科目コード (Code)	科目名 (Course title)	Course title (English)
10H401	統計熱力学	Statistical Thermodynamics
10H405	量子化学 I	Quantum Chemistry I
10H406	量子化学II	Quantum Chemistry II
10H408	分子分光学	Molecular Spectroscopy
10H448	生体分子機能化学	Biomolecular Function Chemistry
10H413	分子機能材料	Molecular Materials
10H416	分子触媒学	Catalysis Science at Molecular Level
10P416	分子触媒学続論	Catalysis Science at Molecular Level 2
10H417	分子光化学	Molecular Photochemistry
10P417	分子光化学続論	Molecular Photochemistry 2
10H423	物性物理化学	Condensed Matter Physical Chemistry
10H422	分子材料科学	Molecular Materials Science
10H427	量子物質科学	Quantum Materials Science
10H428	分子レオロジー	Molecular Rheology
10H430	分子細孔物理化学	Molecular Porous Physical Chemistry
10D432	分子工学特別実験及演習 I	Laboratory and Exercises in Molecular Engineering I
10D433	分子工学特別実験及演習Ⅱ	Laboratory and Exercises in Molecular Engineering II
10D439	分子工学特論第一A	Molecular Engineering, Adv. IA
10D445	分子工学特論第一B	Molecular Engineering, Adv. IB
10D440	分子工学特論第二A	Molecular Engineering, Adv. IIA
10D447	分子工学特論第二B	Molecular Engineering, Adv. IIB
10H436	分子工学特論第三	Molecular Engineering, Adv. III
10P439	分子工学特論第六	Molecular Engineering, Adv. VI
10P440	分子工学特論第七	Molecular Engineering, Adv. VII
10P448	JGP セミナーI	Japan Gateway Project Seminar I
10P450	JGP セミナーⅡ	Japan Gateway Project Seminar II
10P452	JGP セミナーIII	Japan Gateway Project Seminar III
10P454	JGP セミナーIV	Japan Gateway Project Seminar IV
10P456	JGP セミナーV	Japan Gateway Project Seminar V
10P457	JGP セミナーVI	Japan Gateway Project Seminar VI
10P459	JGPセミナーVII	Japan Gateway Project Seminar VII
10P461	JGPセミナーVIII	Japan Gateway Project Seminar VIII
10P463	JGPセミナーIX	Japan Gateway Project Seminar IX
10P465	JGPセミナーX	Japan Gateway Project Seminar X
10P467	JGPセミナーXI	Japan Gateway Project Seminar XI
10P469	JGPセミナーXII	Japan Gateway Project Seminar XII
10P471	JGP計算実習(MO)	Japan Gateway Project Computation Exercise(MO)
10i061	先端マテリアルサイエンス通論(4回コース)	Introduction to Advanced Material Science and Technology(4 times course)
10i062	先端マテリアルサイエンス通論(8回コース)	Introduction to Advanced Material Science and Technology(8 times course)
10i063	先端マテリアルサイエンス通論(12回コース)	Introduction to Advanced Material Science and Technology(12 times course)
10i055	現代科学技術特論(4回コース)	Advanced Modern Science and Technology(4 times course)
10i056	現代科学技術特論(8回コース)	Advanced Modern Science and Technology(8 times course)
10i060	現代科学技術特論(12回コース)	Advanced Modern Science and Technology(12 times course)
10i045	実践的科学英語演習 I	Exercise in Practical Scientific English I
10D043	先端科学機器分析及び実習I	Instrumental Analysis,Adv.I
10D046	先端科学機器分析及び実習II	Instrumental Analysis, Adv. II
88G101	研究倫理・研究公正(理工系)	Research Ethics and Integrity(Scienceand Technology)
88G201	学術研究のための情報リテラシー基礎	Basics of Academic Information Literacy
88G301	大学院生のための英語プレゼンテーション	Presentation for Graduate Students
10i057	安全衛生工学(4回コース)	Safety and Health Engineering(4 times course)
10i058	安全衛生工学(11回コース)	Safety and Health Engineering(11 times course)

Numbering c	ode											
Course title 統 <english> St</english>	計熱; atistic	力学 al Thermo	odyna	mics		Aff dej Joi	iliated partment b title,Na	t, ime	Graduate S Professor,S	choo AT(	ol of Engineering O HIROFUMI	
Target year				Number	of cred	its	1.5	Co yea	ourse offere ar/period	d	2019/Second semester	
Day/period	Thu.2	2	Cla	ss style	Lecture	e			Langua	ige	Japanese	
[Outline and	Purp	oose of t	he C	ourse]								
Many of our su this lecture, we statistical mech of realistic mol	aim t aim t anics ecular	ding subs to understa . Starting r system.	tances and th from t	are conder e behaviors the basics o	nsed sys s of vario of statisti	tem ous cal	s in whi condens mechan	ich c sing iics,	countless mo systems fro we learn sta	olecu m th tisti	ales are gathered. In the viewpoint of cal mechanics handling	
[Course Goals]												
Confirm the relationship between thermodynamics and statistical mechanics, and acquire statistical mechanics ideas to understand various phenomena as well.												
[Course Schedule and Contents]												
Fundamentals of statistical mechanics (3times) cumulant, phase space, micro canonical ensemble, grand canonical ensemble												
Fundamentals Fermi statistics	of stat , Bose	istical me e statistics	chani	cs of quantu	um syste	em (	3times)					
Interacting class imperfect gas, o liquids	sical : cluste	system (5) r expansio	times) on, fur	nctional der	ivative,	dist	ribution	ı fun	action, integr	ral e	quation theory for	
[Class requi	reme	nt]										
Knowledge of	therm	odynamic	s of u	ndergradua	te level	and	elemen	tary	statistical m	nech	anics	
[Method, Po	int of	i view, aı	nd At	tainment	levels	of E	Evaluat	tion	]			
Evaluation will	be ba	ased on ac	tive p	articipation	and an	exa	minatio	n.				
[Textbook]												
Instructed during	ng cla	SS										
[Reference b	ook	s, etc.]										
(Reference	(Reference books)											
Introduced dur	ing ch	ass										
[Regarding s	studi	es out of	i clas	s (prepar	ation a	nd	review	/ <b>)]</b>				
While studying undergraduate,	[Regarding studies out of class (preparation and review)] While studying the thermodynamics and underlying statistical mechanics in the physics chemistry lecture of undergraduate, we recommend that you review it as necessary as the lecture progresses.											
(Others (off	ice h	our etc	))									

The content of the lecture may be revised as necessary according to the situation of participants.

Numbering co	de	G-EN	G14 5	H405 LJ60							
Course title 量子 <english> Qua</english>	子化 antun	学 I n Chemis	try I			Aff dep Job	iliated partment p title,Na	, me	Fuk Pro Gra Ass	ui Institute fo fessor,SAT aduate Schoo ociate Profess	or Fundamental Chemistry OU TOORU ol of Engineering or,HIGASHI MASAHIRO
Target year				Number	of cred	lits	1.5	Co yea	ourso ar/p	e offered eriod	2019/First semester
Day/period	Гue.2	2	Cla	ss style	Lecture	e				Language	Japanese
[Outline and	Purp	oose of t	he C	ourse]							
原子・分子の量 ・フォック理論 について講述す	量子 合、 E する。	力学、お 密度汎関	よび 数 理 詞	多体電子系 論などの理	におけ 論的手	るハ 法、	、ートリ 軌道相	—  互(	・フ 作用	ォック理論  といった量	氰、ポストハートリー 遣子化学の基礎的事項
[Course Goal	s]										
量子化学の基礎	楚とそ	その理解	に必要	要なフレー	ムにつ	いて	習熟す	-る。	)		
[Course Sche	edule	e and Co	onten	its]							
線形代数の復習 線形空間、内利	3、角 責、 5	解析力学 ラグラン	(1回 ジュヲ	l) 形式、ハミ	ルトン	形式	<u>-</u> v				
量子力学の基礎 ブラ、ケット、	楚(2 オフ	2回) ブザーバ	ブル、	正準量子	化、厳	密に	解ける	561	くつ	かの例	
摂動論とそのM 分極率、磁化型	芯用 率、日	(2回) 時間に依 <sup>3</sup>	存する	る摂動論							
分子の量子力等 ボルン・オック	学(2 ペンノ	2回)  \イマー:	近似、	回転、振	動						
ハートリー・フ 多電子系、軌道	フォン 道の相	ック理論 既念、フ	(2回 ェル <sup>3</sup>	) ミ粒子の反	対称性	、ス	レータ	<b>'</b> —1	行列	式、フォッ	ク方程式
ポストハート! CI法、MCSCF	ノー 法、〕	・フォッ MP法	ク理詞	瀹(1回)							
密度汎関数理詞 Hohenberg-Koh	侖(1 nのえ	回) 定理、Ko	hn-Sł	nam法							
軌道相互作用( 軌道混合、フロ 学習到達度の研	(1回 コンラ 寉認	) ティア軌: 1	道理詞	Â							
									- C	ontinue to	量子化学 I <b>(2)</b>

#### 量子化学 I **(2)**

#### [Class requirement]

学部物理化学で出てくる程度の初等的な量子力学

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

平常点及び定期試験に基づく総合判定

#### [Textbook]

Not used

#### [Reference books, etc.]

(Reference books) J.J. Sakurai 『現代の量子力学』(吉岡書店) 福井謙一 『量子化学』(朝倉書店) 米沢 貞次郎 他 『三訂量子化学入門』(化学同人) 福井謙一 『化学反応と電子の軌道』(丸善) R.G.Parr, W.Yang 『原子・分子の密度汎関数法』(シュプリンガー) A. Szabo, N.S. Ostlund 『新しい量子化学 電子構造の理論入門』(東京大学出版会)

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

講義中に指示する。

#### (Others (office hour, etc.) )

Numbering	g coc	le	G-ENO	G14 7	H408 LJ60							
Course title <english></english>	分子 Mole	と ら と い に い に い に	七学 ar Spectro	oscop	У		Affi dep Job	iliated partment p title,Na	, me	Fuku Prof Insti Program Center f Program	ii Institute for Sessor,SAT itute for Ad n-Specific Associa for the Promotion of m-Specific Senio	or Fundamental Chemistry OU TOORU Ivanced Study ate Professor, YAMAGUCHI DAISUKE f Interdisciplinary Education and Research or Lecturer, ASAKURA HIROYUKI
Target ye	ar				Number	of cred	its	1.5	Co yea	ourse ar/pe	offered riod	2019/Second semester
Day/perio	d W	Ved.	2	Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd P	Purp	ose of t	he C	ourse]							
分光学につ	いて	の碁	を礎から	応用き	までを講述	し、演	習を	行う。				
[Course G	oals	6]										
分子分光学	}子分光学の基礎的な原理を理解し、応用例について学ぶ。											
[Course S	ourse Schedule and Contents]											
X 線吸収ス	線吸収スペクトルの基礎と応用(4回)											
X 線吸収ス 性空の三素	Q収スペクトルには内殻電子の遷移に由来する特徴的な構造が現れ、											
存定の元素本講義では	定の元素の電子状態や局所構造を反映する。 講義では、X 線吸収スペクトルの基礎及び応用について紹介する。											
弾性散乱と	講義では、X 線吸収スペクトルの基礎及び応用について紹介する。 性散乱と物質の構造解析(4回)											
弾性散乱(	Ray	leigl	h-Gans-D	ebyei	近似)に関	して散	乱原	原理(Fe	ouri	ier变	換)	
やX線・中	生子	線を	用いた物	物質の	)構造解析(	の方法を	と講	義する。	D			
光の吸収・	散乱	,と予	も光の量	子論(	(3回)	-						
量子論の立	場か	<b>いら</b> ら	う子と光(	の相互	豆作用を取	扱い、	<b>-</b>	マリフ	<u> </u>	- ~ 1	ヽ゚゚゚゚゚゚゚゚゚゙゙゙゙゙゙゙゙゙゙ヽ゚゚゚゚゚゚゚゚゚゚゚゚゚゚゚゚゚゚	7
これらのス	ヘウ		レの知及(	利止甲田	)/バリリによう	うて決る	マフ	(19)	/) יוכ	l	1 ( 講述 9	ຈຸ
[Class req	uire	me	nt]									
学部レベル	の(ł	、学の	D知識									
[Method, F	Poin	t of	view, ar	nd At	tainment	levels	of E	Valuat	ion	]		
各項目の担	当教	(員の	D課すレフ	ポート	トや小テス	ト等の	結果	そ総合	し	て判決	定する。	
[Textbook	]											
Not used												
[Reference	e bo	oks	, etc.]									
( <b>Referer</b> 日本XAFS都 Scott Calvin J. Als-Niels	Reference books, etc.] (Reference books) 本XAFS研究会・編『XAFSの基礎と応用』(講談社サイエンティフィク) cott Calvin『XAFS for Everyone』(CRC Press) Als-Nielsen, D. McMorrow『X線物理学の基礎』(講談社) Continue to 分子分光学(2)											

# 分子分光学**(2)**

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

講義中に指示する。

# (Others (office hour, etc.))

隔年開講科目。

Numbering	, code											
Course title English>     分子触媒学 Catalysis Science at Molecular Level     Affiliated bepartment, Job title,Name     Graduate School of Engineering Professor,TAN-X-X TSUNEHIRO Graduate School of Engineering Associate Professor,TERAMURA KENTARO       Target y=r     Number of credition     1.5     Searror of fered year/period     2019/First semester												
Target ye	ar			Number	of cred	lits	1.5	Co yea	ourse ar/p	e offered eriod	2019/First semester	
Day/perio	d Fri.2		Cla	iss style	Lecture	e				Language	Japanese	
[Outline a	nd Pur	oose of t	he C	ourse]					-			
Fourier Tran	sform fo	or XAFS A	Analy	sis ; Introdu	uction to	o Cat	alytic S	Scier	nce			
[Course G	oals]											
Learning and	l acquiri	ng fundan	nenta	ls of catalty	vic chem	istry	and X	AFS	5			
[Course S	[Course Schedule and Contents]											
Lattice Fouri crystallite, L Hydrogen-lil EXAFS Ana Application Introduction Catalysis and confirmation	Application of Fourier transform and Crystallography,2times,Fick#039s solid diffusion, Green function, Lattice Fourier expansion, Crystal lattice, Reciprocal lattice, Classification of crystals, diffraction by crystallite, Laue factor, Laue amp Bragg condition Hydrogen-like in two dimension,1time,self learning EXAFS Analysis,1time,EXAFS analysis Application of EXAFS,1time,Examples and Recent topics Introduction to catalytic science,3times,Phenomena and basic concepts in catalysis Catalysis and photocatalysis,2times,Examples of catalysis and photocatalysis confirmation of achievement,1time,Report											
[Class req	uireme	nt]		-			-	-				
Knowledge of	of physic	cal chemis	stry li	ke quantum	h chemis	try,	thermoo	dyna	amıc	s and spect	coscopy is preferred.	
[Method, F	Point of	<sup>;</sup> view, ar	nd At	ttainment	levels	of E	Evaluat	tion	]			
Reports												
[Textbook	]											
No text book												
[Reference	e book	s, etc.]										
( Referer	( Reference books )											
[Regarding	g studi	es out of	clas	ss (prepar	ation a	nd	review	<b>')]</b>				
(Others (	office h	our, etc.	))									

Numbering	g code										
Course title <english></english>	分子触 Catalys	媒学続論 is Science	at Mo	olecular Lev	vel 2	Aff dep Job	iliated partment p title,Na	;, me	Gra Progra	duate Scho m-Specific Associa	ol of Engineering ate Professor,HOSOKAWA SABUROU
Target ye	ar		_	Number	of cred	lits	0.5	Co yea	ourse ar/p	e offered eriod	2019/Intensive, First semester
Day/perio	<b>d</b> Inte	nsive	Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd Pur	pose of t	he C	ourse]							
[Course G	ioalsj										
[Course S	chedu	le and Co	onten	its]							
,1time, ,2times, ,1time,											
[Class rec	Juireme	ent]									
None											
[Method, I	Point o	f view, ai	nd At	tainment	levels	of E	Ivaluat	ion	]		
[Textbook	[]										
[Referenc	e book	s, etc.]									
( Referei	nce bo	oks)									
[Regardin	g stud	ies out of	f clas	s (prepara	ation a	nd	review	)]			
(Others (	office l	nour, etc.	))								
*Please visit	KULA	SIS to find	l out a	about office	hours.						

													未更新
Numberin	g cod	le											
Course title <english></english>	分子 Mole	·材料 ecular	科学 Materia	als Sc	ience		Aff der Joi	iliated partment p title,Na	, me	Inst Pro Inst Ass Inst Ass	itute for Ch fessor,KAJ itute for Ch istant Profes itute for Ch istant Profes	emical Res I HIRONO emical Res sor,SHIZU emical Res sor,SUZUK	search RI search KATSUYUKI search I KATSUAKI
Target ye	ear				Number	of cred	its	1.5	Co yea	ourse ar/po	e offered eriod	2019/Firs	t semester
Day/perio	od W	/ed.2		Cla	ss style	Lecture	e				Language	Japanese	
[Outline a	nd P	urpo	se of t	he C	ourse]								
[Course G	Boals	5]											
[Course S	Schee	dule a	and Co	nten	ts]								
,1time,													
,1time,													
, Itime,													
, i time, 1time													
.1time.													
,1time,													
,1time,													
,1time,													
, Itime,													
, i tillit,													
[Class rec	quire	ment	:]										
None													
[Method,	Poin	t of v	iew, ar	nd At	tainment	levels	of E	Evaluat	ion	]			
[Textbook	<b>(</b> ]												
[Referenc	e bo	oks,	etc.]										
(Refere	nce I	book	<b>s</b> )										
										Co	ontinue to	分子材料和	<b></b> 科学(2)

分子材料科学(2)

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

(Others (office hour, etc.))

										未更新		
Numbering	g cod	e										
Course title <english></english>	量子 Quar	物質科学 ntum Materia	ls Sci	ence		Affiliate departm Job title	d lent, ,Name	e Inst Pro	titute for Ch fessor,MIZI	emical Research JOCHI NORIKAZU		
Target ye	ar			Number	of credi	i <b>ts</b> 1.5	C y	cours ear/p	e offered eriod	2019/First semester		
Day/perio	d T	hu.2	Cla	ss style	Lecture				Language	Japanese		
[Outline a	nd P	urpose of t	he C	ourse]								
[Course G	ioals	5]										
[Course S	chec	dule and Co	nten	its]								
,1time,												
,1time,												
,1time,	,1time,											
, Itime,												
,1time, 1time												
Atimes												
1 time.												
, , , , , , , , , , , , , , , , , , , ,												
[Class red	uire	ment]										
None												
[Method, I	Point	t of view, ar	nd At	tainment	levels c	of Eval	uatio	n]				
[Textbook	]											
[Referenc	e bo	oks, etc.]										
( Referei	nce k	books)										
[Regardin	[Regarding studies out of class (preparation and review)]											
(Others (	offic	e hour, etc.	))									
*Please visit	KUI	ASIS to find	out	about office	hours.							

Numbering c	ode												
Course title <english>  M</english>	Course title <english>       分子レオロジー       Affiliated department, Job title,Name       Institute for Chemical Research Professor,WATANABE HIROSHI Institute for Chemical Research Associate Professor,MATSUMIYA YUMI         Target year       Number of credits       1.5       Course offered year/period       2019/First semester</br></english>												
Target year				Number	of cred	lits	1.5	Co yea	ourse ar/pei	offered riod	2019/First semester		
Day/period	Wed.	3	Cla	ss style	Lecture	e			L	anguage	Japanese and English		
[Outline and	Purp	ose of t	he C	ourse]									
Lecture is given	n for tl	he rheolo	gy an	d dynamics	s of poly	mer	ic liquic	ls an	nd the	ir molecul	ar basis.		
[Course Goa	ls]												
Understanding	pheno	menologi	ical as	spect of rhe	ology in	n ger	neral and	d mo	olecul	lar aspect o	of polymer rheology.		
[Course Schedule and Contents]													
Basics of Rheo viscosity, modu Rheological be Newtonian flow Viscoelastic rel among respons Viscoelasticity Stress expressions Rouse/Zimm m discussion on the tube model,2tim on the relaxation feedback of eva and confirmation	[Course Schedule and Contents] Basics of Rheology,1time,Rheology and its role in science and engineering, flow / deformation/ stress, viscosity, modulus Rheological behavior of matter,1time,Rheological behavior of matter and classification, viscoelasticity, non- Newtonian flow, plastic flow Viscoelastic relaxations,2times,Boltzmann's principle, relaxation functions, relaxation time, conversion among response functions, complex modulus Viscoelasticity and temperature,1time,Glass transition, time-temperature superposition, WLF equation Stress expression of polymers,2times,Stress expression, tension / free-energy / distribution-function of subchains Rouse/Zimm model,1time,Model description, model equation, derivation of stress and relaxation modulus, discussion on the relaxation behavior tube model,2times,Model description, model equation, derivation of stress and relaxation modulus, discussion on the relaxation behavior, comparison to Rouse dynamics feedback of evaluation and confirmation of level of understanding,1time,Feedback of evaluation of report etc, and confirmation of level of understanding												
Some basics on	diffe	rential eq	uatior	ns and statis	stical phy	ysic	s of pol	yme	ers				
[Method, Poi	nt of	view, ai	nd At	ttainment	levels	of E	Evaluat	tion	]				
Mainly with rep	port												
[Textbook]													
Original text w	Original text will be distributed in the class												
[Reference b	[Reference books, etc.]												
( <b>Reference</b> Y Matsushita e Polymer Dynar (Garland Scien	[Reference books, etc.] ( Reference books ) Y Matsushita ed, Structure and Property of Polymers (Kodansha)\ M Doi amp S F Edwards The Theory of Polymer Dynamics (Oxford press)\ W Graessley Polymeric Liquids amp Networks: Dynamics and Rheology (Garland Science)												

# 分子レオロジ**ー(2)**

# (Related URLs)

(http://rheology.minority.jp)

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

Differential equations are used to describe the time evolution of polymer chains that governs the rheological properties. It is required to re-visit the content for the under-grad level of differential equation.

# (Others (office hour, etc.))

Numbering	g code											
Course title <english></english>	分子約 Molec	田孔物理化 ular Porous	学 s Phys	ical Chemis	stry	Aff de Jo	filiated partment b title,Na	, me	Inst Pro Inst Progra Inst Progr	titute for Ac fessor,SIVA titute for Ac am-Specific Associa titute for Ac ram-Specific As	Ivanced Study ANIAH, Easan Ivanced Study ate Professor, YAMAGUCHI DAISUKE Ivanced Study sistant Professor, Ghalei, Behnam	
Target ye	ar			Number	of cred	lits	1.5	Co yea	ourse ar/p	e offered eriod	2019/Second semester	
Day/perio	d Tue	2.2	Cla	ss style	Lectur	e				Language	English	
[Outline a	nd Pu	rpose of t	he C	ourse]								
This course adsorption a	will dis nd mei	scuss the pl nbrane sep	nysica aratio	l chemistry n processes.	and eng	gine	ering ap	plic	atior	n of porous	materials in the areas of	
[Course G	ioals]											
The intention of this course is to allow students to become familiar with a range of porous materials, and the practical ways such materials are used. Although the course is not intended to be exhaustive in covering all porous materials and all applications, examples will be followed that are relevant to socially important problems, such as global warming, or water shortage.												
[Course Schedule and Contents]												
Thermodyna Adsorptive p Diffusive pro Case Study: desalination Case Study:	Overview 1 Introduction to course, and broad overview of porous materials Thermodynamics of Mixing 2 Phase equilibria and structure formation processes Adsorptive processes 2 Physical chemistry of adsorptive processes in porous materials Diffusive processes 2 Physical chemistry of diffusion limited processes in porous materials Case Study: Membrane Processes for liquid separation 2 Liquid filtration systems for nanofiltration, desalination Case Study: Membrane Processes for gas separation 2 Case Study: Membrane Processes for gas separation											
[Class req	luirem	ent]										
None												
[Method, I	Point	of view, a	nd At	tainment	levels	of E	Evaluat	ion	<b>)</b> ]			
The course g	grade w	vill be deter	mined	l based on c	class per	fori	mance/at	tten	danc	e (40%) and	d a final report(60%).	
[Textbook	<b>[</b> ]											
Not used	Continue to 公式细矿物理化学(2)											
[ _ <b></b> .			_ =			■		'	Co	ntinue to 分	子細孔物理化学(2)	

#### 分子細孔物理化学**(2)**

# [Reference books, etc.]

(**Reference books**) Introduced during class To be announced during class

# (Related URLs)

http://pureosity.org/en/

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

To be announced during class

# (Others (office hour, etc.))

											未更新
Numbering code											
Course title <english></english>	分子 Labor	-工学特別実 ratory and Exerci	験及》 ses in N	寅習 Molecular Engi	ineering I	Affi dep Job	liated artment title,Na	, me	Gra Proi	duate Scho fessor,SHIF	ol of Engineering RAKAWA MASAHIRO
Target ye	ar			Number	of cred	lits	4	Co yea	urse ar/pe	e offered eriod	2019/Intensive, year-round
Day/perio	dI	ntensive	Cla	ss style	Experin	ment	;			Language	Japanese
[Outline a	nd F	urpose of t	he C	ourse]							
[Course G	ioals	\$]									
[Course S	che	dule and Co	nten	its]							
,7times, ,16times, ,7times,											
[Class rec	luire	ment]									
None											
[Method, I	Poin	t of view, ar	nd Af	tainment	levels	of E	valuat	ion	]		
[Textbook	<b>[</b> ]										
[Referenc	e bo	oks, etc.]									
( Reference books )											
[Regardin	g st	udies out of	clas	ss (prepara	ation a	nd r	eview	)]			
(Others (	offic	e hour, etc.	))								
*Please visit	( Others (office hour, etc.) ) *Please visit KULASIS to find out about office hours.										

											未更新
Numbering code											
Course title <english></english>	分子 Labor	-工学特別実 atory and Exercis	<b>験及</b> 注 ses in N	寅 <b>習</b> Aolecular Engin	neering II	Affil depa Job	iated artment title,Na	, me	Gra Proi	duate Scho fessor,SHIF	ol of Engineering RAKAWA MASAHIRO
Target ye	ar			Number	of cred	lits	4	Co yea	urse ar/pe	e offered eriod	2019/Intensive, year-round
Day/perio	dI	ntensive	Cla	ss style	Experin	ment				Language	Japanese
[Outline a	nd F	urpose of t	he C	ourse]							
[Course G	ioals	\$]									
[Course S	che	dule and Co	nten	its]							
,7times, ,16times, ,7times,											
[Class rec	luire	ment]									
None											
[Method, I	Poin	t of view, ar	nd Af	tainment	levels	of Ev	valuat	ion	]		
[Textbook	<b>x]</b>										
[Referenc	e bo	oks, etc.]									
( Reference books )											
[Regardin	g st	udies out of	clas	s (prepara	ation a	nd re	eview	)]			
(Others (	offic	e hour, etc.	))								
( Others (office hour, etc.) ) *Please visit KULASIS to find out about office hours.											

Numbering	g co	de	G-ENO	G14 6	D439 LB60	)						
Course title <english></english>	・          ・          Affiliated department, Job title,Name           Graduate School of Engin Professor,SHIRAKAWA									ol of Engineering RAKAWA MASAHIRO		
Target ye	ear				Number	of cred	lits	1	Co yea	ourse offered ar/period	2019/Intensive, First semester	
Day/perio	d I	Inten	sive	Cla	ss style	Lecture	e			Language	Japanese	
[Outline a	nd F	Purp	ose of t	he C	ourse]							
分子工学の	)各専	<b>評門</b> 分	う野にお 	ける	トピックス	につい	て、	+00	·ウ.	ム形式などで⁵	学修する。	
[Course G	Soal	s]										
分子工学に	.関れ	)る基	を破り事	頃と知	も端研究の	内容に	つし	1て理解	を	深める。		
[Course S	sche	dule	and Co	onten	its]							
分子工学の 分子工学の する。	子工学のトピックス(8回) }子工学の各専門分野におけるトピックスについて、コロキウム形式やレポート作成を通じて学修 ⁻る。											
[Class rec	quire	eme	nt]		쏭仩나┏┢		10 =		. ÷¥ г			
万丁二子守	-1215	49P0	)导以所)	禹の日	子生は復修	<i>この </i> こ	リ う	以反に	- 市尤 印	羽を文けること	-0	
[Method,	Poin	nt of	view, a	nd At	tainment	levels	of E	valuat	ion	]		
平常点およ	びし	>ポ-	-トによ	り評値	面する							
[Textbook	<b>(</b> ]											
特になし												
[Referenc	e bo	ooks	s, etc.]									
( <b>Refere</b> l 特になし	nce	boo	ks)									
[Regardin	g st	udie	es out of	i clas	s (prepara	ation a	nd ı	review	)]			
(Others (	offic	ce h	our, etc.	))								
*Please visi	t KU	LAS	IS to find	l out a	about office	hours.						

Numbering	g code	G-ENO	G14 6	D445 LB60	)						
Course title <english></english>	se title Jlish> 分子工学特論第一B Molecular Engineering, Adv. IB Affiliated department, Job title,Name Profess									te Schoo or,SHIR	ol of Engineering RAKAWA MASAHIRO
Target ye	ar			Number	of cred	lits	1	Co yea	ourse off ar/perio	fered d	2019/Intensive, Second semester
Day/perio	d Inte	ensive	Cla	ss style	Lecture	e			Lan	guage	Japanese
[Outline a	nd Pui	pose of t	he C	ourse]							
分子工学の	各専門	分野にお	ける	トピックス	につい	て、	+	ウ	ム形式な	よどで学	≤修する。
[Course G	ioals]										
分子工学に	関わる	基礎的事業	頃とタ	も端研究の	内容に	つい	て理解	を	深める。		
[Course S	chedu	le and Co	onten	its]							
分子工学の 分子工学の する。	トピッ 各専門	クス(8回  分野にお	]) ける	トピックス	につい	て、	⊐□‡	・ウ.	ム形式や	<sup>レ</sup> レポー	- ト作成を通じて学修
[Class rec	Juirem	ent]	_								
分子工学専	攻以外	の専攻所	属学:	主は、履修	にあた	り専	攻長に	説	明を受け	けること	20
[Method, I	Point c	of view, ar	nd At	tainment	levels	of E	valuat	ion	]		
平常点およ 	びレポ	ートによ	り評値	面する							
[Textbook	<b>[</b> ]										
特になし											
[Referenc	e bool	(s, etc.]									
( <b>Refere</b> i 特になし	nce bo	oks)									
[Regardin	q stud	ies out o	f clas	s (prepara	ation a	nd r	eview	)1			
- <u>。</u> 必要に応じ	<u>-</u> て指示			M I				-			
(Others (	office	hour. etc.	))								
*Please visit	KULA	SIS to find	l out a	about office	hours.						

Numbering	g code											
Course title <english></english>	分子工 Molecu	学特論第 Ilar Engine	≡ ering	, Adv. III		Affiliate departm Job title	d ient, e,Nam	ne Gra	aduate Schoo fessor,SHIR	ol of Engineering RAKAWA MASAHIRO		
Target ye	ar			Number	of cred	its 1.5		Cours year/p	e offered eriod	2019/Intensive, Second semester		
Day/perio	<b>d</b> Inte	ensive	Cla	ss style	Lecture	e			Language	Japanese		
[Outline a	nd Pur	pose of t	he C	ourse]								
	[Course Goals]											
[Course Goals]												
[Course S	chedu	le and Co	onten	its]								
,5.5times, ,5.5times, ,5.5times,												
[Class requirement]												
None												
[Method,	Point o	f view, ar	nd Af	tainment	levels	of Evalu	uati	on]				
[Textbook	[]											
[Referenc	e book	s, etc.]										
( Refere	nce bo	oks)										
[Regardin	g stud	ies out of	f clas	ss (prepar	ation a	nd revi	ew)]	]				
(Others (	office I	nour, etc.	))									
*Please visit	KULA	SIS to find	l out a	about office	hours.							

Numbering co	ode G-EN	NG14 7	P440 LJ60									
Course title <english>  Mo</english>	子工学特論第 olecular Engir	育七 neering,	, Adv. VII	Adv. VII		iliated partment p title,Na	, me	Graduate Professor Graduate Assistant	e Scho r,SHIF e Scho Profess	ol of Engineering RAKAWA MASAHIRO ol of Engineering sor,MORIMOTO DAICHI		
Target year			Number	of cred	its	0.5	Co yea	ourse offe ar/period	ered	2019/Intensive, First semester		
Day/period	Intensive	Cla	ss style	Lecture	•			Lang	uage	Japanese		
[Outline and	Purpose of	the C	ourse]									
講義タイトル	:タンパク質	の構造	<b>造形成とそ</b>	の破綻	こよ	る疾患	発	 定				
私たちの身体を構成するタンパク質は、数ナノメートル程度の大きさであり、肉 眼や顕微鏡で直接観察することは出来ません。 しかし、その小ささから想像出来ないほど、タンパク質はとても複雑な立体構造 を有します。 タンパク質の構造形成はその機能に密接に関わっており、うまく構造形成できな かったり、凝集体を形成してしまうと、ガンや神経変性疾患をはじめとする重篤 な病気に繋がります。 本講義では、基礎的なタンパク質の構造に関する物理化学的性質を概説し、タン パク質の立体構造の決定方法や解析方法を学びます。 そして、タンパク質の構造形成に異常がある場合、如何に疾患に繋がるのかを生 物学的ならびに物理化学的観点から理解します。												
[Course Goals]												
分子上字に関い	わる最先端の	)研究制	大況を把握	し、実際	除の	り研究に	週月	用するこ	とを目	目指す。		
[Course Sch	edule and C	onten	ts]									
生体分子機能 <sup>;</sup> 生体分子機能 <sup>;</sup>	化学(4回) 化学に関する	3最近0	<b>Dトピック</b>	スを講う	述す	-3.						
[Class require	rement]											
None												
[Method, Poi	nt of view, a	and At	tainment	levels o	of E	valuat	ion	]				
- 平常点および	レポートによ	こり評价	重する。					-				
F						. – –		Continu	e to 分			

# 分子工学特論第七**(2)**

#### [Textbook]

Instructed during class

#### [Reference books, etc.]

(**Reference books**) Introduced during class

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

# (Others (office hour, etc.))

隔年開講

												未更新
Numberin	g cod	le										
Course title <english>       JGPセミナー Japan Gateway Project Seminar I       Affiliated department, Job title,Name       Graduate School of Professor,ATOMI</english>								ol of Engineering MI HARUYUKI				
Target year     Number of credits     0.5     Course offered year/period     2019/Intensive, year-round												
Day/periodIntensiveClass styleLectureLanguageEnglish												
[Outline and Purpose of the Course]												
This is a ser University T aims to gras	This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking.											
[Course C	ioals	5]										
Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.												
[Course Schedule and Contents]												
Introduction, 1 time, The contents of a series of seminar are explained. Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.												

Summary,1time,The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

## [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

											未更新
Numbering	g co	de									
Course title <english></english>	マセミナー an Gateway Pr	roject	Seminar II	Aff dej Jol	filiated partment b title,Na	, me	Gra Prot	duate Schoo fessor,ATO	ol of Engineering MI HARUYUKI		
Target year     Number of credits     0.5     Course offered year/period     2019/Intensive, year-round											
Day/periodIntensiveClass styleLectureLanguageEnglish											
[Outline and Purpose of the Course]											
This is a ser University T aims to gras	This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking.										
[Course Goals]											
Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.											
[Course Schedule and Contents]											
Introduction	1tir	ne The conten	te of	a series of s	eminar	are e	vnlaine	d			

seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed. Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level

of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

# [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

#### 未更新 Numbering code Affiliated Course title JGPセミナー Graduate School of Engineering department, <English> Japan Gateway Project Seminar III Professor.ATOMI HARUYUKI Job title,Name **Course offered** Number of credits 0.5 **Target year** 2019/Intensive, year-round year/period Language Day/period Intensive **Class style** Lecture English [Outline and Purpose of the Course] This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking. [Course Goals] Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English. [Course Schedule and Contents]

Introduction, 1 time, The contents of a series of seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

#### [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

#### 未更新 Numbering code Affiliated Course title JGPセミナー Graduate School of Engineering department, <English> Japan Gateway Project Seminar IV Professor.ATOMI HARUYUKI Job title,Name **Course offered** Number of credits 0.5 **Target year** 2019/Intensive, year-round year/period Language Day/period Intensive **Class style** Lecture English [Outline and Purpose of the Course] This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking. [Course Goals] Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.

#### [Course Schedule and Contents]

Introduction, 1 time, The contents of a series of seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

#### [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

											未更新	
Numbering	g coc	le										
Course title <english></english>	JGP Japa	セミナー in Gateway Pi	roject	Seminar V		Aff der Jol	iliated partment b title,Na	t, ime	Gra Pro	aduate Scho fessor,ATO	ol of Engineering MI HARUYUKI	
Target year     Number of credits     0.5     Course offered year/period     2019/Intensive, year-round												
Day/period     Intensive     Class style     Lecture     Language     English												
[Outline and Purpose of the Course]												
This is a ser University T aims to gras	This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking.											
[Course Goals]												
Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.												
[Course Schedule and Contents]												
Introduction	ı,1tin	ne,The conter	ts of :	a series of s	eminar a	are e	explaine	ed.				

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary,1time,The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

# [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

#### 未更新 Numbering code Affiliated Course title JGPセミナー Graduate School of Engineering department, <English> Japan Gateway Project Seminar VI Professor.ATOMI HARUYUKI Job title,Name **Course offered** Number of credits 0.5 **Target year** 2019/Intensive, year-round year/period Language Day/period Intensive **Class style** Lecture English [Outline and Purpose of the Course] This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking. [Course Goals]

Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.

## [Course Schedule and Contents]

Introduction, 1 time, The contents of a series of seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

## [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

#### 未更新 Numbering code Affiliated Course title JGPセミナー Graduate School of Engineering department, <English> Japan Gateway Project Seminar VII Professor.ATOMI HARUYUKI Job title,Name **Course offered** Number of credits 0.5 **Target year** 2019/Intensive, year-round year/period Language Day/period Intensive **Class style** Lecture English [Outline and Purpose of the Course] This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking. [Course Goals] Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.

#### [Course Schedule and Contents]

Introduction, 1 time, The contents of a series of seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

#### [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

#### 未更新 Numbering code Affiliated Course title JGPセミナー Graduate School of Engineering department, <English> Japan Gateway Project Seminar VIII Professor.ATOMI HARUYUKI Job title,Name **Course offered** Number of credits 0.5 **Target year** 2019/Intensive, year-round year/period Language Day/period Intensive **Class style** Lecture English [Outline and Purpose of the Course] This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking. [Course Goals] Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.

#### [Course Schedule and Contents]

Introduction, 1 time, The contents of a series of seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

#### [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

#### 未更新 Numbering code Affiliated Course title JGPセミナー Graduate School of Engineering department, <English> Japan Gateway Project Seminar IX Professor.ATOMI HARUYUKI Job title,Name **Course offered** Number of credits 0.5 **Target year** 2019/Intensive, year-round year/period Language Day/period Intensive **Class style** Lecture English [Outline and Purpose of the Course] This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking. [Course Goals] Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English. [Course Schedule and Contents]

Introduction, 1 time, The contents of a series of seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

## [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

## [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

										未更新	
Numbering	g cod	de									
Course title       JGPセミナー       Affiliated       Graduate School of Engineering <english>       Japan Gateway Project Seminar X       Affiliated       Graduate School of Engineering          Job title,Name       Course offered       Course offered</english>											
Target yearNumber of credits0.5Course offered year/period2019/Intensive, year-round											
Day/period     Intensive     Class style     Lecture     Language     English											
[Outline a	[Outline and Purpose of the Course]										
This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking.											
[Course Goals]											
Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.											
[Course S	che	dule and Co	onten	tsl							

Introduction, 1 time, The contents of a series of seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

# [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

												未更新
Numbering	g co	de										
Course title <english></english>	Course title JGPセミナー I <english> Japan Gateway Proje</english>					[	Aff dep Job	iliated partment p title,Na	, me	Gra Pro	aduate Schoo fessor,ATO	ol of Engineering MI HARUYUKI
Target ye	Target year     Number of credits     0.5     Course offered year/period     2019/Intensive, year-round											
Day/periodIntensiveClass styleLecture									Language	English		
[Outline a	nd l	Purp	ose of t	he Co	ourse]							
This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking.												
[Course G	Course Goals]											

Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.

#### [Course Schedule and Contents]

Introduction, 1 time, The contents of a series of seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

#### [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

## [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

											未更新	
Numbering	g co	de										
Course title <english>       JGPセミナー II Japan Gateway Project Seminar XII       Affiliated department, Job title,Name       Graduate School of Engineering Professor,ATOMI HARUYUKI         Target year       Number of credits       0.5       Course offered       2019/Intensive year round</english>												
Target year     Number of credits     0.5     Course offered year/period     2019/Intensive, year-round												
Day/period     Intensive     Class style     Lecture     Language     English												
[Outline a	[Outline and Purpose of the Course]											
This is a ser University T aims to gras	This is a series of lectures which are carried out by the professors who are invited with Japan Gateway: Kyoto University Top Global Program (JGP). By attending a lecture from the world top level professors, this course aims to grasping the newest trend of the specific field and extending the view of thinking.											
[Course Goals]												
Understand the fundamental and/or latest contents of a field of chemistry or chemical engineering in English, and obtain the skill of discussing the related contents in English.												
[Course Schedule and Contents]												
Introduction	1 tin	na Tha contan	te of e	corios of se	minar	oro i	avnlaina	d				

tion, Itime, The contents of a series of seminar are explained.

Intensive lectures of the specific theme, 2 times, For a given theme, a series of lectures is executed.

Summary, 1 time, The contents of a series of seminar are summarized, and the exercise for evaluating the level of understanding is executed.

## [Class requirement]

The basic knowledge for understanding the specific theme and the ability of understanding the lecture in English are requested.

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

Attendance at a series of four lectures or more is requested. The report assigned in the lecture and/or the result of final examination are used for evaluation.

#### [Textbook]

A copy of related contents is offered.

## [Reference books, etc.]

#### (Reference books)

Announced in the lecture.

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

#### (Others (office hour, etc.))

Professors of the faculty of engineering who are doing similar research support a student#039s study. In some cases, this course consists of a series of lectures by two or more researchers.

											未更新		
Numbering code													
Course title <english></english>	JGP Japan	計算実習(MG Gateway Projec	D) t Com	putation Exerc	cise(MO)	Aff dep Job	iliated partment p title,Na	, me	Gradua Profess Center for th Program-St	ate Schoo sor,SAT ne Promotion of pecific Assoc	ol of Engineering O HIROFUMI F Interdisciplinary Education and Research iate Professor,FUKUDA RYOICHI		
Target ye	ar			Number	of cred	its	0.5	Co yea	urse of ar/peric	ffered od	2019/Intensive, First semester		
Day/perio	d I	ntensive	Cla	ss style	Semina	ır			Lai	nguage	Japanese		
[Outline a	nd P	Purpose of t	he C	ourse]									
	[Course Goals]												
[Course G	boals	5]											
[Course S	che	dule and Co	nten	its]									
,1time,													
,1time,	ltime,												
,1time, ,1time,													
[Class rec	quire	ment]											
None													
[Method, I	Poin	t of view, ar	nd At	tainment	levels o	of E	İvaluat	ion	]				
[Textbook	<b>k]</b>												
[Referenc	e bo	oks, etc.]											
( Referei	nce l	books)											
[Regardin	g st	udies out of	clas	s (prepara	ation a	nd	review	)]					
(Others (	offic	e hour, etc.	))										
( Others (office hour, etc.) ) *Please visit KULASIS to find out about office hours.													

Numbering	g code											
Course title <english></english>	先端マテ Introduction to	リアルサイ Advanced Mater	イエンス ial Science	ス通論(4回コ e and Technology (4)	コース) times course)	Aff dep Job	iliated partment p title,Na	, me	Gra Sen Gra Sen	duate Scho nior Lecture duate Scho ior Lecturer	ol of Engineering r,YOROZU KAZUAKI ol of Engineering ,KANEKO KENTAROU	
Target ye	ar			Number	of cred	lits	0.5	Co yea	urse ar/p	e offered eriod	2019/First semester	
Day/perio	d Fri.5		Cla	ss style	Lecture	e				Language	English	
[Outline a	nd Purp	oose of t	he C	ourse]								
The various technologies used in the field of material science serve as bases for so-called high technologies, and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.												
[Course G	ioals]											
[Course Goals] To expand your field of vision for material science and to acquire accomplishments to identify the importance of technologies through the classes for developments in material science.												
[Course S	chedul	e and Co	onten	ts]								
Topic I Orga Week 1, Tur Week 2, Car Week 3, Syr Week 4, Cha compounds Topic II Ino Week 5, Pro Week 6, Ap Week 6, Ap Week 7, Tha Week 8, Fab Topic III Po Week 9-10, Week 11-12	anic Mat nor imag bon nan nthesis of emistry of rganic M perties of plication eory of p prication lymeric Electrica , An intr	erials ging and the orings f novel path of asymmetrials of cementials of electrials of electrials of inorgan Materials al conduct	herapy i-conj etric c tious r cal dis uting, nic na ivity o to sma	y through pl ugated mole atalysis - ste materials an scharge to n grinding, p nofiber by e of conjugate art shape ch	hotoirra ecules v ereosele d the fu naterial olishing electrosp ed polyn anging	diati vith ectiv and g and pinn ners mate	on main gr e synthe enviror d relatec ing and app erials	oup esis imer 1 pro	eler of oj ntal opert	ments pically activ technology ties of mate	/e pharmaceutical rials Electronics	
[Class red	luireme	nt]										
Each topic consists of four lectures. This course requests to choose one topic from provided three topics in advance. It is prohibited to change the topic after registration. We may select students who can attend the class before starting the class. Students who intend to join the course are required to submit the application form through the web site which will be informed in the advance.												

Continue to 先端マテリアルサイエンス通論(4回コース)(2)

#### 先端マテリアルサイエンス通論(4回コース)**(2)**

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

The average score of the best two assignments is employed.

For the topic which the students chose, they must attend minimum three lectures and submit minimum two assignments evaluated as "passed".

#### [Textbook]

Course materials will be provided.

#### [Reference books, etc.]

(Reference books)

#### (Related URLs)

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

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

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

#### (Others (office hour, etc.))

It is prohibited to change the registered course.

It is prohibited to attend the lectures of the other topics than the students chose.

All the students are requested to attend the guidance which will be held on the first class.

	Numbering code														
Numbering	l code														
Course title <english></english>	先端マテ Introduction to	リアルサイ Advanced Mater	「エンフ ial Science	ス通論(8回コ e and Technology (8	コース) times course)	Affi dep Job	iliated partment p title,Na	, me	Gra Sen Gra Sen	duate Scho ior Lectures duate Scho ior Lectures	ol of Engineering r,YOROZU KAZUAKI ol of Engineering ,KANEKO KENTAROU				
Target yea	ar			Number	of cred	its	1	Co yea	urse ar/p	e offered eriod	2019/First semester				
Day/perio	d Fri.5		Cla	ss style	Lecture	e				Language	English				
[Outline a	nd Purj	oose of t	he C	ourse]											
The various and, in turn, contribute to briefly introc metal materi material scie	The various technologies used in the field of material science serve as bases for so-called high technologies, and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.  [Course Goals] To expand your field of vision for material science and to acquire accomplishments to identify the importance of technologies through the alagaes for developments in material science.														
[Course G	<b>[Course Goals]</b> Fo expand your field of vision for material science and to acquire accomplishments to identify the importance														
To expand ye of technolog	[Course Goals] To expand your field of vision for material science and to acquire accomplishments to identify the importance of technologies through the classes for developments in material science. [Course Schedule and Contents]														
of technologies through the classes for developments in material science. [Course Schedule and Contents]															
Topic I Orga Week 1, Tun Week 2, Car Week 3, Syn Week 4, Che compounds - Topic II Inor Week 5, Prop Week 6, App Week 7, The Week 8, Fab Topic III Pol Week 9-10, 1 Week 11-12,	of technologies through the classes for developments in material science. <b>[Course Schedule and Contents]</b> Fopic I Organic Materials Week 1, Tumor imaging and therapy through photoirradiation Week 2, Carbon nanorings Week 3, Synthesis of novel pai-conjugated molecules with main group elements Week 4, Chemistry of asymmetric catalysis - stereoselective synthesis of opically active pharmaceutical compounds - Fopic II Inorganic Materials Week 5, Properties of cementitious materials and the future Week 6, Application of electrical discharge to material and environmental technology Week 7, Theory of precision cuting, grinding, polishing and related properties of materials Week 8, Fabrication of inorganic nanofiber by electrospinning Fopic III Polymeric Materials Week 9-10, Electrical conductivity of conjugated polymers and application to organic Electronics Week 11-12, An introduction to smart shape changing materials														
	uireme														
Each topic co This course i It is prohibito We may sele Students who will be inform	equests ed to cha ect stude o intend med in t	to choose ange the to nts who ca to join the he advanc	tures. two to two to two to to two to to two to to two to two two to two	copics from after registr end the clas rse are requi	provide ation. s before red to s	d thi star ubm	ree topi rting the it the ap	cs in clas oplic	n adv ss. catio	vance. on form thro	ugh the web site which				

Continue to 先端マテリアルサイエンス通論(8回コース)(2)

#### 先端マテリアルサイエンス通論(8回コース)**(2)**

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

The average score of the best two assignments for each topic is employed.

For each topic which the students chose, they must attend minimum three lectures and submit minimum two assignments evaluated as "passed".

#### [Textbook]

Not used

#### [Reference books, etc.]

(Reference books)

#### ( Related URLs )

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

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

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

#### (Others (office hour, etc.))

It is prohibited to change the registered course.

It is prohibited to attend the lectures of the other topic than the students chose.

All the students are requested to attend the guidance which will be held on the first class.

Numbering	, code												
Course title <english></english>	先端マテ Introduction to	・リアルサイ Advanced Materi	エンス ial Science	、通論(12回: and Technology (12	コース) times course)	Aff dep Job	iliated partment p title,Na	, me	Gra Sen Gra Sen	duate Scho ior Lecture duate Scho ior Lecturer	ol of Engineering r,YOROZU KAZUAKI ol of Engineering ,KANEKO KENTAROU		
Target ye	ar			Number	of cred	lits	1.5	Co yea	urse ar/pe	e offered eriod	2019/First semester		
Day/perio	d Fri.5		Cla	ss style	Lecture	e				Language	English		
[Outline a	nd Pur	pose of t	he C	ourse]	•								
The various and, in turn, contribute to briefly intro- metal materi material scie	and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.  [Course Goals] To expand your field of vision for metarial science and to eaguire accomplichments to identify the importance.												
[Course Goals] To expand your field of vision for material science and to acquire accomplishments to identify the importance of technologies through the classes for developments in material science.													
[Course S	chedul	e and Co	onten	ts]									
Topic I Orga Week 1, Tur Week 2, Car Week 3, Syr Week 4, Cha compounds Topic II Ino Week 5, Pro Week 5, Pro Week 6, App Week 7, Tha Week 8, Fat Topic III Po Week 9-10, Week 11-12	nic Mat nor ima bon nan thesis o emistry o ganic N perties o plication cory of p rication ymeric Electrica , An intr	erials ging and the orings f novel pate of asymmetrials of cementials of electric orecision control of inorganetrials al conduct roduction to	herapy i-conj etric c tious n cal dis uting, nic na ivity o to sma	y through pl ugated mol atalysis - st materials ar scharge to r grinding, p nofiber by o of conjugate art shape ch	hotoirra ecules v ereosele nd the fu naterial polishing electrosp ed polyr anging	diati vith ectiv and g and pinn ners mate	ion main gr e synthe enviror d related ing and app erials	roup essis nmei 1 pro	eler of of ntal to opert	nents pically activ technology ties of mate	ve pharmaceutical rials Electronics		
[Class req	uireme	ent]											
This course requests to take all provided three topics. We may select students who can attend the class before starting the class. Students who intend to join the course are required to submit the application form through the web site which will be informed in the advance.													
[Method, I	Point o	f view, ai	n <mark>d A</mark> t	tainment	levels	of E	Evaluat	ion	]				
The average	score of	f the best t	wo as	signments f	for each	top	ics is en	nplo	yed.				

For each topic, the students must attend minimum three lectures and submit minimum two assignments

Continue to		
	ルニマンシンルシュエンス喧噪(12回コース)(2)	

先端マテリアルサイエンス通論(12回コース)(2)

evaluated as "passed".

#### [Textbook]

Not used

#### [Reference books, etc.]

(Reference books)

#### (Related URLs)

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

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

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

#### (Others (office hour, etc.))

It is prohibited to change the registered course.

Numbering	g cod	de												
Course title <english></english>	現代 Advan	、科学技術特 nced Modern Scien	<b>論(</b> 4 ce and T	1回コース) echnology (4 tim	) es course)	Affi dep Jot	liated partment title,Na	, me	Gra Seni Gra Seni Gra Sen Gra Sen Gra	duate Schoo ior Lecturer duate Schoo or Lecturer,M duate Schoo ior Lecturer duate Schoo ior Lecturer duate Schoo ior Lecturer	ol of Engineering c,ASHIDA RIYUUICHI ol of Engineering ATSUMOTO RIYOUSUKE ol of Engineering c,MAEDA MASAHIRO ol of Engineering r,YOROZU KAZUAKI ol of Engineering KANEKO KENTAROU			
Target ye	ar		-	Number	of cred	lits	0.5	Co yea	ourse ar/pe	e offered eriod	2019/Second semester			
Day/perio	d T	ĥu.5	Cla	ss style	Lecture	e				Language	English			
[Outline a	nd P	Purpose of t	he C	ourse]										
backgrounds done for furt [Course G The students	ther und	earch and dev understanding	velopr g of th	hnology tow	blems fo he cours	or the se.	e practi		appli	ved by engi	neers. In addition, the			
students lear engineering	[Course Goals] The students understand of each technology towards social issues to be solved by engineers. In addition, the tudents learn the importance for engineers to have multidisciplinary mind and understand the significance of engineering to realize sustainable development.													
[Course S	che	dule and Co	onten	its]										
Topic I Com Week 1-2, L Week 3, CF Week 4, CF Topic II Util Week 5-6, P Week 7, Sol Week 8, Eff Topic III Ma Week 9-10,0 Week 11-12	apute agran D in lizatio hotoo ar Er icieno ateria Cryst , Prir	r-Aided Anal ngian Meshfr Process Syste Hydraulic En on of Light E chemistry of nergy Conver cy Improvem ils Analysis cal Structure A nciples and A	yses f ee Me ems E ginee nergy Organ sion U ent in Analys pplica	for Fluid ethods as Ne ngineering ring lic Molecule Jsing Semic Solar Cells sis by Power ttions of Flu	ew Gene es onducto by Pho x X-ray orescen	or Ph tonio Diff	on Com otocata c Nano raction pectros	iputi llyst Stru Mei cop	ation ts uctur asure y	es ement				
[Class req	luire	ement]												
Each topic c This course It is prohibit	onsis reque ed to	sts of four lec ests to choose o change the t	tures. e one t opic a	opic from p fter registra	rovided tion.	thre	e topic	s in	adva	ince.				

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

The average score of the best two assignments is employed. For the topic which the students chose, they must attend minimum three lectures and submit minimum two assignments evaluated as "passed". Continue to 現代科学技術特論 (4回コース) (2) 現代科学技術特論(4回コース)(2)

#### [Textbook]

Course materials will be provided.

#### [Reference books, etc.]

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

#### (Related URLs)

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

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

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

#### (Others (office hour, etc.))

It is prohibited to change the registered course.

It is prohibited to attend the lectures of the other topics than the students chose.

All the students are requested to attend the guidance which will be held on the first class.

Numbering	g co	de													
Course title <english></english>	現ſ Adva	七科学技術特 Inced Modern Scienc	<b>論(</b> 8 e and T	3回コース) dechnology (8 tim	) nes course)	Affiliated department Job title,Na	t, ime	Graduate S Senior Lect Graduate S Senior Lectur Graduate S Senior Lect Graduate S Senior Lect Graduate S Senior Lect	cho ure cho x,M cho ure cho ure cho ure	ol of Engineering r,ASHIDA RIYUUICHI ol of Engineering IATSUMOTO RIYOUSUKE ol of Engineering r,MAEDA MASAHIRO ol of Engineering r,YOROZU KAZUAKI ol of Engineering ,KANEKO KENTAROU					
Target ye	ar	r     Number of credits     1     Course offered year/period     2019/Second semester       I     Thu.5     Class style     Lecture     Language     English													
Day/perio	d 🛛	Гhu.5	Cla	ss style	Lecture	2		Langua	ge	English					
[Outline a	nd I	d Purpose of the Course] Engineers have been expected to fulfill key roles among social issues and others, such as energy,													
Engineering/Engineers have been expected to fulfill key roles among social issues and others, such as energy, environment and resource. This class introduces cutting edge science and technologies from their backgrounds, research and development, to problems for the practical applications. Group discussions will be done for further understanding of the topics of the course.															
The students students lear engineering	und n th to re	derstand of eac e importance f ealize sustainal	h tec or en ole de	hnology tov gineers to h evelopment.	vards so ave mu	cial issues t tidisciplina	to be ry mi	solved by e ind and unc	ngi ers	neers. In addition, the tand the significance of					
[Course S	che	edule and Co	nter	its]											
Topic I Computer-Aided Analyses for Fluid Week 1-2, Lagrangian Meshfree Methods as New Generation Computational Tools Week 3, CFD in Process Systems Engineering Week 4, CFD in Hydraulic Engineering Topic II Utilization of Light Energy Week 5-6, Photochemistry of Organic Molecules Week 7, Solar Energy Conversion Using Semiconductor Photocatalysts Week 8, Efficiency Improvement in Solar Cells by Photonic Nano Structures Topic III Materials Analysis Week 9-10,Crystal Structure Analysis by Power X-ray Diffraction Measurement															
Week 9-10,0 Week 11-12	Crys , Pri	tal Structure A inciples and Ap	nalys pplica	sis by Powe ations of Flu	r X-ray lorescen	Diffraction ce Spectros	Mea scopy	surement							

#### [Class requirement]

Each topic consists of four lectures.

This course requests to choose two topics from provided three topics in advance. It is prohibited to change the topics after registration.

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

The average score of the best two assignments for each topic is employed. For each topic which the students chose, they must attend minimum three lectures and submit minimum two assignments evaluated as "passed".

Continue to 現代科学技術特論(8回コース)(2)

現代科学技術特論(8回コース)(2)

#### [Textbook]

Course materials will be provided.

#### [Reference books, etc.]

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

#### (Related URLs)

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

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

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

#### (Others (office hour, etc.))

It is prohibited to change the registered course.

It is prohibited to attend the lectures of the other topic than the students chose.

All the students are requested to attend the guidance which will be held on the first class.

Numbering	g cod	le											
Course title <english></english>	現代 Advan	た 和当 ced M	学技術特 lodern Scienc	<b>論 (</b> 1 e and Te	2回コース chnology (12 tin	. ) nes course)	Affiliated department, Job title,Name Affiliated department, Lob title,Name Course offered						
Target ye	ar				Number	of cred	lits	1.5	Co yea	ours ar/p	e offered eriod	2019/Second semester	
Day/perio	d T	hu.5	5	Cla	ss style	Lecture	e				Language	English	
[Outline a	nd P	urp	ose of t	he C	ourse]								
environment backgrounds done for furt [Course G The students students lear engineering	t and s, reso ther u ther u to reso to reso	reso earcl inde <b>5]</b> ersta e imp alize	and of eac portance :	ch tecl for en, ble de	nology tov gineers to h	s cutting blems fo the cours vards so ave mul	g edg or th se.	issues t sciplinar	o be	and t appl e sol	ved by engi and underst	neers. In addition, the tand the significance of	
[Course S	cheo	dule	e and Co	onten	tsj								
Topic I Con Week 1-2, L Week 3, CF Week 4, CF Topic II Uti Week 5-6, P Week 7, Sol Week 8, Eff Topic III Ma Week 9-10, Week 11-12	agrai D in 1 D in 1 lizatio hotoo ar En icieno ateria Crysta , Prir	r-Ai ngian Proc Hyd on o chen nergy cy Ir lls A al St ncipl	ded Anal n Meshfr cess Syste raulic En of Light E nistry of y Conver- mprovem nalysis tructure A les and A	yses f ee Me ems En gineen nergy Organ sion U ent in Analys pplica	or Fluid thods as No ngineering ting ic Moleculo (sing Semic Solar Cells is by Powe tions of Flu	ew Gene conducto by Pho r X-ray torescen	erati or Pł toni Diff ce S	on Com notocata c Nano Fraction Spectros	lyst Stru Mea	atior ts uctur asur y	nal Tools res ement		
Loab toric			f four la -	tune -									

Each topic consists of four lectures. This course requests to take all provided three topics.

#### 現代科学技術特論(12回コース)(2)

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

The average score of the best two assignments for each topics is employed. For each topic, the students must attend minimum three lectures and submit minimum two assignments evaluated as "passed".

#### [Textbook]

Course materials will be provided.

#### [Reference books, etc.]

(Reference books)

#### (Related URLs)

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

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

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

#### (Others (office hour, etc.))

It is prohibited to change the registered course.

Numbering	code												
Course title <english></english>	実践的 Exercis	科学英語 e in Practi	演習 cal Sc	vientific Eng	glish I	Affi der Jot	iliated partment p title,Na	t, me	Gra Seni Gra Seni Gra Seni Gra Seni Gra Seni Gra Seni	iduate Schoo ior Lecturer, ior Lecturer, ior Lecturer, ior Lecturer iduate Schoo ior Lecturer iduate Schoo ior Lecturer iduate Schoo ior Lecturer iduate Schoo ior Lecturer	ol of Engineering NISHIKAWA MIKAKO ol of Engineering ATSUMOTO RIYOUSUKE ol of Engineering r,ASHIDA RIYUUICHI ol of Engineering r,MAEDA MASAHIRO ol of Engineering r,YOROZU KAZUAKI ol of Engineering ,KANEKO KENTAROU		
Target yea	ar			Number	of cred	lits	1	Cou yea	urse ar/p	e offered eriod	2019/First semester		
Day/perio	d Thu.	.4,5	Cla	ss style	Semina	ar				Language	Japanese and English		
[Outline ar	nd Pur	pose of t	he C	ourse]									
This course i It is designed In this course approx. 1000	course is open to all master and doctoral engineering students. designed to help students understand how to write a research paper step by step. is course, the students will write a short research paper (i.e. Extended Research Abstract for Proceeding. ox. 1000 -1500 words) on a topic drawn from assigned readings.												
[Course Goals]													
[Course Goals] The primary goal of this course is to deepen an understanding of the main features of each part of a scientific paper (IMRaD). Throughout the course, students will develop the core competencies required for language, grammar, and style to produce a research manuscript in English.													
[Course So	chedu	le and Co	onter	its]									
Unit 1. Cours Introduction Unit 2. Introd Raising awar	se Over to writi luction reness c	view ng scientif of the regis	fic res	earch article	es esearch	artic	eles (ger	nre, a	audi	ence, purpo	se)		
Unit 3. Prepa Writing a pro	ring to posal f	Write (1) For a resear	rch pa	per, using c	orpus-b	ased	l approa	ıch (l	Exe	rcise: Creat	ing own Corpus)		
Unit 4. Prepa Paraphrasing	ring to ideas f	Write (2) From sourc	e text	s, using cita	tions an	nd re	ference	s in f	forn	nal writing			
Unit 5. Writi Identifying tl	ng Proc	cesses (1) A es for an A	Abstra Abstra	ict ct section by	y hint ey	xpres	ssions						
Unit 6. Writi Writing an A	ng Proc bstract	xesses (2) A (Title), Pe	Abstra er Fe	act-continue edback	¢d								
Unit 7. Writi	n <u>g Pro</u> c	xesses ( <u>3)</u> ]	[ <u>n</u> tr <u>o</u> d	uction					Co	 ntinue to 実践			

#### 実践的科学英語演習 (2)

Identifying the moves for an Introduction section by hint expressions

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

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

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

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

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

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

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

Unit 15. Submission of the Final Paper

#### [Class requirement]

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

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

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

#### [Textbook]

Handout materials will be supplied by the instructor.

#### [Reference books, etc.]

(**Reference books**) Textbooks (for reference)

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

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

Continue to 実践的科学英語演習 (3)

#### 実践的科学英語演習 (3)

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

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

#### (Others (office hour, etc.))

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

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

Numbering	g co	de											
Course title <english></english>	先站 Inst	岩科与 rume	学機器分 <sup>;</sup> ental Anal	析及で lysis,A	び実習 Adv.I		Aff dep Job	iliated partment p title,Na	, me	Gra Pro	duate Schoo fessor,OOE	ol of Engineering KOUICHI	
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[Method, I	Poin	nt of	view, ar	nd At	tainment	levels	of E	valuat	ion	]			
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[Referenc	e bo	ooks	, etc.]										
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[Regardin	g st	udie	es out of	clas	s (prepara	ation a	ndı	review	)]				
(Others (	offic	ce ho	our, etc.	))									
*Please visit	t KU	LAS	IS to find	l out a	about office	hours.							

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[Course G	Soal	s]											
	[Course Schedule and Contents]												
[Course Schedule and Contents]													
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( Refere	( Reference books )												
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(Others (	offic	ce h	our, etc.	))									
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[Course	Scł	nedule	e and	Conte	nts)]												
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													Con	tinue to 研究倫理	・研究公止	(埋丄糸) <b>(2)</b>	

研究倫理・研究公正(理工系)(2)

- 3.利益相反(利害の衝突と回避)
- 4.公的研究費の適切な取扱い
- 5.研究者・研究機関へのペナルティー
- 6.事例紹介(ビデオ:分野共通4件)
- 7.結語

#### 第4講 グループワーク

- 1.例示された課題についてグループ・ディスカッションと発表
- 2.日本学術振興会「研究倫理ラーニングコース」の受講と修了証書の提出

#### [Class requirement]

None

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

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

#### [Textbook]

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

#### [Reference book, etc.]

#### (Reference book)

米国科学アカデミー 編、池内 了 訳 『科学者をめざす君たちへ 研究者の責任ある行動とは』(化 学同人)ISBN:978-4759814286

眞嶋俊造、奥田太郎、河野哲也編著 『人文・社会科学のための研究倫理ガイドブック』(慶応義塾 大学出版会)ISBN:978-4766422559

神里彩子、武藤香織編 『医学・生命科学の研究倫理ハンドブック』(東京大学出版会)ISBN:978-4130624138

野島高彦著 『誰も教えてくれなかった実験ノートの書き方』(化学同人)ISBN:978-4759819335 須田桃子著 『捏造の科学者 STAP細胞事件』(文藝春秋)ISBN:978-4163901916

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

日本学術振興会「研究倫理ラーニングコース」の受講

#### [Others (office hour, etc.)]

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

科目ナンバリング G-LAS01 80001 LJ10													
授業科目 <英訳>	名 学術研究 Basics o	究のため( f Academ	の情報 ic Infor	リテラシ・ mation Li	ー基礎 teracy	担当職名	当者所属 る・氏名	国 <b> 阿</b> 学術 学術 情	ミ高等教育防 属図書館 報メディアセンタ・ 報メディアセンタ・	記 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	牧授 - 教授 -	喜多 化村 LAN/ 诸方	一 由美 AGAN, Brendan 広明
群	大学院共通科目群			分野(分類) 情報テクノサイ			エンス 係		使	吏用言語 日本		本語	
旧群				単位数	0.5単位	立	時間数	汝	7.5時間		授業形	態	講義
開講年度・ 開講期	2019・ 前期集中 曜時限 <sup>集</sup> 限		中 月25日(:	(土)2~5		配当学年		大学院生		対象学生		全学向	
[授業の概要・目的]													
本科目では大学院生として研究室などでの研究活動を本格化させるための基礎的な知識・スキルと して、大学図書館などを活用した学術情報の探索と発信、本学が提供する情報通信サービスの理解 とその適正な運用、その基礎となる情報ネットワークやコンピュータについての実践的事項、情報 セキュリティと情報倫理などを学習する。													
[到達目標]													
大学図書館などを利用した学術目的の情報探索、情報発信について、効果的な文献の探索・収集・ 活用の手法と、論文として発表する際のマナーを知る													
研究活動でコンピュータや LAN、インターネットを適切に利用するための技術的な基礎知識を知る。													
研究室でのネットワーク利用のために本学が提供しているKUINS 等の情報通信サービスについて知 り、適切に利用できるようになる。 研究活動でコンピュータやネットワークを利用する際の本学での遵守事項や情報セキュリティ・情													
報倫理上の留意点を知り、実践できるようになる。													
	■と内谷] □の培業2	を佳山講	美いナ	で宝施す									
以ト、4回の授業を集中講義形式で実施する。 ・学術研究のための大学図書館利用と情報探索、情報発信(1回) ・ネットワークの基礎(1回)													
・大学の情報基盤の利活用(1回) ・情報セキュリティと情報倫理(1回)													
[履修要	件]												
特になし	,												
[成績評価の方法・観点]													
授業への参加(課題の提出)により評価する。情報環境機構が提供する情報セキュリティ e- learning の修了は合格の要件である。													

学術研究のための情報リテラシー基礎(2)

#### [教科書]

プリント等を電子的に配布する。

[授業外学修(予習・復習)等]

情報セキュリティ e-learning についてはあらかじめ修了しておくこと。授業外学習として課題を課す。

[その他(オフィスアワー等)]

受講時に、受講前に持っている情報リテラシーについての知識・スキル等を調査する予定である。 授業資料は電子的に配布するので、ノートPC などを持参して受講することが望ましい。

科目ナン	バリング	G-LAS02 80	0001 SE48								
授業科目 <英訳>	名 大学院生 Presenta	のための英語フ tion for Gradua	<sup>°</sup> レゼンテー te Students	·ション <sub>担当</sub> 職名	当者所属 国際 名・氏名	<sup>紧</sup> 高等教育院	E 講師 R	YLANI	DER , John William		
群	大学院共进	围科目群	分野 <b>(</b> 分类	頁) コミュ	ニケーション	ン	使用言語英語		語		
旧群			単位数	1単位	時間数	15時間	授業形	態	演習		
開講年度・ 開講期	2019・ 前期集中 曜時限 <sup>集</sup> 11 日		集中 9月9日(月) 1日(水)2 ~ 日(金)2・3[	【中 月9日(月)2~4限、 日(水)2~4限、13 (金)2・3限		大学院生	対象学	生	全学向		
[授業の概要・目的]											
This course is designed to provide graduate students with an opportunity to develop their ability and confidence when presenting field-specific content to an informed audience. Giving presentations in an academic setting, whether it is in a classroom, laboratory context, or at a conference, has become increasingly necessary for students at the graduate level. Course content extends from how to greet the audience to how to answer audience questions.											
[到達目標]											
<ul> <li>Create an appropriate presentation slideshow for a conference or a research laboratory presentation;</li> <li>Clearly introduce and provide an overview of the talk through appropriate signposting;</li> <li>Properly display visual aids to enhance audience understanding of research data;</li> <li>Use posture and movement to engage the audience;</li> <li>Use gestures and gaze to emphasize information and connect with the audience;</li> <li>Produce a presentation; and</li> <li>Answer audience questions.</li> </ul>											
[授業計]	画と内容]										
Session 1: Purpose and structure of academic presentations Session 2: Topic selection and development Session 3: Information organization: From greetings to goodbyes Session 4: Creating effective slideshows and displaying research data Session 5: Body language and gestures Session 6: Answering audience questions Session 7: A special focus on data significance Session 8: Student presentations and instructor feedback											
[履修要件]											
This course has a limit set on student enrollment. In the case where many students wish to enroll in class, a lottery system will decide inclusion.											
[成績評価の方法・観点]											
30% Acti 30% Slid 40% Mai	ive Participa eshow Crea n and Minor	ttion tion r Presentations									
						大学院生のため	 りの英語プレゼンラ		 ョン(2)へ続く		

#### 大学院生のための英語プレゼンテーション(2)

#### \_\_\_\_\_ [教科書]

使用しない

[参考書等]

(参考書)

All course materials will be provided to the students by the teacher.

[授業外学修(予習・復習)等]

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

[その他(オフィスアワー等)]