 2	5004 LJ77
Course title (and course title in English)			学1(機 ics of Ma				nam and	ructor's ne, job tit departm ffiliation	nent		nool of Engineering IIMADA TAKAHIRO
Target yea	r	2nd y	ear students	or above	Number credits	r of		2	Year	/semesters	2025/First semester
Days and periods		Ved.	1	Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese
[Overview	and	d pu	irpose o	of the	course]						
[Course o	bjec	tive	es]								
-			-								
[Course s	che	dule	e and co	ntent	:s]						
,1time, ,1time,											
,2times,											
,1time,											
,4times,											
,1time,											
,4times, ,1time,											
[Course re	equi	rem	nents]								
None											
[Evaluatio	n m	eth	ods and	polic	cy]						
[Textbook	s										
-	-										
		-							,	ontinuo to tty	
									L.	onunue to M科门	学1(機宇:学番奇数) <b>(2)</b>

未更新

材料力学1(機宇:学番奇数)(2)

# [References, etc.]

(Reference books)

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

										未更	新
Course nu	umbe	er U-E	NG25 2:	5004 LJ71	U-EN	G25	25004	LJ75	U-ENG25 2	5004 LJ77	
		科力学 1 (札 hanics of M				nan and	ructor's ne, job tit I departm iffiliation			nool of Engineerin RAKATA HIROY	
Target yea	r	2nd year studen	ts or above	Number credits	r of		2	Year	/semesters	2025/First semes	ter
Days and periods		Ved.1		s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese	
[Overview	and	d purpose	of the	course]							
[Course o	bjec	tives]									
[Course solution of the soluti	che	dule and o	content	:s]							
[Course re	equi	rements]									
None											
[Evaluatio	n m	ethods an	nd polic	cy]							
[Textbook	s]										
[Reference		-									
(Referer	nce	books)									
[Study out	tsid	e of class	(prepa	ration and	d revie	w)]					
( Other int	form	nation (off	ice hou	urs, etc.) )							
*Please visit	t KŪ	LASIS to fi	nd out a	bout office	hours.						

U-ENG25 25004 LJ71 U-ENG25 25004 LJ75 U-ENG25 25004 LJ77 **Course number Course title** Instructor's (and course |材料力学1(材エネ原:学番奇数) name, job title, Graduate School of Energy Science and department title in Mechanics of Materials 1 Professor, IMATANI SHIYOUJI of affiliation **English**) Number of 2nd year students or above 2 Year/semesters Target year 2025/First semester credits Days Lecture and Language of instruction Japanese Wed.1 Class style (Face-to-face course) periods [Overview and purpose of the course] [Course objectives] [Course schedule and contents] Concepts of Mechanics of Materials, 2times, Subjects on Simple Stress States, 3times, Strain Energy, 2times, Bending of Beams, 5times, Complex beams, 2times, .1time. [Course requirements] Fundamentals of Mathematics and Physics [Evaluation methods and policy] [Textbooks] ISBN:4-563-03465-7 (Zairyo Rikigaku no Kiso, Shibata, Ohtani, Komai, Inoue, Baifukan) isbn{}{4563034657} [References, etc.] (Reference books) [Study outside of class (preparation and review)] (Other information (office hours, etc.)) \*Please visit KULASIS to find out about office hours.

未更新

										未更新
Course nu	umbe	er U-EN	G25 2	5004 LJ71	U-EN	G25	5 25004	LJ75	U-ENG25 2	5004 LJ77
Course title (and course title in English)		科力学1(材 chanics of Ma			数)	nan and	tructor's ne, job tit I departm offiliation			hool of Energy Science fessor,ABE MASATAKA
Target yea	r	2nd year students	or above	Number credits	r of		2	Year	/semesters	2025/First semester
Days and periods	V	Ved.1	Class	s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese
[Overview	and	d purpose o	of the	course]						
[Course o	bjec	ctives]								
[Course s	che	dule and co	ontent	:s]						
,2times, ,3times,										
,2times,										
,5times,										
,2times,										
,1time,										
[Course re	equi	rements]								
None										
[Evaluatio	n m	ethods and	l polic	≎y]						
[Textbook	s]									
[Reference	es, e	etc.]								
(Referer	nce	books)								
[Study ou	tsid	e of class (	prepa	ration and	d revie	w)]				
( Other in	form	nation (offic	e hou	urs, etc.) )	)					
*Please visit	t KU	LASIS to fin	d out a	bout office	hours.					

Course nu	ımbe	er	U-EN	G25 2	5005 LJ77	U-EN	G25	5 25005	LJ71	U-ENG25 2	5005 LJ75	
Course title (and course title in English)	(and course       材料力学2(機:7,8,9,10組)       name, job title,       Associate Professor,NISHIKAWA MASAAKI         title in       Mechanics of Materials 2       and department       Institute for Life and Medical Sciences											
Target yea	r	2nd ye	ear students	or above	Number credits	of		2	Year/	/semesters	2025/Second semester	
Days and periods	F	Fri.2		Clas	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese	
[Overview	and	d pu	rpose o	of the	course]					<u> </u>		
The simplifi	ed o b- or	ne-di thre	imension e-dimens	al trea	tments lect problems. A	nalytic	al m	ethods t	for the	deformation	attended to include more and the stresses in	
[Course o	bjec	tive	es]									
_	The emphasis is to understand the fundamental concepts and methods for the stress/strain analysis of various tructures or struictural members, by advancing the basic principles given in Mechanics of Materials 1.											
[Course s	che	dule	and co	ntent	s]							
Stress-strair 10-11. Torsi (Torsion of of 12. Buckling (Buckling of 13-14. Axial	ing, ed p dete of ela stress rela on circu g colu y sy inde k	Cast roble ermin astici s stat ation lar b umn, ymm ers, S	ems of be nate beam ity tes, Mohn s, Plane s pars, Coil , Instabili etric prol pherical ent assess	ams ns, Col s's stre stress of spring ity, Eff blems shells, ment:	ntinuous be ss and strain or strain sta gs, Combina fect of supp and bendin Rotating c Regular ex	n circles tes, Rela ation of ort conc g of pla ircular p aminatio	s, Ec ation ben litio tes blate	quilibriu n betwee ding and ns, Buc es, Cylin	m equa en elast d torsio kling d adrical l	tic constants) n) esign) bending, Ben	cement-strain relations,	
		_				<b>— —</b> .					学 2 (機: <b>7,8,9,10</b> 組) <b>(2)</b>	

# 材料力学2(機:**7,8,9,10**組)(2)

# [Course requirements]

Mechanics of Materials 1, and other subjects such as calculus, linear algebra, mechanics of particles and rigid bodies.

#### [Evaluation methods and policy]

[Evaluation method]

Evaluation is based on the mid-term and the final examinations as a general rule,

possibly with considerations of short reports (about three times).

(In the cases where the evaluation for short reports are considered, the ratio of the evaluations for regular examination and short reports is about 9:1.)

[Evaluation standard]

Evaluation is based on class registration guideline.

### [Textbooks]

T. Shibata et al. <sup>P</sup>Fundamentals of Strength of Materials (Zairyo-Rikigaku no Kiso) (Baifu-kan) ISBN: 4563034657

#### [References, etc.]

### (Reference books)

To be referred to during the course

### [Study outside of class (preparation and review)]

It is highly recommended to make the preparation and review with the specified textbook. Homework (short reports: about three times) will be assigned.

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

Course numbe	er U-EN	G25 250	005 LJ77	U-ENG2	25 25005	LJ71	U-ENG25 2	5005 LJ75				
	力学2(機 hanics of Ma			na ar	structor's ame, job ti ad departn affiliation	nent	Graduate Scł Professor,BI	nool of Engineering WA SHIRO				
Target year	2nd year students	or above	Number credits	of	2	Year/	semesters	2025/Second semester				
Days and F periods	ri.2	Class	style	Lecture (Face-to-	face cour	se)	Language of instruction	Japanese				
[Overview and purpose of the course]												
The basic treatments given in the Mechanics of Materials 1 course are extended to problems such as statically indeterminate beams and curved beams subjected to bending, bars subjected to torsion or combination of orsion and bending, columns subjected to compressive loads, cylindrical vessels subjected to internal/external pressures, etc. More general treatments of stresses and strains and their relations are also explained. These issues are of importance for the proper selection and arrangements of materials in the design of various tructures/machine elements, and serve as an introduction to more rigorous subjects of the mechanics of olids.												
[Course objec	tives]											
members such as understand the ba	beams, bars, asis of the tre	column atments	ns and cyli of two- o	indrical ve r three-dir	ssels subj	jected t	o various typ	simple structural bes of loading, and to by developing the				
[Course schee	dule and co	ontents	5]									
situations. Week 1: Bending Week 2: Comple Week 3: Fundam Week 4: Fundam Week 5: Fundam Week 6: Fundam Week 6: Fundam Week 7: Fundam elastic constants) Week 8: Fundam elastic constants) Week 10: Torsion Week 10: Torsion Week 11: Torsion Week 12: Buckli Week 13: Axially Week 14: Solution	<ul> <li>Week 1: Bending of beams (basic equations, Castigliano's theorem, solution methods)</li> <li>Week 2: Complex problems of beams (statically indeterminate beams, curved beams)</li> <li>Week 3: Fundamentals of elasticity (1) (definition of stress, equilibrium equations)</li> <li>Week 4: Fundamentals of elasticity (2) (stresses on an arbitrarily inclined plane, Mohr's circle of stress)</li> <li>Week 5: Fundamentals of elasticity (3) (principal stresses, correspondence to eigenvalue problems)</li> <li>Week 6: Fundamentals of elasticity (5) (strains in an arbitrary direction, Mohr's circle of strain)</li> <li>Week 7: Fundamentals of elasticity (6) (generalized Hooke's law, plane stress/plane strain, relation among elastic constants)</li> <li>Week 9: Solution of exercise problems/mid-term examination</li> <li>Week 10: Torsion of bars (1) (torsion of bars of circular cross-section)</li> <li>Week 12: Buckling of columns (buckling loads, column under eccentric loading, buckling design)</li> <li>Week 13: Axially symmetric problems (basic equations, thin-walled and thick-walled cylinders)</li> <li>Week 14: Solution of exercise problems</li> </ul>											

# 材料力学2(機:**11,12**組、宇)**(2)**

# [Course requirements]

Understanding of the Mechanics of Materials 1 course and other basic subjects such as calculus, linear algebra, and mechanics of particles and rigid bodies is prerequisite.

# [Evaluation methods and policy]

Grading is made based on the report assignments (20%), the mid-term examination (40%) and the final examination (40%). If the mid-term examination is not conducted, the grading is based on the report assignments (20%) and the final examination (80%). Occasional changes will be announced in the classes. The total score is evaluated between 0 and 100 points (the pass mark is 60).

### [Textbooks]

T. Shibata, R. Ohtani, K. Komai and T. Inoue <sup>P</sup>Fundamentals of Strength of Materials (Zairyo-Rikigaku no Kiso) <sup>(1)</sup> (Baifu-kan, 1991) ISBN:ISBN4-563-03465-7

# [References, etc.]

(**Reference books**) Introduced during class

# [Study outside of class (preparation and review)]

Contents of the Mechanics of Materials 1 course should be fully reviewed. Reports will be assigned, which need to be solved as homeworks. In addition, it is desirable that an enrolled student works on the textbook by him/herself prior to or after each lecture.

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

Lectures are given in a black-board style. Students are expected to take the notes to understand the ideas as well as mathematical derivations, and make questions regarding unclear points.

未更新

Course nu	ımbe	er	U-ENO	G25 2:	5005 LJ77	U-EN	G25	25005	LJ71	U-ENG25 2	5005 LJ75	
			学2(材 ics of Mat				Instructor's name, job title, and department of affiliation			Graduate School of Energy Science Associate Professor, KINOSHITA KATSUYUKI		
Target yea	r	2nd y	ear students o	or above	Number credits	<sup>·</sup> of		2	Year	/semesters	2025/Second semester	
Days and periods	F	Fri.2		Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese	
[Overview	and	d pu	irpose o	f the	course]							
[Course o	bjec	tive	es]									
[Course s	che	dule	e and co	ntent	s]							
,3times, ,2times, ,4times, ,4times, ,1time, ,1time,												
[Course re	equi	rem	nents]									
None	•		-									
[Evaluatio	n m	eth	ods and	polic	;y]							
[Textbook	s]											
[Reference	es, e	etc.]	]									
( Referer	nce	boo	oks)									
[Study out	tsid	e of	class (p	orepa	ration and	d revie	w)]					
( Other inf	form	natio	on (offic	e hou	urs, etc.) )							
*Please visit	KU	LAS	SIS to find	l out a	bout office	hours.						

Course nu	umbe	ər	U-ENO	G25 2:	5007 LJ57	U-EN	G25	5 25007	LJ77	U-ENG25 2	5007 LJ71
Course title (and course title in English)			!(機宇 ynamics				nan and	tructor's ne, job tit I departm Iffiliation	tle, nent	Professor,IW Graduate Scl	nool of Engineering /AI HIROSHI nool of Engineering ssor,KISHIMOTO MASASHI
Target yea	r	2nd ye	ar students o	or above	Number credits	r of		2	Year	/semesters	2025/Second semester
Days and periods	Т	Sue.1		Class	s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese
[Overview	and	d pu	rpose o	f the	course]						
[Course o	bjec	tive	s]								
[Course s	che	dule	and co	ntent	s]						
0											
[Course re	equi	rem	ents]								
None											
[Evaluatio	n m	etho	ods and	polic	;y]						
[Textbook	s]										
[Referenc	es, e	etc.]									
( Referei	nce	bool	<b>ks</b> )								
[Study ou	tsid	e of	class (p	orepa	ration and	d revie	w)]				
(Other in	form	natio	n (offic	e hoı	urs, etc.))						
<u>+ ۲۵</u>	1711	TAC	IC 4- f:	1 4	1 4 66	1					

\*Please visit KULASIS to find out about office hours.

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未更新

Course nu	ımbe	er	U-ENO	G25 2:	5007 LJ57	U-EN	G25	25007	LJ77	U-ENG25 2	5007 LJ71
Course title (and course title in English)	e 熱力学 2 (エネ原) Thermodynamics 2 の and department of affiliation of affiliation Graduate School of Energy Science Professor,KAWANABE HIROSHI										
Target yea	r	2nd y	ear students o	or above	Number credits	of		2	Year	/semesters	2025/Second semester
Days and periods	N	1on.	3	Class	s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese
[Overview	and	d pu	irpose o	f the	course]						
10											
[Course o	bjec	τινε	esj								
[Course s	cher	dule	and co	ntent	e]						
,2 ~ 3times, ,2 ~ 3times, ,3times, ,2times, ,2times, ,2times, ,1time,											
[Course re	equi	rem	nents]								
None											
[Evaluatio	n m	eth	ods and	polic	v]						
_											
[Textbook	s]										
[Reference											
( Referer	nce	boo	oks)								
[Study ou	tside	e of	class (p	orepa	ration and	d revie	w)]				
(Other in	orm	natio	on (offic	e hou	urs, etc.) )						
*Please visit			-								

									未更新			
Course nu	umber	U-ENG2	25 35008 LJ71	U-EN	G25	35008	LJ77					
		礎学1(機 entals of Ma		nstructor's name, job title, and department of affiliation Graduate School of Engineering Professor,HIRAKATA HIROYUKI Graduate School of Engineering Professor,SHIMADA TAKAHIRO								
Target yea	<b>r</b> 3rd y	ear students or a	bove <b>Number</b> credits	r of	,	2	Year	/semesters	2025/First semester			
Days and periods	Wed.	.3 C	lass style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese			
[Overview	and pu	urpose of t	the course]									
Introductory	class to	teach funda	mentals for Ma	aterial S	cienc	ce.						
[Course o	bjective	es]										
[Course s	chedule	e and cont	ents]									
Bonding and etc.: 4 times	[Course schedule and contents] Bonding and structure of materials: Crystal structure, defects in crystals, structure and properties of polymers etc.: 4 times											
Plastic defor	mation a	and fracture:	Crystal defect	and fra	cture	etc.: 4	times					
Phase diagra	m: The	phase rule, b	oinary system d	liagram,	terna	ary pha	se dia	gram etc.: 2 ti	imes			
Solidificatio	n and ph	ase transfor	mation, deposi	tion etc.	: 1 ti	me						
Processing:	Hot and	cold process	sing, recrystalli	zation e	etc. 1	time						
Steel: Steel J	processii	ng, material,	, heat treatment	, transfo	ormat	tion etc	.: 2 tin	nes				
feedback les	son: 1 ti	me										
Confirmation	n of lear	ning achieve	ement: by repor	rts and a	a test:	: 1 time	•					
[Course re	equiren	nents]										
None												
[Evaluatio	n meth	ods and p	olicy]									
reports and a	a test											
[Textbook	s]											
isbn:978-4-9	01381-5	58-1 be sold	at 日本材料学	会事務	所(	https://	www.	jsms.jp/index	.html)			
							c	ontinue to 材料				

材料基礎学1(機宇)**(2)** 

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

Read the textbooks before each class, and ascertain the knowledge after the class.

(Other information (office hours, etc.))

										未更新
Course nu	ımbe	er U-ENG	G25 3	5008 LJ71	U-EN	G25	5 35008	LJ77		
Course title (and course title in English)       材料基礎学1(エネ原)       Instructor's name, job title, and department of affiliation       Graduate School of Engineering Professor, TAKAGI IKUJI Graduate School of Engineering Associate Professor, TAISHI KOBAY										
Target yea	r	2nd year students of	or above	Number credits	of		2	Year	/semesters	2025/Second semester
Days and periods	Wed.1 Class style Lecture (Face-to-face course) Language of instruction Japanese							Japanese		
[Overview	and	l purpose o	f the	course]						
In this course, we discuss properties that are important in selecting and using materials, as well as the basic concepts necessary for understanding these properties, focusing on metal.										
[Course o	bjec	tives]								
Course objective: By the end of the course, students will have the basic knowledge they need to pursue further studies in materials science and they will be able to investigate appropriate materials in experimentation and design.										
[Course schedule and contents]										
<ol> <li>(1) Structure of matter, 4 classes: Explain the size of the atoms, which are the basis of matter, and their electron configuration, types of bonds between atoms, the positions of electrons in solid matter, density and thermal expansion, and so on.</li> <li>(2) Production of materials, 3 classes: Explain redox and the coagulation of melts, phase equilibrium of materials comprised of two or more chemical elements, and other information concerning the composition of materials.</li> <li>(3) Mechanical properties, 2 classes: Explain properties related to the structural materials used to support loads such as elastic deformation and plastic deformation, yield strength, creep, and so on.</li> <li>(4) Change in properties, 2 classes: Explain factors behind the change in the mechanical properties of materials such as addition of chemical elements, annealing, normalizing, quenching, and so on, as well as the reasons for these factors.</li> <li>(5) Functions of materials, 2 classes: Explain the main functional properties of materials such as conduction of heat and electricity, specific heat, penetration of light, magnetism, and so on.</li> <li>(6) Resources and recycling, 1 class: Discuss information concerning sustainable development such as abundance and reserves of chemical elements, recycling of materials, and so on.</li> <li>(7) Confirmation of learning attainment, 1 class: Post explanation discussion and review of examination questions on KULASIS.</li> </ol>										
[Course re	qui	rements]								
None										
[Evaluatio	n m	ethods and	polic	cy]						
- [Grading me	thod		•					<sub>c</sub>	continue to 材料	基礎学1(エネ原) <b>(2)</b>

# 材料基礎学1(エネ原)(2)

### [Evaluation standard]

Must score at least 60 out of 100 on the written examination 60 or above: pass 59 or below: fail

### [Textbooks]

Others. In addition, printouts will be distributed in class.

#### [References, etc.]

# (Reference books)

Introuced during class

### [Study outside of class (preparation and review)]

Practice problems and their solutions will be discussed in class. Therefore, please go over what you learned after each class.

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

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

												未更新
Course nu	ımbe	er	U-EN	G25 2	5009 LJ71							
Course title (and course title in English)	nd course 計測学(機エネ原:学番奇数) le in Scientific Measurement								tle, nent	Graduate School of Engineering Professor, TSUCHIYA TOSHIYUKI Graduate School of Engineering Professor, YOKOKAWA RYUUJI Graduate School of Energy Science Associate Professor, KINOSHITA KATSUYUKI Graduate School of Energy Science Professor, MIYAKE MASAO Graduate School of Engineering Associate Professor, HIROTANI JUN		
Target yea	r	2nd ye	year students or above Number of credits 2 Year/semesters 2025/First s								semester	
Days and periods	F	ri.3	Class style Lecture (Face-to-face course) Language of instruction Japanese									
[Overview	and	d pu	rpose o	f the	course]							
Basics of sci	ientif	fic in	sturment	aion i	s covered.							
[Course o	biec	tive	esl									
Understanding of the basics of scientific instrumentation in engineering physics.												
[Course schedule and contents]												
Units and Standards,2times,Units and Standards Measurement uncertainity and its evaluation,3times,Measurement uncertainity and its evaluation Data processing and statistical analysis,3times,Data processing and statistical analysis Electrical and tempeature measurement,2times,Electrical and tempeature measurement Radiation and material measurement,2times,Radiation and material measurement Mechanical measurement,2times,Mechanical measurement level of attainment,1time,level of attainment												
[Course re	equi	rem	ents]									
None		-										
[Evaluatio	n m	etho	ods and	polio	⊳y]							
Examinatior	n. Re	ports	s are cons	sidered	d also.							
[Textbook	s]											
小寺秀俊、 (朝倉書店						富井洋	_、	中部主	敬、爭	箕島弘二、楮	<b>黃小</b> 路泰義	『計測工学」
[Referenc	es, e	etc.]										
( <b>Refere</b> i NA	nce	boo	ks)									
		-						· <b></b>	C	ontinue to 計測学	 (機エネ原:学者	番奇数) <b>(2)</b>

計測学(機エネ原:学番奇数)(2)

[Study outside of class (preparation and review)]

NA

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

# [Courses delivered by instructors with practical work experience]

(1) Category

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

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

								未更新			
Course numbe	r U	J-ENG25 250	009 LJ71								
Course title (and course title in English) Course title (and department of affiliation Course title (and course title) Course title) Course title (and course title) Course title) Course title (and course title) Course title (and course titl											
Target year	2nd year stu	udents or above	Number credits	of	2	Year/	/semesters	2025/First semester			
Days and F periods	ri.3	Class	style	Lecture (Face-t	o-face cour	se)	Language of instruction	Japanese			
[Overview and	l purpo	se of the c	ourse]								
Basics of scientif	ic instur	mentaion is o	covered.								
[Course objec	tives]										
Understanding of	the bas	ics of scienti	fic instrun	nentatio	n in engine	ering pl	hysics.				
[Course schee	lule an	d contents	]								
Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class. Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection. Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by 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.											
[Course requi	rement	s]									
None											
[Evaluation m			-								
Examination. Rej	ports are	considered :	also.								

Continue to 計測学(機エネ原:学番偶数)(2)

計測学(機エネ原:学番偶数)(2)

# [Textbooks]

小寺秀俊、神野郁夫、鈴木亮輔、田中功、冨井洋一、中部主敬、箕島弘二、横小路泰義 『計測工学 (朝倉書店)ISBN:9784254201598

#### [References, etc.]

(Reference books)

#### [Study outside of class (preparation and review)]

NA

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

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course nu	nbei	r U-EN	G25 250	12 LJ75	U-EN	G25	5 25012	LJ52	U-ENG25 2	5012 LJ77	
Course title (and course title in English)       固体物理学(材工ネ原宇) Solid State Physics       Instructor's name, job title, and department of affiliation       Graduate School of Engineering Professor,NAKAMURA HIROYUK											
Target year2nd year students or aboveNumber of credits2Year/semesters2025/Second											
Days and periods	Thu.1 Class style (Face-to-face course) Language of instruction Japanese								Japanese		
[Overview	and	purpose o	of the co	ourse]							
Introduction	o mi	icroscopic sc	olid state	physics							
[Course ob	ject	ives]									
Gateway to atomic and electronic theories for meterials											
[Course sc	hed	ule and co	ntents]								
Crystal and lattice, Diffraction by crystal, Bonding energy of crystal, 2 times, Lattice and crystal structure, Miller indices, Bragg's law, vanishing rule and structure factor, repulsion and attraction between atoms, various atomic bonding Phonon, 3 times, Sound wave in elastic body, dispersion relation, Brillouin zone, acoustic mode and optical mode, phonon Introduction to statistical mechanics, Specific heat of solid, 3 times, Introduction to statistical mechanics, Boltzmann distribution, entropy, state sum and free energy, Einstein model for specific heat of solid, Debye model for specific heat of solid, thermal expansion of solid Introduction to quantum mechanics, 3 times, Introduction to quantum mechanics, Shrodinger equation, free electron/harmonic oscillator/hydrogen atom, physical quantities and operators Free electron model. Thermal and transport properties of metal, 3 times, Density of states, Fermi-Dirac distribution, electron specific heat, resistivity of metals, Hall effect, thermal conductivity of metals Assessment, 1time, Assessment											
[Course requirements]											
None											
[Evaluation	n me	ethods and	policy	]							
Evaluation w	ill be	e based on a	final exa	amination							

Continue to 固体物理学(材工ネ原宇)(2)

固体物理学(材エネ原宇)(2)

# [Textbooks]

M. Shiga <sup>¶</sup>Introduction to Solid State Physics for Materials Scientists <sub>2</sub> (Uchidarokakuho) ISBN: 9784753655526 (in Japanese)

# [References, etc.]

(Reference books)

C. Kittel <sup>II</sup> Introduction to Solid State Physics (Wiley) ISBN:9780471415268

# [Study outside of class (preparation and review)]

Knowledge on quantum mechanics and statistical mechanics is highly helpful.

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

Course nu	ımbe	er	U-EN	G25 3:	5013 LJ77	U-EN	G25	35013	LJ52		
			茲気学( Electrom		:学番奇数 ism		nan and	ructor's ne, job tit I departm ffiliation			nool of Engineering Tessor,SHIKAMA TAIICHI
Target yea	r	3rd ye	ear students o	or above	Number credits	of		2	Year	/semesters	2025/First semester
Days and periods	ds Tue.1 Class style Lecture (Face-to-face course) Language of instruction Japanese								Japanese		
[Overview	and	d pu	irpose o	f the	course]	1					
[Course o	biec	tive	esl								
			•								
[Course s	che	dule	and co	ntent	s]						
,2?3times,											
,3?4times,											
,2?4times, ,3?5times,											
,1time,											
[Course re	equi	rem	ents]								
None											
[Evaluatio	n m	ethe	ods and	polic	¢y]						
[Textbook	s]										
[Reference	es, e	etc.]									
( Referer	nce	boo	ks)								
[Study out	tsid	e of	class (p	orepa	ration and	d review	w)]				
(Other inf	orm	natio	on (offic	e hou	urs, etc.) )						
*Please visit	KU	LAS	SIS to find	d out a	bout office	hours.					

							未更新						
Course number	U-ENG25 3	5013 LJ77 U	U-ENG25	35013	LJ52								
Course title (and course title in English)       応用電磁気学(機宇:学番偶数)       Instructor's name, job title, and department of affiliation       Graduate School of Engineering Associate Professor, NAMURA KYOKO													
<b>Target year</b> 3rd y	ear students or above	Number o credits	of	2	Year/	semesters	2025/First semester						
Days and Tue.1 periods	1 Class		ecture Face-to-fa	ce cours	se)	Language of instruction	Japanese						
[Overview and pu	urpose of the	course]											
The general properties well as the generation taught in lectures.	n and propagati												
[Course objective	esj												
<ul> <li>To understand the general properties of Maxwell's equations, which form the fundamental laws of electromagnetism</li> <li>To understand the generation and propagation of electromagnetic waves and the optical properties of matter</li> <li>To understand how electromagnetic phenomena are applied in engineering</li> </ul>													
[Course schedule	e and content	s]											
The lecturer instructs following items will	•	-		-	•								
<ol> <li>Maxwell's equation</li> <li>Maxwell's equations</li> <li>Generation and p</li> <li>The propagation of e</li> <li>waves, radiation of e</li> </ol>	and other basic propagation of el electromagnetic	matters are re ectromagnetic waves in a va	eviewed. ic waves [ icuum and	5-6 sessi I wavegi	uide, po		f electromagnetic ated motion and other						
related matters are ex (3) Reflection, refrac Matters such as the la dispersion, and reflec	xplained. ction and diffrac aws of reflection ction of electron	tion of electron n and refraction nagnetic wave	omagnetic on at diele es based c	e waves ectric bo on oscilla	[4-5 set oundarie ator mo	ssions] es; absorptio odels; group	n, refraction, velocity and phase						
<ul> <li>velocity; diffraction of electromagnetic waves; and optical properties of metals, plasma, and other materials are explained.</li> <li>(4) Application and development in physical engineering [1-2 sessions]</li> <li>The development and application of electromagnetic waves in engineering are explained.</li> </ul>													
					— — <u>-</u>	 ntinue to 応用電磁	磁気学(機宇:学番偶数) <b>(2)</b>						

# 応用電磁気学(機宇:学番偶数)**(2)**

# [Course requirements]

The subject is based on the continuation of electromagnetism, differential and integral calculus, and linear algebra, classes offered by the Faculty of Integrated Human Studies. Students are required to have basic knowledge in vector analysis.

#### [Evaluation methods and policy]

Evaluation is based on the combined grade for tests and submitted materials.

#### [Textbooks]

Others; printouts are distributed in lectures when needed.

#### [References, etc.]

### (Reference books)

Introduced during teaching sessions

#### [Study outside of class (preparation and review)]

- Students must prepare for and review lecture materials distributed in teaching sessions.
- When appropriate, students are asked to submit reports and assignments demonstrating their learning from preparation and review.

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

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

										未更新
Course nu	umber	U-EN	G25 350	13 LJ77	U-EN	G25	35013	LJ52		
Course title (and course title in English)	ī磁気学( d Electrom			nan and	ructor's ne, job ti I departn Iffiliation	nent		Graduate School of Engineering Professor,SAITOU MANABU		
Target yea	<b>r</b> 3rd	year students of		Number credits	of		2	Year	/semesters	2025/First semester
Days and periods	Tue	.1	Class s	style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese
[Overview	and p	ourpose o	f the co	ourse]						
[Course o	bjectiv	/es]								
[Course s	chedu	le and co	ntents]							
Guidance,2t	imes,G	uidance on	how this	s class is	operate	d, aı	nd how	to use	computing fa	cility for this class.
	edge of	n the role o	f IDS in	network	security	/ and	d how n	nachine	e learning car	help the intrusion
detection.		1 01		1						
										detection by signature-
issued from										ndence between alarms
					0 0					nal and malicious
		•		0						letection performance.
			-	-					-	detection using
machine lea	rning, a	and discuss	it with c	other stud	ents and	d ins	structors			
	auiro	montel								
[Course re None	equire	mentaj								
none										
[Evaluatio	n met	hods and	policy	]						
Toythook	<u></u>									
[Textbook	.2]									
[Referenc	es, etc	.]								
(Referei	nce bo	oks)								
L										
								C	ontinue to 応用	電磁気学(エネ原)(2)

応用電磁気学(エネ原)(2)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

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											不丈利
Course number U-ENG25 25014 LJ57 U-E								25014	LJ75	U-ENG25 2	5014 LJ52
	理学(材 Physics	エネ原	原宇)		Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor,MAJIMA TAKUYA			
Target yea	Target year       2nd year students or above       Number of credits								Year	/semesters	2025/Second semester
Days and periods	nd Fri.3 Class style (Face.							ce cour	se)	Language of instruction	Japanese
[Overview	and	d pu	irpose o	f the	course]						
Students are first given an overview of physical phenomena that lead to the discovery of quantum mechanics. Following this, an introduction to quantum mechanics is given using concrete examples to provide a clear outline of various phenomena in the microscopic world, such as atoms and molecules, and the laws that are derived from them.											
[Course o	bjec	tive	es]								
Targets include understanding phenomena that cannot be described in classical physics, understanding various laws in the microscopic world that relate to atoms and molecules, and acquiring basic knowledge for quantum mechanics.											
[Course se	che	dule	e and co	ntent	s]						
Atomic theories, 1 session: atomic theory of natural philosophy, atomic theory of chemistry, atoms and nuclei, structure of nuclei and elementary particles, current image of elementary particles Kinetic theory of gases, 2 sessions: atomic theory of chemical reactions, basic assumptions of the kinetic theory of gases, pressure and temperature of gases, specific heat of matter, law of the distribution of energy, and velocity of molecules Heat radiation and energy quantum, 2 sessions: properties of heat radiation, Stefan-Boltzmann law, Wien's displacement law, classical radiation formulas (Rayleigh-Jeans, Wien), Planck's radiation formula and energy quantum Photons and electrons, 2 sessions: electrons and their particle properties, the discovery of electrons, beta particles, photons: light particulates, photoelectric effect, Compton effect Atomic models and the quantum condition (old quantum theory), 1 session: theory on the structure of electrons and atoms, Thomson and Nagaoka ' s atomic models, discovery of the atomic nucleus/Rutherford ' s atomic model Wave function and uncertainty principle (introduction to quantum mechanics), 1 session: fluctuation of electrons, de Broglie wave, double-slit experiment, interpretation of wave function Schrodinger equation and its solution, 2 sessions: operator, expected value, time-independent Schrodinger equation, steady state, eigenvalue equation, square-well potential Quantum mechanical description of a hydrogen atom, 3 sessions: spherical coordinate system, particle in a central potential, angular momentum operator, spherical harmonics, wave function, and energy level of a hydrogen atom. Confirmation of learning achieved, 1 session: the degree of learning achieved so far is confirmed											
		-				·			<sub>c</sub>	continue to 原子	

# 原子物理学(材エネ原宇)**(2)**

# [Course requirements]

Classical mechanics, electromagnetism, thermodynamics

#### [Evaluation methods and policy]

Students are evaluated through a test. A raw score is given as their evaluation.

#### [Textbooks]

Not used

#### [References, etc.]

### (Reference books)

Others; Hatakeyama, A., Ryoushirikigaku, (Nihon Hyouronsha, 2017) ISBN-10: 4535860411, Mafune, F., Ryoushi kagaku kiso kara no apuroochi,, (Kagaku-Dojin, 2007) ISBN-10: 4759810846, Kikuchi, K., Genshi butsurigaku bishiteki butsurigaku nyuumon, (Kyoritsu Shuppan, 1969) ISBN-10: 4320030478,

etc.

#### (Related URLs)

()

### [Study outside of class (preparation and review)]

Students should read materials such as introductory books on topics covered in lectures to gain an understanding of how the study of physics has emerged throughout history.

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

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

未更新

Course numbe	er U-EN	G25 35018 LJ71	U-ENG25	35018	LJ75	U-ENG25 3	5018 LJ77				
Course title (and course title in English)量子物理学1(機:学番奇数)Instructor's name, job title, and department of affiliationGraduate School of Engineering Professor,SUZUKI MOTOFUMI											
Target year       3rd year students or above       Number of credits       2       Year/semesters       2025/Second set											
Days and F periods	and Fri.3 Class style (Face-to-face course) Language of instruction Japanese										
[Overview and purpose of the course]											
In this subject, lectures focus on helping students understand the main concepts underlying quantum mechanics and quantum statistical mechanics, as well as deepening their quantum mechanical understanding of the structure of an atom, structure of a molecule, and the electronic structure of a solid material.											
[Course objectives]											
To master the main concepts underlying quantum mechanics and quantum statistical mechanics, and to deepen one's quantum mechanical understanding of the structure of an atom, the structure of a molecule, and the electronic structure of a solid material.											
[Course schedule and contents]											
[Course schedule and contents] (1) Development of quantum mechanics [1-2 weeks] Students receive an overview of Rutherford's atomic model and its difficulties, Bohr's atomic model, experimental facts that show light particulates and the fluctuation of electrons, etc. In addition, students develop an understanding of the limits of classical mechanics and the necessity of quantum mechanics. (2) Principles of quantum mechanics [4 weeks] Students are introduced to wave functions and the Schrodinger equation. Further, students gain an understanding of differences between classical mechanics and quantum mechanics by studying the interpretation and properties of wave functions, expected values of physical quantities, and the properties of operators that reveal observable physical quantities. By examining the eigenvalues of operators and the properties of eigenfunctions, students also develop an understanding of the superposition principle of wave functions. (3) Motion in one dimension [2-3 weeks] Students are asked to think about the motion of a one-dimensional free particle when there is no external field. By examining the motion of particles when potential hills are present, and studying reflection via potential hills and the transmission phenomena of potential hills, students also gain an understanding of the tunneling effect. In addition, the bound state is explained using the square-well potential as an example. (4) Harmonic oscillator [2-3 weeks] Students review harmonic oscillator and are given an explanation of the Einstein model of specific heat. (5) Hydrogen atom [4 weeks] Students are asked to think about motion in a spherically symmetric field using a hydrogen atom as an example. Next, polar coordinates are introduced to allow students to separate a wave function into angular											

量子物理学1(機:学番奇数)**(2)** 

and radial parts. Then, an explanation is given on angular momentum in quantum mechanics. Following this, students are asked to obtain the wave function of a hydrogen atom and are given an explanation of the spectrum of a hydrogen atom. Based on the outcome of these activities, the wave function of a multi-electron atom is then examined generally, and an explanation is given on atomic analyses performed via atomic spectroscopy and Auger electron spectroscopy. In addition, students also gain an understanding of the origin of covalent bonds using a hydrogen molecule as an example.

# [Course requirements]

None

### [Evaluation methods and policy]

[Evaluation method]

Evaluation is conducted through a short-answer test.

[Evaluation criteria]

Students must obtain at least 60 out of 100 marks in the short-answer test

60 marks or above: Pass

59 marks or below: Fail

In addition, up to 30% of the report assignments given during teaching sessions may be added to the above evaluation.

### [Textbooks]

Others; none

### [References, etc.]

#### (Reference books)

Others; there are many textbooks, but any basic textbook will suffice.

### [Study outside of class (preparation and review)]

• Students must prepare for and review lecture materials distributed in teaching sessions.

• When appropriate, students are asked to submit reports and assignments demonstrating their learning from preparation and review.

(Other information (office hours, etc.))

Students are divided into two classes, and lectures on the above contents are given in the same time slots.

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

(1) Category

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

Continue to 量子物理学1(機:学番奇数)(3)

量子物理学1(機:学番奇数)**(3)** 

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

Course nu	umb	er	U-EN	G25 3	5018 LJ71	U-EN	G25	35018	LJ75	U-ENG25 3	5018 LJ77
Course title (and course title in English) 量子物理学1(機:学番偶数) Quantum Physics 1								ructor's ne, job tit departm ffiliation			nool of Engineering essor,NAKAJIMA KAORU
Target yea	r	3rd y	ear students o	or above	Number credits		2	Year	/semesters	2025/Second semester	
Days and periods	F		Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese	
[Overview	an	d pı	irpose o	of the	course]						
[Course o	bjeo	ctive	es]								
[Course s	che	dule	e and co	ntent	s]						
[Course re	equi	irem	nents]								
None											
[Evaluatio	on m	neth	ods and	polic	cy]						
examination	and	hon	nework								
[Textbook	s]										
[Reference	es,	etc.	]								
( Referer	nce	boc	oks)								
[Study ou	tsid	e of	class (p	orepa	ration and	d revie	w)]				
(Other in	forn	nati	on (offic	e hou	urs, etc.) )	)					
*Please visit	t KU	LAS	SIS to find	d out a	bout office	hours.					

未	更	新	

Course nu	umbe	ər	U-EN	G25 3:	5018 LJ71	U-EN	G25 350	8 LJ75	U-ENG25 3	35018 LJ77		
Course title (and course title in English)	and course量子物理学1(材原宇) 情報 Quantum Physics 1name, job title, and departmentname, job title, Part-time Lecturer,Itoh Akio											
Target year3rd year students or aboveNumber of credits2Year/semesters2025/First seme										2025/First semester		
Days and periods		Fri.2		Class	s style	Lecture (Face-	to-face co	urse)	Language of instruction	Japanese		
[Overview	and	d pu	irpose c	of the	course]							
[Overview and purpose of the course] Quantum theory is one of the most successful theories in the modern physics. It explains well a lot of peculiar phenomena which can not be understood within the classical theory. The main purpose of this course is to understand the fundamental mathematical structure of the quantum theory. We may use online materials. Check PandA in advance.												
[Course o	bjec	tive	es]									
An important purpose of this course is to understand the fundamental mathematical structure of the quantum theory. In addition one is hoped to become capable to calculate some basic properties of a quantum mechanical particle on one-dimensional space.												
-					-							
<ol> <li>Mathemat</li> <li>Mathemat</li> <li>Mathemat</li> <li>Mathemat</li> <li>Mathemat</li> <li>Mathemat</li> <li>One partic</li> <li>One partic</li> <li>Potential p</li> <li>Potential p</li> <li>Square v</li> <li>Scatterin</li> <li>Harmoni</li> </ol>	[Course schedule and contents]  1. Introduction. Wave mechanics and matrix mechanics. 2. Mathematical structure of quantum theory (1) State and observable. 3. Mathematical structure of quantum theory (2) Hilbert space and state vectors. 4. Mathematical structure of quantum theory (3) operators and observables 5. Mathematical structure of quantum theory (4) Schroedinger equation and time evolution 6. One particle on one-dimensional space (1) classical theory and its quantization 7. One particle on one-dimensional space (2) CCR and Robertson's uncertainty relation 8. Potential problem (1) General theory 9. Potential problem (2) General theory and its mathematical addendum 10. Square well potential 11. Box potental 12. Scattering theory 13. Harmonic oscillator (1) 14. Harmonic oscillator (2)											
[Course re	aui	rom	ontel									
Classical me	-		_	lgebra								
		_										
									Continue to 量子物:	理学1(材原字) 情報 (2)		

# 量子物理学1(材原宇) 情報 (2)

# [Evaluation methods and policy]

#### [Evaluation method]

Evaluation will be based on reports.

### 【Evaluation policy】

The result of reports should be 60 and above out of 100. 60 and above: Passed

59 and below: Failed

### [Textbooks]

Not used

[References, etc.]

### (Reference books)

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

### [Study outside of class (preparation and review)]

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

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

Send an email.

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

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

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Course nu	Imbe	er	U-ENG	G25 4:	5019 LJ75	U-EN	G25	45019	LJ77	U-ENG25 4	5019 LJ71	
Course title (and course title in English)	Quantum Physics 2						Instructor's name, job title, and department of affiliation				Graduate School of Engineering Professor,HASUO MASAHIRO	
Target yea	et year 4th year students or above Number of credits							2	Year	ear/semesters 2025/First semeste		
Days and periods	v	Ved.	1	Class	s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese	
[Overview	[Overview and purpose of the course]											
[Course o	bjec	tive	s]									
[Course s	cheo	dule	and co	ntent	sl							
,3times, ,3times, ,1?2times, ,1?2times, ,2times, ,3times, ,1time,	,3times, ,1?2times, ,1?2times, ,2times, ,3times,											
[Course re	qui	rem	ents]									
None												
[Evaluatio	n m	etho	ods and	polic	¢y]							
[Textbook	s]											
[Reference	es, e	etc.]										
(Reference books)												
[Study out	tsid	e of	class (p	orepa	ration and	d reviev	w)]					
( Other inf	orm	natic	on (offic	e hoı	urs, etc.) )							
*Please visit KULASIS to find out about office hours.												

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Course number         U-ENG25 45019 LJ75         U-ENG25 45019 LJ77         U-ENG25 45019 LJ71										5019 LJ71		
	(and course title in量子物理学 2 (材原宇) 情報 Quantum Physics 2name, job title, and departmentPart-time Lecturer,Itoh Akio											
Target yeaı	-	3rd year students	or above	Number credits	of		2	Year/	semesters	2025/Second semester		
Days and periods	Т	'ue.1	Clas	s style	Lecture (Face-to-face course) Language of instruction Japanese							
[Overview and purpose of the course]												
Quantum theory is an astonishing theory. It describes perfectly a lot of phenomena inspite of its peculiar mathematical formulation. An important purpose of this course is to understand the formulation and to become capable to manipulate it. We may use online materials. Check PandA in advance.												
[Course o	bjec	tives]										
To understand the fundamental structure of quantum theory. To be able to calculate some properties of quantum mechanical particle in three dimensional space.												
[Course schedule and contents]												
<ol> <li>Angular m</li> <li>Angular m</li> <li>Eigenvalu</li> <li>Spin</li> <li>Central pc</li> <li>Hydrogen</li> <li>perturbation</li> <li>perturbation</li> <li>Heisenber</li> <li>Hiteraction</li> <li>Bell's inter</li> <li>Mixed st</li> <li>Application</li> </ol>	<ol> <li>Fundamental framework</li> <li>Angular momentum (1)</li> <li>Angular momentum (2) generator of space rotation</li> <li>Eigenvalue of Angular momentum operator. SU(2) and SO(3)</li> </ol>											
[Course re	-	-										
Quantum Ph	ysic:	8-1										
[Evaluatio	n m	ethods and	polio	cy]								
[Evaluation Evaluation [Evaluation	n wil	l be based on	repor	ts.								

## 量子物理学2(材原宇) 情報 (2)

The result of reports should be 60 and above out of 100. 60 and above: Passed 59 and below: Failed

### [Textbooks]

Not used

### [References, etc.]

#### (Reference books)

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

### [Study outside of class (preparation and review)]

Solve a distributed problem set.

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

Send an email.

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

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

Course nu	umbe	er	U-EN	G25 3:	5020 LJ71							
Course title (and course title in English)	<b>Purse</b> 連続体力学(エネ) Continuum Mechanics							tructor's ne, job tit I departm affiliation	nool of Energy Science ATANI SHIYOUJI			
Target yea	et year 3rd year students or above Number of credits 2 Year/semesters								2025/First semester			
Days and periods		Fri.3		Class	s style	Lecture (Face-t		-face course) Language of instruction Japanese				
[Overview	and	d pu	irpose o	f the	course]	1				<u> </u>		
[Course objectives]												
[Course schedule and contents]												
Basic assumptions,1 times, Vectors and tensors,2times, Fundamental laws,2 times,												
Constitutive				s,								
Potential the				,								
Wave motio			s,									
Stabilities,2t Examination			,									
[Course re	equi	rem	nents]									
None												
[Evaluatio	on m	eth	ods and	polic	;y]							
[Textbook	sl											
•	-											
┝ – – – .		_										
									C	ontinue to 理	続体力学(エネ) <b>(2)</b>	

連続体力学(エネ)**(2)** 

# [References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Course nu	umber U-ENG25 35020 LJ71										
Course title (and course title in English)		ễ体力学 tinuum 〕									ife and Medical Sciences DACHI TAIJI
Target yea	ar3rd year students or aboveNumber of credits2Year/semesters2025/Second set									2025/Second semester	
Days and periods	Т	ue.3	C	Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese
[Overview	and	d purpo	ose of	the	course]						
[Overview and purpose of the course] This lecture provides an introduction to the theory of continuum mechanics for its application to the fields of bioengineering and biomedical engineering.											
[Course o	bjec	tives]									
[Course objectives] Students will be able to understand tensor analysis and continuum mechanics, and to apply them in modeling of living tissues and cells.											
[Course s	che	dule an	nd cor	ntent	s]						
1 ) Introduction to continuum mechanics											
3,4)Ve	ora, I ector isors	ndex no s and ter s, Scalar	nsors and ve	Sum			-	-		eigenvectors e transformat	ion,Invariants, Nabla
5,6) Ki Bodies and c			ns, Disj	place	ment, Strain	n tensor	, Co	mpatibi	lity, M	laterial time c	lerivative
7, 8) Str Force and str		-			ion, Cauch	y stress,	Pri	ncipal st	tresses	, Equation of	equilibrium
9,10) Mass conser					0 0	1		st law of	f thern	nodynamics f	or continua
<ul> <li>1 1 , 1 2 ) Constitutive models</li> <li>Constitutive equations, Stress-strain relationship, Linear elasticity, Newtonian viscous fluids, Material symmetry, Biological tissues</li> </ul>											
1 3 , 1 4 ) Boundary value problems Differential equations with a set of boundary conditions, Navier-Stokes equation, Navier's equation											

# 連続体力学(機)**(2)**

# 1 5 ) Feedbacks

Application of continuum mechanics to the analyses of biological tissues, Introduction to biomechanics

#### [Course requirements]

None

### [Evaluation methods and policy]

Exam 100 (+ Reports max 10)

### [Textbooks]

安達泰治、冨田佳宏 『連続体力学の基礎(第2版)』(養賢堂, 2022) ISBN:ISBN-10: 4842505907

### [References, etc.]

### (Reference books)

Introduced during class

[Study outside of class (preparation and review)]

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

未	更	新	

Course nu	umbe	er	U-EN	U-ENG25 35023 LJ77 U-ENG25 35023 LJ28 U							5023 LJ71	
Course title (and course title in English)	(and course エネルギー変換工学(コ title in Energy Conversion						Instructor's name, job title, and department of affiliation			Professor,KU	nool of Engineering JROSE RYOUICHI nool of Energy Science n HAYASHI	
Target yea	get year 3rd year students or above Number of credits 2 Year/s									/semesters	2025/First semester	
Days and periods	F	Fri.2		Class	s style	Lecture (Face-to-face course) Language of instruction Japanese						
[Overview	and	d pu	irpose o	of the	course]							
Various energy sources and energy conversion systems will be outlined. Also, basic matters on energy conversion processes and thermodynamics treatments for the effective use of energy will be lectured.												
[Course o	bjec	ctive	es]									
From this class, fundamental issues related to energy conversion engineering are learned, as well as a target is put in the current situation of energy resources, latest technologies of energy conservation and new energy system, environmental measures are comprehensible.												
[Course s	che	dule	e and co	ontent	s]							
Energy source, 3?4times, ,3?4times, ,3?4times, ,3?4times, ,3?4times, ,3?4times,	ce ar	nd er	nergy con	versio	n system,3	?4times,	* Ei	nergy re	source	2S		
[Course re	equi	rem	nents]									
Knowledge	of th	erm	odynamic	cs is re	quired.							
[Evaluatio	n m	eth	ods and	polic	¢y]							
Achievemen	t wil	ll be	synthetic	ally e	valuated fro	om atten	dan	ce, repo	rt and	final examina	tion.	
[Textbook	s]											
Nothing. Pri	nt m	ateri	ial is prop	perly d	istributed.							
[Reference	es, e	etc.	]									
( <b>Referer</b> It will be int			-	ary.								
[Study out	tsid	e of	class (	orepa	ration and	d revie	w)]					
(Other inf	form	natio	on (offic	e hou	urs, etc.) )							

Course nu	umb	er	U-EN	G25 3	5023 LJ77	U-EN	G25	35023	LJ28	U-ENG25 3	5023 LJ71	
Course title (and course title in English)			ギー変換 Conversi		(機)		Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor, KUROSE RYOUICHI Graduate School of Energy Science Professor, Jun HAYASHI		
Target yea	get year 4th year students or above <b>Number of</b> credits								Year	/semesters	2025/First semester	
Days and periods	<b>Class style</b>							ce cours	se)	Language of instruction	Japanese	
[Overview	an	d pu	irpose d	of the	course]							
熱エネルギ の変換,機 する基礎的	ー, 続械ユ 事項	化 ニネノ ミ、ニ	学エネル レギーと ロネルギ	/ギー) :熱エオ	)およびエ ネルギーの	ネルギ 変換,	ー変 なと	∑換過程 ご)につ	▋(化善	学エネルギー	₹(機械エネルギー, −から熱エネルギーへ <ルギー変換過程に関	
[Course o	bjeo	ctive	es]									
											事情、省エネルギー 目標を置く。	
[Course schedule and contents]												
諸・・ エ・・・・・ エ・・ エ・・論エエ ネ機熱化種工 ネ化機 ネ自エ(ネネ ル械工学々ク ル学械 ル然ネールル ギエネエのセ ギエエ ギエル~2ギギ ーネルネエル ーネネ ーネギ	(一) 源ルギルネギ 変ルル 利ルの資 (キーキルー 攅キキ 用キ	ひそう デービント 酸ゴゴ 月ゴ 形源 4 ー ーギの 過ーー (一	と 5 5 5 5 5 5 7 1 1 1 1 1 1 1 1 1 1 1 1 1	の防」 回) ネル= ・ ・ マス=	上 : ≓ーへの変 −の変換	換	 棄物	Jのエネ	・ルギ・	一利用		
		_							c	ontinue to エネ		

エネルギー変換工学(機)**(2)** 

## [Course requirements]

熱力学を学習していることを前提とする。

### [Evaluation methods and policy]

出席状況、レポート、ならびに学期末試験等を総合して到達目標への達成度を評価する(初回の講 義で説明する)。

### [Textbooks]

プリント資料等を適宜配布する。

[References, etc.]

( Reference books ) 日本機械学会 「エネルギー工学」

### [Study outside of class (preparation and review)]

授業の前に,身の回りにある様々なエネルギーの形態およびそれら相互の変換過程について,予備 的に考察しておくことが望ましい.また,授業後は講義内容を復習し,各種エネルギー変換システ ムの原理と適正な評価の方法,設計・制御の指針,等について理解しておく.

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

上記各項目の講義順序および時間配分は、年度によって異なることがある。 資料等の配布は電子的に行う場合がある .

						未更新	
Course number	U-ENG25 35024 LJ7	77 U-EN	G25 35024	LJ71			
	学(機) on Engineering		Instructor's name, job tit and departm of affiliation	tle, nent	Graduate School of Engineering Senior Lecturer,NAKANISHI HIROAKI Graduate School of Engineering Professor,KOMORI MASAHARU Graduate School of Engineering Professor,MATSUBARA ATSUSHI		
<b>Target year</b> βrd y	vear students or above <b>Numb</b>		2	Year/	semesters	2025/Second semester	
Days and Wed. periods	.1 Class style	Lecture (Face-t	o-face cour	se)	Language of instruction	Japanese	
[Overview and pu	urpose of the course	]					
[Course objective	es]						
[Course schedule	e and contents]						
,3times,							
,3times,							
,1time, ,4times,							
,4times, ,3times,							
,1time,							
[Course requirem	nents]						
None							
[Evaluation meth	ods and policy]						
[Textbooks]							
				c	ontinue to 扔	₅	

# 振動工学(機)**(2)**

### [References, etc.]

(Reference books)

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

# [Courses delivered by instructors with practical work experience]

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

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

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

Course nu	ımbe	er	U-EN	G25 35	5024 LJ77	U-EN	G25	35024	LJ71		
Course title (and course title in English)			学(宇) n Engine	ering			nan and	ructor's ne, job ti departn ffiliation	nent	Graduate Scl Professor,SE	nool of Engineering NDA KEI
Target yea	r	2nd y	ear students	or above	Number credits	of		2	Year	/semesters	2025/Second semester
Days and periods	and periodsMon.3Class styleDecenter (Face-to-face course)Language of instructionJapanese										
[Overview	[Overview and purpose of the course]										
	Co introduce the fundamentals of analytical methods for linear dynamic systems, especially the modeling of ibration phenomena and their analysis.										
[Course o	bjed	ctive	es]								
-			U	•				•	•	tems, especia ious dynamic	lly modeling, and systems.
[Course se	che	dule	e and co	ontent	s]						
<ul> <li>(2) Fourier a The fundame explained.</li> <li>(3) Analysis Free vibratic and damping</li> <li>(4) Analysis Equations of vibration sys</li> <li>(5) Analysis An explanatic coordinate sys</li> <li>(6) Analysis Using the log the boundary freedom vibr</li> </ul>	fund naly ental of o on ar g wil of 2 mo of 2 mo of 2 mo of 2 mo of co stem of n ion v yster of d ngitu / con ratio	lame vsis [ ls of ls of l be c-DO tion, s con nulti will l m, an listril udina ndition s and	entals of a 1 week] Fourier s legree-of rced vibr explained F vibrati eigenfre nsisting c -degree-of be given al vibrati ons, natu stems wi	series a -freedo ation of d. on syst of mass of-freedo is of fr istant v on of a ral freed	nd Fourier om vibration of one-degree tem [3 week y, undampe es, springs, dom vibration ee/forced v vibration sy bar, vibration guencies, m splained.	transfor n system ee-of-fre ks] d free v , and da on syste of gene vibratior vibratior fion of a odes, an	rm a ns [4 ibra mpin ems eral a usi 3 we strin nd co	nd their weeks om vibra tion, and ng will [3 week multi-da ng mod eeks] ng, and omparis	applic ation synthesis d propu- be exp (s] egree-(c) e coord bendir on wit	ystems consis erties of eiger lained. of-freedom vi dinates. ng vibration o h analysis of	esented. ration analysis will be ting of masses, springs, afrequency of 2-DOF bration systems, mode f a beam as examples, multi-degree-of- Ordinary Differential
		_								Continue to 排	、 <u></u>

# 振動工学(宇)**(2)**

# [Evaluation methods and policy]

Grades are assessed on a scale of 100 points, based on the scores of regular tests and class participation. Class participation is assessed based on submitted assignments, class participation, and in-class comments. Class participation is taken into account up to a maximum of 20% of the overall grade. The assessment criteria follow the policy for grading in the Faculty of Engineering, as stated in the course handbook.

## [Textbooks]

Takuzo Iwatsubo and Hiroshi Matsuhisa <sup>F</sup>Fundamentals of Vibration Engineering (Morikita Publishing Co., Ltd.) ISBN:9784627666825 (2014)

[References, etc.]

(Reference books)

Introduced during class

### [Study outside of class (preparation and review)]

Students should learn the basic mechanics and mathematics in advance as necessary. They should answer the questions given as assignments, understand the lecture content, review it by reorganizing their notes, etc., and systematize the content they have learned. For this reason, it takes an average of about 4 hours of preparation and review for each lesson.

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

Instructions will be given during class.

										未更新	
Course nu	ımbe	er U-ENG	G25 3:	5025 LJ77	U-EN	G25	35025	LJ71			
Course title (and course title in English)		即工学1(機 trol Engineeri		<b>亰:学番</b> 奇	数)	nan and	tructor's ne, job tit I departm Iffiliation	nent	Professor,KC Graduate Scl	hool of Engineering DH HOSODA hool of Engineering rrer,Kawasetsu Takumi	
Target yea	r	3rd year students o	dents or above Number of credits 2 Year/semesters 2025/First semest								
Days and periods	Т	1	Class style Lecture (Face-to-face course) Language of instruction Japanese							Japanese	
[Overview	and	d purpose o	f the	course]							
[Course o	biec	tives]									
•											
Course s	che	dule and co	ntent	sl							
,1time, ,3times, ,2times, ,2-3times, ,3times, ,2-3times, ,1time,	3times, 2times, 2-3times, 3times, 2-3times,										
[Course re	equi	rements]									
None											
[Evaluatio	n m	ethods and	polic	¢y]							
[Textbook	s]										
[Reference	es, e	etc.]									
(Referer	nce	books)									
[Study ou	tsid	e of class (p	orepa	ration and	d revie	w)]					
(Other in	form	nation (offic	e hoı	urs, etc.) )							
		LASIS to find		-							

										未更新
Course n	umb	er U-EN	G25 3	5025 LJ77	U-EN	G25	35025	LJ71		
Course title (and course title in English)		印工学1(機 ntrol Engineer		<b>亰:学</b> 番偶	数)	nan and	tructor's ne, job tit I departm offiliation	tle, nent	Professor,OF Graduate Scl	nool of Informatics ITSUKA TOSHIYUKI nool of Informatics ZUMA SHUNICHI
Target yea	r	3rd year students	or above	Number credits	r of		2	Year	/semesters	2025/First semester
Days and periods										Japanese
[Overview	ı an	d purpose o	of the	course]						
Control Engineering provides a methodology of controlling various systems including mechanical ones in a systematic way. Its major part consists of both Classical Control Theory and Modern Control Theory. This class describes the fundamentals of Classical Control Theory.										
[Course o	bje	ctives]								
[Course objectives] The course goal is to understand the basic concepts of Classical Control Theory such as transfer functions, frequency responses and stability.										
[Course s	che	dule and co	ntent	s]						
described th Representation the concept representation Responses of Stability tes Properties of control system Frequency r introduced. Design of con Phase Lag,	roug ion c of T on is of dy ts are f fee ems espo The ontro and	ch various rea of dynamical s ransfer Funct shown. namical syste e described. edback system and Root Loc onses,3-4times stability test o ol systems,2tim PID compens	l world system ions is ms,3ti s,2-3ti us are s,The c of feed nes,Ba	d examples. s,2-3times, introduced mes,Time r mes,Basic p explained. concept of F back system asic compon	Mathem based of esponse properti Frequence ns based nents of	natic on L es of es s cy re 1 on	al descr aplace T linear s uch as s esponses the freq	iption Transfo ystems teady s s, Bode juency	of systems is rm, and Bloc are shown. S tate characte diagrams, V responses is	Stability of systems and ristics of feedback
[Course re	-	-			<u>.</u>					
Elementary	knov	wledge of Lap	lace T	ransform is	s require	ed.				
[Evaluatio	[Evaluation methods and policy]									
Scores of quizzes, reports and the regular examination are taken into account. Continue to 制御王学1(機工ネ原:学番偶数)(2)										

制御工学1(機エネ原:学番偶数)(2)

# [Textbooks]

T. Sugie, M. Fujita: Introduction of Feedback Control. Corona Publishing Co. Ltd. isbn{}{9784339033038}

### [References, etc.]

# (Reference books)

T. Sugie, H. Kajiwara: Exercises in System Control Engineering. Corona Publishing Co. Ltd. isbn{}{ 9784339033069}

## (Related URLs)

(none)

# [Study outside of class (preparation and review)]

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

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

Course nu	ımbe	er	U-ENC	G25 35	5025 LJ77	U-EN	G25	35025	LJ71		
			1(宇 gineeri	-			nan and	ructor's ne, job tit departm ffiliation	nent		nool of Engineering essor,MARUTA ICHIROU
Target yea	r	Bind year students or above Number of credits 2 Year/semesters 2025/First set									2025/First semester
Days and periods	Ind Mon.3 Class style (Face-to-face course) Language of instruction Japanese									Japanese	
[Overview	and	d purp	ose o	fthe	course]						
U		0			•	0	•	0		•	ncludes the classical uency response.
[Course o	bjec	tives]									
The goal of the go								-			hodologies to design
[Course s	che	dule a	nd co	ntent	s]						
diagrams 6-8. Transit	d bad cal s wled respo f dyr ency	systems ge on d onse an namical respons	s and tra lynamic nd stabi l systen se	ansfer cal sys lity ns, tra	functions stems, ordin	nary diff	ly re	esponse	and R	outh-Hurwitz	ctions and block stability criteria
14-15. Desig	ce cı gn of	riteria o feedba	of feedb ack con	oack co trol sy	ontrol syste stem,	ems usir	-			•	d the root locus method. ag compensation and
[Course re	qui	remen	nts]								
Complex fur				nary c	lifferential	equatio	n th	eory			
[Evaluatio	n m	ethod	s and	polic	у]						
concepts and	Evaluation will be based on the final examination which determines the degree of comprehension of the basic concepts and the design theory of feedback systems. Also, the reports and assignments will be added up to one third of the points lost in the final examination.										
									<sub>c</sub>	Continue to 制	御工学1(宇) <b>(2)</b>

# 制御工学1(宇)**(2)**

# [Textbooks]

T. Sugie and M. Fujita <sup>III</sup> Introduction to feedback control<sub>1</sub> (Corona Publisher) ISBN:4339033030 (in Japanese)

# [References, etc.]

## (Reference books)

Introduced during class

### [Study outside 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.

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

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

						未更新
Course number	U-ENG25 350	027 LJ71				
	学2(機) Engineering 2		Instructor's name, job tit and departm of affiliation	le, ] ient (	Professor,AZ Graduate Scł	nool of Informatics CUMA SHUNICHI nool of Engineering rer,Kawasetsu Takumi
<b>Target year</b> 3rd y	ear students or above	Number of credits	2	Year/	semesters	2025/Second semester
Days and Wed. periods	3 Class	style Lecture (Face-t	o-face cours	se)	Language of instruction	Japanese
[Overview and pu	urpose of the c	ourse]				
[Course objective	es]					
-						
[Course schedule	e and contents	]				
,1time,						
,2times,						
,2times,						
,2times, ,1time,						
,2times,						
,2times,						
,2times,						
,1time,						
[Course requirem	nents]					
None						
[Evaluation meth	ods and policy	/]				
[Textbooks]						
[References, etc.]	]					
(Reference boo	oks )					
				c	ontinue to 制	御工学 2 (機) <b>(2)</b>

制御工学2(機)**(2)** 

[Study outside of class (preparation and review)]

\_ \_ \_

(Other information (office hours, etc.))

Course nu	Imbe	ər	U-EN	G25 3	5027 LJ71							
			学2(宇 Engineer				nan and	tructor's ne, job tit I departm Iffiliation	nent		nool of Engineering JIMOTO KENJI	
Target yea	r	3rd ye	ar students o	or above	Number credits	of		2	Year/	semesters	2025/Second semester	
Days and periods	Г	Thu.2	,	Class style Lecture (Face-to-face course) Language of instruction Japanese								
[Overview	and	d pu	rpose o	f the	course]							
modeling, ar	nalys	sis an	id synthe		•		-			lynamical sys	stems. It includes	
[Course o	bjec	ctive	s]									
Students wil	l lea	rn sta	ate-space	equat	tions, stabili	ity analy	ysis,	feedbaa	ck cont	roller synthe	sis and observer design.	
[Course se	che	dule	and co	ntent	ts]							
The basic sc	hedu	ile of	f the cour	se is a	s follows.							
1. Introducti	ons											
2. Ordinary			-		-	ce equat	tions	5				
3. Eigenvalu		-		•								
4. Solutions	of st	tate-s	space equ	ations	5							
5. Stability	<b>.</b>	•			41							
<ol> <li>6. Transfer f</li> <li>7. Controllable</li> </ol>			and reall	zation	theory							
8. Observabi	2	/										
9. Coordinat	•	nsfo	rmation a	and ca	nonical dec	omposi	tion					
10. Controlla						omposi	1011					
11. Observal		-										
12. State fee												
13. State obs	serve	ers ar	nd output	feedb	ack control							
14. Optimal		rol a	nd Kalm	an filt	ers							
15. Summar	У											
[Course re	equi	rem	ents]									
Students are	requ	uired	to take b	asic k	nowledge o	of linear	alge	ebra and	differe	ential equation	on theory. I is also	
preferable to							-			-		
									c	ontinue to 制	御工学2(宇) <b>(2)</b>	

# 制御工学2(宇)**(2)**

# [Evaluation methods and policy]

The points will be evaluated based on the score of the paper test. The report assignment and attendance point may adds auxiliary points. The goal of this course is to understand the outline of the modern control and to acquire the ability to design the control system.

### [Textbooks]

Not used

# [References, etc.]

(Reference books)

Introduced during class

# [Study outside of class (preparation and review)]

We will give a report for each unit. Review is necessary after every lecture.

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

Course nu	umbe	er	U-EN	G25 3	5030 LJ71						
			Ź(機) on Engin	eering	<b>7</b>		nan and	ructor's ne, job ti departn ffiliation	nent		nool of Engineering UI KAZUHIRO
Target year     3rd year students or above     Number of credits					of		2	Year	/semesters	2025/Second semester	
Days and periods		Ved.2	2	Clas	s style	Lecture (Face-t		ce cour	se)	Language of instruction	Japanese
[Overview	and	d pu	rpose c	of the	course]						

This course deals with how to construct and operate a manufacturing system of a mechanical product.

### [Course objectives]

The goal is to understand the concept of a manufacturing system, and to become able to handle related basic decision-making problems.

### [Course schedule and contents]

Introduction, 1 time, The overall concept of a manufacturing system is given.

Industrial Economics,2times,After introducing the concept of the manufacturing cost and cash flow, how to make decisions using the concept (for example, the DCF method for investment decisions) is addressed. 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, job shop scheduling, and project scheduling are introduced.

Plant Layout amp Line Blancing,2times,Basic approaches for plant layout and line balancing are introduced. Industrial Engineering,2times,After introducing the principles of motion economy, the approaches for process analysis, human-machine analysis, Therblig analysis, standard time setting, etc. are addressed. ,1time,

#### [Course requirements]

None

# [Evaluation methods and policy]

The regular examination, in-class examinations and reports are taken into account.

# 生産工学(機)**(2)**

# [Textbooks]

Not used

# [References, etc.]

 $(\ {\rm Reference\ books\ })$ 

# [Study outside of class (preparation and review)]

Homework problems are assigned.

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

The topics covered may be modified from the plan according to the actual schedule.

Course nu	mbe	er	U-EN	G25 3:	5035 LJ75								
Course title (and course title in English)					) es and Imper	fections	nan and	ructor's ne, job tit departm ffiliation	ile, nent	Professor,IN Graduate Scl	nool of Engineering UI HARUYUKI nool of Engineering SHIDA KIYOUSUKE		
Target yea	-	3rd ye	ear students	or above	Number credits	of		2	Year	/semesters	2025/First semester		
Days and periods	F	ri.1		Class style Lecture (Face-to-face course) Language of instruction Japanese									
[Overview	and	d pu	urpose o	of the	course]								
mechanical p	[Overview and purpose of the course] Dislocations are the most important lattice defects that strongly affect various propieties, especially nechanical properties of crystalline materials. In this course, fundamental properties of dislocations as well as basics of elasticity will be lectured.												
[Course o	bjec	tive	es]										
	<b>Course objectives]</b> his class aims to help students to acquire fundamental understandings of dislocations and also to acquire ays to understand mechanical properties of crystalline materials based on dislocation theory.												
[Course se	che	dule	e and co	ontent	s]								
<ol> <li>Introduct</li> <li>Basics of</li> <li>Elastic pi</li> <li>Motion o</li> <li>Force on</li> <li>Feedback</li> </ol>	elas roper f dis disle	sticit rties loca ocati	ty theory of dislocations [2 ions [4 w	[5 wee ations weeks]	eks] [2 weeks]								
[Course re	qui	rem	nents]										
None													
[Evaluatio	n m	eth	ods and	l polic	;y]								
Evaluation w determinatio		e ba	ased on o	ne (or	two) writter	n exami	natio	on(s). D	aily re	ports may be	considered in grading		
[Textbook	s]												
Hand out ma	Hand out materials will be provided during the lecture.												
[Reference	es, e	etc.]	]										
J.P. Hirth an	' 転位 d J. ] d J. ]	之論。 Loth Loth	入鬥』( ne 『Theo ne 『Theo	ory of 1 ory of 1	Dislocation Dislocation	s』(M s, 2nd e	lcGr d. ⊿	aw-Hill ( Wile	y ) ISI Brd ed.				

結晶物性学(材エネ)(2)

2017)ISBN:0521864364 幸田成康 『金属物理学序論』(コロナ)ISBN:9784339042870 柴田俊忍[ほか]共著 『材料力学の基礎』(培風館)ISBN:4563034657

[Study outside of class (preparation and review)]

To review contents covered in the previous lecture.

(Other information (office hours, etc.))

未更新

Course nu	mbe	er U-EN	G25 3	5036 LJ62	U-EN	G25	35036	LJ75	U-ENG25 3	5036 LJ76	
		特物理化学( sical Chemist				nan and	ructor's ne, job tit I departm iffiliation	nent		hool of Energy Science IYAKE MASAO	
Target year	•	3rd year students of	or above	Number credits	of		2	Year/	/semesters	2025/Second semester	
Days and periods	Wed.2 Class style (Face-to-face course) Language of instruction Japanese									Japanese	
[Overview	and	d purpose o	f the	course]							
[Overview and purpose of the course] This course discusses physical chemistry in relation to materials and raw materials processing. To do so, ectures focus on thermodynamics, solution chemistry, electrochemistry, the sciences that serve as the basis for material production, functional materials processes, recycling, corrosion and corrosion protection, etc.											
[Course ol	ojec	tives]									
utilizing the 2. Depict log 3. Read log a 4. Express si constant from 5. Determine 6. Consider o 7. Consider o 8. Consider o	<ul> <li>From this course, students will become able to do the following:</li> <li>1. Thermodynamically estimate aqueous solution reactions (acid-base reaction, oxygen reduction reaction) utilizing the free energy of ion formation.</li> <li>2. Depict log a-pH diagrams and phase-pH diagrams.</li> <li>3. Read log a-pH diagrams and phase-pH diagrams.</li> <li>4. Express simple reaction rate equations in differential and integral form, and determine the reaction rate constant from experiment results.</li> <li>5. Determine activation energy in relation to reaction rate temperature dependence from an Arrhenius plot.</li> <li>6. Consider electrode kinetics using the Butler-Volmer equation.</li> <li>7. Consider corrosion in light of equilibrium theory (Potential-pH diagram).</li> <li>8. Consider corrosion in light of kinetic theory (Evans diagram, mixed potential model).</li> </ul>										
-		dule and co		-							
Confirmation will serve as Equilibrium Lectures disc serve as the f prevention. Reaction rate											
serve as the f prevention. Corrosion (3	Explanation is made of chemical reaction rate, dynamic electrochemistry, and solid surface processes, which serve as the foundation for materials processes using aqueous solutions and for corrosion and corrosion prevention.										
Lectures will	dis	cuss equilibri	um the	eory and kir	netics of	f me	tal corro			]	
					'			C	ontinue to 材料	物理化学(エネ) <b>(2)</b>	

# 材料物理化学(エネ)**(2)**

### Feedback class (1 class)

Via questions and answer using the study support service (PandA), students will gain a deeper understanding of the contents of this course.

### [Course requirements]

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

### [Evaluation methods and policy]

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

### [Textbooks]

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

### [References, etc.]

(Reference books) 『アトキンス物理化学』(東京化学同人)

# [Study outside 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.

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

Problem-solving type assignments will be designated as necessary using practice exercises as well as the study support service (PandA).

This lecture may be changed to the on-demand via PandA on account of the speaker.

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.

										未更新
Course nu	umbe	r U-ENG	G25 3:	5037 LJ75	U-EN	G25	5 35037	LJ57		
Course title (and course title in English)		び物質移動 and Mass Tr		tructor's ne, job tit I departm affiliation	nent	Graduate School of Engineering Professor,HIDEYUKI YASUDA				
Target yea	<b>r</b> 3	Brd year students o	or above	Number credits	of		2	Year	/semesters	2025/First semester
Days and periodsWed.2Class styleLecture (Face-to-face course)Language of instructionJapanese										
[Overview	and	purpose o	f the	course]						
The fundame are given.	entals	s of transport	pheno	omena for th	ne engir	ieer	s and/or	resear	chers related	to physical engineering
[Course o	bject	tives]								
-	-	-	nental	equations of	of therm	al a	nd mass	trans	ort studied ir	the class to real
phenomena.		<b>)</b>		1				1		
•										
[Course s	ched	lule and co	ntent	s]						
mass, and m Non-steady I numerical m Conservation Molecular k Heat conduc 2 dimension Green functi Hydrodynan Boundary la Electromagn Achievemen	omen heat t hethod n rule inetic al hea ion,2t nics,2 yer,1 hetic r at chea	atum transfers ransfer,2time l. es,1time,Four es,1time,Max of cylinder ar at conduction imes,Green f times,Navier time, cadiation,1tim ck,1time,Lea	s. Fou es,Diff ier#02 well#( nd sph ,1time unctio • Stoke	rier#039s la fusion equat 39s law, Ste 039s theorr. ere,1time,H e,2 dimension. Relation es equation.	iw, Stea tion, sol ady hea leat tran onal Laj betwee	dy l ved t co sfer plac n Se	heat con by Four onduction of cylir e equati chroedir	ductio rier ex n. ndrical on. nger ec	n. pansion, Lapl and sperical	ffusion equation.
None										
[Evaluatio	on me	ethods and	polic	cy]						
Assignment	and w	vritten exami	natior	1						

Continue to 熱及び物質移動(材)(2)

# 熱及び物質移動(材)**(2)**

### [Textbooks]

河合著 『物理工学・化学工学を学ぶための熱・物質移動の基礎』(丸善,2005) ISBN:4621076086 河合著:「物理工学・化学工学を学ぶための熱・物質移動の基礎」丸善(2005) isbn{}{4621076086}

# [References, etc.]

(Reference books)

(Related URLs)

((50370) http://www.process.mtl.kyoto-u.ac.jp/)

# [Study outside of class (preparation and review)]

The homework will be announced in the lecture.

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

										未更新
Course nu	imbe	er U-EN(	G25 35	5037 LJ75	U-EN	G25	5 35037	LJ57		
Course title (and course title in English) ABD び物質移動(エネ) Heat and Mass Transfer						nan and	tructor's ne, job til d departm affiliation	tle, nent	Associate Profe Graduate Scl Professor,SA Graduate Scl	hool of Energy Science ssor,OKUMURA HIDEYUKI hool of Energy Science AGAWA TAKASHI hool of Energy Science fessor,OGAWA TAKAYA
Target yea	r	3rd year students o	Dr above Number of credits 2 Year						/semesters	2025/First semester
Days and periods	N	Mon.2	Class	s style	Lecture (Face-t		ace cours	se)	Language of instruction	Japanese
[Overview	and	d purpose o	f the	course]						
[Course o	bjec	ctives]								
[Course s	che	dule and co	ntent	s]						
,2times,										
,2times,										
,3times, ,2times,										
,2times, ,2times,										
,3times,										
,1time,										
[Course re	qui	rements]								
None										
[Evaluatio	n m	nethods and	polic	y]						
[Textbook	s]									
[Reference	es, (	etc.]								
( Referer	ıce	books)								
[Study out	tsid	e of class (p	orepai	ration and	l revie	w)]				
(Other inf	orn	nation (offic	e hou	rs, etc.) )						
*Please visit	KU	LASIS to find	d out a'	bout office	hours.					

未	更	新	Ī

Course number		er U-EN	U-ENG25 35040 LJ59 U-ENG25 35040 LJ52 U-ENG25 35040 LJ77						5040 LJ77	
		∍ズマ物理学(原宇)				Instructor's name, job title, and department of affiliation		Graduate School of Engineering Professor,MURAKAMI SADAYOSHI Graduate School of Engineering Assistant Professor,Morishita, Yuya		
			Number of credits			2	Year/	/semesters	2025/Second semester	
Days and periods	Т	ue.2	Class	s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese
[Overview	anc	l purpose o	f the	course]						
Fundamental properties of plasma as a universal state of high-temperature matters, basic equation describing plasma, magnetohydrodynamics, plasma waves and transport phenomena are explained.										
[Course objectives]										
to understand basic properties of plasmas and learn fundamental method of analysis										
[Course schedule and contents]										
What is a plasma?,2times, Motion of charged particles,2times, Coulomb collision,1time, Basic equations,2times, Equilibrium and stability,1time, Plasma waves,2times, Wave-particle interaction,1time, Transport phenomena,1time, Gas discharge,1time, Nuclear fusion,1time, Confirmation of achievement,1time, <b>[Course requirements]</b> Basic knowledges of electromagnetism, statistical physics, fluid dynamics and atomic physics are expected.										
[Evaluation methods and policy]										
semester-end examination and reports										
[Textbooks]										
Hand out will be distributed.										
[References, etc.]										
(Reference books) Introduced during class Continue to プラズマ物理学(原宇)(2)										

プラズマ物理学(原宇)**(2)** 

# [Study outside of class (preparation and review)]

Please read and study the handouts in advance about the contents of the day's class.

(Other information (office hours, etc.))

										未更新	
Course nu	ımbe	er U-ENG	G25 3:	5041 LJ53	U-EN	G25	35041	LJ52			
	and course 量子反応基礎論(原) itle in Fundamentals of Particle Interactions						tructor's ne, job tit I departm offiliation	nent	nool of Engineering ATOU MANABU		
Target yea	r	3rd year students o	or above	Number credits	of		2	Year	/semesters	2025/Second semester	
Days and periods	F	Fri.3	Class	s style	Exple Lecture (Face-to-face course) Language of instruction Japanese						
[Overview	and	d purpose o	f the	course]							
[Course o	bjec	ctives]									
[Course s	che	dule and co	ntent	s]							
,2times,											
,4times,											
,2times, ,2times,											
,2times,											
,2times,											
, 1 times,											
[Course re	qui	rements]									
None											
[Evaluatio	n m	ethods and	polic	¢y]							
[Textbook	s]										
[Reference	es, e	etc.]									
(Referer	nce	books)									
[Study ou	tsid	e of class (p	orepa	ration and	d revie	w)]					
(Other in	orn	nation (offic	e hoı	urs, etc.) )							
*Please visit	KU	LASIS to find	l out a	bout office	hours.						

	· · · · · · · · · · · · · · · · · · ·										
Course nu	ımbe	er U-EN	G25 3:	5045 LJ77	U-EN	G25	5 35045	LJ52			
Course title (and course fitle in English)						nan anc	tructor's ne, job ti I departn affiliation	nent	Graduate School of Engineering Professor, TAKATA SHIGERU		
Target yea	r	3rd year students o	or above	Number credits	of		2	/semesters	2025/First semester		
Days and periods	Г	Tue.2	Class	s style	Lecture (Face-t	ecture Face-to-face course) Language of instruction Japanese					
[Overview	and	d purpose o	f the	course]							
In this cours typical phen	<b>[Overview and purpose of the course]</b> Dynamics of high speed gas flows is treated on the basis of the fluid dynamics for compressible inviscid fluid. In this course, one-dimensional and quasi one-dimensional flows are mainly discussed, in order to show typical phenomena coming from the fluid compressibility.										
[Course o	-	_	4.1.	· c.			11.0	· 1 @			
		and fundamen		-	c to com	pre	ssible fi	u1d TIO	WS		
-		dule and co		sj							
<ol> <li>Sound pro</li> <li>Quasi one</li> <li>Propagation</li> <li>Standing Standing Standing</li></ol>	paga -dim on of Shoc	puations (2-3 t ation (2 times mension flow ( f finite amplit ek wave (1-2 t oblem (2 time	) pro (2-3 tin ude di imes)	nes) isen sturbance ( Rankine-	tropic fl 2-3 time Hugoni	low, es) - ot r	, Laval r - wave o elation,	nozzle, deform etc.	etc. ation, Riema	nn invariants, etc. es	
[Course re	qui	rements]									
Fluid dynam	ics 1	I, Elemental C	Calculı	us (A,B, I,I	I), Linea	ar A	lgebra (	A,B)			
[Evaluatio	n m	ethods and	polic	;y]							
By the final	exar	n., in principle	e.								
[Textbook	s]										
H. M. Liepn	nann	and A. Roshl	co 『E	Elements of	Gasdyn	ami	ics』(]	Dover	Publications	) ISBN:0486419630	
[Reference	es, (	etc.]									
•	(Reference books) J. D. Anderson, Jr. <sup>®</sup> Modern Compressible Flow (2nd ed.) <sup>』</sup> (McGraw-Hill) ISBN:0071006656										
[Study out	tsid	e of class (p	orepa	ration and	d revie	w)]					
Students are	exp	ected to read t	the tex	tbook by th	nemselv	es ii	n accord	ance v	vith the progr	ess of the class.	
( Other inf	orn	nation (offic	e hoı	urs, etc.) )							
( <b>Other information (office hours, etc.)</b> ) Actual times and order of topics may change, depending on the class attendants or other reasons.											

							未更新		
Course number	U-ENG25 35	5046 LJ77 U	U-ENG2	5 35046	LJ52				
Course title (and course title in English)       熱統計力学(宇) Thermodynamics and Statistical Mechanics       Instructor's name, job title, and department of affiliation       Graduate School of Engineering Professor, ERIGUCHI KOUJI									
<b>Target year</b> βrd y	ear students or above	Number o credits	of	2	Year/	semesters	2025/First semester		
Days and Thu. periods	1 Class		ecture Face-to-	face cours	se)	Language of instruction	Japanese		
[Overview and pu	urpose of the	course]							
[Course objective	es]								
[Course schedule	e and content	s]							
, 2 times, , 4 times, , 3 times, , 2 times, , 4 times,									
[Course requirem	nents]								
None									
[Evaluation meth	ods and polic	y]							
[Textbooks]									
[References, etc.]	]								
(Reference boo	oks ) 						·統計力学(字) <b>(2)</b>		
							invu日/ノ」ナ(ナ) <b>(4)</b>		

# 熱統計力学(宇)**(2)**

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

## [Courses delivered by instructors with practical work experience]

(1) Category

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

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

											小文初	
Course nu	Imbe	er	U-EN	G25 3	5047 LJ77	U-EN	G25	35047	LJ52			
	<ul> <li>空気力学(宇)</li> <li>Aerodynamics</li> </ul>						Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor,TAKATA SHIGERU		
Target yea	r	3rd ye	ear students o	or above	Number credits	of		2	Year	/semesters	2025/Second semester	
Days and periods	F	Fri.2		Class	s style	Lecture (Face-t	Japanese					
[Overview	and	d pu	irpose o	f the	course]					<u> </u>		
<b>[Overview and purpose of the course]</b> 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 o	bjec	ctive	es]									
To learn/ une flight.	ders	tand	the funda	imenta	ll issues of	two-din	nens	ional co	mpres	sible gas flow	vs related to high speed	
[Course se	che	dule	and co	ntent	s]							
<ol> <li>ShockEz</li> <li>Non-isent etc.</li> <li>Small perf</li> <li>Steady tw</li> </ol>	kpan ropio turba o-di	sion c flo ation mens	wave the w and Mr theory (3 sional flo	ory an occo's d times w and	d Interactions theorem (1 3) Potenti the method	on of ob 1-2 time al flow, l of chai	oliqu es) , Sin racte	e shock · Bow sh nilarity peristics (	s (2 tir nock, S rules, e 3-4 tir	nes) ShockExpan etc.	Meyer fan, etc. sion wave interaction, tion, etc.	
[Course re			_									
Fluid dynam	ics 1	1,2, 0	Gasdynan	nics, E	lemental C	alculus	(A,I	3, I,II), I	Linear	Algebra (A,I	3)	
[Evaluatio				-	;y]							
By the final		n., ir	n principl	e.								
[Textbook	_											
H. M. Liepm	nann	and	A. Roshl	ko <sup>┏</sup> Ε	clements of	Gasdyr	nami	cs⊿ (]	Dover	Publications	) ISBN:0486419630	
[Reference	es, e	etc.]										
(Reference books) J. D. Anderson, Jr. <sup>®</sup> Modern Compressible Flow (2nd ed.) <sup>¶</sup> (McGraw-Hill) ISBN:0071006656												
[Study out	tsid	e of	class (p	orepa	ration and	d revie	w)]					
Students are	exp	ected	d to read	the tex	tbook by th	nemselv	es ir	n accord	ance v	vith the progr	ess of the class.	
( Other inf	forn	natio	on (offic	e hou	Irs, etc.) )							
Actual times	and	ord	er of topi	cs may	v change, de	ependin	g on	the clas	ss atter	ndants or othe	er reasons.	
*Dlease visit	Please visit KIII ASIS to find out about office hours											

未更新

										未更新		
Course nu	umbe	r U-EN	G25 3	5048 LJ77								
	(and course title in推進基礎論(宇)Fundamentals of Aerospace Propulsion						ructor's ne, job tit I departm Iffiliation	tle, nent	hool of Engineering RIGUCHI KOUJI hool of Engineering essor,URABE KEIICHIRO			
Target yea	r :	3rd year students of	or above	Number credits	<sup>r</sup> of	•	2	Year	semesters	2025/Second semester		
Days and periods		Ion.1	Class style Lecture (Face-to-face course) Language of instruction Japanese									
[Overview	and	l purpose o	f the	course]								
[Course o	hiec	tivesl										
	Djec	1163]										
[Course s	chec	dule and co	nten	ts]								
,3times, Ionized Gase Electromagr Equation of Atomic and Diffusion an	es,1ti netics Ioniz Mole Id Tra es ne	s,2times, zed Gases,1tin ecular Collisio ansport of Ior ar Solid Surfa	me, ons,2t nized (	Gases,1time	2,							
[Course re	equi	rements]										
Fluid Dynan	nics,	Gas Dynamic	cs, Th	ermodynam	nics, Ele	ctro	magneti	cs				
[Evaluatio	n m	ethods and	poli	cy]								
[Textbook	s]											
[Reference	es, e	etc.]										
(References, etc.) (Reference books) R.W. Humble, G.N. Henry, and W.J. Larson, Space Propulsion Analysis and Design (McGraw-Hill, New Continue to 推進基礎論 ( 宇 ) (2)												

推進基礎論(宇)**(2)** 

York, 1995)

G.P. Sutton and O. Biblarz, Rocket Propulsion Elements, 8th ed. (John Wiley amp Sons, Hoboken, 2010) isbn{}{9780470080245};

G.P. Sutton and O. Biblarz, Rocket Propulsion Elements, 7th ed. (Wiley, New York, 2001) isbn{}{ 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-Interscience, Hoboken, 2005) isbn{}{0471720011}.

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

## [Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course numb	Course number U-ENG25 35049 LJ77											
	(and course file in航空宇宙機力学(宇)name, job title, and departmentGraduate School of Engineering Professor,SENDA KEI											
Target year	3rd year	r students o	or above	Number credits	r of		2	Year	/semesters	2025/Second semester		
Days and M periods	Mon.2		Class	s style	Lecture (Face-t	e-to-face course)						
[Overview and	d pur	pose o	f the	course]	•							
Flight dynamics	of aer	ospace v	vehicl	es.								
[Course object	ctives	5]										
To understand an		-	anics	through flig	ght dyna	amic	s of aer	ospace	vehicles.			
[Course sche	dule a	and co	ntent	sl								
Analytical mech - introduction - coordinates - principle of vir - d'Alembert prin - potential - Lagrange equat - conservation la - Lagrange multi - Euler-Lagrange Rigid body kinet - Euler angles - angular rate - pseudo coordin Rigid body dyna - kinetic energy - linear and angu - inertia tensor - Euler equation Dynamics of spa - topics of attitue Achievement co	tual wo nciple tion of w iplier e equat matics, ates mics, i of rigio lar mo of mot ice veh le dyna nfirma	ork f motion tion , 3 times d body omentun tion nicle, 2 t amics of tion, 1 t	s n imes f spac ime		funders	stand	ling	c	ontinue to 航空	至宇宙機力学(字)(2)		

## 航空宇宙機力学(宇)**(2)**

## [Course requirements]

Foundation of mechanics and mathematics

## [Evaluation methods and policy]

Grades are assessed on a scale of 100 points, based on the scores of regular tests and class participation. Class participation is assessed based on submitted assignments, class participation, and in-class comments. Class participation is taken into account up to a maximum of 20% of the overall grade.

The assessment criteria follow the policy for grading in the Faculty of Engineering, as stated in the course handbook.

[Textbooks]

Instructed during class

### [References, etc.]

### (Reference books)

L. D. Landau and E. M. Lifshitz <sup>®</sup>Mechanics: Volume 1<sup>a</sup> (Butterworth-Heinemann) ISBN: 9780750628969 (1982)

Herbert Goldstein Classical Mechanics (Pearson) ISBN:9781292026558 (2013)

Morikazu Toda <sup>P</sup>Introductory course of physics 1 Mechanics<sup>1</sup> (Iwanami Shoten ) ISBN:9784000298612 (2017, in Japanese )

Shoichro Koide <sup>F</sup>Introductory course of physics 2 Analytical Mechanics <sub>1</sub> (Iwanami Shoten ) ISBN: 9784000298629 (2017, in Japanese )

Miki Wadachi <sup>P</sup>Introductory course of physics 10 Mathematics for physics (Iwanami Shoten) ISBN: 9784000298704 (2017, in Japanese)

### [Study outside of class (preparation and review)]

Students should learn the basic mechanics and mathematics in advance as necessary. They should answer the questions given as assignments, understand the lecture content, review it by reorganizing their notes, etc., and systematize the content they have learned. For this reason, it takes an average of about 4 hours of preparation and review for each lesson.

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

Instructions will be given during class.

Course nu	Course number U-ENG25 35051 LJ71											
Course title (and course title in English)							Instructor's name, job title, and department of affiliation			nool of Engineering WA SHIRO		
Target yea	<b>r</b> 3	rd year students	or above	Number credits	r of		2	Year	/semesters	2025/First semester		
Days and periodsMon.1Class styleLecture (Face-to-face course)Language of instructionJapanese										Japanese		
[Overview	and	purpose o	of the	course]								
"Mechanics physical law as three-dim law) are trea	of Ma rs of the ension ted to at for t	aterials" cou he mechanic nal expressio gether with the understa	rses, th al beha ons of mather nding o	ne significate avior of sol stress and s matical anate of basic prime	nce of th ids. Nar strain, ec llysis of nciples	his c nely quili stat	course li y, fundat brium e ic defor	es in tl mental quatio matior	ne treatments principles of ns, constitutions is in elastic be	main topics in the of more general solid mechanics such ve equations (Hooke's odies. These subjects alysis employed for the		
[Course o	bject	ives]										
of deformation	on an	alysis of sol	ids and	l structures	. It is als	so tł	ne aim o	of this c		rain and fundamentals xamine the values of ewpoint.		
[Course s	ched	ule and co	ntent	s]								
situations. Week 1 [Pre Weeks 2-3 [ Infinitesima Weeks 4-6 [ of stress cor Weeks 7-8 [ Weeks 9-10 Compatibili Weeks 9-10 Compatibili Weeks 11-1 equation; St Week 13 [St walled cross	limin Defor I strai: Stress Stress [Func ty rela 2 [Tw ress fu Ven secti incipi ergy inatio	aries] Basis mation and n; Transform and laws of ents; Cauchy s-strain relati damental equation for stra to-dimension unction in po ant's theory ons le of virtual on>	vecotrs strain] hation f motic 's laws ions] H hations in hal pro- blar co- of tors	s; Kronecke Description of strain co on] Stress ve of motion; Hooke's law of elasticit blems of el ordinates; S ion] Warpi	er's delta n of mo omponer ector, E ; Equilit ; Elastic ty] Navi astic de Stress co ng funct	a; A tion nts; 1 uler priur c mo fer's form pnce tion	Iternatir ; Materi Principa 's laws on equationduli; Vo equation nations] ntration ; Prandt	ng sym al time I strain of moti ions; P oigt ex ns; Pla Airy's aroun l's strea	bol; Summat e derivative; G on; Cauchy's rincipal stress pression ne stress and stress function d a circular ho ss function; T	on; Biharmonic		
								c	Continue to	国体力学(字) <b>(2)</b>		

## 固体力学(宇)**(2)**

## [Course requirements]

The enrolling students are expected to have knowledge in the Mechanics of Materials courses. Good understanding of calculus, linear algebra (eigenvalue problems) and vector analysis is also necessary.

### [Evaluation methods and policy]

Grading is made based on the examination (80%) and the reports (20%). The total score of the examination and the reports is evaluated between 0 and 100 points (the pass mark is 60). Occasional changes will be announced in the classes.

### [Textbooks]

Textbooks are not assigned. The lecture is given in the blackboard style.

### [References, etc.]

### (Reference books)

T. Inoue, "Fundamentals of elasticity" (Nikkan Kogyo)

S. Kobayashi and K. Kondo, "Elasticity" (Baihu-kan)

For references written in English, students are advised to contact the instructor directly.

### [Study outside of class (preparation and review)]

Contents of "Mechanics of Materials" courses should be fully reviewed. Homeworks (reports) will be assigned to review the lectures.

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

Lectures are given in a black-board style. Students are expected to take the notes to understand the ideas and mathematical derivations, and make questions regarding unclear points.

						未更新			
Course number	U-ENG25 3	5054 SJ77 U-EN	G25 35054	<b>SJ</b> 71					
Course title (and course 物理工 title in Exercis English)		of Energy Science AWA TAKASHI							
Target year 3rd	year students or above	Number of credits	1	Year/seme	sters <sub>202</sub>	5/First semester			
Days and Mor periods	and Mon.4 Class style (Face-to-face course) Language of instruction Japanese								
[Overview and p	urpose of the	course]							
[Course objectiv	/es]								
[Course schedu	le and conten	ts]							
,9times,									
,6times,									
[Course requirer	nents]								
None									
[Evaluation mether	hods and polic	суј							
[Textbooks]									
[References, etc	.]								
(Reference bo	oks)								
				Continue		夏 <mark>夏 / _</mark> 夏習 1 (エネ) <b>(2)</b>			

物理工学演習1(エネ)(2)

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

## [Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course nu	Course number         U-ENG25 35054 SJ77         U-ENG25 35054 SJ71										
Course title (and course title in English)	and course物理工学演習1(原)name, job title, and departmentGraduate School of Engineeringtle inExercise on Engineering Science 1and departmentGraduate School of Engineering										
Target yea	r	3rd year students	or above	Number credits	r of		1	Year/	semesters	2025/First semester	
Days and periods	Т	'ue.3,4	4.4 Class style Seminar (Face-to-face course) Language of instruction Japanese								
[Overview	and	d purpose (	of the	course]							
10											
[Course o	bjec	tives									
[Course se	cheo	dule and co	ontent	sl							
Linear algeb				-							
Linear differ			5times,								
Laplace tran Confirmation			in stu	ly 1 time							
Commano			in stud	iy,itime,							
[Course re	aui	rementsl									
differential a	-	-	r alget	ora							
		U ,	U								
[Evaluatio	n m	ethods and	d polic	>y]							
exercises and	d rep	orts									
	_					_					
[Textbook	-	. 11 . 1									
Prints are dis	stribi	uted in the cl	ass.								
[Reference	es. e	etc.]									
(Referer	-	-									
[Study out	tsid	e of class (	prepa	ration and	d reviev	w)]					
(Other inf	form	nation (offi	ce hou	urs, etc.))	1						
*Please visit	KU	LASIS to fir	nd out a	bout office	hours.						

Course nu	Course number         U-ENG25 35054 SJ77         U-ENG25 35054 SJ71										
		L学演習 1 ise on Engi				nan and	ructor's ne, job ti I departn ffiliation	nent		ırer,KOBAYASHI TAKUMI cturer,Ishiguro Takahisa	
Target year	- 3ro	d year students	or above	Number credits	r of		1	Year	r/semesters	2025/First semester	
Days and periods	and Thu.3,4 Class style (Face-to-face course) Language of instruction Japanese									Japanese	
[Overview	and	purpose c	of the	course]							
dynamics, ai Also, this co system desig	rcraft urse ir n, etc.	structure, and a struct	ircraft	systems, ed	quipmen	it, et	c.	-		aft, including flight tion type, aircraft	
[Course ol	-	-		1 '11	11	• 1	1 1		· 6.1 ·	TT1' 1 1 4	
									aircraft desig	n. This course helps to he university.	
[Course so	chedu	ule and co	ntent	s]							
<ul> <li>Determi</li> <li>(2) Airframe</li> <li>Basic kn</li> <li>Design a</li> <li>(3) Aircraft S</li> <li>Basic kn</li> </ul>	nation struct owled and str System	lge of aircra of aircraft ural design lge of aircra engh calcul	oft and config <instru- oft stru- ation of oment oft syst</instru- 	flight mech uration (3 s uctor: Taka cture, load of main stru <instructor æms and ec</instructor 	hanics ( sessions agi Yoho s, streng uctural n :: Ishigu juipmen	) ei> th, r nem ro T	naterial bers (3 akahisa	sessio >		g methods (2 sessions)	
[Course re	quire	ements]									
This course 1	require	es understar	nding t	he fundame	ental of	dyna	amics.				
[Evaluatio			-								
Evaluation w • Attendand • Submissio	ce and	participatio	on in c	ourse.	nd home	wor	ks.				
							. – –	<sub>c</sub>	 Continue to 物现		

## 物理工学演習1(宇)**(2)**

## [Textbooks]

To be distributed at class.

## [References, etc.]

### (Reference books)

To be introduced during class.

## [Study outside of class (preparation and review)]

Possibly will be given some homeworks, which requires submission of reports.

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

For exercises during the class, writing tools, rulers, compasses and a calculator. It is recommended to use laptop PC or tablet which spread software like EXCEL is installed.

							未更新		
Course number	U-ENG25 35	5055 SJ71	U-ENG	azs 35055	SJ77				
Course title (and course title in English) 物理工学演習2(エネ) Exercise on Engineering Science 2				Instructor's name, job tit and departm of affiliation	tle, nent	Graduate School of Energy Science Professor, KAWANABE HIROSHI Graduate School of Energy Science Professor, IMATANI SHIYOUJI Graduate School of Energy Science Professor, MATSUMOTO KAZUHIKO Graduate School of Energy Science Associate Professor, HORIBE NAOTO Graduate School of Energy Science Associate Professor, OGAWA TAKAYA Graduate School of Energy Science Associate Professor, KAWANISHI SAKIKO Part-time Lecturer, HAYASHI KAZUHIRO			
Target year	l year students or above	Number credits	of	1	Year/	/semesters	2025/Second semester		
Days and periods	.2 Class		Seminar (Face-to	o-face cours	se)	Language of instruction	Japanese		
[Overview and p	ourpose of the	course]							
to solve them and s	submit assignmen	•••		-	-		students are supposed ls will also be provided.		
[Course objectiv	-				~ 11	-			
This class aims to h exercises.	elp students to le	arn fundame	ental ma	tters in the	; field c	of energy scie	ence acquire by solving		
[Course schedu	le and content	ːs]							
Thermal engineerin Hydrodynamics, 3 Mechanics of mater Thermodynamics, 2 Physical Chemistry Crystallography, 2 Summary, 1 week	weeks rials. 2 weeks 2 weeks 7, 2 weeks								
[Course require	ments]								
It is desirable that s	tudents learned th	ne basis of ea	ach topi	c.			 江学演習 2 (エネ) <b>(2)</b>		
						ontinue to 初连	ユ子供自 2 (エ <b>ヤ)(2)</b>		

# 物理工学演習2(エネ)(2)

# [Evaluation methods and policy]

Evaluation will be based on active participation and assignments.

### [Textbooks]

Handout will be provided in each topic.

### [References, etc.]

# (Reference books)

Introduced during class

# [Study outside of class (preparation and review)]

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

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

Course nu	ımb	er	U-EN	G25 3:	5055 SJ71	U-EN	G25	35055	SJ77			
	物理工学演習 2 (原) Exercise on Engineering Science 2						nam and	ructor's ne, job ti departn ffiliation	tle, nent	Graduate School of Engineering ALL STAFF Graduate School of Engineering Assistant Professor,OGURE KENZOU Graduate School of Engineering Senior Lecturer,NARITA EMI		
Target yea	r	3rd y	ear students o	or above	Number credits	of	1 Year/seme			/semesters	2025/Second semester	
Days and periods	]	Гue.∠	4,5	Class	s style	Semina (Face-t		ce cour	se)	Language of instruction	Japanese	
[Overview	an	d pı	urpose o	of the	course]							
					1 .			-		through prac are significa	tical exercises. These nt.	
[Course o	bje	ctive	es]									
equations, an In addition, physical med and phenom [Course so Boundary va diffusion. Special func differential e	nd sj stuc char enol <b>che</b> due tion equa	pecia lents logic <b>dule</b> prob s (5 tion. naly	al function s will learn s behind t cally repla e and co blems (5 c classes): 1	ns. Thi n the b he obs ce the <b>ntent</b> lasses Partial	is is importation oasics of state physical m (s] ): Initial-bo differential	ant for s tistical o and for echanis undary- l equatio	tudy data cons ms i valu	incluc analysi structing n the fu e proble ike Leg	ling flu s. This g statis ture. ems lil	tid thermal end is important tical models ke wave phen	artial differential ngineering, in the future. for identifying the that can approximately omena and thermal quation and Bessel al modeling.	
[Course re	-		_									
Calculus, Li	near	alge	ebra									
[Evaluatio	n n	neth	ods and	polic	¢y]							
Students will learn how to solve the problems and answer the exercises. The solutions will be submitted as a report through PandA. Grades will be based on the content of the reports, which will be graded on a 100-point scale.												

\_\_\_\_\_Continue to 物理工学演習 2 (原)(2)

物理工学演習2(原)(2)

# [Textbooks]

Texts will be distributed.

# [References, etc.]

( Reference books )

# [Study outside of class (preparation and review)]

Students will answer the exercises and submit the solutions as a report through PandA.

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

Students can ask their questions during and after the lessons or by email.

Course number         U-ENG25 35055 SJ71         U-ENG25 35055 SJ77											
	I course     物理工学演習2(宇)       in     Exercise on Engineering Science 2						tle, nent	Part-time Lecturer,NAKANISHI TOSHIYUKI Part-time Lecturer,FUJIWARA SATOSHI Part-time Lecturer,SASAKI ATSUSHI			
Target year	Brd year students of	or above	Number credits	r of		1	Year	<b>r/semesters</b> 2025/Second semester			
Days and Fr periods	ri.3,4	Class	style	Semina (Face-t		ce cour	se)	Language of instruction	Japanese		
[Overview and	l purpose o	f the c	course]								
Conduct lecture a	nd exercise of	on aircr	aft and spa	acecraft	desi	ign.					
Course chiese	414001										
[Course object		<b>C</b> . /	<u> </u>	1	<u></u>	1.4.1	•	1 .	1 1		
Understand the ba aircraft/spacecraft		tt/space	ecraft syste	ems and	flig	ht dynai	mics, a	and acquire a	basic attitude toward		
[Course sched	lule and co	ntents	6]								
<ol> <li>History of airch History of space</li> <li>Spacecraft - Su Summary of sa Summary of ro Summary of pr</li> <li>Spacecraft - Or Kepler motion Transfer of orb</li> <li>Spacecraft - Pr Thrust and effe Specific impuls Ideal velocity a Multi-stage roc Required veloc</li> <li>Spacecraft - De Exercise on siz</li> <li>Aircraft - Sum Airplane shape Airplane subsy Airplane engim</li> <li>Aircraft - Airpl Standard atmos Definition of va Aerodynamic c</li> </ol>	raft developm cecraft developm cecraft developm immary of sa itellite system ocket system ropulsion system ropulsi ropulsion	hent and opment and tellite an tem of a te [1 we eket pro- t veloci nponent t e [1 or 2 specifi ane sys	d effort in and effort and rocket spacecraft eek] opulsion [1 ity t 2 weeks] ication item [1 we	in Japa systems or 2 we	s [1 ·	-					

物理工学演習2(宇)**(2)** 

Engine performance Major performances of airplane 8. Aircraft - Airplane stability and controllability [1 week] Longitudinal stability and controllability Center of gravity limits 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

\* As part of the class, students may take a tour of facilities outside the university related to aircraft/spacecraft.

### [Course requirements]

Assumes students understand the fundamentals of dynamics.

### [Evaluation methods and policy]

[Evaluation method]

Evaluation will be based on report (75%) and class performance (25%).

Evaluation for class performance includes the attendance at the class and the effort toward the exercise. [Evaluation policy]

Evaluate the degree of understanding of aircraft/spacecraft systems and flight dynamics, and the degree of mastery of basic attitude toward aircraft/spacecraft design.

### [Textbooks]

Handouts will be distributed.

### [References, etc.]

(Reference books)

Introduced during class

### [Study outside of class (preparation and review)]

Students are likely to make reports outside of class time, which will be imposed during class.

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

The contents and number of classes are subject to change depending on the situation.

										未更新	
Course num	ber	U-EN	G25 35	5056 EJ71							
(and course 機械システム工学実験1(機) title in Mechanical and System Engineering Laboratory 1						Instructor's name, job title, and department of affiliation			Graduate School of Engineering Associate Professor, HIROTANI JU Graduate School of Engineering Associate Professor, NAMURA KYOK Institute for Life and Medical Science Associate Professor, MAKI KOICHIR Graduate School of Engineering Assistant Professor, KURIYAMA REIK Graduate School of Engineering Assistant Professor, PILLAI, Abhishek Lakshn Graduate School of Engineering Assistant Professor, GUO Yuting Graduate School of Engineering Professor, TSUCHIYA TOSHIYUI Institute for Life and Medical Science Assistant Professor, Hironori Takeo Graduate School of Informatics Assistant Professor, BANNO IKUM		
Target year	3rd ye	ear students o	or above	Number credits	r of		1	Year/	semesters	2025/First semester	
Days and periods	Wed.	4,5	Class	s style	Experin (Face-t		ce cour	se)	Language of instruction	Japanese	
[Course obje	[Overview and purpose of the course] [Course objectives]										
[Course sch	eaule	e and co	ntent	sj							
,1time, ,2times, ,2times, ,2times, ,2times, ,1time, ,1time, ,2times,											
								C	ontinue to 機械シ	ステム工学実験1(機) <b>(2)</b>	

機械システム工学実験1(機)**(2)** 

# [Course requirements]

None

[Evaluation methods and policy]

[Textbooks]

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

						未更新			
Course number	U-ENG25	5 35056 EJ71							
	✓ステム工学詞 ical and System I	<b>実験1(機)</b> Engineering Laborator	Instructor's name, job and depart of affiliatio	title, ment	Graduate School of Engineering Associate Professor, HIROTANI JUN Graduate School of Engineering Associate Professor, NAMURA KYOKO Institute for Life and Medical Science Associate Professor, MAKI KOICHIRO Graduate School of Engineering Assistant Professor, KURIYAMA REIKO Graduate School of Engineering Assistant Professor, PILLAI, Abhishek Lakshma Graduate School of Engineering Assistant Professor, GUO Yuting Graduate School of Engineering Professor, TSUCHIYA TOSHIYUK Graduate School of Informatics Assistant Professor, BANNO IKUM Institute for Life and Medical Science Assistant Professor, Hironori Takeda Graduate School of Engineering				
Target year 3rd	year students or ab	Number of credits	1	Yea	r/semesters	2025/Second semester			
Days and Mor periods	n.4,5 <b>Cla</b>		eriment ce-to-face cou	rse)	Language of instruction	Japanese			
[Overview and p	ourpose of th	ne course]							
[Course objectiv	/es]								
[Course schedu	le and conte	ents]							
Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class. Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection. Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by 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.									

機械システム工学実験1(機)**(2)** 

# [Course requirements]

None

[Evaluation methods and policy]

[Textbooks]

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

										未更新
Course num	ber	U-EN	G25 3:	5057 EJ71						
(and course title in English) 機械システム工学実験2(機) Mechanical and System Engineering Laboratory 2						nan and	ructor's ne, job tit departn ffiliation	tle, nent	Associate Pro Graduate Sch Associate Profess Graduate Sch Assistant Profess Graduate Sch Assistant Profe Graduate Sch Associate Profe Graduate Sch Associate Profe Graduate Sch Associate Profe Graduate Sch Senior Lecture Graduate Sch Assistant Profe Institute for L	nool of Engineering ofessor,HIROTANI JUN nool of Engineering or,NAMURA KYOKO nool of Engineering sor,TERAKAWA TATSURO nool of Engineering ssor,Wataru MATSUNAGA nool of Engineering essor,FUJIMOTO KAZUYA nool of Engineering r,WAKABAYASHI HIDENOBU nool of Engineering fessor,KOUNO DAISUKE nool of Engineering er,NAKANISHI HIROAKI nool of Engineering ssor,SHIMOFURI MASAKI ife and Medical Sciences fessor,Kaneko Taikopaul
Target year	3rd ye	ear students	or above	Number credits	of		1	Year	/semesters	2025/First semester
Days and periods	Thu.4	1,5	Class	s style	Experir (Face-t		ce cour	se)	Language of instruction	Japanese
	[Overview and purpose of the course] [Course objectives]									
[Course sch ,1time, ,2times, ,2times, ,2times, ,2times, ,2times, ,1time, ,1time, ,2times,	edule	e and co	entent	s]						
								C	ontinue to 機械シ	ステム工学実験2(機) <b>(2)</b>

機械システム工学実験2(機)**(2)** 

# [Course requirements]

None

[Evaluation methods and policy]

[Textbooks]

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course number         U-ENG25 35057 EJ71           Course title (and course in addition of the professor, HROTANI JUN Graduate School of Engineering Associate Professor, HAUTANI JUN Graduate School of Engineering Assistant Professor, HAUTANI JUN Graduate School of Engineering Assistant Professor, HAUTANI JUN Graduate School of Engineering Assistant Professor, WAKBANASHIIDE/OBU Assistant Professor, WAKBANASHIIDE/OBU Assistant Professor, WAKBANASHIIDE/OBU Assistant Professor, WAKBANASHIIDE/OBU Assistant Professor, WAKBANASHIIDE/OBU Assistant Professor, WAKBANASHIIDE/OBU Assistant Professor, SHIMOFURI MASAKI Institute for Life and Medical Sciences Senior Lecturer, NAKANISHIIHR/OAKU Graduate School of Engineering Assistant Professor, SHIMOFURI MASAKI Institute for Life and Medical Sciences Days and periods           Target year         3rd year students or abov         Number of credits         1         Year/semesters         2025/Second semester           Days and periods         Thu.1.2         Class style         Experiment (Face-to-face course)         Japarese           [Course objectives]											未更新
Course title (and course title in English)       根城システム工学実験2(様) (mechanical and System Engineering Laboratory 2 and department of affiliation       Instructor's name, job title, and department of affiliation       Instructor's name, job title, and department of affiliation         Target year       Ind year students or above periods       Number of credits       1       Year/semesters         Days and periods       Thu.1,2       Class style       Experiment (Face-to-face course)       Impact School of Engineering Assistant Professor, WARMANISHI HIROARU Graduate School of Engineering Assistant Professor, KARABYASHI HIROARU Graduate School of Engineering Assistant Professor, KARABYASHI Graduate School of Engineering Assistant Professor, KARABYASHI Institute for Life and Medical Science Assistant Professor, Kaneko Taikopaul Japunese         [Darys Graduate School of the course]       1       Year/semesters       2025/Second semester         [Course objectives]	Course nu	mber	U-EN	G25 3:	5057 EJ71						
Image type       prod year students or above       credits       1       rear/semesters       2025/Second semester         Days and periods       Thu.1,2       Class style       Experiment (Face-to-face course)       Laquage d/listicutor       Japanese         [Overview and purpose of the course]       Image d/listicutor       Japanese       Image d/listicutor       Japanese         [Course objectives]       Image d/listicutor       Image d/listicutor       Japanese         [Course schedule and contents]       Image d/listicutor       Image d/listicutor       Japanese         [Course schedule and contents]       Image d/listicutor       Image d/listicutor       Japanese         [Course schedule and contents]       Image d/listicutor       Japanese         [Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class.       Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection.         Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by 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 p	(and course title in機械システム工学実験2(機) Mechanical and System Engineering Laboratory 2					name, job title, and department			Associate Professor, HIROTANI JU Graduate School of Engineering Associate Professor, NAMURA KYOU Graduate School of Engineering Assistant Professor, TERAKAWA TATSU Graduate School of Engineering Assistant Professor, Wataru MATSUNA Graduate School of Engineering Assistant Professor, WAKABAYASHI HIDENO Graduate School of Engineering Associate Professor, KOUNO DAISU Graduate School of Engineering Senior Lecturer, NAKANISHI HIROA Graduate School of Engineering Assistant Professor, SHIMOFURI MASA Institute for Life and Medical Scien		
and periods       Thu.1,2       Class style       Experiment (Face-to-face course)       Impuged instruction       Japanese         [Overview and purpose of the course]       [Course objectives]       [Course objectives]       [Course objectives]         [Course schedule and contents]       [Course schedule and contents]       [Course schedule and contents]       [Course schedule and contents]         [Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class. Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection.         Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by 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.	Target year	3rd y	year students o	or above		of		1	Year	/semesters	2025/Second semester
[Course objectives] [Course schedule and contents] Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class. Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection. Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by 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.	and periods		·		s style				se)	Language of instruction	Japanese
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Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class. Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection. Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by 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.											
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	Basic knowled detection. Intrusion Det based IDS by issued from I Intrusion Det traffic by may Presentation,	edge on ection y studyi DS and ection chine le 1time,F	the role o by Signatu ng open so l commun by Machir earning alg Based on th	of IDS are-Ba ource s ication ne Leas gorithm he exe	in network sed IDS,5ti signature-ba s, and addi rning,7time ns and publ rcise, stude	security mes,Lea ased ID ng signa s,Learn ic datas nts pres	arn t arn t S an ature the et fe ents	d how m the mech d attack es to det method or bench their m	hanism hanism s, such ect atta of cla markin ethods	e learning car of intrusion as correspon acks. ssifying norm ng intrusion c of intrusion	a help the intrusion detection by signature- adence between alarms hal and malicious letection performance. detection using

機械システム工学実験2(機)**(2)** 

# [Course requirements]

None

[Evaluation methods and policy]

[Textbooks]

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

		-								未更新	
Course nu	mber	U-EN	G25 35	5058 EJ71							
(and course機械システム工学実験3(機)title inMechanical and System Engineering Laboratory 3						Instructor's name, job title, and department of affiliation			Graduate School of Engineering Associate Professor, HIROTANI JUL Graduate School of Engineering Associate Professor, NAMURA KYOK Graduate School of Engineering Program-Specific Associate Professor, FURUTA KOZ Graduate School of Engineering Assistant Professor, Susumu Minam Graduate School of Engineering Assistant Professor, ADACHI MASAT Graduate School of Informatics Assistant Professor, HOSHINO KENT Graduate School of Engineering Program-Specific Assistant Professor, Jike Ha Graduate School of Informatics Assistant Professor, KATO SHOTA Graduate School of Engineering Assistant Professor, KATO SHOTA Graduate School of Engineering Assistant Professor, Satomi Matsumot		
Target year	· 3rd	year students of	or above	Number credits	of		1	Year/	semesters	2025/First semester	
Days and periods	Fri.4			s style	Experir (Face-t		ce cour	se)	Language of instruction	Japanese	
[Overview	[Overview and purpose of the course]										
[Course of	ojectiv	/es]									
[Course so	chedu	le and co	ntent	s]							
,1time, ,14times,											
[Course re	quire	ments]									
None											
								Co	ontinue to 機械シ	ステム工学実験3(機) <b>(2)</b>	

機械システム工学実験3(機)**(2)** 

# [Evaluation methods and policy]

[Textbooks]

### [References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

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

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

		-								未更新	
Course nur	nber	U-EN	G25 3:	5058 EJ71							
(and course title in機械システム工学実験3(機)Mechanical and System Engineering Laboratory 3						Instructor's name, job title, and department of affiliation			Graduate School of Engineering Associate Professor, HIROTANI JU Graduate School of Engineering Associate Professor, NAMURA KYOK Graduate School of Engineering Program-Specific Associate Professor, FURUTA KOZ Graduate School of Engineering Assistant Professor, Susumu Minam Graduate School of Engineering Assistant Professor, ADACHI MASAT Graduate School of Informatics Assistant Professor, HOSHINO KENT Graduate School of Engineering Program-Specific Assistant Professor, Jike H Graduate School of Informatics Assistant Professor, KATO SHOTA Graduate School of Engineering Program-Specific Assistant Professor, Jike H Graduate School of Engineering Assistant Professor, KATO SHOTA Graduate School of Engineering Assistant Professor, Satomi Matsumo		
Target year	3rd y	ear students o	or above	Number credits	of		1	Year	/semesters	2025/Second semester	
Days and periods	Thu.4			s style	Experir (Face-t		ce cour	se)	Language of instruction	Japanese	
[Overview and purpose of the course]											
[Course ob	jective	es]									
[Course sc	hedule	e and co	ntent	s]							
Basic knowled detection. Intrusion Dete based IDS by issued from II Intrusion Dete traffic by mac	dge on ection b studyin DS and ection b chine le ltime,B	the role o by Signatung open so community Machir arning alg ased on the	f IDS are-Ba ource s ication he Lea gorithm he exe	in network sed IDS,5ti signature-ba s, and addi rning,7time ns and publ rcise, stude	security mes,Lea ased ID ng signa es,Learn lic datas nts pres	y and arn t S an ature the et fo ents	d how m he mech d attack es to det method or bench their m	hanism hanism s, such eet att l of cla marki hethods	e learning car n of intrusion n as correspon acks. ssifying norm ng intrusion of s of intrusion	cility for this class. a help the intrusion detection by signature- and malicious letection performance. detection using	
								C	ontinue to 機械シ	ステム工学実験3(機)(2)	

機械システム工学実験3(機)**(2)** 

# [Course requirements]

None

[Evaluation methods and policy]

[Textbooks]

[References, etc.]

 $(\ {\rm Reference\ books\ })$ 

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

										未更新
Course n	umbe	er	U-ENG25 3	35059 SJ71						
Course title (and course title in Exercise of Machine Design 1					Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor,NISHIWAKI SHINJI Graduate School of Engineering Associate Professor,NAKAJIMA KAORU Graduate School of Engineering Associate Professor,FUJIMOTO KAZUYA Part-time Lecturer,Akai Kazuki Part-time Lecturer,ISOME YUKA Part-time Lecturer,Kawabata Shinichi Part-time Lecturer,Nishimura Kosuke Part-time Lecturer,Morishima Akichika		
Target yea	r	3rd ye	ear students or above	Number credits	r of		2	Year	/semesters	2025/First semester
Days and periods			.,5,Fri.4,5 <b>Clas</b>		Semina (Face-t		ice cour	se)	Language of instruction	Japanese
[Overview	and and	d pu	rpose of the	course]						
[Course o	bjec	ctive	es]							
[Course s	che	dule	and conten	ts]						
,4times,										
,3times,										
,-times, ,21times,										
,21times,										
,21times,										
,2times,										
[Course re	equi	irem	ents]							
None										
		_						c	continue to 機柄	

## 機械設計演習1(機)(2)

# [Evaluation methods and policy]

#### [Textbooks]

#### [References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

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

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

							未更新
Course numb	er U-E	NG25 35059	SJ71				
	戒設計演習 ercise of Mac	1 (機) chine Design	1	Instructor name, job and depa of affiliati	title, rtment	Professor,NI Graduate Scl Associate Prof Graduate Scl Senior Lectu	hool of Engineering SHIWAKI SHINJI hool of Engineering Fessor,SHIKAMA TAIICHI hool of Informatics rer,EGUCHI KANA urer,NAKAMURA KIMIO
Target year	3rd year student	to or about	Imber of dits	2	Yea	r/semesters	2025/First semester
Days and T periods	ue.4,5,Thu.4	5 <b>Class sty</b>	le Semin (Face-	ar •to-face co	urse)	Language of instruction	Japanese
[Overview and	d purpose	of the cou	rse]				
[Course object	ctives]						
[Course sche							
Basic knowledge detection. Intrusion Detect based IDS by stu issued from IDS Intrusion Detect	e on the role ion by Signa idying open and commu- ion by Mach- ne learning a ne,Based on	of IDS in ne ature-Based I source signa inications, an ine Learning algorithms an	twork securit DS,5times,Le ture-based IE d adding sigr ,7times,Lear d public data , students pre	y and how earn the mo DS and attan natures to o n the meth set for bern sents their	machir echanisr cks, suc letect at od of cla chmark method	ne learning car n of intrusion h as correspon- tacks. assifying norm ing intrusion of	cility for this class. In help the intrusion detection by signature- indence between alarms hal and malicious detection performance. detection using
[Course requi	irements]						
None							
[Evaluation m	nethods an	nd policy]					
						Continue to 機材	

## 機械設計演習1(機)**(2)**

### [Textbooks]

### [References, etc.]

( Reference books )

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

										未更新
Course nu	umbe	r U-ENC	<b>325</b> 3:	5059 SJ71						
Course title (and course title in English)		設計演習 1 cise of Machi				nan and	ructor's ne, job tit I departm Iffiliation	nent	Professor,NI Graduate Sch Associate Professo Graduate Sch Senior Lecture Part-time Lectu	nool of Engineering SHIWAKI SHINJI nool of Engineering or,MATSUMOTO MITSUHIRO nool of Engineering or,NAKANISHI HIROAKI rer,YAMAMURA SHINYA urer,KANATANI KENICHI
Target yea	r 3	3rd year students o	r above	Number credits	<sup>.</sup> of		2	Year	/semesters	2025/First semester
Days and periods	W	ed.4,5,Fri.4,5	Class	sstyle	Semina (Face-t		ice cours	se)	Language of instruction	Japanese
[Overview	/ and	l purpose of	f the	course]						
[Course o	bjec	tives]								
-		dule and co		-						
Basic knowl detection. Intrusion De based IDS b issued from Intrusion De traffic by ma Presentation machine lea	ledge etectic by stuc IDS a etectic achino a,1tim rning	on the role of on by Signatu dying open so and communi on by Machin e learning alg te,Based on th , and discuss	f IDS are-Ba burce s cation a Leas gorithm ne exe	in network sed IDS,5ti signature-ba ns, and addi rning,7time ns and publ rcise, stude	security imes,Lea ased IDS ing signa es,Learn lic datas ents pres	y and arn t S an ature a the set fo sents	d how m the mech d attack es to det method or bench their m	hanism hanism ts, such tect att of cla umarki tethods	e learning can n of intrusion n as correspor acks. Issifying norm ng intrusion d	cility for this class. help the intrusion detection by signature- indence between alarms hal and malicious letection performance. detection using
[Course re	equir	ements]								
None										
[Evaluatio	on me	ethods and	polic	;y]						
								,	Continue to 機柄	

## 機械設計演習1(機)**(2)**

### [Textbooks]

### [References, etc.]

( Reference books )

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

													未更新
Course nu	umb	er	U-EN	JG25 3	5060 SJ71								
Course title (and course title in English)			計演習 2 e of Mac				nan and	ructor's ne, job tit I departm Iffiliation	nent	Pi G Pi G A Pa	rofessor,KC Fraduate Sch rofessor,HI Fraduate Sch ssociate Prof art-time Lect	nool of Eng fessor,KOUN turer,KANE	ASAHARU ineering TOMOKO
Target yea	r	3rd ye	ear students	s or above	Number credits	r of		2	Yea		emesters		ond semester
Days and periods	ľ	Mon.	.1,2,3,4	Clas	s style	Semina (Face-t		ice cours	se)	L	Language of instruction	Japanese	
[Overview	<i>ı</i> an	d pu	irpose	of the	course]								
[Course o	bje	ctive	es]										
[Course s	che	dule	and co	onten	ts]								
,14times, ,1time,													
[Course re	equ	irem	nents]										
None													
[Evaluatio	n n	neth	ods and	d poli	cvl								
F				* F -	-71								
[Textbook	(S]												
-	_												
		• -				• •			(	Cor	ntinue to 機柄	城設計演習2(	(機)(2)

機械設計演習2(機)(2)

#### [References, etc.]

(Reference books)

### [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

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

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

										未更新	
Course nu	ımbe	er U-EN	G25 2	5061 PJ71							
•		、 城製作実習( rcise for Mac		hop Practic	се	nan and	ructor's ne, job ti I departn Iffiliation	nent	Professor, M. Graduate Scl Associate Pro- Graduate Scl Professor, NI Graduate Scl Assistant Prof- Institute for I Assistant Prof Graduate Scl Assistant Prof Graduate Scl Assistant Prof Graduate Scl Assistant Profe Graduate Scl Assistant Profe	hool of Engineering ATSUBARA ATSUSHI hool of Engineering fessor,KOUNO DAISUKE hool of Engineering SHIWAKI SHINJI hool of Engineering essor,KURIYAMA REIKO ife and Medical Sciences ofessor,Hironori Takeda hool of Engineering essor,ADACHI MASATO hool of Engineering ic Assistant Professor,Jike Han hool of Informatics ofessor,KATO SHOTA hool of Engineering ssor,Wataru MATSUNAGA hool of Engineering ofessor,GUO Yuting hool of Engineering ofessor,Yinli Wang turer,Ryuei HAKAMATA urer,YUKAWA SHINJIRO mer,KUSUURA TAKAHISA	
Target yea	r	2nd year students	or above	Number credits	r of		1	Yea	r/semesters	2025/Second semester	
Days and periods		Ved.5		s style	Practica (Face-t		aining ace cour	se)	Language of instruction	Japanese	
-		d purpose o		-							
In this training, you will gain general knowledge and experience regarding manufacturing. This training consists of the following three. (1) Machine manufacturing training to practice the process of creating parts with various machine tools (2) Lectures by faculty members and mechanical engineers outside the university (3) Factory tour Machine manufacturing training will be conducted intensively for about a week from August to September in the machine workshop on the Katsura campus. In particular, we will focus on manufacturing parts for Stirling engines and evaluate performance after assembly. In addition, we will assemble and disassemble commercially available engines to deepen our understanding of actual mechanical elements and systems. In the lecture, in addition to faculty members, mechanical engineers engaged in design, manufacturing, management, etc. at machine makers were invited as lecturers, and examples of machine development,											
								(	Continue to 機		

# 機械製作実習(機)**(2)**

knowledge of machine technology required in the field, engine operating principles, etc. Lecture on safety engineering.

In the factory tour, you will tour the factory of the manufacturer and learn about the actual manufacturing in society.

#### [Course objectives]

Experience the basics of machining such as turning, milling, and drilling, and acquire basic knowledge about machine tools, machining methods, tools, measurement, machining accuracy, etc. through practical learning. Gain general knowledge about safety and manufacturing.

#### [Course schedule and contents]

Machine tool lecture: 1 time (1 hour)

Lecture on basic knowledge for safely using machine tools (lathes, milling machines, drilling machines) used in practical training.

Stirling engine production training: 3 times (18 hours in total)

Practicing the production of round parts (cylinders, bores, etc.) by lathe work, the production of plates (pedestals, etc.) by milling work, assembly, finishing, and evaluation of rotation speed, and manufacturing Stirling engines in pairs.

Engine operating principle: 1 time (1.5 hours) Learn the basic knowledge of Stirling engine and diesel engine.

Engine assembly / disassembly: 1 time (7 hours) Understand the basics of engine mechanism and machine assembly principles through the assembly and disassembly of commercially available diesel engines.

Introduction to Safety Engineering: Once (3 hours)

Lectures and discussions will be given on the mechanism of occupational accidents that occur in factories, disaster prevention technology, fall accidents, malfunctions / malfunctions in crane work, system safety in the equipment industry, etc.

[Lecturer schedule] Mr. Kunihito Sato, Sato R & D

Manufacturing Seminar: 4 times (1.5 hours each) Machine engineers engaged in design, manufacturing, management, etc. will be invited as lecturers to give lectures on actual examples of machine development and knowledge of machine technology required in the field.

[Lecturer schedule]

Mr. Atsushi Iejo, Okuma Corporation

Mr. Shinjiro Yukawa, Office YUKAWA

Mr. Takao Kusuura, TechnoProducer Co., Ltd.

Mr. Takashi Iwasaki, Kyoto University (formerly Mitsubishi Electric)

Factory tour: 1 time (actual time of the tour is about 4 hours) Tour the factories of manufacturers in the Kansai region and learn about the actual manufacturing in society. Continue to 機械製作実習(機)(3)

# 機械製作実習(機)**(3)**

# [Course requirements]

None.

### [Evaluation methods and policy]

For the credit, students are in principle required to participate in all the classes, and to submit all the reports.

#### [Textbooks]

A textbook will be handed out in class.

#### [References, etc.]

### (Reference books)

None.

### (Related URLs)

(None.)

#### [Study outside of class (preparation and review)]

The review of the class is reuired for repoert writing. The preparation for the class is occasionally required. The content for the preparation is given through PandA.

#### (Other information (office hours, 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 at the guidance. 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 given on PandA. All the students who want to take this class must come to this guidance.

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

											未更新
Course nu	umbe	ər	U-ENG2:	5 35	5062 SJ75						
			学実験およて s Science Lab			_	nan and	tructor's ne, job tit d departm affiliation	tle, nent	ALL STAFF Graduate Sc	hool of Engineering hool of Engineering essor,TABATA YOSHIKAZU
Target yea	r	3rd yı	ear students or ab	oove	Number credits	of		3	Year	/semesters	2025/First semester
Days and periods	i		3,4,Thu.3,4 <b>Cla</b>		s style	Seminar (Face-t		ace cours	se)	Language of instruction	Japanese
[Overview	and	d pu	urpose of th	he	course]						
[Course o	bjec	∶tive	es]								
-	che	dule	e and conte	ent	s]						
,6times, ,6times, ,6times, ,6times,											
[Course re	equi	rem	nents]								
None											
[Evaluatio	n m	eth	ods and po	olic	y]						
[Textbook	s]										
[Reference	AS.	etc.	1								
( Referen	-	_	-								
[Study out	tsid	e of	f class (pre	pa	ration and	d revie	w)]				
(Other inf	form	natio	on (office h	าอน	irs, etc.) )						
*Please visit	t KU	LAS	SIS to find ou	ut a <sup>l</sup>	bout office	hours.					

											未更新
Course nu	umbe	ər	U-ENG25	3506	53 SJ75						
			学実験およひ s Science Labo			1)	nan and	tructor's ne, job tit d departm affiliation	nent	ALL STAFF Graduate Scl	hool of Engineering hool of Engineering ssor,TABATA YOSHIKAZU
Target yea	r	3rd ye	ear students or abo	110	Number redits	r of		3	Year	r/semesters	2025/Second semester
Days and periods	i		3,4,Thu.3,4 <b>Cla</b> s		tyle	Seminar (Face-t		ace cours	se)	Language of instruction	Japanese
[Overview	and	d pu	urpose of the	e co	urse]						
[Course o	bjec	∶tive	es]								
-	che	dule	e and conter	nts]							
,6times,											
,6times, ,6times,											
,6times,											
[Course re	equi	rem	nents]								
None											
[Evaluatio	n m	eth	ods and pol	icy]							
[Textbook	(s]										
[Reference	es, (	etc.]	]								
( Referer	nce	boo	vks)								
[Study ou	tsid	e of	f class (prep	arat	ion and	d revie	w)]				
(Other inf	form	natio	on (office ho	ours	, etc.) )	,					
*Please visit	t KU	LAS	SIS to find out	abor	ut office	hours.					

										未更新
Course nu	umber	U-EN	G25 35	5066 EJ77						
Course title (and course title in English)		宇宙工学実 ering Laboratory			onautics 1	nam and	ructor's e, job tit departm filiation	tle, nent	Professor, TA Graduate Scl Professor, SE Graduate Scl Assistant Profes Graduate Scl	nool of Engineering KATA SHIGERU nool of Engineering NDA KEI nool of Engineering ssor,HATTORI MASANARI nool of Engineering of Engineering
Target yea	<b>r</b> 31	rd year students (	or above	Number credits	r of		1	Year	/semesters	2025/First semester
Days and periods	Fr	i.3,4	Class	style	Experir (Face-t		ce cour	se)	Language of instruction	Japanese
[Overview	and	purpose o	of the o	course]						
[Course o	bject	ives]								
	ched	ule and co	ntents	s]						
,1time, ,4times, ,4times, ,4times,										
[Course re	equir	ements]								
None										
[Evaluatio	n me	thods and	polic	у]						
[Textbook	s]									
		<b></b>						C	ontinue to 航空	宇宙工学実験1(宇) <b>(2)</b>

航空宇宙工学実験1(宇)(2)

#### [References, etc.]

(Reference books)

### [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

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

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

										未更新
Course nu	umbe	r U-EN	G25 35	5067 EJ77						
		宇宙工学実 cering Laboratory			onautics 2	nam and	ructor's le, job tit departm ffiliation	tle, nent	Professor, TA Graduate Scl Associate Prof Graduate Scl Associate Prof Graduate Scl	nool of Engineering KATA SHIGERU nool of Engineering essor,URABE KEIICHIRO nool of Engineering essor,MARUTA ICHIROU nool of Engineering er,SUGIMOTO HIROSHI
Target yea	r a	Brd year students	or above	Number credits	of		1	Year	/semesters	2025/Second semester
Days and periods	T	ue.3,4	Class	style	Experir (Face-t		ce cour	se)	Language of instruction	Japanese
[Overview	and	purpose o	of the o	course]						
[Course o	bjec	tives]								
-	chec	lule and co	ontents	s]						
,1time, ,4times, ,4times, ,4times,										
[Course re	equir	rements]								
None										
[Evaluatio	on me	ethods and	l polic	у]						
[Textbook	s]									
						_		C	ontinue to 航空	宇宙工学実験2(宇) <b>(2)</b>

航空宇宙工学実験2(宇)(2)

#### [References, etc.]

(Reference books)

### [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

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

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

										未更新	
Course nu	ımbe	er U-EN	G25 3	5069 LJ75							
Course title (and course title in English)		屬材料学(材 ctural Metalic		erials		nan and	tructor's ne, job tit I departm offiliation	nent		hool of Engineering SUJI NOBUHIRO	
Target yea	r	3rd year students of	or above	Number credits	of		2	Year	/semesters	2025/Second semester	
Days and periods		Thu.2		s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese	
[Overview	and	d purpose o	f the	course]							
[Course o	bjec	tives]									
	-										
[Course s	che	dule and co	ntent	s]							
Microstructu Deformation ,3times, Heat Treatm	Outline of Lecture, 1 time, Microstructure Evolution in Cast Alloys, 2 times, Deformation, Recovery, Recrystallization and Grain Growth, 3 times, ,3 times, Heat Treatment in Steels, 5 times, Summary, 1 time,										
[Course re	equi	rements]									
None											
[Evaluatio	n m	ethods and	polic	cy]							
Attendance,	exer	cises, home-v	vorks	and exam.							
[Textbook	s]										
[Reference	es, e	etc.]									
(Referer	nce	books)									
(Related	I UR	Ls)									
(http://www	v.tsuj	jilab.mtl.kyoto	o-u.ac	.jp/01TsujiI	Lab/Edu	icati	on/Strue	ctMeta	lMater/)		
[Study ou	tsid	e of class (p	orepa	ration and	d revie	w)]					
( Other in	forn	nation (offic	e hoı	urs, etc.) )							
*Please visit	KU	LASIS to find	l out a	bout office	hours.						

Course nu	ımbe	er	U-EN	G25 3:	5070 LJ75						
			<mark>度物性(</mark> of Streng		Materials		nan and	ructor's ne, job tit departm ffiliation			nool of Engineering UI HARUYUKI
Target yea	r	3rd ye	ear students o	or above	Number credits	of		2	Year	/semesters	2025/Second semester
Days and periods	F	ri.1		Class	s style	Lecture (Face-t	o-fa	ce cours	se)	Language of instruction	Japanese
[Overview	and	d pu	irpose o	f the	course]						
deformation	rview and purpose of the course] ourse explaines fundamentals of crystal plasticity and strength of materials including plastic nation of crystals, yielding, work-hardening, solution hardening, precipitation hardening, properties of boundaries, based on dislocation theory.										
[Course o	ourse objectives]										
	s class aims to help students to acquire fundamentals of deformation of crystalline materials and also to uire ways to interpret strength of crystalline materials based on dislocation theory.										
[Course se	che	dule	e and co	ntent	s]						
<ul> <li>(2) Work has</li> <li>(3) Strength</li> <li>(4) Dislocati</li> <li>(5) Dislocati</li> <li>(6) Grain bo</li> </ul>	<ul> <li>Course schedule and contents]</li> <li>1) Yielding in crystalline materials [2 weeks]</li> <li>2) Work hardening, solution hardening and precipitation hardening [3 weeks]</li> <li>3) Strength and toughness of composites [1 week]</li> <li>4) Dislocations in crystalline materials [6 weeks]</li> <li>5) Dislocation motions and thermal activation processes [1 week]</li> <li>6) Grain boundaies and crystal plasticity of polycrystals [1 week]</li> <li>7) Feedback [1 week]</li> </ul>										
[Course re	qui	rem	nents]								
Physics of C	rysta	al Pr	operties a	and Im	perfections						
[Evaluatio	n m	eth	ods and	polic	;y]						
Evaluation v	vill b	be ba	used on a	writte	n examinati	on. Dail	ly re	ports m	ay be	considered in	grading determination.
[Textbook	s]										
Hand out ma	Hand out materials will be provided during the lecture.										
[Reference	es, e	etc.]									
J.P. Hirth an	'転位 d J. ] d J. ]	立論. Loth Loth	入門』( ne 『Theo ne 『Theo	ory of I ory of I	Dislocation Dislocation	s』(M s, 2nd e	lcGı d.⊿	aw-Hill ( Wile	y ) IS Brd ed.		

### 材料強度物性(材)**(2)**

2017)ISBN:0521864364 角野浩二(編)『結晶の塑性』(丸善)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』(内田老鶴圃)ISBN:978-4-7536-5090-3

[Study outside of class (preparation and review)]

To review contents covered in the previous lecture.

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

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course nui	mbe	r U-EN	G25 4	5071 LJ71						
Course title (and course [ title in F English)		物性学(機 ics of Solids	)			nar anc	tructor's ne, job tit I departm affiliation	nent		hool of Engineering essor,NAKAJIMA KAORU
Target year	4	th year students of	or above	Number credits	r of		2	Year/	semesters	2025/First semester
Days and periods	Τι	ue.2	Clas	s style	Lecture (Face-1		ace cour	se)	Language of instruction	Japanese
[Overview	and	purpose o	f the	course]						
[Course objectives]										
[Course schedule and contents]										
Crystal struct				.5]						
Diffraction of			ls,3~4	times,						
Vibrations of	•									
Thermal prop										
Electronic dtr Assessment o		•		times,						
		,								
[Course red	quir	rements]								
None										
[Evaluation	n me	ethods and	polic	cy]						
[Textbooks	5]									
	-									
[Reference	s, e	tc.]								
( Reference books )										
quotIntroduction to solid state physicsquot by Charles Kittel isbn{}{9780471415268}, international ed. isbn{}{0471680575}										
[Study out:	-	of class (	orepa	ration and	d revie	w)]				
( Other info	orm	ation (offic	e hoi	urs, etc.) )						
*Please visit		-								

未更新

Course nu	mbe	er U-EN	G25 45	5073 LJ71	U-EN	G25	5 45073	LJ75	U-ENG25 4	5073 LJ57		
	統計熱力学 Statistical Thermodynamics name, job title, and department of affiliation of affiliation School of Engineering Professor, INOUE YASUHIRO											
Target yea	-	3rd year students o	or above	Number credits	of		2	Year	/semesters	2025/First semester		
Days and periods	F	Fri.2	Class	style	Lecture (Face-t		ace cours	se)	Language of instruction	Japanese		
Statistical m mechanics th mechanics, s	erview and purpose of the course] stical mechanics provides a firm foundation for thermodynamics. I'll give a standard course of statistical anics through several basic examples in various fields of science and engineering, including quantum anics, solid state physics, heat transfer engineering, and information technology.											
- Understand - Scientific	ourse objectives] nderstanding the relation between macroscopic variables and microscopic states. cientific view of various phenomena in science and engineering based on statistics.											
[Course se	che	dule and co	ntent	s]								
2nd week: C 3rd week: M 4th-6th week 7th-8th week 9th-10th week 11th week: F 12th week: F 13th week: A 14th week: F	ouni icro cs: V cs: C eks: Photo Polyn Appl Exan Feed	back class	pic star emble bles ar tics (B o solid ons classio	tes nd Free ene ose-Einste l state phys cal systems	rgies in vs. Fe ics							
[Course re	equi	irements]										
Basic knowl useful.	Basic knowledge of thermodynamics, calculus, statistics, analytical mechanics, and quantum physics will be useful.											
[Evaluatio	n m	ethods and	polic	у]								
- Written exa - Paper assig												

# 統計熱力学(2)

# [Textbooks]

Lecture notes will be provided.

## [References, etc.]

(**Reference books**) Introduced during class

# [Study outside of class (preparation and review)]

Since this class covers basics in physics with many examples encountered in science and engineering, students of various research fields are welcome.

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

未更新

Course nu	nber	U-ENG	G25 45	5073 LJ71	U-EN	G25	45073	LJ75	U-ENG25 4	5073 LJ57	
		熱力学(材 tical Thermo				Instructor's name, job title, and department of affiliation					
Target year	3r	d year students o	or above	Number credits	<sup>r</sup> of		2	Year	/semesters	2025/Second semester	
Days and periods	Tu	e.3	Class	style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese	
[Overview	and	purpose o	f the o	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 objectives]											
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, I time, Basic ideas of Statistical Thermodynamics, thermal equilibrium, fundamentals of Statistics, means of measuremnts, ergodic theory. Themodynamic functions, I time, 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), 1time, 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, 1time, Understanging of typical applications of statistic themodynamics and submission of homeworks.											
[Course re	-	-									
Students are mechanics, th					basics	of m	athema	tics, dy	ynamics, elen	nentary quantum	

統計熱力学(材エネ)(2)

# [Evaluation methods and policy]

Situation of voluntary submission of some reports and score of exam are totally evaluated.

### [Textbooks]

The textbook is not appointed. Writing on the blackboard is performed in every lecture.

#### [References, etc.]

#### (Reference books)

- 1. 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
- 人, isbn{}{4807903225}
- 3.市村 浩:「統計力学」裳華房, isbn{}{4785321342}
- 4. 市村 浩:「熱学演習 統計力学」裳華房, isbn{}{4785321350}
- 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,L.ナイゼ,H.シュテッカー(伊藤伸泰,青木圭子訳):「熱力学・統計力学」 シュプリンガー, isbn{}{9784431100577} 8.久保亮五:「ゴム弾性」裳華房 isbn{}{478532807X}

### [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

2nd year students may undestand this lecture if they catch on basics of physics.

Course nu	ımbe	er U-	-ENG25 4	5087 LJ71							
		〔管理 lity Conti	rol			Instructor's name, job title, and department of affiliation		ile, nent	Graduate School of Engineering Professor,NISHIWAKI SHINJI Graduate School of Engineering Professor,IZUI KAZUHIRO Part-time Lecturer,Kikkawa Toyotsugu		
Target yea	r	4th year stuc	students or above <b>Number of</b> credits				2		semesters	2025/First semester	
Days and periods	v	Ved.4	Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese	
[Overview	and	d purpos	se of the	course]							
This course of	deals	s with the	basics of	quality con	trol met	hod	ologies	and reli	ability engin	neering techniques.	
[Course o	bjec	tives]									
The goal is to	o un	derstand	the concep	ot of numer	ical and	stra	tegic ap	proach	es of quality	control techniques.	
[Course so	che	dule and	d content	ts]							
Statistics and Statistical pr Design of ex Analysis of Application Reliability,4	oces perinvaria	s control, ments,2ti nce,2time esign of e	,2times, mes, es,								
[Course re	equi	rements	s]								
None											
[Evaluatio	n m	ethods	and polic	cy]							
The regular of	exan	nination,	in-class ex	aminations	and rep	orts	are take	en into	account.		
[Textbook	s]										
Not used											
[Reference	es, e	etc.]									
( Referer	nce	books)									
[Study out	tside	e of clas	ss (prepa	ration and	d revie	w)]					
Homework p	orobl	ems are a	assigned.								
(Other inf	orm	nation (c	office hou	urs, etc.) )							
*Please visit	KU	LASIS to	o find out a	about office	hours.						

										未更新	
Course num	ber	U-ENG	G25 3:	5096 LJ68	U-EN	G25	35096	LJ57			
(and course 生物物理学 title in Molecular Biophysics English)							ructor's ne, job ti I departn Iffiliation	I I I I I I I I I I I I I I I I I I I	Graduate School of Engineering Associate Professor, TSUCHIDA HIDETSUGU Institute for Integrated Radiation and Nuclear Science Professor, TANAKA HIROKI Institute for Integrated Radiation and Nuclear Science Associate Professor, SAKURAI YOSHINOR Institute for Integrated Radiation and Nuclear Science Associate Professor, Watanabe Tsubasa Institute for Integrated Radiation and Nuclear Science Assistant Professor, TAKATA, Takush Institute for Integrated Radiation and Nuclear Science Assistant Professor, TAKATA, Takush Institute for Integrated Radiation and Nuclear Science Assistant Professor, Kondo Natsuko Institute for Integrated Radiation and Nuclear Science Assistant Professor, SANADA YU		
Target year	3rd y	ear students c	or above	Number credits	of		2	Year/	semesters	2025/First semester	
Days and periods	Mon	.2	Class	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese	
[Overview a	nd pı	urpose o	f the	course]							
10											
[Course obj	ective	esj									
[Course sch	edule	e and co	ntent	s]							
,1time, ,2times, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time,								c	ontinue to	生物物理学(2)	
								С	ontinue to	生物物理学 <b>(2)</b>	

生物物理学**(2)** 

[Course requirements]

None

[Evaluation methods and policy]

[Textbooks]

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

										未更新
Course nu	imbe	er U-ENG	G25 4	5099 LJ71						
	的工学(機 ision Machin				Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor,MATSUBARA ATSUSHI Graduate School of Engineering Associate Professor,KOUNO DAISUKE		
Target yea	-	4th year students o	or above	Number credits	of		2	Year	/semesters	2025/First semester
Days and periods	Т	'ue.1	Class	s style	Lecture (Face-t	ure e-to-face course)			Language of instruction	Japanese
[Overview	and	l purpose o	f the	course]						
The concept of precision required for functional parts is described, and then the machining methods and machines such as machine measurement, cutting / grinding / polishing are described. In addition, the beam processing method, special processing method, and additive manufacturing will be explained.										
[Course objectives]										
Understand the basic items of removal processing, its processing machine, beam processing, which are the basis of precision processing, and their applications. By acquiring the basic knowledge of the latest machine manufacturing, you will be able to explain the mechanism of the machine manufacturing process.										
[Course schedule and contents]										
<ol> <li>The accuracy required for parts and measuring instruments, 3 times, precision machine parts are illustrated, and the accuracy required for parts is outlined. In addition, the measuring instrument is described together with the measurement principle, and the processing method of measurement data is described.</li> <li>Precision cutting / grinding / polishing, 4 times, the principle of precision cutting / grinding / polishing, 4 times, the principle of precision cutting / grinding / polishing, dynamics, typical tool materials and their selection methods are explained.</li> <li>Machine tools, once, describe the basic structure and components of machine tools.</li> <li>The concept and measurement method of motion accuracy, twice, machine tool motion accuracy are described.</li> <li>The basics of beam processing, once, processing using a laser beam or electron beam will be explained.</li> <li>The principle of additional processing, once, and additional processing is described.</li> <li>Special processing methods such as special processing, one-time processing, micro processing, ultraprecision processing, electric discharge machining, and etching will be explained.</li> <li>Latest processing technology, once, the trend of research and development on the latest processing technology and processing technology.</li> <li>Summary / Feedback, 1 time,</li> </ol>										
[Course requirements]										
		echanical des aining(Kikai \$			uring is	req	uired. It			
			_					C	continue to 精	密加工学(機) <b>(2)</b>

# 精密加工学(機)**(2)**

### [Evaluation methods and policy]

Depends on the test score. Test whether you can acquire the knowledge shown in the goal and solve the problem by applying it.

#### [Textbooks]

Not used

#### [References, etc.]

(Reference books)

### [Study outside of class (preparation and review)]

Review the materials distributed after each lecture. Perform the tasks given during the class to deepen your understanding.

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

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course numb	ber U-H	ENG25 35	5102 LJ75								
Course title (and course title in English)       材料電気化学(材) Electrochemistry of Materials Processing       Instructor's name, job title, and department of affiliation       Graduate School of Engineering Professor,MURASE KUNIAK Graduate School of Engineering Professor,FUKAMI KAZUHII											
Target year	3rd year stude	ear students or above Number of credits 2 Year/semesters 2025/Fir							2025/First semester		
Days and periods	Wed.1	Class	style	Lecture (Face-t	re e-to-face course) Language of instruction Japanese				Japanese		
[Overview ar	nd purpos	e of the o	course]								
This course serves the fundamentals related to solution chemistry of electrolytes and electrode reactions, which become the basis of wet processing such as electrolytic refining, electrowinning, corrosion, anticorrosion, and functional electrodeposition.											
[Course objectives]											
In this course students learn basic technical terms and basic concepts of physical chemistry, which are necessary to study materials science and engineering from the viewpoints of solution chemistry and electrochemistry, to take subsequent advanced courses on materials science and engineering.											
[Course schedule and contents]											
Overview 1 time											
Solution chemi	stry of elect	rolytes, 2	times, acid	-base re	eacti	ons, red	ox rea	ctions, equilil	orium of them.		
	ce as an inte						•		s, explanation of electrode potential		
Electrolysis, 1 t electrodes).	ime, explan	nation on t	he importa	nce of t	hree	electro	de setu	p (working, c	counter and reference		
Electrode reactions, 4 times, explanation on the fundamentals of electrochemical reaction rate on a electrode surface toward understanding of batteries and corrosion, explanation on the relation between current and potential, overpotential, diffusion-limitation of reactants.											
Transfer of ions, 2 times, explanation on the transfer of ions in solution for understanding diffusion potential and liquid junction potential.											
Summary, 1 tin	ne.										

Continue to 材料電気化学(材)(2)

# 材料電気化学(材)**(2)**

# [Course requirements]

Knowledge given in Thermodynamics of Materials 2 (by Prof. Uda) is preferable.

### [Evaluation methods and policy]

(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.

#### [Textbooks]

A course booklet written in Japanese will be given out at the first lecture.

#### [References, etc.]

( Reference books )

### [Study outside of class (preparation and review)]

Reports given in the lectures will return after checking. Brush up according to the reports returned.

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

Course nu	ımber	U-EN	G25 45	5107 SJ77	U-EN	G25 45107 S	SJ57	U-ENG25 4	5107 SJ28		
		中基礎演習 uclear React		<b>贠(原)</b> reise and Exp	eriments	Instructor's name, job tit and departm of affiliation	I I I I I I I	Institute for Integrated Radiation and Nuclear Science Professor, UNESAKI HIRONOBU Institute for Integrated Radiation and Nuclear Science Professor, MISAWA TSUYOSHI Institute for Integrated Radiation and Nuclear Science Associate Professor, PIYON CHIYORUHO Institute for Integrated Radiation and Nuclear Science Associate Professor, YASUNORI KITAMURA			
Target yea	r 4th year students or above <b>Number of</b> credits				2	Year/	semesters	2025/First semester			
Days and periods	Mor	n.3,4	Class	s style	Semina (Face-t	r to-face cours	se)	Language of instruction	Japanese		
[Overview	and p	urpose c	of the (	course]							
	eactor a	are carried	out. Gi	uidance and	d lecture	es before exp	perimei	nts are perfor	which is a small and med at Yoshida main -cho).		
[Course objectives]											
Understandi experiments	ng nucl	ear charact	teristics	s and safety	y system	n of nuclear	reactor	through read	ctor physics		
[Course s	chedu	le and co	ntent	s]							
-	1time,E dance 2	Experiment 2) criticality	ts are po y appro	berformed a oarch expen	at Reseau riment 3	rch Reactor 3) control roo	Institut	e (Kumatori	n campus. -cho, Osaka) for 1 ment 4) neutron flux		
[Course re	quire	nents]									
Basic knowl	edge ab	out reactor	r physi	ic							
[Evaluatio	n met	nods and	polic	y]							
reports befor	re and a	fter experi	ments								
[Textbook	[s]										
Korean versi	ion is av	vailable									

# 原子炉基礎演習・実験(原)**(2)**

#### [References, etc.]

#### (Reference books)

Introduced during class

# [Study outside of class (preparation and review)]

Before experiment, several reports related to reactor physics should be submitted.

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

English course for this experiment is opened.

\*Please visit KULASIS to find out about office hours.

# [Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course number       U-ENG25 15110 LJ71       U-ENG25 15110 LJ71       U-ENG25 15110 LJ71         Graduate School of Engineering Professor, HIRAKATA HIROYU       Graduate School of Engineering Professor, SHIMADA TAKAHIR Graduate School of Informatics Professor, SHIMADA TAKUHIR Graduate School of Informatics Professor, SHIMADA TAKU Graduate School of Engineering Professor, SHIMAKU HIROFUN Graduate School of Engineering Professor, SHINTAKU HIROFUN Graduate School of Engineering Professor, SHINTAKU HIROFUN Graduate School of Engineering Professor, AJSUO MASAHIRO Graduate School of Engineering Professor, COWADA TAKU Graduate School of Engineering Professor, SENDA KEI Graduate School of Engineering Professor, SENDA KEI Graduate School of Engineering Professor, AJSUO MASAHIRO Graduate School of Engineering Professor, AJSUO MASAHIRO Graduate School of Engineering Professor, AJSUO MASAHIRO Graduate School of Engineering Professor, BINVA SHIRO Graduate School of Engineering Professor, BINVA SHIRO Grad											未更新
Course title (and course title in English)       物理工学総論 A Introduction to Engineering Science A       Instructor's name, job title, and department of affiliation       Instructor's rates or, KUROSE RYOUCH Graduate School of Engineering Professor, NAGATA KOJI Graduate School of Engineering Professor, AGATA KOJI Graduate School of Engineering Associate Professor, AGATA KOJI Graduate School of Engineering Professor, AGATA KU Graduate School of Engineering Professor, AGU AAKU Graduate School of Engineering Professor, TAKATA SHICRU Graduate School of Engineering Profes	Course num	ber	U-EN	G25 15	5110 LJ71	U-EN	G25	15110	LJ77		
I arget year       Ist year students or above       credits       2       Year/Semesters       2025/First semester         Days and periods       Wed.5       Class style       Lecture (Face-to-face course)       Language of instruction       Japanese         [Overview and purpose of the course]       Image: semester       Image: semester       Image: semester       Image: semester	(and course 物 title in Int	-		nginee	ring Scienc	ce A	nam and	e, job tit departm	nent	Professor,HI Graduate Scl Professor,SH Graduate Scl Professor,KU Graduate Scl Professor,KU Graduate Scl Professor,KU Graduate Scl Professor,AZ Graduate Scl Professor,SH Graduate Scl Professor,SH Graduate Scl Professor,HZ Graduate Scl Professor,CO Graduate Scl Professor,OC Graduate Scl Professor,CO Graduate Scl Professor,SH Graduate Scl Professor,SH Graduate Scl Professor,SH Graduate Scl Professor,SH Graduate Scl Professor,SH Graduate Scl Professor,SH Graduate Scl Professor,SH Graduate Scl Professor,SH	RAKATA HIROYUKI hool of Engineering HIMADA TAKAHIRO hool of Engineering UROSE RYOUICHI hool of Engineering AGATA KOJI hool of Engineering OH HOSODA hool of Informatics ZUMA SHUNICHI hool of Engineering ofessor,HIROTANI JUN Life and Medical Sciences HINTAKU HIROFUMI hool of Engineering ASUO MASAHIRO hool of Engineering Sor,NAMURA KYOKC hool of Engineering DWADA TAKU hool of Engineering ENDA KEI hool of Engineering AKATA SHIGERU hool of Engineering
and periods       Wed.5       Class style       Lecture (Face-to-face course)       Language of instruction       Japanese         [Overview and purpose of the course]	Target year	1st year	r students o	or above		r of		2	Year	/semesters	2025/First semester
	and periods				s style			e cours	se)	Language of instruction	Japanese
[Course objectives]	[Overview and	nd pur	pose o	f the	course]						
[Course objectives]											
	[Course obj	ectives	s1								
		0011463	~]								
						,			(	 Continue to ≸	

### 物理工学総論A(2)

# [Course schedule and contents]

,10times,

,4times,

,1time,

### [Course requirements]

None

[Evaluation methods and policy]

[Textbooks]

### [References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

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

												未更新
Course nu	umbe	er (	J-ENC	G25 1	5111 LJ28	U-EN	G25	5 15111	LJ77	U-ENG25 1	5111 LJ75	
Course title (and course title in English)		里工学総論 B Foduction to Engineering Science B						tructor's ne, job tit I departn Iffiliation	nent	Graduate School of Engineering Professor,TSUJI NOBUHIRO Graduate School of Engineering Professor,UDA TETSUYA Graduate School of Engineering Professor,MURASE KUNIAKI Graduate School of Engineering Associate Professor,ICHII TAKASHI Graduate School of Engineering Associate Professor,YUGE KORETAKA Graduate School of Energy Science Professor,IMATANI SHIYOUJI Graduate School of Energy Science Professor,MIYAKE MASAO Graduate School of Energy Science Associate Professor,IKENOUE TAKUMI Graduate School of Engineering Senior Lecturer,NARITA EMI Graduate School of Engineering Professor,TAKAGI IKUJI Graduate School of Engineering Professor,YOKOMINE TAKEHIKO Graduate School of Engineering Professor,YOKOMINE TAKEHIKO Graduate School of Engineering Professor,SAITOU MANABU		
Target yea	r	1st year st	udents o	r above	Numbe credits	r of		2	Yea	r/semesters	2025/Secon	nd semester
Days and periods		ue.1		Clas	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese	
[Overview	/ and	d purpo	ose o	f the	course]							
[Course o	bjec	tives]										
[Course s	che	dule ar	nd co	ntent	s]							
,1time, ,5times, ,4times, ,4times, ,1time,												
									(	Continue to \$	<b>办</b> 理工学総論	В <b>(2)</b>

物理工学総論 B **(2)** 

# [Course requirements]

None

[Evaluation methods and policy]

[Textbooks]

[References, etc.]

( Reference books )

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

										未更新
Course nu	ımbe	er U-EN	G25 35	5115 LJ53	U-EN	G25	35115	LJ72		
		速器工学(原 icle Accelerat				nan and	tructor's ne, job tit I departm offiliation	nent		hool of Engineering ssor,TSUCHIDA HIDETSUGU
Target yea	r	3rd year students o	or above	Number credits	of		2	Year	/semesters	2025/First semester
Days and periods		Wed.1		s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese
[Overview	and	d purpose o	f the	course]						
[Course o	bjec	ctives]								
[Course s	che	dule and co	ntent	s]						
,2times,										
,2times,										
,3times, ,2times,										
,2times, ,2times,										
,3times,										
,1time,										
[Course re	equi	rements]								
None										
[Evaluatio	n m	ethods and	polic	;y]						
-			-							
[Textbook	s]									
[Reference	es, e	etc.]								
( Referer	nce	books)								
[Study out	tsid	e of class (p	orepa	ration and	d revie	w)]				
( Other in	orn	nation (offic	e hou	ırs, etc.) )						
*Please visit	KU	LASIS to find	l out a	bout office	hours.					

Course nu	ımbe	er	U-EN	G25 35	5116 LJ60	U-EN	G25 35	116 I	_J77		
			を(エネ mistry	原)			Instruct name, jo and dep of affilia	ob titl bartm	le, ent	Professor,SA Graduate Scl	hool of Engineering ASAKI TAKAYUKI hool of Engineering essor,TAISHI KOBAYASHI
Target yea	r	3rd yea	ar students	or above	Number credits	r of	2		Year	/semesters	2025/Second semester
Days and periods	N	/Ion.1		Class	style	Lecture (Face-t	o-face c	cours	e)	Language of instruction	Japanese
[Overview	and	d pur	rpose c	of the	course]						
	nical	fund	amental	s relate	• •	-			-	of radioactiv erials, and es	e waste, sential analytical
[Course o	bjec	tives	s]								
	-			-		-					and reactivity of ed on these principles.
[Course s	che	dule	and co	ntent	s]						
The main co	nten	ts of e	each cla	ss sess	ion are as f	follows:					
<ol> <li>Actinide (</li> <li>Environm</li> <li>Environm</li> <li>Chem</li> <li>Electroc</li> <li>Reproce</li> <li>Reproce</li> <li>Waste tr</li> <li>Feedbac</li> </ol>	ay a Datin naly Fue f Geo Cher Cher cher aenta ical hem ssing eatm k; cc	nd ha ng, Tr vsis, N el Cyc ologic nistry l Rad Thern istry ( g (ext nent (i onfirm	If-life, r racer Ch VAA, Cr ele (Cycl cal Disp (Analy lioactivity modynan (redox, e raction e ion exch nation of	adiatio emistry oss sec le Engi osal (A sis, Spe ty mics(co electric equilibri ange re	y ction, Appl neering: N dvection I ectroscopy omplexatio double lay rium, extra eaction, me	ied use ( uclear F Dispersio ) on,solubi /er) ctant, co embrane	Fuel, Rei on Diffu lity)	finin ision	g, Cor ,Chem t distri	nical Equilibr	ium)
<b>[Course re</b> N/A	qui	reme	FILS								

# 放射化学(エネ原)**(2)**

# [Evaluation methods and policy]

Grading is based on the score of the periodic evaluations. Students will be evaluated based on their demonstrated understanding of the physicochemical properties and reactivity of radioactive materials and the engineering processes involved.

#### [Textbooks]

Other materials are not specified. Handouts, etc. will be distributed during lectures.

#### [References, etc.]

#### (Reference books)

Other, Radiochemistry and Nuclear Chemistry, 4th ed., G. R. Choppin et al., Elsevier (2013) isbn{ 9780124058972};

Nuclear Chemical Engineering, 2nd Ed., M. Benedict et al., McGraw-Hill (1981) isbn{0070045313}, etc.

#### [Study outside of class (preparation and review)]

Focusing on reviewing lecture content and exercises is advisable.

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

Attend as needed. Some materials may be omitted or added depending on the number of classes in the relevant year.

											未更新
Course nu	umbe	er	U-EN	G25 35	5118 LJ75						
Course title (and course title in English)					2学1(材 und Materials		nam and	uctor's e, job ti departn filiation	nent		nool of Energy Science or,HASEGAWA MASAKATSU
Target yea	r	3rd yea	r students	or above	Numbe credits	r of		2	Year	/semesters	2025/First semester
Days and periods		1on.3		Class	style	Lecture (Face-t		ce cour	se)	Language of instruction	Japanese
[Overview	and	d pur	pose c	of the	course]						
This course environment	-						•		will be	e necessary to	think about
[Course o	bjec	tives	5]								
Students wil use phase di			o calcul	ate the	rmochemi	cal prop	erties	of pur	e subs	tances, mixtu	res and solutions, and
[Course s	cheo	dule	and co	ntent	s]						
1st, 2nd and Ellingham d Activity in b Phase diagra Standard sta Review(1 w Feedback(1	iagra oinary am of te of eek)	um an y solu f bina activ	d equili tion(2 v ry syste	brium veeks) m(3 w	in gas phas	,	ks)				
[Course re	equi	reme	ents]								
None											
[Evaluatio	n m	etho	ds and	polic	v]						
Results are e	evalu	ated b	by a terr	n-end	examinatio		es in	the lec	tures a	re considered	l.
[Textbook	s]										
Instructed d	uring	class									
[Referenc	es, e	etc.]									
	skell ethar	l <sup>┏</sup> In	troducti						Proces	s fundamenta	o ) ISBN:0070229457 ls』 (Elsevier ) ISBN:
									C	ontinue to エネルギ	ー・材料熱化学1(材エネ) <b>(2)</b>

エネルギー・材料熱化学1(材エネ)(2)

# (Related URLs)

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

# [Study outside of class (preparation and review)]

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

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

Please bring a scientific calculator and a ruler.

										-	
Course nu	umber	U-EN	G25 35	5119 LJ75							
Course title (and course title in English)		レギー・材 ochemistry for 1				Instruc name, j and de of affili	ob title partme			nool of Energy or,HASEGAWA M	
Target yea	<b>r</b> 3r	d year students (	or above	Number credits	r of	2		Year/	/semesters	2025/Second	semester
Days and periods	Mo	on.2	Class	s style	Lecture (Face-t		course	e)	Language of instruction	Japanese	
[Overview	and	purpose o	f the	course]							
This course environment	-					•		ill be	necessary to	think about	
[Course o	bjecti	ves]									
Students wil use phase di			ate the	rmochemic	cal prope	erties of	f pure	subst	ances, mixtu	res and solutic	ons, and
[Course s	chedu	ule and co	ntent	s]							
Regular solu Gibbs-Duhe Henrian acti Gibbs phase Phase diagra Nernst equat Review(1 w Feedback(1	m equa vity(1 rule(3 um of t tion(1 eek) week)	ation(1 wee week) weeks) ernary syste week)	k)	veeks)							
[Course re	equire	ements]									
None											
[Evaluatio	n me	thods and	polic	;y]							
Results are e However, th	evaluat	ted by a terr	n-end	examinatio		es in the	e lectu				
								Co	ontinue to エネルギ	-・材料熱化学2(材	エネ ) <b>(2)</b>

エネルギー・材料熱化学2(材エネ)**(2)** 

# [Textbooks]

Instructed during class

# [References, etc.]

#### (Reference books)

David R. Gaskell <sup>[7]</sup> Introduction to metallurgical thermodynamics <sup>[3]</sup> (Scripta Pub. Co) ISBN:0070229457 Seshadri Seetharaman ed. <sup>[7]</sup> Treatise on process metallurgy, vol.1 Process fundamentals <sup>[3]</sup> (Elsevier) ISBN: 9780080969862

# (Related URLs)

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

## [Study outside of class (preparation and review)]

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

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

Please bring a scientific calculator and a ruler.

Course num	ber	U-EN	G25 35	5121 LJ75						
		子論(材 Theory o		ls		name and d	ictor's , job ti epartn lliation	nent		hool of Engineering essor,KUROKAWA SHIYUU
Target year	3rd y	vear students of	or above	Number credits	r of	2	,	Year	/semesters	2025/First semester
Days and periods	Tue.	1	Class	s style	Lecture (Face-1		e cour	se)	Language of instruction	Japanese
[Overview a	nd pi	urpose o	f the	course]						
energy bands a such as metals understanding of the second	nd the and se of ser	e basics of emicondu niconduct stics of act	band ctors c or proj tual ele	theory. Net an be expla perties base ectronic de	xt, we d ained by ed on in vices su	iscuss / think forma ch as	the fating in tion al p-n ju	act that terms bout banctions	t the electron of band strue ands. We also s. Finally, we	ew the concept of ic properties of solids cture. Next, we gain an o discuss the main e explain the electronic potential.
[Course obje	ectiv	es]								
Understand co general informa	-		-		0				•	bus). Understand
[Course sch	edul	e and co	ntent	s]						
energy gaps, B zone schemes, Fermi surfaces band diagrams, Rothery rules. Semiconductor movement of e semiconductors Surface/interfaces	loch recipr and b diffe s, 4 c lectro s, p-n ce/det faces class	's theorer rocal lattic pand struct rences bet lasses: Mo on holes, F junctions fect electro , work fun s: Discuss	n, one ces and ture of tween oveme cermi l , carrie onic st actions the lat	-dimension l Brillouin : metal, 3 cl metal and i nt of Bloch evel and ca er diffusion ates, 2 clas , surface el est research	al energ zones. lasses: T insulato electro arrier de , operat ses: No ectronic h and te	gy ban Three- rs, ban ns in o nsity, ing pr tation e state chnolo	ds, red dimen nd stru electri intrins inciple of ele s. ogies i	duced a sional acture of c fields sic sem es of tr actron a	zones, expan- lattice Fermi of metal, rigio s, concept of niconductors, cansistors. arrangement i	al, the occurrence of ded zones, periodic i surfaces and energy d band model, Hume- effective mass, extrinsic in crystal surfaces, band nt of the course. Review
[Course requ	uiren	nents]								
Students should Scienceand Eng		-	ed the	solid state	physics	cours	e offer			ent of Physical 回体電子論(材) <b>(2)</b>

# 固体電子論(材)**(2)**

# [Evaluation methods and policy]

Final test, quizzes

#### [Textbooks]

Printouts will be provided

#### [References, etc.]

(Reference books)

『固体物理学入門(上)(下)』(丸善)ISBN:9784621076538 志賀正幸『材料科学者のための固体電子論入門』ISBN:9784753655533

#### [Study outside of class (preparation and review)]

do exercises at course printouts

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

In addition, course printouts will be distributed

										未更新		
Course nu	umber	U-EN	G25 35	5124 SJ77	U-EN	G25	35124	SJ71				
Course title (and course title in English)	インタ Interns	アーンシッ hip	プ(様	送)		nam and	ructor's ne, job tif departm ffiliation		Professor,TS Graduate Scl	hool of Engineering SUCHIYA TOSHIYUKI hool of Engineering AGATA KOJI		
Target yea	<b>r</b> 3rd	year students (	or above	Number credits	r of		2	Year	/semesters	2025/Intensive, Second semester		
Days and periods	Inte	ensive	Class	s style	Semina (Face-t		ce cour	se)	Language of instruction	Japanese		
[Overview	and p	ourpose c	of the	course]								
designing an	nd resea	urch of indu	istrial	goods at a t	factory of	or a i	research	n labor	atory of Japa	facturing, development, nese leading companies. turing is also the aim.		
[Course o	bjectiv	/es]										
Engineering	The goal of the internship is to master a general method of thinking and methodology at Mechanical Engineering. Furthermore, by learning the relationship between a human and machines at an industry, notivate oneself to study and think about one's career development.											
[Course s	chedu	le and co	ontent	s]								
weeks. Thus company tou internship su	, the fo ir, a con ich as I pocation:	llowing ca mpany exp AESTE ca Based on	ses are lanatic n be ac recruit	not approvon meeting cceptable.	ved as and and so of company	n int on. L nies.	ernship longer t You car	; a sho erm m n find	ort internship fore than two them at comp	be not less than two such as a week, a weeks and an overseas bany's web sites and/or		
[Course re	equire	ments]										
None												
[Evaluatio	n met	hods and	polic	;y]								
Credits (2) a activities.	re appr	oved based	d on th	e summary	report (	(50%	) and p	resent	ation (50%) a	bout the internship		
[Textbook	s]											
Not used												
[Referenc	es, etc	:.]										
( Referer	nce bo	oks)										
[Study ou	tside o	of class (I	orepa	ration and	d revie	w)]						
Consult with	the int	ternship ho	st loca	tion.								
(Other in	format	ion (offic	e hou	Irs, etc.) )								
		-				Engii	neering	Scien	ce (Butsuri K	youmu) is required.		
*Please visit	KULA	ASIS to find	d out a	bout office	hours.							

						未更新
Course number	U-ENG25 35124 SJ77	U-ENG	25 35124 \$	SJ71		
Course title (and course インタ・ title in Internsh English)		r	nstructor's name, job tit and departm of affiliation	le, k ent (	KANKEI KY Graduate Scl	nool of Engineering OIN nool of Engineering AJIMA TAKUYA
<b>Target year</b> 3rd y	ear students or above <b>Numbe</b> credits	er of	2	Year/	semesters	2025/Intensive, Second semester
Days and Inter periods	nsive Class style	Seminar (Face-to	-face cours	se)	Language of instruction	Japanese
[Overview and pu	rpose of the course]					
[Course objective	es]					
[Course schedule	e and contents]					
"						
[Course requirem	nents]					
None						
[Evaluation meth	ods and policy]					
[Textbooks]						
[References, etc.]	]					
(Reference boo	oks)					
				C	ontinue to イン	ターンシップ(原) <b>(2)</b>

# インターンシップ(原)**(2)**

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

# [Courses delivered by instructors with practical work experience]

(1) Category

A course that includes off-campus training classes.

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

										未更新
Course nu	umbe	er U-EN	G25 3:	5125 LE77	U-EN	G2.	5 35125	LE48		
Course title (and course title in English)		里工学英語( lish for Engin	-	g Science		nan and	tructor's ne, job tit I departm offiliation	tle, nent	KANKEI KY Graduate Scl Professor,HI Graduate Scl	hool of Engineering COIN hool of Engineering NOKI TATSUYA hool of Engineering AJIMA TAKUYA
Target yea	r	4th year students of	or above	Number credits	<sup>·</sup> of		2	Year	/semesters	2025/Intensive, First semester
Days and periods		Intensive	Class	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese and English
[Overview	and	d purpose o	of the	course]						
[Course o	bjec	tives]								
-	che	dule and co	ntent	:s]						
,14times, ,1time,										
[Course re	equi	rements]								
None										
[Evaluatio	n m	ethods and	polic	≎y]						
[Textbook	(s]									
[Referenc	es (	etc 1								
( Referei		-								
[Study ou	tsid	e of class (p	orepa	ration and	d revie	w)]				
( Other in	form	nation (offic	e hou	urs, etc.))						
*Please visit	t KU	LASIS to find	d out a	bout office	hours.					

										未更新	
Course nu	umbe	r U-EN	G25 2	5127 LJ71							
Course title (and course title in English)		設計製作( gn and Manu			ses	nan and	tructor's ne, job tit I departn Iffiliation	nent	Professor,MA Graduate Sch	hool of Engineering ATSUBARA ATSUSHI hool of Engineering SHIWAKI SHINJI	
Target yea	r	2nd year students	or above	Number credits	<sup>.</sup> of		2	Year	/semesters	2025/First semester	
Days and periods		Ion.3	Clas	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese	
[Overview	anc	l purpose c	of the	course]							
lectures expl in machine r [Course o To acquire b	lain t nanu <b>bjec</b> pasic	he processing facturing. <b>tives]</b> and general k	g princ	ciples and p	ractice	of va	arious p	rocessi	-	product. In addition, used during production stems, and	
[Course s	nanufacturing methods. [Course schedule and contents]										
mechanisms required for overview is Manufacture casting, forg described, ar materials of Methods of manufacture semi-finishe should be ap Confirmatio	Mechanisms of machine products & outline of machine manufacturing, 3 sessions, an outline is given on the mechanisms of machine products. In addition, the relationship between the function, shape and precision equired for machine products, and how these qualities relate to manufacturing cost are explained, and an overview is given on the methods used to process parts and the procedure for these methods. Manufacture of semi-finished materials, 4 sessions, the principles and practice of processing methods such as asting, forging, welding, and fabricating sheet metal for the manufacture of semi-finished materials are escribed, and an explanation is given on which methods are suited for manufacturing the semi-finished materials of different parts. Methods of finish processing, 7 sessions, the principles and practice of the process in which machine parts are nanufactured by applying finish processing (represented by cutting, grinding, and abrasive machining) to emi-finished materials are described, and an explanation is given on which methods of finish processing hould be applied to the semi-finished materials of different parts.										
-	[Course requirements]										
None	None										
[Evaluatio	n m	ethods and	polio	cy]							
		-		•						on. As a general rule, ons makes up 20%.	
					·			<sub>c</sub>	 continue to 機械語	設計製作(機エネ宇) <b>(2)</b>	

# 機械設計製作(機エネ宇)(2)

# [Textbooks]

Not used

#### [References, etc.]

#### (Reference books)

Chichiiwa, K. (ed.), Kikai seisaku-hou tsuuron-jou, (University of Tokyo Press, 1982) ISBN: 4130650343

## [Study outside of class (preparation and review)]

Report assignments may be assigned.

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

\*Please visit KULASIS to find out about office hours.

## [Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course nu	ımbe	er U-H	ENG25 3:	5128 LJ77						
Course title (and course title in English)		ステム工学 rems Engin		习)		nan and	ructor's ne, job tit departm ffiliation	nent		nool of Energy Science AWANABE HIROSHI
Target yea	r	3rd year stude	nts or above	Number credits	of		2	Year	/semesters	2025/Second semester
Days and periods	v	Ved.1	Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese
[Overview	and	d purpos	e of the	course]						
method of a	syste	em, functio	on analysi	is, economi	cal eval	uati	on, opti	mizatio		e course, modeling d reliability analysis t is lectured.
[Course o	bjec	tives]								
- To underst	and a	a variety of	f method	and charact	teristics	of s	ystem a	nalysi	s.	
- To acquire	the	basic know	vledge to	optimize th	e energ	y sy	stems.			
[Course s	che	dule and	content	s]						
1. Introducti performance		-	-	-					-	stem and basic
2. Schedule Evaluation a	-	-							-	sses. "Program
3. Linear pro example, and	0	0				the o	optimiza	ation o	f a system. Fo	or the application
4. Decision- optimization		ing problei	m(2): Lec	tures on a r	nodelin	g of	decisio	n-mak	ing process a	nd method for
5. System re	liabi	lity analys	is(2): Leo	ctures on a s	system o	desi	gn and r	eliabil	ity analysis n	nethod.
6. Applicatio	5. Application for a energy system(2): Systems engineering method is applied to thermal and power plants.									
[Course re	equi	rements]								
None										
								c	ontinue to シス	テム工学(エネ原) <b>(2)</b>

# システム工学(エネ原)**(2)**

# [Evaluation methods and policy]

Evaluate by report(s) and examination.

#### [Textbooks]

Instructed during class

[References, etc.]

## (Reference books)

Introduced during class

# [Study outside of class (preparation and review)]

Instruct in class.

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

\*Please visit KULASIS to find out about office hours.

# [Courses delivered by instructors with practical work experience]

(1) Category

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

Course nu	ımbe	ər	U-EN	G25 35	5129 LJ75							
			生学(材 al Propert		Materials		nam and	ructor's ne, job tit departm ffiliation	tle, nent	Associate Profe Graduate Sch	nool of Engineering essor,NOSE YOSHITAROU nool of Engineering UJI NOBUHIRO	
Target yea	r	3rd ye	ear students o	or above	Number credits	of		2	Year/	semesters	2025/First semester	
Days and periods	Т	Sue.3		Class	style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese	
[Overview	and	d pu	rpose o	f the	course]							
processing. V from the atom	operties of metals and alloys strongly depend on thier microstructures, which are controlled by ing. We give the lecture on formation mechanism on micro- and nano-structures in metals and alloys e atomistic viewpoints and thermodynamics. Through the lecture, how to control or utilize practical ls are studied.											
[Course o	urse objectives]											
•	study relationship between microstructures and properties in metals and alloys. To understand formation chanism of microstructures through each phase transformation and its control.											
[Course s	response through each phase transformation and its control. <b>Se schedule and contents]</b> ermodynamics and phase diagram in alloy systems [7 weeks]											
<ol> <li>(1) Thermod</li> <li>(2) Thermod</li> <li>(3) Phase tra</li> <li>(4) Feedback</li> </ol>	ynar nsfo	mics ormat	and atom tion throu	nic diff	fusion [1-2	weeks]	_	7 weeks	]			
[Course re	equi	rem	ents]									
None												
[Evaluatio	n m	etho	ods and	polic	vl							
Evaluation v				•	-	on.						
In some case												
[Textbook	s]											
Utilizing res	_	s pro	wided in	the lec	ture.							
[Reference	es, e	etc.]										
(Referer			-									
Introduced d	ntroduced during class											
[Study out	tsid	e of	class (p	orepa	ration and	d revie	w)]					
To review co See lecture v					efore the le	cture.						
( Other inf	orm	natio	on (offic	e hou	rs, etc.) )							
*Please visit	KU	LAS	IS to find	d out a	bout office	hours.						

Course nu	umb	er	U-ENG	G25 2:	5133 LJ75						
Course title (and course title in English)	nd course 物質科学基礎(材) e in Fundamentals of Materials Science										nool of Engineering URASE KUNIAKI
Target yea	Target year     2nd year students or above     Number of credits								Year	/semesters	2025/First semester
Days and periods		Fri.3		Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese
[Overview	Overview and purpose of the course]										
1	sed primarily on the solid-state chemistry, this course serves the outline of notation (descriptive method) d analytical techniques for solid substances, which become the basis of materials science and materials gineering.										

#### [Course objectives]

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 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

#### [Course requirements]

Knowledge of physics and chemistry for the entrance examination of Kyoto University.

未更新

# 物質科学基礎(材)**(2)**

# [Evaluation methods and policy]

(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.

#### [Textbooks]

No textbook is required for this course. A course booklet will be given out at the first lecture.

#### [References, etc.]

#### (Reference books)

B. D. Cullity, S.R. Stock <sup>F</sup>Elements of X-Ray Diffraction (3rd ed.) (Prentice Hall ) ISBN: 9780201610918

L. Smart, E. Moore <sup>C</sup>Solid State Chemistry: An Introduction (4th ed.) (CRC Press) ISBN: 9781439847909

A. R. West <sup>C</sup>Solid State Chemistry and Its Applications (2nd ed.) (Wiley) ISBN:9781119942948

## (Related URLs)

(Not available)

## [Study outside of class (preparation and review)]

The take-home assignments and their suggested answers should effectively be used for preparation and review.

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

Not available

Course nu	nbei	r U-EN	G25 2	5134 LJ75							
	e 材料統計物理学(材) Statistical Physics of Materials						tructor's ne, job tit I departm offiliation	tle, nent	Graduate School of Engineering Associate Professor, TABATA YOSHIKAZU Graduate School of Engineering Associate Professor, YUGE KORETAKA		
Target year	2	nd year students	or above	Number credits	r of		2	Year	ar/semesters 2025/Second ser		
Days and periods	Τι	1e.2	Clas	lass style Lecture (Face-to-face)				se)	Language of instruction	Japanese	
[Overview	and	purpose o	f the	course]							
[Course ob	ject	ives]									
[Course schedule and contents]											
-				-	preible n	roce	as Itim	25			
First and second law of thermodynamics, Irreversible process,2times, Thermodynamic functions, Phase Equilibrium and Phase Transition,2times,											
Analytical mechanics and concept of statistical mechanics, 3 times,											
Basic of class	sical	statistical th	ermod	lynamics,2t	imes,						
,3times,											
Quantum stat Check of acq		•	namics	s,3times,							
-											
[Course re	quir	ementsj									
None	_					_					
[Evaluation	n me	ethods and	polic	cy]							
[Textbooks	:1										
[Reference	s, e	tc.]									
(Referen	ce b	ooks )									
[Study outside of class (preparation and review)]											
(Other information (office hours, etc.))											
*Please visit	KUL	ASIS to find	l out a	bout office	hours.						

										未更新	
Course nu	umbe	er U-EN	IG25 2:	5135 LJ75							
	nd course 材料科学基礎 1 (材) le in nglish)				e 1	Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor,KISHIDA KIYOUSUKE Graduate School of Engineering Associate Professor,NOSE YOSHITAROU		
Target yea	r	2nd year students	or above	Number credits	of		2	Year	/semesters	2025/Second semester	
Days and periods	W	Ved.1	Ted.1 Class style Lecture (Face-to-face course) Language of instruction Japanese							Japanese	
[Overview	anc	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 objectives]											
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]											
<ul> <li>(2) Lattice d</li> <li>(3) Phenome</li> <li>(4) Microsco</li> <li>(5) Thermod</li> <li>(6) Mid-term</li> <li>(7) Deforma</li> <li>(8) Plastic de</li> <li>(9) Plastic de</li> <li>(10) Deforma</li> </ul>	[Course schedule and contents] (1) Structure of solids [1 week] (2) Lattice defects [1 week] (3) Phenomenology of diffusion in crystals [1 week] (4) Microscopic understanding of diffusion [2 weeks] (5) Thermodynamics and diffusion [2 weeks] (6) Mid-term exam [1 week] (7) Deformation of crystalline materials [2 weeks] (8) Plastic deformation of single crystals of metallic materials [2 weeks] (9) Plastic deformation of polycrystalline metals [2 weeks] (10) Deformation twinning and creep deformation [1 week]										
[Course re	equi	rements]									
None											
[Evaluatio	n m	ethods and	d polic	;y]							
	d in	grading dete	rminati	ion. The all	ocation	of n				and daily reports may 's and Nose's part. The	

# 材料科学基礎1(材)**(2)**

# [Textbooks]

Utilizing resumes provided in the lecture.

# [References, etc.]

(**Reference books**) Introduced during class

### [Study outside of class (preparation and review)]

To review contents in the last time before the lecture. See lecture videos if necessary.

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

A part of themes will be added or omitted depending on a number of classes in the term.

						未更新				
Course number	U-ENG25 2513	36 LJ75								
	学基礎 2 (材エネ nentals of Materials	_	Instructor's name, job tit and departm of affiliation	tle, nent	Graduate School of Engineering Professor,FUKAMI KAZUHIRO Graduate School of Engineering Associate Professor,ICHII TAKASHI					
Target year 2nd y	upon students on shore	Number of redits	2	Year/	/semesters	2025/Second semester				
Days and Thu.2 periods	2 Class s	style Lecture (Face-t	o-face cours	se)	Language of instruction	Japanese				
[Overview and purpose of the course]										
This lecture focuses on symmetry, tensor and elastodynamics that are of importance for materials science.										
[Course objective	es]									
To understand the ro	le of symmetry, te	ensor and elastod	ynamics on	materi	als science.					
[Course schedule and contents]										
Vector and tensor,4-5times,Fundamentals of vector and tensor										
Symmetry in molecules and crystals,4-5times,Fundamentals of symmetry in molecules and crystals Elastodynamics,4-5times,Fundamentals of elastodynamics										
Elastociynannes,+ 5t	inies,i undamentar	s of clastodynam	iles							
[Course requirem	nents]									
Fundamentals of the	rmodynamics									
[Evaluation meth	ods and policy]									
Grading is due to the	term-end examination	ation. The record	l of attendar	nce may	y be taken int	to account.				
[Textbooks]										
Handouts will be giv	en in lectures.									
[References, etc.	]									
(Reference boo	oks )									
[Study outside of class (preparation and review)]										
(Other information (office hours, etc.))										
*Please visit KULASIS to find out about office hours.										

										未更新
Course nu	ımbe	er U-ENO	G25 3	5139 LJ76						
Course title (and course title in English)		<ルギー化学 rgy Chemistry		⊑ネ原 )		nan and	tructor's ne, job tit I departn Iffiliation	nool of Energy Science TSUMOTO KAZUHIKO		
Target yea	r	3rd year students o	or above	Number credits	of		2	2025/First semester		
Days and periods	Г	Sue.2	Class	s style	Lecture (Face-t	re e-to-face course) Language of instruction Japanese				Japanese
[Overview	and	d purpose o	f the	course]						
Fundamental chemistry such as quantum chemistry, solid state chemistry, physical chemistry will be described in this course for deeper understanding of energy conversion and applications. Especially chemical bonding and structures and their energetics will be discussed in this course.										
[Course objectives]										
Deeper understanding of energy conversion and applications from the viewpoint of chemistry										
[Course schedule and contents]										
Atomic structure, 2times, Understanding of fundamentals of inorganic chemistry such as atomic orbital, electronic structure of many-electron atoms, atomic radii, ionic radii, lanthanide contraction, ionization potential, electron affinity and electronegativ. ,3times, Understanding of fundamentals of inorganic solid state chemistry such as crystal lattice, symmetry of crystal, close packing structure, metals, alloys, intermetallic compounds, ionic crystals and covalent crystals ,2times, The factors such as ionic radii, coordination number, lattice energy affecting the crystal structure will be described. Thermochemistry of solid compounds will be discussed. ,3times, Chemical bonding theory and energetics such as Lewis structure, resonance structure, valence bond theory, molecular geometry and VSEPR theory, hybridization orbital, molecular orbital, bond length, bonding radii, bond energy will be described. ,2times,Symmetry operation and symmetry elements, molecular point groups will be described. Applications to molecular orbitals, molecular vibration, vibrational spectroscopies will be discussed. ,3times,Concepts and theory of Bronsted acids and bases, Lewis acids and bases, their reactions, solvent effects will be described. Learning achievement evaluation will be made in the last class.										
[Course re	equi	rements]								
None										
[Evaluatio	n m	ethods and	polic	>y]						
Overall eval	uatio	on of the activ	ity in	the class, he	omewor	·k, a	nd term			- デー化学 1 (エネ原) <b>(2)</b>
								U U	onunue to 工个儿	<sup>〃</sup> 〒 ̄10チャ(エ <b>ホ</b> 尿丿 <b>(4)</b>

エネルギー化学1(エネ原)**(2)** 

# [Textbooks]

Shriver amp Atkins#039 Inorganic Chemistry, the 6th ed., Oxford University Press.

# [References, etc.]

 $(\ {\rm Reference\ books\ })$ 

[Study outside of class (preparation and review)]

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

Homeworks will be occasionally assigned as supplementary exercises. Depending on the progress in the class, schedule may be partially changed. Homeworks and supplementary materials are provided at URL:http://www.echem.energy.kyoto-u.ac.jp The text book will be used in Energy chemistry II held in fall semester.

										未更新	
Course nu	imbe	er U-EN	G25 3:	5140 LJ76							
		ペルギー化学 rgy Chemistry		□ネ原)		nan and	ructor's ne, job tit I departm Iffiliation	nool of Energy Science TSUMOTO KAZUHIKO			
Target yea	r	3rd year students o	or above	Number credits	of		2	Year	/semesters	2025/Second semester	
Days and periods	F	ri.4	Class	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese	
[Overview	and	d purpose o	f the	course]							
The lecturer teaches fundamental matters in inorganic chemistry related to energy conversion and storage. In particular, Redox reactions, analytical methods, molecular geometries, and coordination chemistry as well as electrochemical energy conversion devices will be lectured.											
[Course objectives]											
Understanding fundamental matters on energy conversion and utilization related inorganic chemistry as well as their relations to daily life and state-of-the-art researches											
[Course s	[Course schedule and contents]										
reduction po elements 2. Molecular an introducti representation 3. An introdu- language of complex form 4. Physical t diffraction m analysis, ma 5. Exercises Exercises an	1. Oxidation and Reduction, 3 times, reduction potentials, redox stability, diagrammatic presentation of potential data, chemical extraction of the										
[Course re	equi	rements]									
Students are	sup	posed to unde	rstand	the lecture	"Energ	y Ĉl	nemistry	/ 1".			
[Evaluatio	n m	ethods and	polic	¢y]							
Evaluation v	vill b	be based on qu	uizes a	nd exercise	es (40 %	) an	d final e	examin	ation (60%).		
								C	ontinue to エネル	/ギー化学2(エネ原) <b>(2)</b>	

エネルギー化学2(エネ原)**(2)** 

## [Textbooks]

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

#### [References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

Reading the textbook and reviewing the assignments are recommended.

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

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

Course number         U-ENG25 25142 LJ71         U-ENG25 25142 LJ77												
Course title (and course title in English)		、力学 1 d Dynar					Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor,NAGATA KOJI Graduate School of Engineering Associate Professor,Watanabe Tomoaki		
Target yeaı	r	2nd year st	tudents or a	above	Number credits	r of		2	Year	/semesters	2025/Second semester	
Days and periods	Т	Sue.2	СІ	lass	style	Lecture (Face-t	co-face course) Language of instruction Ja				Japanese	
[Overview	[Overview and purpose of the course]											
Fundamental of fluid dynamics: introduction, fluid properties, governing equations (Navier-Stokes equations, N-S equations), solution methods of N-S equations, laminer/turbulent flows, boundary layer flow.												
[Course ol	-	_										
Understandi	<u> </u>	-	-									
[Course se			nd cont	tent	s]							
<ol> <li>time : Introduction</li> <li>time : Stationary fluid</li> <li>times: Viscous fluid (Laminar flow /Turbulent flow)</li> <li>times: Macroscopic expression of fluid motion</li> <li>times: Exercise</li> <li>times: Summary</li> </ol>												
[Course re	qui	rement	ts]									
N/A												
[Evaluatio	n m	ethods	s and p	olic	у]							
Term-end ex	am											
[Textbook	s]											
Instructed du	- iring	class										
[Reference	es, e	etc.]										
(Referer	nce	books	)									
[Study outside of class (preparation and review)]												
Instructed during class.												
(Other information (office hours, etc.))												
*Please visit KULASIS to find out about office hours.												

						未更新					
Course number	U-ENG25 25142 LJ71	U-ENC	G25 25142	LJ77							
	学1(エネ原宇) ynamics 1		Instructor's name, job tit and departm of affiliation	le, ient	Graduate School of Engineering Professor,OOWADA TAKU Graduate School of Engineering Senior Lecturer,SUGIMOTO HIROSHI						
Target year 2nd y	vear students or above <b>Number</b> credits	r of	2	Year/	semesters	2025/Second semester					
Days and periods	2 Class style	Lecture (Face-to	o-face cours	se)	Language of instruction	Japanese					
[Overview and purpose of the course]											
[Course objective	es]										
[Course schedule	and contents]										
Basic knowledge on detection. Intrusion Detection b based IDS by studyir issued from IDS and Intrusion Detection b traffic by machine le Presentation,1time,B machine learning, an	[Course schedule and contents] Guidance,2times,Guidance on how this class is operated, and how to use computing facility for this class. Basic knowledge on the role of IDS in network security and how machine learning can help the intrusion detection. Intrusion Detection by Signature-Based IDS,5times,Learn the mechanism of intrusion detection by 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.										
[Course requirem	ients]										
None											
[Evaluation meth	ods and policy]										
[Textbooks]											
[References, etc.]											
(Reference boo	oks )										
				C	ontinue to 流体	力学1(エネ原宇) <b>(2)</b>					

流体力学1(エネ原宇)(2)

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Course number         U-ENG25 35143 LJ77         U-ENG25 35143 LJ71												
	流体力学2(機) Fluid Dynamics 2					Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor,HANAZAKI HIDESHI			
Target yea	r	3rd ye	ear students o	or above	Number credits	r of		2	Year	ear/semesters 2025/First semest		
Days and periods	Г	Thu.2	2	Class	s style	Lecture (Face-t	co-face course) Language of instruction Jap			Japanese		
[Overview and purpose of the course]												
[Course objectives]												
[Course s	che	dule	and co	ntent	s]							
,2times, ,4times, ,2times, ,3times, ,1time, ,2times, ,1 times,												
[Course re	qui	irem	nents]									
- Fluid Dynan	nics	1										
[Evaluatio	n m	eth	ods and	polic	;v]							
-				-								
[Textbook	s]											
[Reference	es, (	etc.]	]									
( <b>Referen</b> G. K. Batche 052104118X	elor,	An	Introducti				amł	oridge U	nivers	ity Press, 196	57). isbn{}{	
[Study outside of class (preparation and review)]												
(Other information (office hours, etc.))												
*Please visit KULASIS to find out about office hours.												

											未	更新
Course nu	ımbe	er U	J-ENC	G25 3:	5143 LJ77	U-EN	G25	35143	LJ71			
Course title (and course title in English)		体力学 2 d Dynan			)		nan and	ructor's ne, job ti I departn ffiliation	nent	Graduate School of Engineering Professor,OOWADA TAKU Graduate School of Engineering Senior Lecturer,SUGIMOTO HIROSHI		
Target yea	r	3rd year stu	udents o	r above	Number credits	r of		2	Year	/semesters	2025/First sen	nester
Days and periods	Т	Thu.2		Class	s style	Lecture (Face-t		ce cour	se)	Japanese		
[Overview and purpose of the course]												
[Course o	bjec	tives]										
[Course se	che	dule an	id coi	ntent	:s]							
,2times,												
,3times, ,3times,	3times, 3times											
,6times,												
,1time,												
[Course re	qui	rement	ts]									
- None	•		•									
[Evaluatio	n m	ethods	and	nolic	ev]							
		ctilous	, and	pond	· <b>1</b>							
[Textbook	s]											
[Reference	es, e	etc.]										
( Referer	nce	books )	)									
[Study out	tsid	e of cla	iss (p	repa	ration and	d revie	w)]					
(Other inf	orm	nation (	office	e hou	urs, etc.))							
*Please visit	KU	LASIS t	to find	out a	bout office	hours.						

										未更新	
Course nu	umber	U-EN	G25 4.	5144 LJ71							
Course title (and course title in English) マイクロ加工学(機エネ) Microfabrication						nan and	ructor's ne, job ti I departn Iffiliation	tle, nent	Graduate School of Engineering Professor, YOKOKAWA RYUUJI Graduate School of Engineering Associate Professor, HIROTANI JUN Graduate School of Engineering Associate Professor, FUJIMOTO KAZUYA		
Target yea	<b>r</b> 4th <u>r</u>	year students	or above	Number credits	r of		2	Year	/semesters	2025/First semester	
Days and periods	Fri.1	L	Class	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese	
[Overview	and p	urpose o	of the	course]							
This course	covers r	nicrofabri	cation	technology	y for ME	EMS	as well	as sen	niconducors.		
[Course o	bjectiv	/es]									
[Course s	chedul	e and co	ontent	.s]							
,1time,											
,2times,											
,3times,											
,2times,											
,2times,											
,2times,											
,2times,											
,1time,											
[Course re	equirer	nents]									
None											
[Evaluatio	on meth	nods and	l polic	;y]							
[Textbook	s]										
					· ·						
								C		クロ加工学(機エネ) <b>(2)</b>	

マイクロ加工学(機エネ)**(2)** 

#### [References, etc.]

(Reference books)

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

## [Courses delivered by instructors with practical work experience]

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

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

						未更新			
Course number	U-ENG25 45145 LJ77	7							
Course title (and course title in English)航空宇宙工学演義(宇) Engineering Exercise in Aeronautics and AstronauticsInstructor's name, job title, and department of affiliationGraduate School of Engineering ALL STAFF Graduate School of Engineering Professor, TAKATA SHIGERU									
<b>Target year</b> 4th y	ear students or above <b>Numbe</b>		2	Year/	/semesters	2025/First semester			
Days and Tue.3 periods	3,4 Class style	Lecture (Face-to-f	ace cours	se)	Language of instruction	Japanese			
[Overview and pu	urpose of the course]								
[Course objective	es]								
[Course schedule	e and contents]								
"									
[Course requirem	nents]								
None									
[Evaluation meth	ods and policy]								
[Textbooks]									
[References, etc.]	]								
(Reference boo	oks)								
				C	ontinue to 航空	宇宙工学演義(宇) <b>(2)</b>			

航空宇宙工学演義(宇)(2)

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

## [Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course nu	ımbe	er	U-ENO	G25 3:	5147 LJ75							
			論(材 l Matte				name, job title, and department			Graduate School of Engineering Professor,NAKAMURA HIROYUKI Graduate School of Engineering Associate Professor,TABATA YOSHIKAZU		
Target yea	r	3rd year s	students c	or above	Number credits	of		2	Year	/semesters	2025/Second semester	
Days and periods	F	Fri.3		Class	s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese	
[Overview and purpose of the course]												
Basic concep	pt of	magne	etic and	l super	rconducting	proper	ties	of matte	ers.			
[Course o	bied	tives	1									
	-	-		ot of n	nagnetic and	l superc	ond	ucting p	ropert	ies of matters	5.	
[Course se	che	dule a	nd co	ntent	s]	-		01	-			
Review of electromagnetism, 2times, magnetic field, definition and detection of vector potential, Hamiltonian for charged particle in electromagnetic field, etc. Magnetism and superconductivity, 12 times, angular momentum of electron, spin and exchange interaction, atomic magnetism and effect of crystal field, magnetic moment in crystals, molecular field model, interatomic exchange interaction, metallic magnetism, magnetization process, magnetic anisotropy, phase transitions, magnetic measurements, etc. Assessment, 1time, Assessment												
[Course re	equi	remer	nts]									
None												
[Evaluatio	n m	ethod	ls and	polic	¢y]							
Evaluation w	vill t	be based	d on a t	final e	xamination	•						
[Textbook	sl											
Not used												
-		-										
S. Blundel ISBN:01985	[References, etc.] (Reference books) S. Blundel 『Magnetism in Condensed Matter (Oxford Master Series in Physics)』 (Oxford University Press) ISBN:0198505914 C. Kittel 『Introduction to Solid State Physics』 (Wiley) ISBN:9780471415268											
[Study out	tsid	e of cl	lass (p	orepa	ration and	l revie	w)]					
Basics of qua	antu	m mecl	hanics	and st	atistical me	chanics	is n	ecessar	y.			
( Other inf	form	nation	(offic	e hou	urs, etc.) )							
*Please visit	KU	LASIS	to find	l out a	bout office	hours.						

Course numbe	er U-EN	G25 25150 L	Course number         U-ENG25 25150 LJ57         U-ENG25 25150 LJ28         U-ENG25 25150 LJ77									
	Z核工学序論 oduction to N		eering 1	nan and	ructor's ne, job tit I departm iffiliation	tle, Anent (	ALL STAFF Graduate Sch	nool of Engineering nool of Engineering SAKI TAKAYUKI				
Target year	2nd year students or above Number of credits 2 Year/semes						semesters	2025/First semester				
Days and M periods	Ion.2	Class style	Lecture (Face-		ice cour	se)	Language of instruction	Japanese				
Overview and	d purpose o	of the cours	e]				<u> </u>					
[Overview and purpose of the course] Study of basic concepts necessary for understanding the principles of various nuclear engineering studies from the physicochemical properties of atoms, nuclei, and radiation to the generation and use of energy by fission reactions.												
[Course objec	tives]											
[Course objectives] The course objective is to understand the link between basic science and the latest research in the field of nuclear engineering, and to understand the latest advancements made in basic and applied research and future issues.												
[Course sched	dule and co	ontents]										
Introduction to R 1) Discovery of r 2) History of radia 3) Basics of radia 4) Interaction with 5) Detection of radia 6) Generation of 7) Industrial uses Energy generation 8) Energy situation 9) Basics of reaction 10) Reactor contribution 11) Reactor selection 12) Reactor selection 13) Reactor selection 14) Viewpoints of 15) Feedback; contribution 15) Feedback; contribution 15) Feedback; contribution 15) Detection to Reactor to R	cadiation iation ation th substances adiation radiation of radiation on and utilization on and nuclea tor physics rol ction-present ction-past ction-next gen on nuclear en	tion 1 ar power neration react ergy utilization	on and devel	lopm	ient							
[Course requi	rements]											
None						<u>-</u>	 ontinue to 原子	 核工学序論1(原) <b>(2)</b>				

## 原子核工学序論1(原)(2)

# [Evaluation methods and policy]

Evaluation will be based on a written periodic examination. 5 or more absences from class will result in a failing grade (feedback sessions will not be included in the attendance count). The examination will test the basic knowledge and understanding of atoms, nuclei, radiation, quantum calculations, etc. discussed in each lecture.

#### [Textbooks]

Other materials are not specified. Handouts, etc. will be distributed during lectures.

[References, etc.]

(Reference books)

N/A

[Study outside of class (preparation and review)]

Review mainly the contents of each lecture and the exercises during the lecture is advisable.

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

Attend as needed. Some materials may be omitted or added depending on the number of classes in the relevant year. Attending Introduction to Nuclear Engineering 2 at the same time as this course is desirable.

Course nu	ımbo	er	U-EN	G25 25	5151 LJ28	U-EN	G25	25151	LJ77	U-ENG25 2	5151 LJ57	
	(and course原子核工学序論2(原)name, job title, and departmentALL STAFFtitle inIntroduction to Nuclear Engineering 2and departmentGraduate School of Engineering											
Target yea	Farget year     2nd year students or above     Number of credits     2     Year/semesters     2025/Second semesters											
Days and periods	N	Aon.	2	Class	s style	Lecture (Face-1		ce cour	se)	Language of instruction	Japanese	
[Overview	and	d pu	rpose c	of the	course]							
-	fund	dame	entals of a	radiatio	on properti					••	ion and management,	
[Course o	bjed	ctive	es]									
	ngine										est research in the field pplied research and	
[Course s	che	dule	and co	ntent	s]							
Introduction 1) Radiation 2) Medical a 3) Effects of 4) Safe use o 5) Radiation Energy gene 6) History an 7) Fusion rea 8) Prediction 9) Power rea 10) Ensuring 11) Advance 12) Radiation 13) Nuclear 14) Radioacc 15) Feedbac	biol ppli radii radii ratio ratio nand fu actor n and ctor g saf d M n in fuel tive	logy catio iation diation diation tet l con and and and and and and and and and an	on of radia n on the h on aws and d utilizat mentals of relopmen ntrol of F ems als Deve environm e e disposa	numan regula ion 2 of nucle t usion 1 lopme ent	tions ear fusion Reactor nt	ement						
[Course re	equi	irem	ents]									
Attending In	trod	uctio	on to Nuc	lear E	ngineering	1 is des	irab	le.				
[Evaluatio	n m	ethe	ods and	polic	;y]							
					-						lass will result in a mination will test the	
		-							c	continue to 原子	核工学序論 2 (原) <b>(2)</b>	

# 原子核工学序論2(原)**(2)**

basic knowledge and understanding of atoms, nuclei, radiation, quantum calculations, etc. discussed in each lecture.

#### [Textbooks]

Other materials are not specified. Handouts, etc. will be distributed during lectures.

#### [References, etc.]

(Reference books)

N/A

### [Study outside of class (preparation and review)]

Review mainly the contents of each lecture and the exercises during the lecture is advisable.

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

Exercises and report tasks will be assigned as necessary. Some materials may be omitted or added depending on the number of classes in the relevant year.

Course nu	Course number         U-ENG25 35152 LJ71         U-ENG25 35152 LJ77										
Course title (and course title in English)	ind course 流体熱工学(原) tle in Fluid Flow and Heat Transfer nglish)									School of Engineering YOKOMINE TAKEHIKO	
Target yea	r	3rd year student	s or above	Number credits	r of		2	Year	/semesters	2025/Second semester	
Days and periods	N	/Ion.2	Clas	s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese	
[Overview	and	d purpose	of the	course]							
<b>[Overview and purpose of the course]</b> This lecture provides the following subjects: thermal radiation, steady and unsteady heat conduction, laminar and turbulent convective heat transfer, phase change phenomena (boiling and condensation). The main goals are to understand the basic theory of fluid dynamics, thermodynamics, heat transfer and their allocation through the understandings of the mechanisms of heat transfer; especially thermal hydraulics in a nuclear reactor as a typical energy conversion system will be discussed including a safety engineering point of view.											
[Course o	bjeo	ctives]									
In order to understand the relation between heat and fluid based on the basic theory of fluid dynamics, thermodynamics, heat transfer and their allocation. It is very important to											
[Course s	che	dule and c	ontent	:s]							
,1.0times, ,1.0times, ,2.0times, ,4.0times, ,1.0times, ,5.0times, , 1.0times,											
[Course re	equi	rements]									
None											
[Evaluatio	n m	ethods an	d polio	cy]							
Evaluation b	asec	l on the writ	ten exa	mination, b	ut it is a	lso 1	rating a	studen	t#039s class j	performance.	
[Textbook	s]										
[Referenc		-									
( Referei	nce	books)									
·							. – –	c		体熱工学(原) <b>(2)</b>	

流体熱工学(原)**(2)** 

[Study outside of class (preparation and review)]

\_ \_ \_

(Other information (office hours, etc.))

Course nui	nbe	u-EN	G25 3	5153 LJ71							
	(and course title in伝熱工学(機)name, job title, and departmentGraduate School of Engineering Professor,KUROSE RYOUICHI										
Target year		3rd year students of	or above	Number credits	of		2	Year	/semesters	2025/Second semester	
Days and periods	F	ri.1	Clas	s style	Lecture (Face-t		ace cours	se)	Language of instruction	Japanese	
[Overview	anc	l purpose o	of the	course]							
[Overview and purpose of the course] This course focuses on the heat transfer phenomena at the foundation of heating, cooling, and insulation techniques, that is heat conduction, convection heat transfer, and thermal radiation. With respect to heat conduction, we will discuss the steady-unsteady phenomenon and the theory of extended surface heat transfer. With respect to convective heat transfer, we will discuss single-phase forced convection/natural convection and the boiling and condensation transfer accompanying phase transitions. With respect to thermal radiation, we will discuss the basic theory.											
[Course objectives] Provide basic knowledge and deepen understanding of heat transfer phenomena (heat conduction, convective heat transfer, thermal radiation).											
neat transfer,	the		1).								
[Course sc	heo	dule and co	ntent	:s]							
insulation tec engineering a (2-4) Heat conduct conductivity a basic case exa resistance in f (5) Basic informa Explain dime and Rayleigh transfer. (6-9) Convective h as well as ger boundary layo	hnic nd t ion: and amp flat nution nu	ques, and ten the basic mec Explain the F Fourier 's la ples. Explain to plates, pipes, n on convection onless numbe nber. Derive transfer without l information ow over a fla	nperat hanisi basics w, an therma etc., t ve hea rs such the mo- but pha . As et t plate	ure control ns of heat to of heat con d the deriva al contact re he theory of at transfer: In as Prandtl omentum ar ase change: xamples of e accompany	of equip ransfer p duction tion of p esistance f extend Formula number nd energ Explair external ying hea	phe phe the o e, sto led s rize r, N gy eo h spo l flo at tra	nt, expla nomena. enomena equation eady hea surfaces the gov usselt nu quations ecific ex w heat t ansfer. A	ain the a, special of heat at cond (fins), rerning umber, for the amples ransfer Also, as	importance of fically heat f at conduction uction, and h and so on. equations of Stanton num e boundary la s of forced co c, explain lam s an example	ing, cooling, and of heat transfer lux, thermal , with reference to eat conduction flow in heat transfer. ber, Grashof number, ayer flow and heat onvective heat transfer, inar and turbulent of internal flow heat long a vertical heated	
Convective h	eat 1	transfer accor	mpany	ring phase c	hanges:	Wi	th respe			unsfer, explain the	
-------------------------------------											

# 伝熱工学(機)**(2)**

boiling curve in pool boiling and nucleate boiling, transition boiling, film boiling heat transfer mechanisms, and the effects of various factors that affect nucleate boiling heat transfer and methods to enhance heat transfer. With respect to condensation heat transfer, explain the difference between dropwise condensation and film condensation, phenomena in condensation interfaces, and the Nusselt solution in vertical plate film condensation.

(12-14)

Radiation heat transfer: Discuss black bodies and gray bodies, Kirchhoff 's law, Planck 's law, and Wien 's displacement law, Stefan-Boltzmann 's law, radiation transfer between black body surfaces and radiation in actual surfaces, and the properties of radiation in gases.

(15)

Confirmation of learning attainment.

#### [Course requirements]

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

# [Evaluation methods and policy]

A final examination will be held. In-class reports will be factored in.

#### [Textbooks]

日本機械学会 『伝熱工学』(丸善出版)ISBN:ISBN978-4-88898-120-0

#### [References, etc.]

 $(\ {\rm Reference\ books\ })$ 

#### [Study outside of class (preparation and review)]

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

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

The order of classes listed above and their timing may differ depending on the year.

										未更新		
Course nu	umbe	er U-EN	G25 3	5154 LJ75								
										hool of Energy Science ssor,OKUMURA HIDEYUKI		
Target yea	r	3rd year students	or above	Number credits	/semesters	2025/First semester						
Days and periods		Ved.2		s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese		
[Overview and purpose of the course]												
[Course o	bjec	tives]										
[Course s	che	dule and co	onten	ts]								
,3times,												
,2times,												
,2times,												
,2times,												
,1time, ,1time,												
,3times,												
,1time,												
[Course re	equi	rements]										
None												
[Evaluatio	n m	ethods and	poli	cy]								
[Textbook	sl											
-	-	bought at the	e soci	ety of mater	rial scier	100	Ianan a	t Hyal	umanhen neg	ar Kyoto university.		
http://www.						icc,	Japan a	t Hyak		a Ryoto university.		
								C	ontinue to 材料	料基礎学2(エネ) <b>(2)</b>		

材料基礎学2(エネ)**(2)** 

# [References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

						未更新		
Course number	U-ENG25 35	5155 LJ71						
Course title (and course title in Design D English)	学 1 Engineering 1		Instructor's name, job tir and departn of affiliation	tle, ] nent (	Professor,KC Graduate Scł	te School of Engineering or,KOMORI MASAHARU te School of Engineering or,HIRAYAMA TOMOKO		
<b>Target year</b> 3rd y	ear students or above	Number of credits	2	Year/	semesters	2025/First semester		
Days and Mon. periods	.1 Class	s style Lecture (Face-	e to-face cour	se)	Language of instruction	Japanese		
[Overview and pu	urpose of the	course]						
[Course objective	es]							
[Course schedule	e and content	s]						
,1time,								
,4times,								
,3times, ,3times,								
,2times,								
,2times,								
,1time,								
,1time,								
[Course requirem	nents]							
None								
[Evaluation meth	ods and polic	;y]						
[Textbooks]								
					ontinuo to			
				U U	Untinue to	設計工学 1 (2)		

設計工学 1 **(2)** 

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Course nu	mbei	r U-EN	G25 3	5156 LJ71							
	(and course title in English) 日記書							tle, nent	Graduate School of Engineering Professor,KOMORI MASAHARU Graduate School of Engineering Professor,MATSUBARA ATSUSHI Graduate School of Engineering Professor,NISHIWAKI SHINJI		
Target year	3	rd year students	or above	Number credits	r of		2	Year	/semesters	2025/Second semester	
Days and periods	Τι	ıe.2	Clas	s style	Lecture (Face-t	ure ce-to-face course) Language of instruction Japanese					
[Overview	and	purpose o	f the	course]							
[Course ob	oject	tives]									
•	•	•									
	hod	ulo and co	ntoni	kel							
[Course sc ,5times,	neu		mem	ເວງ							
,3times,											
,2times,											
,4times,											
,1time,											
[Course re	auir	ementsl									
None		· · •									
[Evaluation	n me	ethods and	polio	cy]							
[Textbooks	5]										
[Reference		tc 1									
( Referen		_									
Γ	. —				• •			(	Continue to	設計工学 2 <b>(2)</b>	

# 設計工学 2 **(2)**

# [Study outside of class (preparation and review)]

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

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

Course nu	umber	U-EN	G25 3:	5157 EJ28						
Course title (and course title in English)						nam and	ructor's he, job tit departn ffiliation	tle, ] nent	Associate Profes Graduate Sch Associate Prof Graduate Sch Associate Prof Graduate Sch Professor,IM Graduate Sch Associate Prof Graduate Sch Associate Profess Graduate Sch Associate Profess Graduate Sch Associate Prof Graduate Sch Professor,Jur Graduate Sch Professor,MA Graduate Sch Professor,MA Graduate Sch Professor,MI Graduate Sch Assistant Profe Graduate Sch Assistant Profe Graduate Sch Assistant Profe Graduate Sch Assistant Profes Graduate Sch	nool of Energy Science ssor,OKUMURA HIDEYUKI nool of Energy Science fessor,ABE MASATAKA nool of Energy Science essor,IKENOUE TAKUMI nool of Energy Science ATANI SHIYOUJI nool of Energy Science sor,CGAWA TAKAYA nool of Energy Science or,KINOSHITA KATSUYUKI nool of Energy Science or,HASEGAWA MASAKATSU nool of Energy Science fessor,HACHIYA KAN nool of Energy Science fessor,HORIBE NAOTO nool of Energy Science fessor,HORIBE NAOTO nool of Energy Science trsumoto KAZUHIKO nool of Energy Science sor,MATSUI RYUTARO nool of Energy Science essor,MATSUI RYUTARO nool of Energy Science essor,HWANG JINKWANG nool of Energy Science ssor,HWANG JINKWANG nool of Energy Science ssor,OKAZAKI YUTAKA nool of Energy Science essor,OKAZAKI YUTAKA nool of Energy Science essor,OKAZAKI YUTAKA nool of Energy Science ssor,OKAZAKI YUTAKA
Target yea	<b>r</b> 3rd	year students (	or above	Number credits	r of		3	Year/	semesters	2025/First semester
Days and periods	Wed.	3,4,Thu.3,4	Class	s style	Experin (Face-t		ce cour	se)	Language of instruction	Japanese
[Overview	and p	urpose o	of the	course]						
								— — <sub>Co</sub>	ntinue to エネルギ・	- 応用工学設計演習・実験 1 <b>(2)</b>

エネルギー応用工学設計演習・実験1 <b>(2)</b>	
[Course objectives]	
[Course schedule and contents]	
6times,	
6times,	
6times,	
6times,	
[Course requirements]	
None	
[Evaluation methods and policy]	
[Textbooks]	
[References, etc.]	
(Reference books)	
[Study outside of class (preparation and review)]	
(Other information (office hours, etc.))	
*Please visit KULASIS to find out about office hours.	

Course number         U-ENG25 35158 EJ77         U-ENG25 35158 EJ57         U-ENG25 35158 EJ53									5158 EJ53		
		工学実験 ·Engineer		aboratory 1		nan and	tructor's ne, job tit I departm offiliation	tle, nent	ALL STAFF Graduate Scl	nool of Engineering nool of Engineering ofessor,IMAI MAKOTO	
Target year	year3rd year students or aboveNumber of credits3Year/semesters2025/First semesters								2025/First semester		
Days and periods	Thu.	1,2,3,4	Class	s style	Experir (Face-t		t ice cour	se)	Language of instruction	Japanese	
[Overview a	nd pi	urpose o	f the	course]							
<b>[Overview and purpose of the course]</b> Basic knowledge of a wide range of scientific and engineering fields (e.g. physics, chemistry, biology, electrical engineering, mechanical engineering, and materials engineering) that form the basis of nuclear engineering, as well as basic proficiency with standards related to radiation and quantum beam technologies specific to nuclear engineering. In addition, students will study experimental procedures through practical training as well as procedures for the safe handling of radioisotopes and radiation generators, methods for processing experimental data, and how to prepare scientific reports.											
[Course obj		-									
• Cultivate fa	milia	rity with e	xperir	nental proc	edures a	and a	a sense o	of engi	neering best	practices.	
<ul> <li>Acquire bas application.</li> </ul>	sic kno	owledge a	nd ski	lls related t	o scienc	ce ar	nd engin	eering	with a mind	towards practical	
• Cultivate th	e abil	ity to acqu	uire an	nd utilize ba	isic knov	wlec	lge and	techno	logy related t	o nuclear engineering.	
• Learn how	to con	duct expe	rimen	ts while con	nsiderin	g pe	ersonal a	nd env	vironmental s	afety.	
• Cultivate th	e abil	ity to wor	k effe	ctively, inde	ependen	ıtly,	and con	tinuou	sly on variou	s tasks.	
[Course sch	edul	e and co	ntent	s]							
regarding the h	andli	ng of radi	oisoto	pes.						ion and training ding exercises may	
Lecture 1: Ove learning instrue		-						-	mental task, t	ext distribution, pre-	
Lecture 2: Basi as exercises to		-	-	÷ .				is on ci	reating exper-	imental reports, as well	
		-		•	-				-	ocedures for handling	
RIs. Students will study safe procedures for handling nuclear fuel materials.											

### 原子核工学実験 1 **(2)**

Lecture 4: Mechanical drawing: Exercises and lectures on basic aspects of mechanical drawing.

Lecture 5: Circuit meter training and electronic safety training: Students will learn the operating principles and usage of analog and digital testers. Students will assemble various circuits and learn safe and reliable circuit manufacturing techniques.

Lecture 6: X-ray diffraction: Using a powder X-ray diffractometer, students will learn the basic properties of X-rays and gain an understanding of the relationship between diffraction patterns and crystal structures.

Lectures 7 and 8: The properties of radiation - -ray: Students will learn about the characteristics of -ray attenuation in matter and the detection method of particles using a semiconductor detector.

Lecture 9: Electron beams/vacuums: Students will focus on an electron beam by electric and magnetic fields to learn the functions of electrostatic and magnetic lenses and understand the fundamental principles of vacuum technology.

Lectures 10 and 11: Neutron Detection: Students will focus on the principles of neutron generation and detection using a 241Am-Be neutron source and 3He detector, and learn about the behavior of neutrons in moderator (paraffin).

Lectures 12 and 13: Absorption of and -rays: Students will study procedures for the safe handling of RIs through experiments on energy absorption by and -ray-emitting substances.

Lecture 14: Radiochemistry: Students will learn the safe handling of unsealed Cs-137 through milking, and the principles of its separation.

Lecture 15: Report check: Confirmation of the content of students ' submitted reports and provision of guidance regarding resubmission of deficient reports to confirm learning achievement.

#### [Course requirements]

N/A

#### [Evaluation methods and policy]

Students will prepare a report for each task, and performance will be evaluated on a scale of 1 to 3 with respect to the degree of achievement of each learning objective, and the total score is converted into a score out of 100.

Note that completing all assignments and submitting reports is a prerequisite for receiving credit.

Reports submitted late may be penalized, and messy or incomplete reports may require correction and resubmission.

#### [Textbooks]

Texts and reference materials will be distributed for each experimental theme.

Continue to 原子核工学実験 1 (3)

原子核工学実験 1 **(3)** 

#### [References, etc.]

#### (Reference books)

Other materials will be introduced as needed for each experimental theme.

#### [Study outside of class (preparation and review)]

Submit reports on all experimental themes within the deadline.

In addition, follow the instructions in the experiment outline description for each experiment theme.

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

The method of contacting the faculty in charge of each experimental theme will be given in the instructional material for each experiment.

Taking this course together with Nuclear Engineering Experiment 2 is desirable.

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

(2) Details of instructors ' practical work experience related to the course ・ RI主任者【工学部の事業所(宇治)におけるRI管理の実務経験】

(3) Details of practical classes delivered based on instructors ' practical work experience ・ RI管理の経験に基づく実務的な教育が行われている。

										未更新	
Course numb	ber	U-ENC	G25 35	5159 SJ28							
	se エネルギー応用工学設計演習・実験 2 Design Practice and Experiments for Applied Energy Science and Engineering 2					name and d	ictor's , job tit lepartm iliation	tle, nent	Associate Professor,OKUMURA HIDEYUK Graduate School of Energy Science Associate Professor,ABE MASATAKA Graduate School of Energy Science Associate Professor,HACHIYA KAN Graduate School of Energy Science Associate Professor,IKENOUE TAKUM Graduate School of Energy Science Professor,IMATANI SHIYOUJI Graduate School of Energy Science Associate Professor,OGAWA TAKAYA Graduate School of Energy Science Associate Professor,KINOSHITA KATSUYUK Graduate School of Energy Science Associate Professor,HASEGAWA MASAKATSU Graduate School of Energy Science Professor,Jun HAYASHI Graduate School of Energy Science Professor,Jun HAYASHI Graduate School of Energy Science Professor,MATSUMOTO KAZUHIKO Graduate School of Energy Science Professor,MATSUMOTO KAZUHIKO Graduate School of Energy Science Professor,MATSUMOTO KAZUHIKO Graduate School of Energy Science Assistant Professor,HWANG JINKWANO Graduate School of Energy Science Assistant Professor,HWANG JINKWANO Graduate School of Energy Science Assistant Professor,OKAZAKI YUTAKA Graduate School of Energy Science Assistant Professor,OKAZAKI SUI Graduate School of Energy Science Assistant Professor,OKAZAKI EMI Graduate School of Energy Science Assistant Professor,OKAZAKI EMI Graduate School of Energy Science Assistant Professor,OKAZAKI EMI Graduate School of Energy Science Assistant Professor,OKAZAKI EMI		
Target year	3rd year s	tudents of	r above	Number credits	r of	3		Year	/semesters	2025/Second semester	
periods	Wed.3,4,7				Semina (Face-t		e cour	se)	Language of instruction	Japanese	
[Overview ar	nd purp	ose of	f the	course]							
								<sub>c</sub>	 ontinue to エネルギ・	ー応用工学設計演習・実験2 <b>(2)</b>	

エネルギー応用工学設計演習・実験 2 <b>(2)</b>
[Course objectives]
[Course schedule and contents]
6times, 6times
6times,
6times,
6times,
ltime,
[Course requirements]
None
[Evaluation methods and policy]
[Textbooks]
• •
[Poforoncos oto]
[References, etc.]
(Reference books)
[Study outside of class (preparation and review)]
(Other information (office hours, etc.))
*Please visit KULASIS to find out about office hours.

Course nu	Course number         U-ENG25 35160 EJ57         U-ENG25 35160 EJ53         U-ENG25 35160 EJ77								5160 EJ77		
		·核工学実験 lear Engineer		aboratory 2		Instructor's name, job title, and department of affiliation			Graduate School of Engineering ALL STAFF Graduate School of Engineering Assistant Professor,IMAI MAKOTO		
Target year	•	3rd year students of	or above	Number credits	r of		3	Year	Year/semesters 2025/Second semester		
Days and periods	Т	hu.1,2,3,4	Class	s style	Experir (Face-t		ce cour	se)	Language of instruction	Japanese	
[Overview	and	l purpose o	f the	course]							
Basic knowledge of a wide range of scientific and engineering fields (e.g. physics, chemistry, biology, electrical engineering, mechanical engineering, materials engineering) that form the basis of nuclear engineering, as well as basic proficiency with standards related to radiation and quantum beam technologies specific to nuclear engineering. In addition, students will study practical experimental procedures through practical training as well as procedures for the safe handling of radioisotopes and radiation generators, methods for processing experimental data, and how to prepare scientific reports.											
[Course ol	bjec	tives]									
• Cultivate	fami	iliarity with e	xperir	nental proc	edures a	and a	a sense o	of engi	neering best	practices.	
• Acquire b application.	oasic	knowledge a	nd ski	lls related t	o scienc	e ar	nd engin	eering	with a mind	towards practical	
		•					C			to nuclear engineering.	
• Learn how	w to	conduct expe	rimen	ts while con	nsiderin	g pe	rsonal a	nd env	vironmental s	afety.	
• Cultivate	the a	ability to wor	k effe	ctively, inde	ependen	ıtly,	and con	tinuou	sly on variou	s tasks.	
[Course so	cheo	dule and co	ntent	s]							
		r the followin ures differs fo	0		ntal grou	ıp, a	nd the c	ontent	of correspon	ding exercises may	
Lecture 1: O learning instr		-						-	mental task, t	ext distribution, pre-	
	Lecture 2: Numerical experiment 1: Students will focus on the basic grammar of Python and practice data processing and graph creation using libraries.									on and practice data	
Lecture 3: Notes that the created code.		rical experim	ent 2:	Students w	ill learn	a fl	uid sim	ulation	code and per	rform analysis using the	
Lectures 4 ar	nd 5:	In-air PIXE	and R	BS analysis	s: Using	elec	ctrostati			tudents will observe 子核工学実験 2 <b>(2)</b>	

# 原子核工学実験 2 **(2)**

the trajectory of a proton beam in the atmosphere. They will also learn elemental analysis using Particle-Induced X-ray Emission (PIXE) and Rutherford Backscattering Spectrometry (RBS).

Lecture 6: Digital measurement: Students will study the characteristics of digital measurements, as well as the principles of impedance matching and sampling, by actually creating circuits in practice.

Lectures 7 and 8: Uranium chemistry: Lectures will focus on the separation of uranium thorium radiative equilibrium solutions (ion exchange, oxidation-reduction reaction) and will perform colorimetric quantitative analysis as study of the handling of nuclear fuel.

Lecture 9: Radiation detection: Students will attempt detection of -rays emitted from substances existing in nature by using a Ge semiconductor detector as well as the identification and quantification of emitted nuclides. Students will also deepen their understanding of radiation and radioactive materials by measuring contamination using a survey meter and by measuring the decay process of nearby radioisotopes.

Lecture 10: Slow neutron beams: Students will measure neutrons from accelerator driven neutron source using a neutron counter to learn about the properties of neutrons and their interaction with matter.

Lecture 11: Numerical experiment 3: Students will learn about simulation using numerical calculation libraries.

Lectures 12 - 15: Report check: Confirmation of the content of students ' submitted reports and provision of guidance regarding resubmission of deficient reports to confirm learning achievement.

#### [Course requirements]

N/A

#### [Evaluation methods and policy]

Students will prepare a report for each task, and performance will be evaluated on a scale of 1 to 3 with respect to the degree of achievement of each learning objective, and the total score is converted into a score out of 100.

Note that completing all assignments and submitting reports is a prerequisite for receiving credit.

Reports submitted late may be penalized, and messy or incomplete reports may require correction and resubmission.

Continue to 原子核工学実験 2 (3)

#### [Textbooks]

Texts and reference materials will be distributed for each experimental theme.

#### [References, etc.]

#### $(\ {\rm Reference\ books\ })$

Other materials will be introduced as needed for each experimental theme.

# 原子核工学実験 2 **(3)**

# [Study outside of class (preparation and review)]

Submit reports on all experimental themes within the deadline.

In addition, follow the instructions in the experiment outline description for each experiment theme.

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

The method of contacting the faculty in charge of each experimental theme will be given in the instructional material for each experiment.

Taking this course together with Nuclear Engineering Experiment 1 is desirable.

\*Please visit KULASIS to find out about office hours.

# [Courses delivered by instructors with practical work experience]

(1) Category

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

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

・RI主任者【工学部の事業所(宇治)におけるRI管理の実務経験】

(3) Details of practical classes delivered based on instructors ' practical work experience ・ RI管理の経験に基づく実務的な教育が行われている。

Course nu	umb	er	U-EN	G25 4:	5161 LJ71							
	nd course 材料強度学 le in Strength and Fracture of Materials								tle, nent	Graduate School of Engineering Professor,HIRAKATA HIROYUKI Graduate School of Engineering Professor,SHIMADA TAKAHIRO		
Target yea	r	4th year students or above <b>Number of</b> credits						2	Year/	semesters	2025/First semester	
Days and periods		Thu.2	2	Class	s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese	
[Overview	an	d pu	irpose o	f the	course]							
	hia	otive										
[Course o	nleo	SUVE	:5]									
[Course s	che	dule	e and co	ntent	s]							
,2times,												
,2times,												
,3times,												
,1?2times,												
,1?2times,												
,1?2times,												
,1?2times,												
,1time,												
[Course re	equi	irem	nents]									
- None	•		-									
[Evaluatio	on m	neth	ods and	polic	;y]							
[Textbook	s]											
┝ ·		-								<b></b> _		
									C	ontinue to	材料強度学(2)	

材料強度学**(2)** 

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Course nu	umbe	er	U-EN	G25 2:	5162 LJ71	U-EN	G25	25162	LJ57	U-ENG25 2	5162 LJ77	
Course title (and course title in English)	(and course 熱力学1(機宇) title in Thermodynamics 1						Instructor's name, job title, and department of affiliation			Graduate School of Engineering Professor,IWAI HIROSHI Graduate School of Engineering Associate Professor,KISHIMOTO MASASH		
Target yea	r	2nd y	ear students	r students or above Number of credits 2 Y						Year/semesters 2025/First semester		
Days and periods		Fri.1		Class	s style	Lecture (Face-t		ce cour	se)	Language of instruction	Japanese	
[Overview	and	d pı	irpose o	f the	course]							
[Course o	bjec	ctive	es]									
[Course s	che	dule	e and co	ntent	s]							
0												
[Course re	equi	irem	nents]									
None												
[Evaluatio	n m	eth	ods and	polic	¢y]							
[Textbook	s]											
[Reference	es, e	etc.	]									
( Referer	nce	boo	oks)									
[Study out	tsid	e of	class (p	orepa	ration and	d revie	w)]					
(Other in	form	natio	on (offic	e hou	urs, etc.) )							
*Please visit	KU	LAS	SIS to find	d out a	bout office	hours.						

未更新

Course nu	ourse number         U-ENG25 25162 LJ71         U-ENG25 25162 LJ57         U-ENG25 25162 LJ77							5162 LJ77				
Course title (and course title in English)		熱力学1(エネ原) Thermodynamics 1						ructor's ne, job tif departm ffiliation	nent	Graduate School of Energy Science Associate Professor, HASEGAWA MASAKATSU		
Target yea	r	2nd y	ear students o	or above	Number credits	of		2	Year	/semesters	2025/First semester	
Days and periods	F	Fri.1		Class	s style	Lecture (Face-t		ce cour	se)	Language of instruction	Japanese	
[Overview	and	d pı	irpose o	f the	course]							
<b>[Overview and purpose of the course]</b> In this course, Thermodynamics 1, the basic laws of thermodynamics are introduced. Also discussed are fundamental items including state changes of ideal and real gases, cycles, phase transformation, free energy, phase equilibrium and the phase rule, single-component phase diagrams, etc.												
[Course o	bjec	ctive	es]									
Students will gain an understanding of the meaning and significance of the first and second laws of thermodynamics, fundamental concepts for thermodynamics. Students will also be able to quantitatively deal with changes in thermodynamic quantity that accompany state changes.												
[Course s	che	dule	e and co	ntent	s]							
Introduction system, phas		,										
The first law heat, work, c			•			capacity	/spe	ecific he	at			
The second l reversible pr Carnot's theo Poisson's lay	oces orem	ss, he i, the	eat engine ermodyna	e, Tho mic te	mson's prin mperature,	Mayer's	s rel	-	ciple,			
Free energy and thermodynamic equilibrium (3 classes) Helmholtz energy, Gibbs energy, Maxwell relations, Gibbs-Helmholtz equation, Joule's experiment, Joule-Thomson experiment, open system and chemical potential, conditions and stabilities of equilibrium state, Gibbs-Duhem equation												
State quantities of gas phase (1 class) ideal gas, van der Waals gas												
Gibbs' phase	Phase equilibrium and transformation (1 class) Gibbs' phase rule, phase diagram of single-component system, Clapeyron-Clausius equation, critical point											

# 熱力学1(エネ原)**(2)**

Gas mixture and solution (1 class) ideal gas mixture, ideal solution, entropy of mixing, elevation of boiling point, depression of freezing point

Review (1 class)

Feedback (1 class)

# [Course requirements]

None

### [Evaluation methods and policy]

Results are evaluated by a term-end examination.

### [Textbooks]

Not used

### [References, etc.]

#### (Reference books)

Thermodynamics and statistical mechanics (A. Harajima, Baifukan) (in Japanese). isbn{}{9784563021399}

### [Study outside of class (preparation and review)]

It is better to prepare and review the lecture materials posted on PandA.

#### (Other information (office hours, 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.

						未更新	
Course number	U-ENG25 3	5169 SJ71					
	vステム学セミ: r on Mechanical and	ナー(機) d System Engineering	Instructor's name, job tit and departm of affiliation	nent	Graduate School of Engineering Associate Professor, N A M U R A K Y O K O Graduate School of Engineering Associate Professor, MATSUMOTO MITSUHIRO		
Target year	year students or above	Number of credits	2	Year	/semesters	2025/Intensive, Second semester	
Days and Inte periods	ensive Class	s style Semina (Face-t	r o-face cours	se)	Language of instruction	Japanese	
[Overview and p	ourpose of the	course]					
[Course objectiv	ves]						
[Course schedu	le and content	s]					
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"							
[Course require	ments]						
None							
				,		 ステム学セミナー(機) <b>(2)</b>	
				U	onunue lo r成mン	∧ノムナビベノ ̄ ( 110 J <b>(4)</b>	

# 機械システム学セミナー(機)(2)

# [Evaluation methods and policy]

#### [Textbooks]

#### [References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

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

\*Please visit KULASIS to find out about office hours.

#### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

											未更新
Course nu	umb	er	U-EN	G25 4	5170 SJ71						
	(and course マイクロ材料の加工・評価の基礎 r title in Fabrication and Analysis of Micromaterials						nan and	tructor's ne, job tit I departm affiliation	tle, nent	School of Engineering ISUCHIYA TOSHIYUK School of Engineering SUZUKI MOTOFUMI School of Engineering YOKOKAWA RYUUJI School of Engineering Professor,HIROTANI JU School of Engineering ofessor,FUJIMOTO KAZUY	
Target yea	r	4th y	vear students of	or above	Number credits	r of		2	Year	/semesters	s 2025/Intensive, Second semester
Days and periods		Inter	nsive	Clas	s style	Semina (Face-t		ace cours	se)	Language of instruct	tion Japanese
[Overview	ı an	d pı	urpose c	of the	course]						
[Course o	bje	ctive	es]								
			_								
[Course se	che	dule	e and co	ntent	ts]						
,1time,											
,1time, ,1time,											
,1time, ,1time,											
,1time,											
,3times,											
,3times,											
,1time,											
,2times,											
,1time,											
[Course re	equ	iren	nents]								
None	-										
[Evaluatio	on m	neth	ods and	l poli	cy]						
		• =						. – –	C	ontinue to マイ	クロ材料の加工・評価の基礎 <b>(2)</b>

マイクロ材料の加工・評価の基礎(2)

## [Textbooks]

### [References, etc.]

( Reference books )

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

(1) Category

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

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

							未更新			
Course number	U-ENG25 4	5171 LJ71								
	vステム工学(材 gent Systems Eng		nar and	tructor's ne, job ti I departn affiliation	tle, nent					
Target year 4th	year students or above	Number of credits	f	2	Year	/semesters	2025/First semester			
Days and Wea periods	d.2 Clas		cture face-to-fa	ace cour	se)	Language of instruction	Japanese			
[Overview and p	ourpose of the	course]								
[Course objectiv	ves]									
[Course schedu	le and conten	ts]								
,2times,										
,2times,										
,2times,										
,2times,										
,2times,										
,2times,										
,2-3times,										
[Course require	ments]									
None	-									
[Evaluation met	hods and poli	cy]								
[Textbooks]										
					C	ontinue to 知能	システム工学(機) <b>(2)</b>			

# 知能システム工学(機)(2)

#### [References, etc.]

(Reference books)

### [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

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

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

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

Course nu	ımbe	er	U-EN	G25 2:	5172 LJ75						
Course title (and course title in English)			学基礎 3 entals of ]	Materi	ials Science	e 3	nan and	tructor's ne, job tit I departm Iffiliation	nent		nool of Engineering ssor,TOYOURA KAZUAKI
Target yea	r	2nd y	ear students o	or above	Number credits	r of		2	Year	/semesters	2025/Second semester
Days and periods		ri.1		Class	s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese
[Overview	and	d pu	irpose o	f the	course]						
[Course o	bjec	ctive	es]								
[Course s	che	dule	and co	ntent	s]						
,1time,											
,1time,											
,1time, ,3times,											
,3times, ,4times,											
,4times,											
,1time,											
[Course re	ani	rem	entsl								
None											
[Evaluatio	n m	oth	ode and	nolic	<u></u>						
[Evaluatio		em	ous anu	polic	<i>,</i> y]						
[Textbook	-										
isbn{}{9784	254	2401	84}								
[Reference	es, e	etc.]									
(Referer	nce	boo	ks)								
isbn{}{9784			,				• •		1 . 11	• • • • • •	412 4502051
								Metals a	ind All	oys isbn{}{0	412450305}
[Study out	[Study outside of class (preparation and review)]										
(Other information (office hours, etc.))											
*Please visit	KU	LAS	SIS to find	l out a	bout office	hours.					

										未更新		
Course nu	umbe	er U-EN	G25 3	5173 LJ75								
Course title (and course title in English)		斗組織学 damentals of N	licrost	ructure of M	laterials	nan and	ructor's ne, job tit I departm Iffiliation	nent		nool of Engineering DEYUKI YASUDA		
Target yea	r	3rd year students of	or above	Number credits	of		2	Year	/semesters	2025/Second semester		
Days and periods	N	/Ion.1	Clas	s style	style Lecture (Face-to-face course) Language of instruction Japanese							
[Overview	Overview and purpose of the course]											
Physical and chemical properties of materials depend on not only lattice structure and composition but also microstructure. In this lecture, the microstructure evolution during phase transformation (i.e. solidification) will be explained by using thermodynamics and kinetics (atomic diffusion, thermal energy transport and momentum transport). Students study the fundamentals of microstructure evolution (nucleation, growth mechanism, solute partition, microstructure selection, dendritic growth, eutectic growth and equilibrium / non-equilibrium processes).												
[Course o	bjec	ctives]										
2. To be able	e to i	relationship use thermody	namic	s and kinetion								
[Course s	che	dule and co	ntent	is]								
class 2. Nucleatio 3. Interface 4.Growing i 5.Dendritic 6.Solute par solutes) 7.Eutectic g 8.Non-equil 9. Microstru rules in phas 10. Learning	<ol> <li>Nucleation (1): classical nucleation theory and curvature effect</li> <li>Interface morphology (1): interface morphology (atomic scale), macroscopic interface shape</li> <li>Growing interface (3): local equilibrium at interface, solute partition, stability of interface</li> <li>Dendritic growth (2): mechanism of dendritic growth, selection mechanism</li> <li>Solute partition and segregation (2): solute partition at interface, segregation (non-uniform distribution of</li> </ol>											
-		ethods and	-									
Evaluation method: Evaluation will be based on one written examination at the end of semester. Evaluation standard: The result of a written examination should be 60 and above out of 100. (60 and above:												
<b></b>								c	Continue to	材料組織学 <b>(2)</b>		

### 材料組織学(2)

Passed, 59 and below: Failed) Evaluation may include short reports.

### [Textbooks]

松原英一郎他 『金属材料組織学』(朝倉書店)ISBN:9784254240184

### [References, etc.]

(Reference books)

### [Study outside of class (preparation and review)]

Students are required to carry out a review of class.

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

Course nu	ımbe	er	U-EN	G25 3:	5174 LJ72	U-EN	G25	35174	LJ53			
Course title (and course title in English)	放射線計測学 Radiation Detection and Measurement Instructor's name, job title, and department of affiliation Graduate School of Engineering Associate Professor, TSUCHIDA HIDETSUGU											
Target yea	r	3rd ye	ear students o	or above	Number of credits 2 Year/semesters 2025/First semest							
Days and periods	v	Ved.2	2	Class	Class styleLecture (Face-to-face course)Language of instructionJapanese							
[Overview	and purpose of the course]											
- 放射線(イ 放射線と物	[Overview and purpose of the course] 対射線(イオンや電子などの荷電粒子線、X線や 線などの光子線、中性子線)の計測法について、 対射線と物質との相互作用、計測に用いる各種放射線検出器の動作原理や計測技術等を述べる。本 講義の目的は、様々な分野への放射線利用において放射線計測の重要性を理解することである。											
[Course o	bjec	tive	es]									
放射線の性 技術を理解											ふ的な動作原理や測定	
[Course s	che	dule	and co	ntent	s]							
	体的	」な根	既要を説	明する							)概要(測定の種類や )て説明する。	
(2)光子 光子線(X 連した基本	線・	約	泉)の性	質及て	が物質との	相互作	用 (	相互作	用過利	呈とその断面	「積、減衰など)に関	
(3)荷電 荷電粒子( ど)に関連	イオ	ン、	電子)	の性質		との相	互作	『用(相	互作月	<b>刊過程、エ</b> ネ	・ルギー損失、飛程な	
(4)中性 中性子の性		-	· ·		月 ( 相互作	用過程	、杉	返反応な	ど)।	こ関連した基	基本的事項を説明する。	
放射線検出	(5)放射線検出器【4週】 放射線検出器(ガス入り検出器、半導体検出器、シンチレーション検出器、その他の検出器)の基 本的な動作原理を述べるとともに、放射線の種類に応じた検出器の検出原理及び基本特性等を解説 する。											
放射線計測	(6)放射線計測技術【1週】 放射線計測の基本構成(放射線のエネルギー計測や時間計測をする場合の構成など)、計測回路( Eジュールの種類とその役割)及び計測回路の信号処理などについて説明する。											
									c	Continue to ;		

#### 放射線計測学**(2)**

(8)放射線計測の定量【1週】 放射線計測の定量に関わる基本的事項について解説する。具体的には、絶対測定と相対測定との違い、検出効率、立体角などを説明する。

(9)放射線計測における統計【2週】 放射線計測に用いる統計学(確率分布及び誤差伝播など)を説明する。

(10)総括【1週】

本講義の全体のまとめを行うとともに、放射線計測を基礎とした放射線の安全な取扱いについて考 察する。

#### [Course requirements]

原子物理学

#### [Evaluation methods and policy]

筆記試験で成績(100点満点)を評価する。

#### [Textbooks]

特に定めない

#### [References, etc.]

#### (Reference books)

ニコラス・ツルファニディス著 阪井英次訳 放射線計測の理論と演習(上、下巻)現代工学社な ど ibid{}{TW86012413} ibid{}{BB01056431}

#### [Study outside of class (preparation and review)]

講義中に配布する演習問題及び参考書等を用いて行う。

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

必要に応じてプリントを配布する。

Course nu	ımbe	er U-EI	NG25 2	5175 LJ75								
Course title (and course title in English)		¥熱力学(材 rmodynamic		aterials		nan and	tructor's ne, job tit I departm affiliation	nent		nool of Engineering DA TETSUYA		
Target yea	r	2nd year student	s or above	Number credits	r of		2	Year	/semesters	2025/First semester		
Days and periods	Т	Sue.3	Clas	s style	Lecture (Face-t		ace cours	se)	Language of instruction	Japanese		
[Overview	Overview and purpose of the course]											
[Overview and purpose of the course] 化学ポテンシャルの概念を中心に熱力学の概要を復習し、多成分・多相平衡時に、化学ポテンシャ ルが満たすべき条件を授業する。各温度での相平衡関係の軌跡として、温度-組成の状態図を説明 する。授業の後半では、電極とイオンを含む系の熱力学的な考え方を紹介する。さらに、三元系の 化学ポテンシャル図の一般的な考え方と、電位-pH図を紹介する。												
[Course o	bjec	ctives]										
ルギー曲線	<b>[Course objectives]</b> 相平衡を化学ポテンシャルを用いて思考できるようになること。温度-組成の状態図とギブズエネ ルギー曲線の関係を理解すること。ラウール基準、ヘンリー基準の標準状態に習熟すること。電位 -pH図などの化学ポテンシャル図の考え方に習熟すること。											
[Course s	che	dule and c	ontent	s]								
熱力学の基 ーと変化の			ネルキ	ー、エング	タルピ-	-、	比熱、	エント	・ロピーと第	2法則、自由エネルギ		
	ズの									-dG図と化学ポテンシ <sup>틸</sup> 状態と活量、溶体モ		
状態図<1回 態図	>状	態図とギフ	゙゚ズエネ	ルギー曲約	泉の関係	系、	二元系	におけ	トる種々の不	変反応、実在系の状		
電極とイオ	ンの	)平衡論<2[	回>電極	電位、起電	電力、↑	ィオ	ンの標準	準状態	<sup>〔</sup> 、標準水素	電極		
化学ポテン	シャ	・ル図(電位	-pH図)-	<3回>3元系	系の化学	゠゚゚゚゚゚゚゚゚゚゚゚゚゚゚゚゚	テンシャ	ァル図	、電位-pH図	]		
レポート課	題解	¥答と概説<	10>									
フィードバ	フィードバック<1回>											
			· <b></b>					c	Continue to 材	料熱力学(材) <b>(2)</b>		

### 材料熱力学(材)**(2)**

### [Course requirements]

None

#### [Evaluation methods and policy]

成績は、テストの結果を重視する。宿題の提出も加点対象とする。

#### [Textbooks]

Not used

#### [References, etc.]

(Reference books) 杉本孝一 他『材料組織学』(朝倉書店) ISBN:9784254240115 粟倉泰弘 他『金属物理化学』(日本金属学会) ISBN:4889030115 D.R.Gaskell『Introduction to the Thermodynamics of Materials』 ISBN:9781591690436

#### [Study outside of class (preparation and review)]

第一回の授業で配布するレジメを必ず目を通してから授業を受けること。 授業後は、宿題を毎回提出のこと

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

できるだけ授業後に質問してください。その他の場合には、授業で知らせるメールアドレスでアポ イントをしてください。

										未更新
Course nu	ımbe	er U-EN	G25 3	5200 LJ75						
		う子材料概論 oduction to Po				nan and	ructor's ne, job ti I departn Iffiliation	nent	Graduate Sc	urer,SAWAMOTO MITSU( hool of Engineering ofessor,ICHII TAKASH
Target yea	r	3rd year students o	or above	Number credits	r of		2	Year	/semesters	2025/First semester
Days and periods	N	Mon.2	Class	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese
[Overview	and	d purpose o	of the	course]						
[Course o	bjec	tives]								
[Course s	che	dule and co	ontent	s]						
,1time,										
,3times, ,4times,										
,4times,										
,2times, ,1time,										
, i uine,										
[Course re	equi	rements]								
None										
[Evaluatio	n m	ethods and	polic	cy]						
[Textbook	s]									
[Reference	es, e	etc.]								
( Referer	nce	books)								
[Study out	tsid	e of class (p	orepa	ration and	d revie	w)]				
( Other inf	orn	nation (offic	e hou	urs, etc.) )	I					
*Please visit	KU	LASIS to find	d out a	bout office	hours.					

未更新

Course number	U-ENG25 3:	5203 LJ77	U-EN	G25	35203	LJ52	U-ENG25 3	5203 LJ28	
Course title (and course title in Nuclear English)	物理学(原) Reactor Physic	s		nan and	Instructor's name, job title, and department of affiliation				
<b>Target year</b> 3rd y	ear students or above	Number credits	r of		2	Year	/semesters	2025/First semester	
Days and Fri.1 periods		s style	Lecture (Face-t		ice cours	se)	Language of instruction	Japanese	
[Overview and pu	urpose of the	course]							
[Course objective	es]								
[Course schedule	e and content	s]							
,4times,									
,4times,									
,3times,									
,3times,									
,1time,									
[Course requirem	nents]								
None									
[Evaluation meth	ods and polic	ev]							
		· <b>y</b> ]							
[Textbooks]									
[References, etc.]	1								
( Reference boo	_								
						<sub>c</sub>	Continue to 原子	子炉物理学(原) <b>(2)</b>	

原子炉物理学(原)**(2)** 

# [Study outside of class (preparation and review)]

(Other information (office hours, etc.))

\*Please visit KULASIS to find out about office hours.

### [Courses delivered by instructors with practical work experience]

(1) Category

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

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

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

Course nu	ımbe	er U-	ENG25 35	5233 LJ75									
Course title (and course title in English)		昌回折学( y Diffracti				nan and	ructor's ne, job tit I departm iffiliation	nent	Part-time Lec	turer,OKUDA HIROSHI			
Target yea	r	3rd year stude	ents or above	Number credits	of	of 2 Year/semesters 2025/Second seme							
Days and periods	F	ri.2	Class	style	Lecture (Face-to-face course) Language of instruction Japanese								
[Overview	and	d purpos	urpose of the course]										
									are, the prope es will be lec	rties of X-rays, X-ray tured.			
[Course o	bjec	tives]											
Students wil crystalline st		•		•	•	•	U		ourse works o	f X-ray properties,			
[Course s	che	dule and	l content	s]									
ray filter6.G Crystallogra Practical exa lattices6. Cry Description projection Diffraction b Calculation Diffraction b Structural ar Determination	ener phy, mpl ystal of cr by cr of str by a j alys on of attice Rec	ation of x- 3times,1.0 es of cryst line struct ystal plan ystals,3tin ructure fac powder sa es of cubi Bravais# e and diffr iprocal lat	-rays One diment tals4. Body tures of sev tes and dire mes,1. Diff ctors imple,1tim to systems, 039 lattice raction cor ttice and d	sional crys y-centered veral comp ections,1tin fraction by he,1. Princip time,1. Det in cubic syndition,3tim	tal symi cubic, fa ounds ne,1. De crystall ple of di terminat ystems nes,1. D	metrace- escri ine l iffration efin	ry2.7 cry centered ption of lattice2. ctomete of a latt	ystal sy d cubic f lattice Bragg r2. X-1 ice par	ystems and 14 c and hexagor e planes and c conditions a ray diffraction rameter in cul	.X-ray absorption5.X- 4 Bravais#039 lattices3. hal close-packed directions2. Stereo nd scattering angle3. h by powder sample bic systems2. Reciprocal lattice and			
None	-qui	i cincinto	<b>'</b>										
[Evaluatio The course v			•		a midte	erm (	examina	ntion (4	40%) and a fi	nal examination (60%).			
								c	Continue to 結				

結晶回折学(材)**(2)** 

### [Textbooks]

Instructed during class

# [References, etc.]

 $(\ {\rm Reference\ books\ })$ 

### [Study outside 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.

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

										未更新
Course nu	ımbe	er U-EN	G25 2	5300 LJ71	U-EN	G25	25300	LJ77		
Course title (and course title in English)		・クトロニクス oduction to El		(	情報	nan and	tructor's ne, job tit I departm offiliation	nent	Associate Profe Graduate Sch	nool of Informatics essor,AWANO HIROMITSU nool of Informatics ofessor,UENO REI
Target yea	r	2nd year students o	or above	Number credits	of		2	Year	/semesters	2025/First semester
Days and periods	N	Ion.4	Clas	s style	Lecture (Face-t		ice cour	se)	Language of instruction	Japanese
[Overview	[Overview and purpose of the course]									
In this course, students will learn about the basic characteristics of electronic circuits, digital circuits that are indispensable in today's information society, and computer architecture as hardware for running programs.										
[Course o	bjec	tives]								
[Course objectives] In this course, students will learn the minimum level of electronic circuits required for research in the Department of Physics and the Department of Computer Science, and as researchers and engineers.										
[Course s	che	dule and co	ntent	:s]						
depending o * Fundamen * Amplificat * Fundamen algebra, Kar * Sequential * Circuit De * Digital rep which is ofte	n the tals of tals of naug circ lay ( reset	e lecture polic of Electronic Circuits (1 cla of digital logi gh diagrams, e uits (1 class) 1 class) Learn ntation of nur sed in scientifi	y of th Circui uss) Le c circu etc. Learn n abou nbers ic and	ts (3 clases) earn about a nits (1 class) how to con t what deter (1 class) Le technologie	r and the Dearn Dearn Dearn Dearn Struct ci rmines t carn how cal calcu	e ba DC, ation fund ircui the c v to ulati	ckgroun , AC, an n circuit damenta its with operating represen ons.	nd and ad trans its using ils of lo interna g speed nt num	understanding sient analysis. g operational ogic circuits i ll states. d of a circuit. bers includin	amplifiers. ncluding Boolean g floating point format,
<ul> <li>* Arithmetic logic circuits (1 class) Learn about the structure of arithmetic circuits for digitally represented numbers.</li> <li>* Overview of computer architecture (1 class) Learn about the configuration of computers, the hardware that executes programs.</li> <li>* Machine language (1 class) Learn about the relationship between high-level languages such as C and instructions that can be interpreted by hardware.</li> <li>* Composition of computer architecture (2 classes) Learn about the composition and operation of computers, using a processor that can execute simple instructions as an example.</li> <li>* Integrated circuit manufacturing process (1 class)</li> </ul>										
Translated w	Translated with www.DeepL.com/Translator (free version) Continue to エレクトロニクス入門 (機字) 情報 (2)									

# エレクトロニクス入門(機宇) 情報 (2)

### [Course requirements]

Students who do not specialize in electrical and electronic engineering can take this course if they have some prior knowledge of high school physics.

### [Evaluation methods and policy]

Multiple report assignments will be given during the course to evaluate the achievement of the objectives.

#### [Textbooks]

Not used

### [References, etc.]

### ( Reference books )

Introduced during class

### [Study outside of class (preparation and review)]

Students are required to review mathematical expressions using complex numbers in advance.

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

Course nu	umbe	er	U-EN	G25 35	5301 LJ51	U-EN	G25 35301	LJ25	U-ENG25 3	5301 LJ71	
Course title (and course title in English)	course         生体機械工学           in         Biomechanical Engineering							tle, nent	Institute for Life and Medical Sciences Professor,SHINTAKU HIROFUMI Institute for Life and Medical Sciences Professor,ADACHI TAIJI Graduate School of Engineering Professor,YOKOKAWA RYUUJI Graduate School of Engineering Professor,INOUE YASUHIRO		
Target yea	r	3rd ye	ear students	or above	Numbe credits	r of	2	Year	r/semesters	2025/Second semester	
Days and periods		Ved.	4	Class	s style	Lecture (Face-t	o-face cour	se)	Language of instruction	Japanese	
[Overview	anc	l pu	irpose	of the	course]						
は生体およ	び機 組織	<sup>後</sup> 械を えく	を包含し アールて	たシス 観察さ	くテム全体 される複雑	の設計 な生命	指針を得る 現象につい	っ上で <u>i</u> いて物 <sup>3</sup>	重要である. 理学的視点か	からの生命現象理解 そこで,生体分子, いら理解し,その知見	
[Course o	bjec	tive	es]								
材料力学,	流体 ぶ.	力学	学等の機 れにより	《械工学 ,機柄	└科目が生 城工学に対	体シス	テムの理解	ある	いは制御の上	生配当である熱力学 , で重要な洞察を与え 学の立場から生命現	
[Course s	cheo	dule	and co	ontent	s]						
1週:生体 生体機械工					のから組結	の器官	あるいは	t体全	体まで、その	)機能と構造を物理工	

生体機械工学は,生体分子,細胞から組織や器官,あるいは体全体まで,その機能と構造を物理工学の観点から解析し,得られる知見を医療や福祉に応用し,社会的な諸問題の解決に寄与する学問である.第1週は,生命現象を定量的に取り扱い,その背後にある物理の理解に必要な数理モデルの考え方,数や量の見積もり方を紹介する.

2週-4週:生体機械工学と熱力学

細胞を構成する様々な小器官は,それぞれの固有の機能を発揮できる形や構造をしている.これらの小器官の形状を考察する上で力学的・熱的平衡に注目する.細胞小器官スケールでは熱的な擾乱の取り扱いが必要であることから平衡の統計力学の手法を紹介する.ボルツマンの関係式から得られるエントロピーを用いてエントロピー最大化,自由エネルギーの最小化と熱的平衡の関係について学ぶ.さらに,系の微視的状態の実現確率とエネルギーの依存関係がボルツマン分布で記述できることを示す.

5-6週:生体機械工学と材料力学

自由結合鎖モデルを導入し,DNAのエントロピー弾性を力学的・熱的平衡を通して理解することを 目指す.1次元のランダムウォークを仮定し,末端間距離の確率密度関数を導出する.そして,自 由結合鎖のエントロピー弾性を特徴づけるばね定数を導出し,その特徴について議論する.また, エントロピー弾性の簡単な実験を実施する.

Continue to 生体機械工学(2)

生体機械工学(2)

7 - 8週:生体機械工学と流体力学 生体分子は常に熱的な擾乱にさらされており,例えば細胞質内部においてもブラウン運動を示す. 1次元のランダムウォークがブラウン運動のモデルとしても有用であることを紹介し,第一種散逸 揺動定理について考察する.まずは,エントロピーを出発点に希薄溶液系における浸透圧を統計力 学的な方法で導出する.その上でミクロスケールの球形粒子の拡散係数がストークス-アインシュ タインの関係式として与えられることを示す.

9 - 10週:生体機械工学と機械力学 ブラウン運動のモデルとしてランジュバン方程式が有用であることを紹介し,第二種散逸揺動定理 について考察する.ランジュバン方程式を用いて平均二乗変位を導出し,それがブラウン粒子の運 動を特徴づけることを示す.また,速度相関から揺動力の大きさについて考察する.

#### 11-12週:生体機械工学と生物学

受精卵から始まる個体発生を経て,体を構成する器官がどのように形作られるのか,また,成体に おける組織のリモデリングや再生現象を紹介し,先端的な生体機械工学の応用に必要となる幹細胞 分化,形態形成,生体適応などの生物学の基礎的事項について紹介する.さらに,形態と機能の観 点から、進化的に獲得された生物の形作りと構造最適化設計との類似性を解説し,力学を基礎とす る機械工学の生物学への応用や,その逆として,生物に着想を得た構造設計工学への新たな展開を 解説する.

13週:生体機械工学による生体模倣システム

生体模倣システム(Microphysiological systems (MPS))とは,マイクロチップ上に幹細胞や前駆細胞から誘導したミニ臓器を構築し,培養液などの送液システム,各種分析装置などをパッケージしたヒト生理機能を模倣するシステムである.ヒトiPS細胞からの形態形成や腫瘍微小環境における生化学シグナルの解析といった基礎研究、創薬や再生医療などの応用研究に展開されており,MPSの設計開発における生体機械工学からの展開を解説する.

14週:生体機械工学による生体計測

最先端科学研究では生体機能発現の構成的理解を目指し1つ1つの細胞機能を詳細に計測する1細胞 解析が用いられており,そこには多くの機械工学技術が活用されている.ここでは細胞分化や細胞 間相互作用の解析などの具体例を示しながら1細胞解析技術の開発設計における生体機械工学の応 用を解説する.

#### [Course requirements]

None

### [Evaluation methods and policy]

レポート課題,期末試験を総合して判定する.

### [Textbooks]

Not used

Continue to 生体機械工学(3)

生体機械工学(3)

#### [References, etc.]

#### (Reference books)

Rob Phillips, Jane Kondev, Julie Theriot 『細胞の物理生物学』(共立出版) David Boal 『細胞のメカニクス』(森北出版) 土井正男 『統計力学』(朝倉書店) 田崎晴明 『熱力学=現代的な視点から』(培風館) 米沢富美子 『ブラウン運動』(共立出版)

[Study outside of class (preparation and review)]

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

Course nu	Imbe	er	U-EN	G25 3	5302 LJ75								
Course title (and course title in English)			幾材料学 ic Structu		) Inorganic M	aterials	nan and	ructor's ne, job tit departm ffiliation	nent		nool of Engineering KO ATSUTO		
Target yea	r	3rd ye	ear students	or above	Number credits								
Days and periods	г	Tue.2	2	Class	s style	Lecture (Face-t		ce cours	se)	Language of instruction	Japanese		
[Overview	and	d pu	irpose c	f the	course]								
本講義では	,原	<b> </b>	,分子,	固体の	D電子状態	の理解	に有	雨な量	子化学	学やバンド理	ることが重要となる		
[Course o	bjed	ctive	es]										
-	よび	ダバン	<u>-</u> ンド理論	の基礎	楚事項に加	え , そ	ne	を材料	科学	こおける問題	[に応用するための方		
[Course s	che	dule	e and co	ntent	:s]								
電子状態理 て講述する	論の ・	)基础	楚,2回,波	動関数	枚,一電子。	エネル	ギー	・の性質	や物理	里的意味,自	ついて講述する . 由電子モデルについ 切る理論や近似につ		
いて講述す 量子化学計 トリー近似 バンド計算 理論,擬ポ	る算おのテの	) 理び し で 論 シ 子 橋	侖と近似 と」 と」 と」 と ル よ と 化	お - よて ういう して ういう して ういう して ういう して ういう して ういう して ういう して ういう ういう ういう ういう ういう ういう ういう ういう ういう うい	び手法(2),3  クォック近( F法,2回,固 枚の基底関 ≧,2回,分子	回,電子 以を中小 体の計 数展開 ・固体	状心算をの	影の理解 講述し こ 有用な 記 子 構造	解に有) ,適用 :バン 諸述する :および	用な量子化╡ 月例を紹介す ド計算手法に る. び化学結合に	学計算について , ハー		
[Course re 前期開講科	-		_	料学	1」の学習	内容を	習得	してい	1320	とが望ましい	١		
[Evaluatio	n m	eth	ods and	polic	cv1								
						レポー	トσ.	)結果を	加味	することがあ	53.		
		-								continue to 量子	·無機材料学(材) <b>(2)</b>		

### 量子無機材料学(材)**(2)**

# [Textbooks]

プリントを配布

#### [References, etc.]

#### (Reference books)

A.ザボ,N.S.オストランド 著,大野公男,阪井健男,望月祐志 訳 『新しい量子化学 電子構造の理 論入門 上 』(東京大学出版会)ISBN:9784130621113 原田義也 『量子化学 上巻』(裳華房)ISBN:9784785330736

### ( Related URLs )

http://cms.mtl.kyoto-u.ac.jp/seko.html

### [Study outside of class (preparation and review)]

講義中に配布される課題を実施してください.

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

Course num	ber	U-EN	G25 4	5995 GJ77							
Course title (and course 株 title in G English)		究1(機 tion Thesi	-			nan and	tructor's ne, job tit I departm offiliation	nent		nool of Engineering SHIWAKI SHINJI	
Target year	4th y	year students o	or above	Number credits	r of		4	Year	/semesters	2025/Intensive, First semester	
Days and periods	Inte	nsive	Clas	s style	Semina (Face-t		ace cours	se)	Language of instruction	Japanese	
[Overview and purpose of the course] 担当教員の指導のもと、機械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 obj	ectiv	es]									
課題設定、関	連研	究の調査	、研究	記計画の立	案、報	告の	)作成な	:どをi	通じて、研究	<b>活動について学ぶ。</b>	
[Course sch	nedul	e and co	ntent	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											
<b>[Course req</b> 物理工学科機 ること。		-	3-J	スが指定す	る、入	学年	≡次に対	応した	こ特別研究着	<b>i手条件を満たしてい</b>	
[Evaluation			-								
成績評価は一	·連の	研究活動	の実放	も状況に基	づいて	行う	Ò.				
[Textbooks] 配属研究室で		される。									
[References	s, etc	.]									
( <b>Reference books</b> ) 木下是雄 『理科系の作文技術』(中央公論新社 (新書))ISBN:9784121006240											
[Study outs	ide o	f class (p	orepa	ration and	d revie	w)]					
各指導教員の	指示	に従うこ	と。								
(Other information (office hours, etc.))											
*Please visit KULASIS to find out about office hours.											

Course num	ber	U-EN	G25 4	5995 GJ77							
	and course特別研究1(機)name, job title, and departmentGraduate School of Engineering Professor,NISHIWAKI SHINJI										
Target year	4th y	year students o	or above	Number credits	r of		4	Year	/semesters	2025/Intensive, Second semester	
Days and periods	ds Intensive Class style Seminar (Face-to-face course) Language of instruction Japanese										
- 担当教員の指 体的に取り組	[Overview and purpose of the course] 担当教員の指導のもと、機械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 obj	ectiv	es]									
課題設定、関	連研	究の調査	、研究	記計画の立	案、報	告の	)作成な	:どを)	通じて、研究	『活動について学ぶ。	
[Course sch	nedul	e and co	ntent	ts]							
研究課題の設 5 ~ 9 回 先行研究の調 1 0 ~ 1 2 回 設定課題の新 1 3 ~ 1 5 回	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										
<b>[Course req</b> 物理工学科機 ること。		-	3-;	スが指定す	る、入	学年	三次に対	応する	5特別研究着	言手条件を満たしてい	
[Evaluation			-								
成績評価は一	·連の	研究活動	の実放	も状況に基	づいて	行う	Ò.				
[Textbooks] 配属研究室で		される。									
[References	s, etc	.]									
( <b>Referenc</b> 木下是雄『珰			術』	(中央公論	斎新社 (	新書	;) ) ISB	N:9784	4121006240		
[Study outs	ide o	f class (p	orepa	ration and	d revie	w)]					
各指導教員の指示に従うこと。											
(Other information (office hours, etc.))											
*Please visit K	ULA	SIS to find	l out a	about office	hours.						

Course nu	urse number U-ENG25 45995 GJ77											
Course title (and course title in English)			₹1(材 on Thesi				name, job title, and department			Professor,KI Graduate Scl	nool of Engineering SHIDA KIYOUSUKE nool of Engineering ofessor,ICHII TAKASHI	
Target yea	r	4th ye	ar students (	or above	Number credits	of		4	Year	/semesters	2025/Intensive, First semester	
Days and periods	J	Inten	ensive <b>Class style</b> Seminar (Face-to-face course) Language of instruction Japanese								Japanese	
- 正副指導教 を主体的に	[Overview and purpose of the course] 正副指導教員の指導のもと、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 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。											
<b>[Course objectives]</b> 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、研究活動の進め方を習得 する。 <b>[Course schedule and contents]</b>												
設定課題候 先行研究の 設定課題候	補の 調査	)選定 〔 〔 〔 〔 〔 】	E(3回 發告(6Ⅰ	) 回)		6回)						
[Course re	equi	rem	ents]									
物理工学科	材料	科学	シコース	が指え	Eする入学	年次の	特別	J研究着	手条	牛を満たして	こいること	
<b>[Evaluatio</b> 成績は正副 料科学コー	指導	敎	しが一連	の研究		施状況	、作	■成した	:報告な	などに基づい	ヽて総合的に評価し材	
[Textbook	s]											
適宜指示す	る。											
[Reference	es, e	etc.]										
( Referer	nce	boo	ks)									
[Study out		e of	class (j	orepa	ration and	d revie	w)]					
適宜指示す												
(Other inf			•									
*Please visit	KU	LAS	IS to find	d out a	bout office	hours.						

Course num	ber	U-EN	G25 4	5995 GJ77								
Course title (and course 特 title in G English)		究1(エ tion Thesi	-			nar anc	tructor's ne, job tit I departm affiliation	nent		hool of Energy Science IATANI SHIYOUJI		
Target year	4th y	year students o	or above	Number credits	r of		4	Year	/semesters	2025/Intensive, First semester		
Days and periods	Inte	nsive	Clas	s style	Semina (Face-t	eminar Face-to-face course) Language of instruction Japanese						
[Overview and purpose of the course] 各区分の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 obj		-			<u> </u>	4		18-4-3	7.1			
課題設定、度 [Course sch					.条、報	告0.	)作成な	:とを)	通じて、研究	記録について学ぶ。		
1~4回 研究課題の設 5~9回 先行研究の調 10~12回 設定課題の新 13~15回 研究計画の立	]査、 ] [規性、 ] [案	、独創性	等の <u>t</u>	<b></b>								
物理工学科エ	ネル	ギー応用	工学:	コースが指	定する	入学	を年次の	)特別	研究着手条件	牛を満たしていること。		
[Evaluation												
		美施状况	に 是 :	ついて行う	0							
[Textbooks] Not used												
[References	s, etc.	.]										
(Referenc	e boo	oks)										
[Study outs			-	ration and	d revie	w)]						
各指導教員の												
( Other information (office hours, etc.) ) *Please visit KULASIS to find out about office hours.												
*Please visit k	ULA	SIS to find	1 out a	bout office	hours.							

Course numb	ber	U-ENO	G25 4	5995 GJ77								
Course title (and course 特, title in Gr. English)		究1(原 tion Thesi				name and c	uctor's e, job tit departm filiation	tle, nent	KANKEI KY Graduate Scl Professor,HI Graduate Scl	Graduate School of Engineering ANKEI KYOIN Graduate School of Engineering Professor,HINOKI TATSUYA Graduate School of Engineering Professor,MAJIMA TAKUYA		
Target year	4th y	ear students o	or above	Number credits	r of	2	1	Year	/semesters	2025/Intensive, First semester		
Days and periods	Intensive Class style (Face-to-face course) Language of instruction Japanese									Japanese		
[Overview ar	nd pi	urpose o	f the	course]								
	組む。	。この研	究活動	前を通じて	課題解	決能	力を習			やのための研究活動に こ成果を関連研究と比		
[Course obje		-										
課題設定、関連	<b>連研</b>	究の調査	、研究	記計画の立	案、報	告の	作成な	:どを)	通じて、研究	『手法を習得する。		
[Course sche	edul	e and co	ntent	s]								
1 ~ 4回 研 5 ~ 9回 先 1 0 ~ 1 2 回 1 3 ~ 1 5 回	行研 設	究の調査、 定課題の	新規性		等の検	討						
[Course requ	iiren	nents]										
物理工学科原·	子核	工学コー	スが打	旨定する入	学年次	の特別	別研究	着手	条件を満たし	っていること		
[Evaluation r	neth	ods and	polio	cy]								
成績評価は一う	連の	研究活動	の実放	も状況に基	づいて	行う。	0					
[Textbooks]												
Not used												
[References,	etc.	]										
( <b>Reference</b> 各指導教員が約												
[Study outsid	de o	f class (p	orepa	ration and	d revie	w)]						
各指導教員の	指示	に従うこ	L									
( Other infor	mati	on (offic	e hou	urs, etc.) )	)							
*Please visit K	JLA	SIS to find	l out a	bout office	hours.							

Course nu	mbe	r U-EN	G25 4	5995 GJ77							
	le       Instructor's         se       特別研究1(宇)         Graduation Thesis 1       Instructor's         of affiliation       Graduate School of Engineering         Professor, TAKATA SHIGERU										
Target year	, ,	4th year students of	or above	Number credits	r of		4	Year	/semesters	2025/Intensive, First semester	
Days and periods	d Intensive Class style (Face-to-face course) Language of instruction Japanese										
[Overview	and	d purpose o	of the	course]							
学,制御工 動を主体的 と比較し,・	学, に取 その	機能構造力 (り組む . こ )意義や重要	学,素 の研究	<sup>熟工学)に</sup> 究活動を通	:関する <sup>;</sup> じて課:	研究 題解	₹課題を 解決能力	:設定) )を習(	し,その課題	, 流体数理学 , 推進工 夏解決のための研究活 られた成果を関連研究	
[Course of	-	_									
課題設定,	関連	研究の調査	,研究	<sup>え</sup> 計画の立	案,報	告 <i>0</i>	)作成な	:どをi	通じて,研究	記話動について学ぶ.	
-	chec	dule and co	nten	ts]							
1~4回 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	調査 回 新規 回	:,報告 ]性,独創性	等の村	<b></b> ( ()							
[Course re											
					入学年	次の	)特別研	究着	手条件を満た	こしていること.	
-		ethods and	-								
一連の研究	活動	)の実施状況	に基?	<u> ブいて評価</u>	する.						
[Textbooks	s]										
Not used											
[Reference	es, e	etc.]									
( <b>Referen</b> 各担当教員)			に応し	じて指示す	る.						
[Study out	[Study outside of class (preparation and review)]										
指示された参考書および学術論文等を学期をかけて読み進めること.											
(Other inf	orm	nation (offic	e ho	urs, etc.) )	)						
*Please visit	KUI	LASIS to find	d out a	about office	hours.						

Course nu	rse number U-ENG25 45995 GJ77												
			〒1(材 on Thesi				name, job title, Pr and department Gr			Professor,KI Graduate Scl	Graduate School of Engineering Professor, KISHIDA KIYOUSUKE Graduate School of Engineering Associate Professor, ICHII TAKASHI		
Target year	r	4th ye	ar students o	or above	Number credits	<sup>r</sup> of		4	Year	/semesters	2025/Intensive, Second semester		
Days and periods	]	Inten	sive	Class	s style	Semina (Face-t		ce cours	se)	Language of instruction	Japanese		
[Overview	and	d pu	rpose o	f the	course]								
を主体的に 比較し、そ	[Overview and purpose of the course] 正副指導教員の指導のもと、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 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。												
-	<b>[Course objectives]</b> 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、研究活動の進め方を習得 する												
[Course so	che	dule	and co	ntent	·s]								
設定課題候 先行研究の 設定課題候	調査	Ē、 🛉	<b>6</b> 6 (6 [	回)	<del>〕</del> の検討(	6回)							
[Course re	qui	rem	ents]										
物理工学科	材料	科学	ダコース	が指定	Ĕする入学	年次の	特別	」研究着	手条件	牛を満たして	こいること		
[Evaluatio	n m	etho	ods and	polic	су]								
成績は正副 料科学コー					記活動の実	施状況	、作	■成した	:報告な	などに基づい	1て総合的に評価し材		
[Textbook	s]												
適宜指示す	る。												
[Reference	es, e	etc.]											
(Referen	nce	boo	ks)										
[Study out	tsid	e of	class (	orepa	ration and	d revie	w)]						
適宜指示す	る。												
(Other inf	orm	natio	on (offic	e hou	urs, etc.)								
*Please visit			•										

Course num	ber	U-EN	G25 4	5995 GJ77							
Course title (and course 株 title in G English)		究1(エ tion Thesi	-			nan and	tructor's ne, job tit I departm affiliation	nent		hool of Energy Science IATANI SHIYOUJI	
Target year	4th y	year students o	or above	Number credits	r of		4	Year	/semesters	2025/Intensive, Second semester	
Days and periods	Inte	Intensive Class style Seminar (Face-to-face course) Language of instruction Japanese									
[Overview and purpose of the course] 各区分の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 obj 運動設定 問		-	ΣΠZ	で計画のさ	安起	生の		いた	るいて 四名	記動について学ぶ。	
标题设定、 )美 [Course sch					.宋、刊		71-112/9	<u>ر</u> ج ۲		の理測とフロビチの。	
1~4回 研究課題の設 5~9回 先行研究の調 10~12回 設定課15回 研究計画の立	]査、 <sup>[]</sup>     [規性、   [案	、独創性	等の村	<b> </b>							
<b>[Course req</b> 物理工学科工		-	工学:	コースが指	定する	入学	を年次の	)特別研	研究着手条件	‡を満たしていること。	
[Evaluation			-	-							
一連の研究活		実施状況	に基:	ブいて行う	0						
[Textbooks] Not used											
[References		-									
(Referenc	e boo	oks)									
[Study outs			-	ration and	d revie	w)]					
各指導教員の			-								
( Other information (office hours, etc.) ) *Please visit KULASIS to find out about office hours.											
*Please visit K	.ULA	SIS to find	1 out a	bout office	hours.						

Course nur	nber	U-ENO	G25 4:	5995 GJ77								
Course title (and course title in English)		究1(原 iion Thesi	-			Instructor'sKANname, job title,Graand departmentPropositionof affiliationGra			KANKEI KY Graduate Scl Professor,HI Graduate Scl	raduate School of Engineering NKEI KYOIN raduate School of Engineering ofessor,HINOKI TATSUYA raduate School of Engineering ofessor,MAJIMA TAKUYA		
Target year	4th y	ear students o	or above	Number credits	r of		4	Year	/semesters	2025/Intensive, Second semester		
Days and periods	nd Intensive Class style (Face-to-face course) Language of instruction Japanese									Japanese		
[Overview a	and pu	urpose o	f the	course]								
主体的に取り 較し、その意	)組む。 意義やi	、この研究 重要性等	究活重	カを通じて	課題解	決能	〔力を習			快のための研究活動に こ成果を関連研究と比		
[Course ob	-	-		···	· · · -							
					案、報	告の	)作成な	:どをi	通じて、研究	『手法を習得する。		
[Course sc			ntent	s]								
1 ~ 4 回    瓴 5 ~ 9 回 <i>ජ</i> 1 0 ~ 1 2 區 1 3 ~ 1 5 區	も行研? 回 設な	究の調査、 定課題の	新規性		等の検	討						
[Course red	quiren	nents]										
物理工学科原	夏子核.	工学コー	スが打	『定する入	、学年次	の特	別研究	着手夠	条件を満たし	っていること		
[Evaluation	meth	ods and	polic	:y]								
成績評価は−	−連の	研究活動	の実施	も状況に基	づいて	行う	) <sub>o</sub>					
[Textbooks	]											
Not used												
[Reference:	s, etc.	]										
( <b>Referend</b> 各指導教員 <i>t</i>												
[Study outs	side o	f class (p	orepa	ration and	d revie	w)]						
各指導教員0	D指示	に従うこ	L									
( Other info	ormati	on (offic	e hou	irs, etc.) )	)							
*Please visit I	KULAS	SIS to find	l out a	bout office	hours.							

Course nu	umbe	er	U-ENO	G25 4:	5998 GJ77								
Course title (and course title in English)		特別研究 2 (機) Graduation Thesis 2 「機」 Graduation Thesis 2 「機」 Graduation Thesis 2 「人機」 Of affiliation Graduate School of Engineering Professor,NISHIWAKI SHINJI											
Target yea	r	4th year	students of	or above	Number credits	r of		6	Year	/semesters	2025/Intensive, Second semester		
Days and periods	]	Intensi	ive	Class style Seminar (Face-to-face course) Language of instruction Japanese									
[Overview	and	d pur	pose o	f the	course]								
- 担当教員の 体的に取り し、その意	指導 組む 義や	i い い で で で で で で い で で む い む い む い む い む	と、機 の研究 性等に	械工学 活動を	ー 学に関する E通じて課	題解決	能力	」を習得			Dための研究活動を主 伐果を関連研究と比較		
[Course o	-		-										
課題設定、 まとめ、発									行う。	これらの反	<b>戈果を特別研究として</b>		
[Course s	che	dule a	and co	ntent	:s]								
- 1 回					-								
- 回 設定課題の 2 ~ 1 0 回		!性、	独創性	等の種	<b> </b>								
		<b>緑</b> 討	の実施	結果	見の考察、	実験ま	たは	<b>t</b> 理論検	討の調	計画の修正な	などにより研究を遂行		
11~13							/ - 10						
成果のまと	_	特別	研究報	告書0	D執筆、学	土発表	会Œ	っための	資料的	乍成			
14回	•••	1.777			2 // <del>-</del> - 1	<b>1</b> 70 K	4		22111	1 7-20			
	での	)発表											
15回													
特別研究報	告書	の訂	正										
10							_						
[Course re			-			`	))/ L	->_					
								-次に対	応する	る特別研究着	<b>i</b> 手条件を満たしてい		
ること。ま	た、	特別	研究 13	を腹側	<b>診済みで</b> あ	ること	D						
[Evaluatio	n m	etho	ds and	polic	cv]								
-				•		十発表	会に	おける	発表の	カ容、特別を	研究報告書の内容に基		
づいて行う		_ • • • • • • • •	/ U/ II ±/J	~ > > </th <th></th> <td><b>1</b>70 K</td> <th></th> <th></th> <th></th> <th>10,000</th> <th></th>		<b>1</b> 70 K				10,000			
	•												
						• – – •		•	c	Continue to 特			

# 特別研究2(機)**(2)**

# [Textbooks]

各研究室において指定する。

### [References, etc.]

(Reference books)

木下是雄 『理科系の作文技術』(中央公論新社(新書)) ISBN:9784121006240

# [Study outside of class (preparation and review)]

各指導教員の指示に従うこと。

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

Course number	U-ENG25 4	5998 GJ77								
Course title (and course title in English)特別研究 2 ( 機 ) Graduation Thesis 2Instructor's name, job title, and department of affiliationGraduate School of Eng. Professor,NISHIWAKI										
Target year 4th y	ear students or above	Number of credits	6	Year	/semesters	2025/Intensive, First semester				
Days and Inter periods	and Intensive Class style (Face-to-face course) Language of instruction Japanese									
[Overview and pu	urpose of the	course]								
	この研究活動を	E通じて課題解注	央能力を習得			Dための研究活動を主 伐果を関連研究と比較				
[Course objective	es]									
課題設定、関連研究 まとめ、発表するる				を行う。	これらの成	<b>找果を特別研究として</b>				
[Course schedule	e and content	s]								
11~13回 成果のまとめ、特別 14回 学士発表会での発調 15回 特別研究報告書の語	討の実施、結界 引研究報告書の 表 訂正	その考察、実験ま				≩どにより研究を遂行				
[Course requirem	-				고 쓰는 다니가파 다리 수					
物理工学科機械ン ること。また、特別				小心 9 な	る特別研究者	<sup>1</sup> 手条件を満たしてい				
[Evaluation meth	ods and polic	;y]								
成績評価は一連のそ づいて行う。	研究活動の実放 	■状況、学士発表	長会における 			研究報告書の内容に基 				
					Jonunue IO 桁	がいでして(1茂ノ <b>(4)</b>				

# 特別研究2(機)**(2)**

# [Textbooks]

配属研究室で指定される。

### [References, etc.]

(Reference books)

木下是雄 『理科系の作文技術』(中央公論新社(新書)) ISBN:9784121006240

# [Study outside of class (preparation and review)]

各指導教員の指示に従うこと。

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

Course nu	umbe	umber U-ENG25 45998 GJ77										
Course title (and course title in English)		J研究 2 luation		-			name, job title, and departmentProfessor,KISH Graduate School			nool of Engineering SHIDA KIYOUSUKE nool of Engineering ofessor,ICHII TAKASHI		
Target yea	r	4th year st	tudents or	: above	Number credits	of		6	Year	/semesters	2025/Intensive, Second semester	
Days and periods	Ι	ntensive	ensive <b>Class style</b> Seminar (Face-to-face course) Language of instruction Japanese									
[Overview	anc	l purpo	ose of	the	course]							
- 正副指導教 を主体的に	[Overview and purpose of the course] 正副指導教員の指導のもと、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 を主体的に取り組む。得られた成果を客観的に評価し、論理に基づいて説明する能力を習得する。 最終的に研究論文としてまとめる能力を養う。											
[Course o	bjec	tives]										
-	<b>Course objectives]</b> 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、研究活動の進め方を習得 「る。											
[Course s	ched	dule ar	nd cor	ntent	s]							
設実成特実特 上定験果別験別 記録実ま究実のの研の研の研の研の研の研 のりかい しんしょう しんしょう しんしょう しんしょう しんしょう しんしんしん しんしんしんしん しんしんしんしん しんしんしんしんしん しんしんしん しんしんしん しんしんしん しんしんしん しんしんしん しんしんしんしん しんしんしん しんしんしん しんしんしんしん しんしんしんしんしんしんしんしん しん	、 結 、 間 、 告	果の考 中間会で で う の 執 筆	察、 察の た で の 発 で の た の た の た で の た で の た で の た で の た で の た で の で の た の で の で の た の で の で の で の で の で の で の で の で の の で の で の で の で の の で の で の で の で の で の で の で の の で の の で の の で の で の の で の の の で の の の の の の の の の の の の の	実験の1 長い (1 に し に し に し に し に し に し に し の に し し の の に り の の の の の の の の の の の の の の の の	†画の修正 ⊃資料作成 └ 回 ) †画の修正	などに ( 2 回 などに	) より	研究を	·遂行			
[Course re	equi	rement	ts]									
- 特別研究1	・ を履	修済み	- 	<u>L</u>								
[Evaluatio	n m	ethods	s and	polic	;y]							
							• •			おける発表内 議で承認する	]容、および特別研究 ら。	
[Textbook	s]											
」 適時指示す	<u>-</u> る。											
[Referenc	es, e	etc.]										
( Referer	nce	books	)						<sub>c</sub>	continue to 特	别研究 2 (材) <b>(2)</b>	

# 特別研究2(材)**(2)**

\_ \_ \_

# [Study outside of class (preparation and review)]

適時指示する。

(Other information (office hours, etc.))

Course nu	imbe	er	U-EN	G25 4	5998 GJ77						
Course title (and course title in English)			究2(エ ion Thesi	-			nan and	ructor's ne, job tit I departm Iffiliation	nent		nool of Energy Science IATANI SHIYOUJI
Target yea	r	4th ye	ear students o	or above	Number credits	of		6	Year	/semesters	2025/Intensive, Second semester
Days and periods	]	Inten	nsive	Clas	s style	Semina (Face-t	ar -to-face course) Language of instruction Japanese				
[Overview	[Overview and purpose of the course]										
各区分の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 o	bjec	tive	es]								
課題設定、関連研究の調査、研究計画の立案、実験と検証を行う。これらの成果を特別研究として まとめ、発表することを通じて、研究活動について学ぶ。											
[Course schedule and contents]											
2~10回 実験12 1 1 1 2 1 2	- 1回 設定課題の新規性、独創性等の再検証 2~10回 実験の実施、結果の考察、実験計画の修正などにより研究を遂行 11~12回 成果のまとめ、中間発表のための資料作成										
[Course re	-		-	<del></del>		<u> </u>	<u>, ,,,</u>				
						正りる.	人子	中次の	特別的	<b>卅</b> 究看于余竹	‡を満たしていること。
[Evaluatio	n m	ethe	ods and	polio	>y]						
ー連の研究 ·	活動 	」の 写 一	<b>∈ – −</b>	、中間 	<sup>周</sup> 発表会に 	おける 	発表	表内容、 			O内容に基づいて行う。 別研究2 (エネ) <b>(2)</b>
									Ľ	onunue lU 付	ソリ₩「フレ᠘(エヤノ <b>(ム)</b>

## 特別研究2(エネ)**(2)**

## [Textbooks]

Not used

## [References, etc.]

 $(\ {\rm Reference\ books\ })$ 

## [Study outside of class (preparation and review)]

各指導教員の指示に従うこと。

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

Course nu	umbe	er	U-EN	G25 4	5998 GJ77							
Course title (and course title in English)		特別研究2(原) Graduation Thesis 2						ructor's ne, job tit departm ffiliation	tle, nent	Graduate School of Engineering KANKEI KYOIN Graduate School of Engineering Professor,HINOKI TATSUYA Graduate School of Engineering Professor,MAJIMA TAKUYA		
Target yea	r	4th ye	ear students o	or above	Number credits	of		6	Year	/semesters	2025/Intensive, Second semester	
Days and periods	]	Inten	sive	Class	s style	Semina (Face-t	nar e-to-face course) Language of instruction Japanese					
[Overview and purpose of the course]												
特別研究1の成果を踏まえ、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に主体的に取り組む。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 o	bjec	tive	es]									
[900136 05]201743] 課題設定、関連研究の調査、研究計画の立案、実験と検証を行う。これらの成果を特別研究として まとめ、発表することを通じて、研究手法を習得する。												
[Course schedule and contents]												
1回 設定課題の新規性、独創性等の再検証 2~10回 実験の実施、結果の考察、実験計画の修正などにより研究を遂行 11回 成果のまとめ 12~14回 特別研究報告書の執筆 15回 特別研究報告会での成果発表(ポスター発表)												
[Course re	equi	rem	ents]									
						学年次	の特	F別研究	着手約	条件を満たし	っていること	
[Evaluatio	n m	ethe	ods and	polic	>y]							
成績評価は おける発表					<b>迤状況、特</b>	別研究	報告	書の内	]容、\$	寺別研究報告	言会(ポスター発表)に	
[Textbook	s]											
Not used												
[Reference	es, e	etc.]										
( <b>Referer</b> Introduced d												
[Study out	tsid	e of	class (p	orepa	ration and	d revie	w)]					
各指導教員の指示に従うこと												
(Other information (office hours, etc.))												
( <b>Other information (office hours, etc.)</b> ) *Please visit KULASIS to find out about office hours.												

Course nu	ımbe	er	U-EN	G25 45	5998 GJ77							
			:2(宇 on Thesi				nan and	ructor's ne, job tit departm ffiliation	nent	Graduate School of Engineering Professor,TAKATA SHIGERU		
Target yea	r	4th year	r students o	or above	Number credits	of		6	Year	/semesters	2025/Intensive, Second semester	
Days and periods	Intensive Class style Seminar (Face-to-face course)					Language of instruction	Japanese					
[Overview	and	l pur	pose o	f the	course]							
- 担当教員の 学,制御工	指導 学, に取	し のも 機能 い組	と,航 構造力 む.こ	空宇宙 学,熱 の研究		関する じて課題	研究 題解	記課題を 注決能力	:設定し を習る	」,その課題	流体数理学 , 推進工 夏解決のための研究活 られた成果を関連研究	
[Course o	bjec	tives	6]									
										ション含む) 舌動について	と検証を行う.これ ご学ぶ.	
[Course schedule and contents]												
1回 2~10定課題の 2~10 実験の実 11~12 成果の 13 研究の	, 回 め 5 回	課の 発表	考察 ,	実験言 の資料	十画の修正	などに、	より	り研究を	·遂行			
[Course re	qui	reme	ents]									
-	宇宙	基礎	<u>-</u> 工学コ	ースカ	「指定する	入学年	次の	)特別研	究着	手条件を満た	<u>-</u> し,特別研究1(宇)	
[Evaluatio	n m	etho	ds and	polic	;y]							
-	一連			-			おけ	る発表	内容	, 特別研究 <sup>執</sup>	8告書の内容に基づい	
	_								C	continue to 特	詞研究 2 (字) <b>(2)</b>	

### 特別研究2(宇)**(2)**

## [Textbooks]

Not used

#### [References, etc.]

( **Reference books**) 各担当教員から研究テーマに応じて指示する.

#### [Study outside of class (preparation and review)]

指示された参考書および学術論文等を学期をかけて読み進めること、

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

Course nu	e number U-ENG25 45998 GJ77										
Course title (and course title in English)			2(材 n Thesis				nam and	ructor's ne, job tit departm ffiliation	le,	Professor,KI Graduate Sch	nool of Engineering SHIDA KIYOUSUKE nool of Engineering ofessor,ICHII TAKASHI
Target yea	r	4th year	students o	or above	Number credits	of		6	Year	/semesters	2025/Intensive, First semester
Days and periods	Ι	Intensive Class style Seminar (Face-to-face course) Language of instruction Japanese						Japanese			
[Overview and purpose of the course]											
正副指導教員の指導のもと、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 を主体的に取り組む。得られた成果を客観的に評価し、論理に基づいて説明する能力を習得する。 最終的に研究論文としてまとめる能力を養う。											
[Course o	bjec	tives	]								
[Course objectives] 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、研究活動の進め方を習得 する。											
[Course schedule and contents]											
実験の実施 成果のまと 特別研究中 実験の実施 特別研究報	設定課題の新規性、独創性等の再検証(1回) 実験の実施、結果の考察、実験計画の修正などにより研究を遂行(7回) 成果のまとめ、中間発表のための資料作成(2回) 持別研究中間発表会での発表(1回) 実験の実施、結果の考察、実験計画の修正などにより研究を遂行(2回) 持別研究報告書の執筆(2回) 上記の研究活動に加え、特別研究報告書の執筆指導を受ける。										
[Course re	equi	remei	nts]								
- 特別研究 1			-	F							
[Evaluatio	n m	ethod	ds and	polic	:y]						
							• •			おける発表内 議で承認する	9容、および特別研究 ら。
[Textbook	s]										
- 適時指示す	<u>-</u> る。										
[Referenc	es, e	etc.]									
( Referer	nce	books	s) 						<sub>c</sub>	continue to 特	別研究 2 (材) <b>(2)</b>

### 特別研究2(材)**(2)**

\_ \_ \_

# [Study outside of class (preparation and review)]

適時指示する。

(Other information (office hours, etc.))

Course nu	imbe	er	U-EN	G25 4	5998 GJ77							
Course title (and course title in English)			究2(エ ion Thesi	-			nan and	ructor's ne, job tit I departm iffiliation	nent		nool of Energy Science ATANI SHIYOUJI	
Target yea	r	4th ye	ear students o	or above	Number credits	r of		6	Year	<b>Ir/semesters</b> 2025/Intensive, First ser		
Days and periods	]	Inter	nsive	Class	s style	Semina (Face-t	ar -to-face course) Language of instruction Japanese				Japanese	
[Overview	and	d pu	irpose o	f the	course]	•						
[Overview and purpose of the course] 各区分の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 o	bjec	tive	es]									
課題設定、関連研究の調査、研究計画の立案、実験と検証を行う。これらの成果を特別研究として まとめ、発表することを通じて、研究活動について学ぶ。												
[Course schedule and contents]												
2~10回 実験12 1 1 1 2 1 2	- 1回 設定課題の新規性、独創性等の再検証 2~10回 実験の実施、結果の考察、実験計画の修正などにより研究を遂行 11~12回 成果のまとめ、中間発表のための資料作成											
[Course re	-		-	<u>– – – –</u>		<u>⇔+</u> 7	<u> </u>			コウギイタル	トナンサイト・テレッファート	
						正する	人 字	*年次の	特別的	<b>卅</b> 究看于杀忤	を満たしていること。	
[Evaluatio	n m	eth	ods and	polic	¢y]							
ー連の研究 	活動 	)の  - 	<b>∈ – −</b>	、中間 	引発表会に 	おける <sup>:</sup>	発表 	表内容、 			)内容に基づいて行う。	
									Ľ	onunue lO 付	引研究2(エネ) <b>(2)</b>	

## 特別研究2(エネ)**(2)**

## [Textbooks]

Not used

## [References, etc.]

 $(\ {\rm Reference\ books\ })$ 

## [Study outside of class (preparation and review)]

各指導教員の指示に従うこと。

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

Course nu	umbe	er	U-EN	G25 4	5998 GJ77							
Course title (and course title in English)		特別研究 2 (原) Graduation Thesis 2						ructor's ne, job tit departm ffiliation	ile, nent	Graduate School of Engineering KANKEI KYOIN Graduate School of Engineering Professor,HINOKI TATSUYA Graduate School of Engineering Professor,MAJIMA TAKUYA		
Target yea	r	4th ye	ear students o	or above	Number credits	of		6	Year	/semesters	2025/Intensive, First semester	
Days and periods	]	Intensive Class style Seminar (Face-to-face course) Language of instruction Japanese						Japanese				
[Overview and purpose of the course]												
特別研究1の成果を踏まえ、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に主体的に取り組む。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 o	bjec	tive	es]									
課題設定、関連研究の調査、研究計画の立案、実験と検証を行う。これらの成果を特別研究として まとめ、発表することを通じて、研究手法を習得する。												
[Course schedule and contents]												
- 1回 設定課題の新規性、独創性等の再検証 2~10回 実験の実施、結果の考察、実験計画の修正などにより研究を遂行 11回 成果のまとめ 12~14回 特別研究報告書の執筆 15回 特別研究報告会での成果発表(ポスター発表)												
[Course re	equi	rem	ents]									
						学年次	の特	閉研究	着手約	条件を満たし	っていること	
[Evaluatio	n m	ethe	ods and	polic	>y]							
成績評価は おける発表					<b>迤状況、特</b>	別研究	報告	書の内	容、\$	寺別研究報告	言会(ポスター発表)に	
[Textbook	s]											
Not used												
[Reference	es, e	etc.]										
( <b>Referer</b> Introduced d												
[Study out	tsid	e of	class (p	orepa	ration and	d revie	w)]					
各指導教員の指示に従うこと												
(Other information (office hours, etc.))												
-	( Other information (office hours, etc.) ) *Please visit KULASIS to find out about office hours.											

										未更新
Course nu	ımbe	er U-	-ENG26 16	5063 LJ72						
Course title (and course title in English)		回路基码 damentals	<b>濋論</b> s of Circuit	Theory		Inst nan and of a	hool of Engineering essor,HISAKADO TAKASHI			
Target yea	r	1st year stud	lents or above	Number credits	of		2	Year	/semesters	2025/First semester
Days and periods	Tue.5Class styleLecture (Face-to-face course)Language of instructionJapanese							Japanese		
[Overview 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 o	bjec	tives]								
Students are expected to learn the transient analysis by differential equation and steady state analysis by phasor.										
[Course schedule and contents]										
DC circuit,3times,We introduce Kirchhoff#039s current law and Kirchhoff#039s voltage 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.										
[Course re	qui	rements	\$]							
None										
[Evaluatio	n m	ethods	and polic	у]						
Reports and	exan	ninations								
[Textbook	s]									
奥村浩士『	'т-	・ス電気	回路理論ノ	\門』(朝	] 倉書店	) [	SBN:42	54227	469	
[Reference	es, e	etc.]								
( Referer	nce l	books)								
[Study ou	tside	e of clas	ss (prepar	ration and	d review	w)]				
After the les	son,	solve pro	blems in th	ne text.						
(Other information (office hours, etc.))										
*Please visit KULASIS to find out about office hours.										

										未更新
Course nu	imbe	er U-EN	G29 3'	9025 LJ55	U-EN	G29	9 39025	LJ10		
		直解析 nerical Analy	sis							anced Integrated Studies in Human Survivability Professor,YOSHIKAWA HITOSHI
Target yea	r	2nd year students	or above	Number credits	r of		2	Year	r/semesters	2025/Second semester
Days and periods	Wed.3     Class style     Lecture (Face-to-face course)     Language of instruction						Japanese			
[Overview and purpose of the course]										
[Course o	bjec	ctives]								
-	che	dule and co	ntent	s]						
,1time,										
,6times, ,3times,										
,4times,										
,1time,										
[Course re	equi	irements]								
None										
[Evaluatio	n m	nethods and	l polic	;y]						
[Textbook	s]									
[Reference	es, e	etc.]								
( Referer	ice	books)								
[Study out	tsid	e of class (	prepa	ration and	d revie	w)]				
(Other inf	orm	nation (offic	e hou	urs, etc.) )	)					
*Please visit	KU	LASIS to find	d out a	bout office	hours.					

Course nu	umb	er U-EN	G29 4	9118 LJ55	U-EN	G29	49118	LJ10		
Course title (and course title in English)		里解析 llysis in Math	al Sciences	3	nan anc	tructor's ne, job tit I departm affiliation	nent		dvanced Integrated Studies in Human Survivability. ic Professor,YOSHIKAWA HITOSHI	
Target yea	r	4th year students of	or above	Number credits	r of		2	Year	/semesters	2025/First semester
Days and periods		Thu.4	Class	s style	Lecture (Face-t		ace cour	se)	Language of instruction	Japanese
[Overview and purpose of the course]										
[Course o	bjeo	ctives]								
[Course s	che	dule and co	ontent	s]						
,1time,										
,5times,										
,3times,										
,2times,										
,1time,										
,1time,										
,1time,										
,1time,										
[Course re	ani	irements]								
None										
[[].						_				
Evaluatio	n n	nethods and	polic	;y]						
[Textbook	s]									
								c	ontinue to	

数理解析**(2)** 

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))