Course number	U-ENG29 22050 LJ5	5 U-ENG29	22050	LJ10		
Course title (and course title in English)	学A 1 I Mathematics A1	nai and	tructor's me, job tit d departm affiliation			nool of Informatics sor,SHIBAYAMA MITSURU
Target year 2nd	year students or above Numbe	r of credits	2	Yea	/semesters	2020/Second semester
Days and periods Thu.	2 Class style	Lecture			Language of instruction	Japanese
[Overview and p	urpose of the course]					
	raditionally known as the sis that investigates functi some integral.					
[Course objective	es]					
To understand proper mathematics and phy	erties of complex function ysics.	ns with a skill	for eval	uation	of integrals a	ppearing in applied
[Course schedul	e and contents]					
 Application to in Point at infinity and 	ions mplex plane theorem ies ctions iation ng trigonometric functior mproper integral and Riemann sphere	15				
[Course requiren						
Calculus, Linear alg	ebra					
[Evaluation meth	ods and policy]					
Evaluation depends needed.	mainly on marks of exam	nination, but r	narks of	exerc	ises are taken	into account when
[Textbooks]						
Not used				,	Continue to	

Target yea	ar Bro	l year students	or above	Number	of credi	ts 2	Year	r/semesters	2020/First semes
Days and per	iods Mo	n.2	Clas	s style	Lecture			Language of instruction	Japanese
[Overview				-					value problem and
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-			/ and	practical me	ethods for	application	ons the	ough general.	purpose softwares
				al of this co		appread	5115 UII	ough general-	parpose sortwares
[Course s	- ah au	. اد مده		(a]					
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工業数学A1 (2)		
References, etc.]	
(Reference boo		
ars v. Anifors UC	Complex Analysis. (McGraw-Hill Education) ISBN:978-0070006577	
(Related URLs)		
(Related ORLS) KULASIS)	·	
Study outside of tudents need to solv	f class (preparation and review)]	
tudents need to solv	ve exercises.	
	ion (office hours, etc.))	
Please visit KULA	SIS to find out about office hours.	

工業数学A 2(2)

[Textbooks] quothtroduction of Numerical Analysisquot (in Japanese) by T. Yamamoto, SAIENSU-SHA isbn{}{

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[References, etc.] (Reference books)

[Study outside of class (preparation and review)]

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

										未更新
Course nu	umbe	r U-EN	G29 3	2070 LJ10	U-EN	G29	32070	LJ55		
Course title (and course title in English)		数学A3 leid Mathema	tics A	13		nan and	ructor's ne, job ti departr ffiliatior	nent		nool of Informatics AGASAKI KAZUYUKI
Target yea	r	3rd year students o	or above	Number	of cred	lits	2	Yea	r/semesters	2020/First semester
Days and perio	ods W	/ed.1	Clas	s style	Lectur	e			Language of instruction	Japanese
[Overview	and	l purpose o	f the	course]						
provides its	theor bjec nd the	ies and applie tives] e fundamenta	cation	s along with	h Lapla	ce ar	alysis	closely	related to it.	hnology. This course
Fourier serie such as com Properties and applications One-dimens and their fur equations ar Multi-dimer given, and the Laplace tran are discusse Summary ar	es,2-3 putat nd ap to di ional ndam e diso siona heir f sform d. nd lea	ion of Fourie plications of fferential and Fourier trans ental properti cussed. al Fourier tran undamental p ns,2-3times,F	finition r coef Fouri- l diffe form, es suc- nsform proper troper	n of Fourier ficients and er series, 3-4 rence equat 3-4times, TI th as the inv n, 2-3times, 7 ties and app ties of Lapl evaluation,	conver times,S ions and he defin version t The defi lication ace tran ,1time,A	gend seven itior form inition s to sfor	ce of For ral prop nal prop n of one ula and on of m partial ms and	urier s erties -dime appli ulti-di differe their a	series are discu of Fourier seri g are discussed nsional Fourie cations to part mensional Fou ential equation applications to	ies and their
[Course re	equi	rements]								
Calculus, Li	near	Algebra and	Differ	ential Eqau	tions					
[Evaluatio	n m	ethods and	poli	cy]			_			
Evaluation c account whe			mark	s of examin	ation, b	out m	arks of	exerc	ises and home	work are taken into

業数学A 3 (2) extbooks] Nakamura: Fourier analysis, Asakura shoten isbn{}{9784254115741} teferences, etc.] (Reference books) Fukawa: Mathematics of control and vibration, KORONA-SHA ibid{}{TW86010572} Study outside of class (preparation and review)] Other information (office hours, etc.)) lease visit KULASIS to find out about office hours.
Fextbooks] Nakamura: Fourier analysis, Asakura shoten isbn{}{9784254115741} References, etc.] (Reference books) Fukawa: Mathematics of control and vibration, KORONA-SHA ibid{}{TW86010572} Study outside of class (preparation and review)] Other information (office hours, etc.))
iextbooks] Nakamura: Fourier analysis, Asakura shoten isbn{}{9784254115741} References, etc.] (Reference books) Fukawa: Mathematics of control and vibration, KORONA-SHA ibid{}{TW86010572} Study outside of class (preparation and review)] Other information (office hours, etc.))
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ar/semesters	2020/First semester	Т	arget year	4	Ith year students of	or above	Number	of cred	lits	2	Year	/semesters	2020/First	semester
Language of instruction	Japanese	C	Days and perio	ds Ti	hu.3	Clas	s style	Lecture	e			Language of instruction	Japanese	
		Π	[Overview	and	purpose o	of the	course]							
	mes very important not chnology. This course				sed on engin various facult							sent engineer rch fields.	s and scienti	ists.
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olications to part dimensional Foo erential equation r applications to supplements of	ies and their d. r transforms is given, ial differential urier transforms is is are discussed. differential equations this course are given	e C C g e E E E t t t E E t t t E E t t T T	examples are geotechnical liscussing th engineering a Engineering genering Engineering dengineering engineering dengineering articular eth art-view con- ngineering. he QOL-eva Comita: Engi Ethics of bio	disc eng e un ntrod ind e ethic Ethic orma ies fo n, de ical cept Som luati neer ech	russed. (K. H ineering and derground pu lucing some e- engineering e is as an appli- ics by compar- ation technol or engineerin- problems in for engineer e practical e: on will be di ing Science) nology and st	arada engin iblic u examp thics ed eth ing w logy. (ag ethi rtue eth engine ing. (xampl scusse	Architectu eering ethic se, slope st oles of natu will be disce M. Mizutar cs. (5/2) 1 t hics, profes eering ethic 5/9) 1time. 4 es in medic ed from both	re) ss. (4/18 ability, g ral disas ussed. (1 1 time. I r fields of iii: Gradu iii: Gradu ii: Gradu ii	3) 1 ti geo-s sters a K. K In this of Ap uate 1 is lec ethics eda: 0 t of "6 and v on-op 1 time	me. Ge acquest and con ishida: s lectur oplied l School cture for etc.) v Gradua quality velfare otimizi	eotechn ration Globa re, I wi Ethics. of Let ocus on which v ate Sch of life fields ng view	ances of engi nical Enginee of byproduct ion accidents. Il Engineering ill show the b And show it: ters) various idea will be useful ool of Letters " is required will be introc w point and a pid developm goes beyond	ring is indis; for the energ, geotechnic; g) asic Idea of s unique cha s in ethics for thinking ;) for human re luced, and p rt view poin ent of genor	pensable in gy al tracter in g about elated roblem of t. (N. me editing
	work are taken into 工業数学A 3 (2)↓↓↓	P P b d r E	possible, at le problems acc Research and pelongs there liscussed in esearch or esearch or esearch or ese Ethics in bio	east t omp eng to. T term ngino nedi	technically. I wanying technicineering ethi ineering ethi the sense of o s of the impo- eering. (H. M ccal engineering	n this nologie cs. (5/ ethics ortance fikada ing. (5	lecture, I w cal develops (23) 1time. necessary t e of equitab :: Global En (730) 1time.	ill intro ment. (O It is said o whom ility and gineerin Recent	duce G. Ein 1 that 1 cond 1 fair ng) dram	these l raku: In He tha ducts r evalua natic pr	atest te ndustri at will esearch tion to rogress iques,	echnologies a al Chemistry; do no ill, mus h and enginee anyone invo in biology-ra is causing rev Continue to	nd think abo st do nothing ring work ir lved in each elated techni rolutions in t	out ethical g that n society is a area of iques, such the fields o

工学倫理(2)

medicines and food productions. Associated with it, problems of their safety and ethics are arising, which should be addressed by our societies. In this class, the recent progress in biology-related techniques, and problems we have and will have in near future are described. (M. Shirakawa: Industrial Chemistry) Patents and ethics (Part 1). (6/6) Itime. This course will teach the students about 1) patent systems which protect inventions and research results and 2) ethical issues in patents. The first class, in preparation for the next subject of patent ethics, introduces Japan's patent system with comparisons to the patent systems in the world's major countries and international framework. (M. Nakagawa: Electrical and Electronics Engineering)

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

Ethics required for advanced science. (6/27) 1 time. Engineers and researchers are at the forefront of reventing harm caused by advanced chemistry. Think about social roles and thics required by engineers and researchers through relationships between chemical substances and environmental problems, efforts to avoid

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

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

to engineering ethics.(S. Biwa: Engineering Science) Ethics in nuclear engineering. (7/18) time. Discussion on engineering ethics in the TEPCO accident from view point of Tsunami evaluation by the Japanese government. (I. Takagi: Engineering Science) Ethical issues on sound design. (7/25) 1 time. Every working things consuming energy emits acoustic sound. Even a small sound energy affect human as noise and may create annoyance and health problems. Sound problems of various things are introduced in the lecture. Ethical issues, which shall be considered during design and operation environment, will be discussed. (Y. Takano: Architecture)

[Course requirements]

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[Evaluation methods and policy]

Class participation and reports

[Textbooks]

ecture materials will be distributed.

[References, etc.]

(Reference books)

[Onnibus Engineering Ethics] (Kyoritsu Shuppan Co., Ltd.) ISBN:978-4320071964 [Practical Engineering Ethics - A Short Course, New Edition.] (Kagaku-Dojin Publishing Company,INC) ISBN:9784759811551

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

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

_____ Continue to 工学倫理(3)↓↓↓

工学倫理(3) [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 (3) Details of practical classes delivered based on instructors' practical work experience

職業指導(2)

[Course requirements]

None

[Evaluation methods and policy] レポート試験の成績(60%) 平常点評価(40%) 平常点評価には、授業への参加状況、授業内での積極的発言を含む。

[Textbooks] Instructed during class

[References, etc.]

(Reference books) 堀内達夫・佐々木英一・伊藤一雄・佐藤史人編『日本と世界の職業教育』(法律文化社)ISBN: 978-4-589-03511-0 佐藤史人・伊藤一雄・佐々木英一・堀内達夫編『新時代のキャリア教育と職業指導--免許法改定に 対応して』(法律文化社)ISBN:978-4-589-03953-8

[Study outside of class (preparation and review)]

復習:授業で配布した資料等をよく読んで、講義内容の理解を深めておくこと。

(Other information (office hours, etc.)) 開講時期: 令和2年8月26日 (水) ~8月31日 (月)の土日を除く4日間の集中講義 各日ともⅠ時限~Ⅳ時限まで(8月28日(金)のみⅡ~Ⅳ時限)

*Please visit KULASIS to find out about office hours.

Course nu	umber	U-ENC	325 3:	5148 LJ57	U-EN	G25	351481	LJ75		
Course title (and course title in English)	104014470	尊 nal Guida	nce			nam and	ructor's ne, job tit departm ffiliation		Part-time Lee	cturer,INOUE MAKI
Target yea	r Brd y	ear students o	r above	Number o	of cred	its	2	Year	/semesters	2020/Intensive, First semester
Days and perio	ods Inter	nsive	Class	s style	Lecture	•			Language of instruction	Japanese
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第2回日2 日2 第2回日2 学校 第第10回 支税 第第10回 支税 東第10回 専門 第110回 日 日 日	業本交交界術を引用用本等本本本本本本本本本本本本本本本本本本本本本本	かーおとして、 かーおとして、 かーおとして、 のののの した。 ののの のの のの のの のの のの のの のの のの	概進接接米す格業業職育職リ育会路続続にると教教教言教教	・ を 種類 (1) 日本 (2) 日本 (2	内距職業 相職業 業業 本本 1) 2) 3) 2) 3) 4) 4) 5) 5) 5) 5) 5) 5) 5) 5) 5) 5	ス格育のけ指資体核制題	テムととやります。	学特徴教育方とマス観要	f の位置)意義 : 進路状況 厚門教科の内 ーンシップ)	
									Continue to	職業指導(2)↓↓↓

Course title (and course title in English)			ngineering	n	nstructor's ame, job tir nd departn f affiliation	nent	Senior Lectu Graduate Scl Senior Lecture Graduate Scl	nool of Engineering rer,OHTA HIROTO nool of Engineering er,KANEKO KENTAROU nool of Engineering er,YOROZU KAZUAK
Target yea	r lst ye	ear students o	r above Number (of credit	s 1	Year	/semesters	2020/Intensive, First semester
Days and peric			Class style	Lecture			Language of instruction	Japanese
[Overview	and pu	irpose o	f the course]					
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工学序論(2)

[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.

*Please visit KULASIS to find out about office hours.

GLセミナー1(企業調査研究)(2) [References, etc.] (Reference books) (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 (3) Details of practical classes delivered based on instructors' practical work experience

未更新

										小文初
Course nu	mber	U-EN	G23 2	3181 LJ73		_				
		ミナー I Leadershi		業調査研究 ninar I	<u>(</u>)	nai and	tructor's me, job tit d departm affiliation	ent	Senior Lectur Graduate Scl	hool of Engineering rer,YOROZU KAZUAKI hool of Engineering rr,KOMIYAMA YOSUKE
Target year	2nd	year students	or above	Number	of cred	lits	1	Year	r/semesters	2020/Intensive, year-round
Days and perio	ds Inte	ensive	Clas	s style	Semin	ar			Language of instruction	Japanese
[Overview	and p	urpose c	f the	course]						
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[Course of	jectiv	es]								
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[Course so	hedu	e and co	nten	ts]						
Week 1, Gui										
Week 2-13, I Week 14, Pre Week 15, Fir	-prese	ntation								
[Course re	quire	nents]								
How to regis class.	ter will	be annou	nced l	ater. Studer	nts who	war	nt to join	this c	ourse is reque	ested to attend the first
[Evaluation	n metl	nods and	polie	cy]						
Students are	prohib	ted to skip	hand	s-on trainin	ıg. Eval	uati	on will b	e base	ed on presenta	ition.
[Textbooks	5]					_				
Not used	-									
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									Jontinue to G L T :	ミノ ̄ I (近乗詞宜研究)(2)↓↓↓

Course nu	umber	U-EN0	323 3	3184 PJ73					
Course title (and course title in English)				ンシップ 1 ernational Inte	ernship 1	Instructor's name, job ti and departr of affiliatior	tle, nent	Approved	
Target yea	r 3rd y	ear students o	or above	Number	of cred	its 1	Year	/semesters	2020/Intensive, year-round
Days and perio	ods Inte	nsive	Clas	s style	Semina	r		Language of instruction	Japanese and English
[Overview	and p	urpose o	f the	course]					
									ernship programs applicant belongs to.
[Course o	bjectiv	es]							
The acquisit hosted by th							anguag	ge through the	e to internship program
[Course s	chedul	e and co	nten	tsl					
[Course re	equiren 1 the app ills for th	nents] lication be	ooklet ation.	t for each in		•		•	ion among participants uested to have enough
Marit rating responsible credit is not the Global L determined	is done to identi included eadersh dependir	based on t fy if the cr 1 in the un ip Educati	he pro edit e dergra on Ce	esentation of earned by th aduate scho enter as a op	is subject ol in wh ptional c	t to be incl ich the part redit. The r	uded a ticipan umber	t belongs to, t of credits, ei	Each Department ones or not. If the he credit is granted by ther 1 or 2, will be pant has participated in
[Textbook	s]								
·							c	Continue to 工学部	国際インターンシップ1(2)↓↓

[References, etc.]	
(Reference books)	
Study outside of cla	ss (preparation and review)]
(Other information (office hours, etc.))
nandatory credits or not a chool or educational pro	to check if the internship program to participate in could be evaluated as part of und could earn how many credits before the participation to the undergraduate gram the student in enrolled. If the credit could not be treated as mandatory ones, al Leadership Engineering Education Center.
Please visit KULASIS to	o find out about office hours.
Courses delivered b	y instructors with practical work experience]
 Category Course that includes off 	-campus training classes.
2) Details of instructors'	practical work experience related to the course
3) Details of practical cla	sses delivered based on instructors' practical work experience

[Textbooks]		
Will be indicated as nece	sary.	
[References, etc.]		
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Course nu	mber	U-ENG	23 33182 LJ7	'3					
			I (課題解決 Seminar II	演習)	nan and	ructor's ne, job ti departn ffiliation	nent	Senior Lecture Graduate Scl	hool of Engineering r,KANEKO KENTAROU hool of Engineering rer,OHTA HIROTO
Target yea	r 2nd y	ear students or	above Numbe	r of cred	lits	1	Yea	/semesters	2020/Intensive, Second semester
Days and perio	ds Inten	sive C	Class style	Semin	ar			Language of instruction	Japanese
[Overview	and pu	rpose of	the course					·	
rained throu	gh group ough ora	o works in Il presenta	residential tra tions regardin	ining and	skil	ls of pre	esentat	ion and comm	nd problem-solving are nunication are the process from a
[Course of	bjective	s]							
			ction or setting a group works		enge	s to pro	posal	of solutions a	iming at creating new
[Course so	chedule	and con	ntents]						
organized. Lectures,2tir Group works are done. Residential t problems is p Preliminary Report meeti	nes,Lect s,3times, raining,7 planned, review n ing,1time	ures by ex Setting up 'times,Thr a draft rep neeting,1ti e,Final pre	perts are giver challenges, e:	n. xtraction o e group w nd a few j nary revie	of pr orks prese w m	oblems, based o entation eeting is	colled on disc s are n s held	cting informat russion, a prop nade. and discussio	rking groups are tion, and group works posal for solving ns are made.
[Course re	quirem	ents]							
None									
[Evaluatio	n meth	ods and	policy]						
concerning a	bilities i	n group di	tial training. A scussion to ex ation of the pro	tract or se	t up	challen	ges an	d to propose :	ve evaluation solutions for achieving
							,	Continue to G L セミ	テーⅠⅠ (課題解決演習) (2)↓↓

Course num	ber	U-ENO	327 3°	7137 LE48	U-EN	IG2	7 37137	LE61				
Course title (and course title in English) エ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												
Farget year	3rd year	students o	r above	Number	of cred	lits	2	Year	/semesters	2020/Intensive, year-round		
Days and periods Intensive Class style Seminar Language disturtion Japanese and English												
[Overview and purpose of the course] Acquisition of international skills with wth the training of foreign language through the participation to the international internship programs held by the Faculty of Engineering or its subsidiary bodies.												
[Course obje	ectives]										
The acquisition programs is exp	of inter pected. I	rnationa Detailed	l and l objec	foreign lan ctives of th	guage si e partici	kills pati	through on shou	the p ld be i	articipation to dentified by o	o international each program.		
[Course sch	edule a	and co	ntent	s]								
[Course requ	uireme e applic	nts]	ooklet	-			·		-	ion among participants.		
[Evaluation I	nethoo	ds and	polic	:y]								
Marit rating is or responsible to i credit is not inc the Global Lead	done ba dentify luded ir dership	sed on t if the cr n the un Education	he pre edit e dergra on Ce	esentation of arned by the aduate schoor nter as a op	nis subje ool in wh ptional c	ct to nich redi	be incl the part t. The n	uded a icipan umber	s mandatory t belongs to, of credits, ei	Each Department ones or not. If the the credit is granted by ther 1 or 2, will be oant has participated in.		
[Textbooks]												
			_			-		C	continue to 工学部	国際インターンシップ2(2)↓↓		

[References, etc.]	
(Reference books)	
[Study outside of class	ss (preparation and review)]
(Other information (office hours, etc.))
It is required for students mandatory credits or not school or educational pro	to check if the internship program to participate in could be evaluated as part of and could earn how many credits before the participation to the undergraduate gram the student in enrolled. If the credit could not be treated as mandatory ones, al Leadership Engineering Education Center.
*Please visit KULASIS to	o find out about office hours.
[Courses delivered b	y instructors with practical work experience]
 Category Course that includes off 	-campus training classes.
(2) Details of instructors'	practical work experience related to the course
(3) Details of practical cla	asses delivered based on instructors' practical work experience

Course nu	mbe	r U-EN	G25 45	5019 LJ77	U-ENG25	45019	LJ71	U-ENG25 4	5019 LJ75		
Course title (and course title in English) 日子物理学2(材原字)〈情報〉 Quantum Physics 2 日本 (本) (本) (本) (本) (本) (本) (本) (本) (本) (本											
Target year	. 3	rd year students o	or above	Number	of credits	2	Year/	semesters	2020/Second semester		
Days and perio	ds Ti	ue.1	Class	style	Lecture			Language of instruction	Japanese		
[Overview	and	purpose o	f the	course]							
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mathematica					citoes periec	y a 10	c or pite	inomena moj	price of its peculial		
			ource	is to und	stand the f	mulat-	n and t	o bacome	nable to manipul-t- it		
An importan	t pur	pose or uns c	ourse	is to under	stand the for	mutatio	in and t	o become ca	pable to manipulate it		
Course of	hine	kivoel									
[Course of											
To understan											
To be able to	o calc	ulate some p	roperti	ies of quan	tum mechani	ical par	ticle in	three dimen	sional space.		
	To be able to calculate some properties of quantum mechanical particle in three dimensional space.										
[Course schedule and contents]											
[Course so	ched	lule and co	ntent								
-			ntent						•		
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量子物理学1(材原字)〈情報〉(2) 60 and above: Passed 59 and below: Failed

Modern Quantum Mechanics (J.J.Sakurai) isbn{}{9780805382914} isbn{}{9781292024103}

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

Lectures on Quantum Theory (C.J. Isham) isbn{}{1860940013} [Study outside of class (preparation and review)]

[Courses delivered by instructors with practical work experience]

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

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

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

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours.

[Textbooks] Not used

Send an email.

(1) Category

[References, etc.] (Reference books)

Course number U-ENG25 35018 LJ75 U-ENG25 35018 LJ77 U-ENG25 35018 LJ71 Course tit name, job title, and department of affiliation 量子物理学1(材原宇)〈情報〉 Graduate School of Engineering Associate Professor, MIYADERA TAKAYUKI (and course title in Quantum Physics 1 English) Brd year students or above Number of credits 2 Year/semesters Target year 2020/First semester Days and periods Fri.2 Class style Lecture anguage of instruc Japanese [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. [Course objectives] An important purpose of this course is to understand the fundamental mathematical structure of the quantum heory. In addition one is hoped to become capable to calculate some basic properties of a quantum echanical particle on one-dimensional space. [Course schedule and contents] Introduction. Wave mechanics and matrix mechanics. Mathematical structure of quantum theory (1) State and observable. Mathematical structure of quantum theory (2) Hilbert space and state vectors. Mathematical structure of quantum theory (3) operators and observables Mathematical structure of quantum theory (2) operators and observators. Mathematical structure of quantum theory (4) Schroedinger equation and time evolution . One particle on one-dimensional space (1) classical theory and its quantization . One particle on one-dimensional space (2) CCR and Robertson's uncertainty relation Potential problem (1) General theory 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) 15. Summary [Course requirements] Classical mechanics, Linear algebra [Evaluation methods and policy] [Evaluation method] Evaluation will be based on one written examination. [Evaluation policy] The result of a written examination should be 60 and above out of 100. esuit of a written Camination Annual (根報) (2)↓↓ Continue to 量子物理学T(树原字)(情報)(2)↓↓

量子物理学2(材原宇)〈情報〉(2)	
[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 (affine house at a))	
(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	

未更新

Course n	umber										
Course title (and course title in English)		トロニクス ction to El			〈情報〉	nan and	tructor's ne, job tit I departm ffiliation	nent		nool of Informatics DRIKURA MASAHIRO	
Target yea	r 2nd y	year students (or above	Number	of cred	its	2	Year	/semesters	2020/First semester	
Days and peri				style	Lecture	e			Language of instruction	Japanese	
[Overview	/ and pi	urpose o	f the	course]							
[Course o	bjectiv	es]									
[Course s	chedul	e and co	ntent	s]							
,2times, ,5times,											
.2times.											
,5times,											
,1time,											
[Course r	equiren	nents]									
None											
[Evaluatio	on meth	ods and	polic	;y]							
[Textbook	(s]										
[Referenc		-									
Refere	nce boo	oks)									
10.		,									
[Study ou	tside of	r class (p	orepa	ration and	a revie	w)]					
	(Other information (office hours, etc.))										
*Please visi	t KULA	SIS to find	l out a	bout office	hours.						

U-ENG26 26010 LJ72 Course number Course title Instructor's name, job title, and department of affiliation 雷子同路 (and cours Graduate School of Engineering Associate Professor,SUGIYAMA KAZUHIKO Electronic Circuits title in English) 2nd year students or above Number of credits 2 Year/semesters 2020/First semester Farget year Days and periods Fri.2 Class style Lecture inguage of instruction Japanese [Overview and purpose of the course] Following the lecture of fundamentals of active device circuits in the course quotElectric and Electronic Circuitsquot, modeling of active devises, fundamentals of transistor circuits, various amplifier circuits, negative feedback in circuits, operational amplifiers, and oscillators are lectured. Nonlinear circuits, power supplies, and noise would be included in the course, when the lecture time remains. [Course objectives] The goal of this course is to acquire the fundamentals of electronic circuits. Starting with understanding of a fundamental concept of electronic circuits i.e., modeling of active devices, the lecture based on the fundamental concept proceeds step by step to understand electric circuits. In this style, the lecturer wants to give the students an ability to understand the principles of more complicated circuits by application of deep understanding the fundamentals. The main targets to be understood are the circuits with bipolar transistors and operational amplifiers, as well as the fundamental concepts. [Course schedule and contents] Modeling of active devices (3 times): The essential concepts in the electronic circuit are lectured in order to treat active devices in the electric circuit theory. The concepts are the controlled source and the linearization. The decoupling between the bias and the signal, another important concept, is lectured. ndamentals of transistor circuits (3 times) The characteristics of the basic bipolar-transistor circuits of three different common references are lectured based on the operation principle of the bipolar transistor. The biasing circuits are lectured with somewhat practical circuits. Various amplifier circuits (3 times) Several power amplifier circuits are lectured as we focus on their power efficiencies. DC amplifier circuits are lectured as we bear in mind that they are applied in operational amplifiers. Operational amplifiers (2 times): The concept and advantages of the negative feedback circuit are lectured, and an important concept in the operational amplifier, the virtual short, is explained. The linear operational circuits such as integrator and differential circuits, and nonlinear operational circuits such as logarithmic and exponential amplifiers are introduced. Oscillators (2 times): The principle of the oscillator circuit is lectured as a concept of the positive feedback. Various oscillator Continue to 電子回路(2)↓↓↓

電子回路(2)

circuits are introduced with their characteristics.

If we have a more lecture time, nonlinear circuits of multiplier and modulation/demodulation circuits, power supplies for electronic circuits, and the noise in electronic circuits will be lectured.

Feedback (1 time):

Others (1 time):

We make an examination in order to investigate the achievement in the lecture. We will offer an additional chance for discussion to the students who do not achieve satisfactorily.

[Course requirements]

quotElectric and Electronic Circuit (60030)quot and quotFundamentals of Circuit Theory (60630)quot. (The lecturer recommends moderate understanding of fundamentals of electric circuit as the minimum prerequisites in order to achieve this course.)

[Evaluation methods and policy]

Examination and reports. Details about evaluation of the reports are opened on the homepage of this lecture located on PandA.

[Textbooks]

Masao Kitano Fundamentals of Electronic Circuits J (Reimei Publishing, Kyoto) (ibid:BB04087527)

[References. etc.]

(Reference books) (addition to Japanese books, Tietze and Schenk: Electronic Circuits (Splinger) isbn{}{354050608X} isbn{} (9783540004295);

Hayes and Horowitz: Student Manual for the Art of Electronics (Cambridge) isbn{}{0521377099}

(Related URLs)

(Link to the homepage of this course is here; (https://panda.ecs.kyoto-u.ac.jp/portal/site/2020-110-6010-000) or (https://panda.ecs.kyoto-u.ac.jp/portal/). Sorry for Japanese version only.)

[Study outside of class (preparation and review)]

In case you need.

(Other information (office hours, etc.))

The topics will be selected owing to limit of lecture time.

The students should prepare quotBar Coverquot from the website of the Faculty of Electric and Electronic Engineering (http://www.s-ee.t.kyoto-u.ac.jp/ja/student/index.html)) by themselves, and use it as a title page of each report and the exercise in the lecture.

____Continue to 電子回路(3)↓↓↓↓

電子回路(3)

The homepage of this course is located on PandA (https://panda.ecs.kyoto-u.ac.jp/portal/).

Contact the instructor after the lecture, when the students have any questions.

*Please visit KULASIS to find out about office hours.

通信基礎論(2) [Course requirements] Students are required to have taken the course Industrial Mathematics (Fourier Analysis) and Electronic Circuits. [Evaluation methods and policy] Evaluation is made of extent of student's understanding of course contents via written examination. [Textbooks] 守倉他『通信方式』(オーム社)ISBN:9784274214738 [References, etc.] (**Reference books**) 寺田他: 情報通信工学 (オーム社) isbn{}{4274129322} [Study outside of class (preparation and review)] Students are required to have taken the course Industrial Mathematics (Fourier Analysis) and Electronic Circuits. (Other information (office hours, etc.)) After classes, from 10:30-12:00 *Please visit KULASIS to find out about office hours. [Courses delivered by instructors with practical work experience] Category A course with practical content delivered by instructors with practical work experience (2) Details of instructors' practical work experience related to the course (3) Details of practical classes delivered based on instructors' practical work experience

未更新

Course nu	umber	U-ENC	326 36	5032 LJ72						
Course title (and course title in English)		基礎論 ition Theory i	n Elect	rical Commu	inication	nan and	tructor's ne, job ti I departn affiliation	tle, nent	Professor,MO Graduate Scl	nool of Informatics DRIKURA MASAHIRO nool of Informatics ssor,MURATA HIDEKAZ
Farget yea	r Brd	l year students o	r above	Number	of cred	its	2	Yea	/semesters	2020/First semester
Days and perio	ods We	d.1	Class	style	Lecture	e			Language of instruction	Japanese
	discuss ations,	es all types as well as t	of mo he pri	dulation m	nodulat	ion/	demodu	lation.	Further focus	e, frequency, phase, s is made on signal
[Course o	biecti	vesl				_				
wireless loca	al area ssion a ion sig	networks (L nd signal pr nals, chiefly	AN), ocessi in th	optical fib ng (modul e physical i	er comn ation/de	nuni moc	cations, dulation	etc. S) with	pecifically, st in time axis a	d in mobile telephones udents will master nd frequency axis of
namely, Fou especially of random sign Analog mod Discussion i	is mad rier sen f the ba als. ulation s made method	e of the con- ries and Fou- sics of rand a and demode of the prine ls, with com-	ncept irier tr om si lulatio ciples	ansforms a gnals and the n methods of amplitue	nd their heories (5-6 cla de modu	pra rega sses ilati	ctical ap urding th s) on and a	pplicat ne stan angle 1	ions. Discussi dardization ar nodulation an	andling frequency, ion is next made d quantization of d their generation and upied bandwidth and
digital modu	otion o ilation n is ma	f various me types, inclu ide of the ex	ethods ding n ttent o	of pulse m nodulation	odulati phase s	on, t hift	there is keying	(PSK)	, etc., plus the	ples and methods of basics of signal space. Ission to further
	n is ma	de of the ex	tent tl	nat students	s have le				s of this cours	se. Additional imperfect.

Course n	umber	U-EN	G29 2	9017 LJ11								
Course title (and course title in English) Course title Instructor's Instructor's and epartment Graduate School of Informatics Professor, TANAKA TOSHIYUKI Graduate School of Informatics Associate Professor, GBUCHI TOMOYUKI												
Target yea	r 2nd y	ear students	or above	Number	of cred	its	2	Yea	r/semesters	2020/Second semester		
Days and peri	ods Tue.	2	Clas	s style	Lecture	e			Language of instruction	Japanese		
[Overview and purpose of the course] We will start by showing some examples of dyanamical systems in engineering. Then we mention modelling and analysis techniques. We explain Electrical circuits and mechanical systems that use the linearizaton technique in detail. Throughout the course, we aim to understand the importance of dynamical system modeling and the implication of system control based on mathematical models.												
[Course o	bjectiv	es]										
linearized s	[Course objectives] We will learn examples of dynamical systems and the rudiments of dynamical systems and approximated linearized systems. This course will be the basics of Linear Control Theory (90720) and Modern Control Theory (90580).											
[Course s	chedul	e and co	nten	ts]								
capacitor an State equati systems and Laplace tran functions of Examples o biological sy Discrete-tin System ider Exercises,3	mical sy di an indu on and li l their res asform at f first and f system ystems, a ne system tification times,Ex	stems, 3tir actor and near appro- ponses. d transfer second o modeling nd social as, 1 time, E cercises.	nes,Fi mecha oxima r func rder s ,2time infras Discret	rst and seco anical syste tion,1 times tion,2times. es,Examples tructures. te-time syst	ond orde ms cons s,Linear Laplace s of syst ems des	er sy istin ized tran em 1 crib	stems sing of a s system nsform a modelin ed by di	pring s at an and lir g incl ifferen	and a dumper. a operating poi	int. Linear dynamical al equations. Transfer		
[Course r			Calar	lun (A and	D)							
Linear Alge	bra (A a	id B) and	Calci	llus (A and	в) are r	ecoi	nmende	ea.				
[Evaluation												
The grade is	s determi	ned by the	e final	examinatio	on.			(Continue to シスラ			

システム解析入門(数理) (2)	
[Textbooks]	·
Handouts are given.	
[References, etc.]	
(Reference books) Shimemura, What is automatic control?, Korona (in Japanese) isbn{}{9784339031409}	
sinnenura, what is automatic control?, Korona (in Japanese) ison{}{9784559051409}	
(Related URLs)	
(http://www.bode.amp.i.kyoto-u.ac.jp/member/yoshito{}_ohta/system/index.html)	
[Study outside of class (preparation and review)]	
Read the handouts in advance. Solve problems in the houdouts and exercise problems.	
(Other information (office hours, etc.))	
Contact the instructor using email. Address: yoshito{}_ohta@i.kyoto-u.ac.jp	
Please visit KULASIS to find out about office hours.	
rease visit KOLASIS to find out about office nours.	

Course nu	umber	U-ENO	329 2	9022 SJ11								
Course title (and course title in English)		感科学実験及演習1(H26以前入学者) and department of affiliation Graduate School of Informatics Graduate School of Informatics Graduate School of Informatics Associate Professor,TWAMASA YUU Associate Professor,IIYAMA MASAA										
Target yea	r 2nd year students or above Number of credits 1 Year/semesters 2020/First semester											
Days and perio	ods We	d.3,4	Class	s style	Semina	ır			Language of instruction	Japanese		
[Overview	and p	ourpose o	f the	course]								
[Course o	bjectiv	/es]										
[Course s	chedu	le and co	ntent	s]								
"												
··												
"												
**												
·· ··												
[Course re	equire	ments]										
None												
[Evaluatio	n met	hods and	polic	cy]								
[Textbook	s]					_						
[Referenc		-										
(Referer	nce bo	oks)										
[Study out	tside o	of class (p	orepa	ration and	d revie	w)]						
(Other in	format	tion (offic	e hou	urs, etc.))								
*Please visit	t KULA	SIS to find	l out a	about office	hours.	-						

未更新

Course nu	umb	er	U-EN	G29 2	9021 SJ11						
Course title (and course title in English)	and course and course Programming Languages And course Programming Languages Course										
Target yea	r	2nd ye	ar students	or above	Number	of cred	its	2	Year/	semesters	2020/Second semester
Days and perio					s style	Lecture	e			Language of instruction	Japanese
[Overview	an	d pu	pose o	f the	course]						
[Course o	bied	ctive	s1				_				
1000.000			-1								
					-						
[Course s	che	dule	and co	nten	ts]						
,1time, .2times.											
.4times.											
.2times.											
,2times,											
,3times,											
,1time,											
[Course re	auri	ireme	entsl								
None	oqu			_			_				
[Evaluatio	nn	hotho	de and	noli	-v1		_				
		letito	us anu	point	~y]						
[Textbook	s]										
[Referenc	es,	etc.]									
Refere	nce	bool	(s)								
[Study ou	tsid	le of	class (j	orepa	ration and	d revie	w)]				
(Other in	forn	natio	n (offic	e hoi	urs, etc.))	_					
*Please visit	t KU	JLASI	S to fin	l out a	about office	hours.					

					未更新
Course number	U-ENG29 39025 LJ1	0 U-ENG2	9 39025 LJ55		
	科学実験及演習 2 (計 er Science Laboratory and	算機) na Exercise 2 an	tructor's ne, job title, d department affiliation	Associate Pro Graduate Sch Associate Prof Graduate Sch Associate Profes Graduate Sch Associate Profes Graduate Sch	ool of Informatics fessor, TAKASE HIDEKI jool of Informatics essor, KAWAHARA JUN jool of Informatics sor, YAMADA MAKOTO ool of Informatics sor, NAKAZAWA ATSUSHI jool of Informatics essor, IWAMASA YUNI
Target year 2nd	year students or above Numbe	r of credits	2 Yea	ir/semesters	2020/Second semester
Days and periods Tue.		Seminar		Language of instruction	Japanese
[Overview and p	urpose of the course]				
[Course objectiv	es]				
[Course schedul	e and contents]				
,7times, ,7times, ,1time,					
[Course requirer	nents]				
None					
[Evaluation meth	nods and policy]				
[Textbooks]					
				Continue to 計算機科	学実験及演習2(計算機)(2)↓↓↓

計算機科学実験及演習 2 (計算機)(2)
[References, etc.]
(Reference books)
[Study outside of class (preparation and review)]
[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
(1) Calegory
(2) Details of instructors' practical work experience related to the course
2) Details of instructors plactear work experience related to the course
(3) Details of practical classes delivered based on instructors' practical work experience
(a) - 1

Course nu	umber	U-ENG29 29	9030 LJ10							
Course title (and course title in English)	ourse 確率と統計 name, job title, Probability and Statistics and department Professor, Shimodaira, Hidetoshi									
Target yea	get year bird year students or above Number of credits 2 Year/semesters 2020/First semester									
Days and perio			style	Lecture	e		Language of instruction	Japanese		
This course random num maximum li	involves iber gen kelihood	eration. Theory and the design of the design	obability and applica	tions of				llustrated through ayesian inference and		
[Course o To understar applications	nd the ba	-	ity and stat	istics fr	om the vie	wpoints	of mathemat	ics, algorithm, and		
[Course s	chedul	e and content	s]							
sampling, rejection sampling, Markov chain Monte Carlo (Metropolis-Hastings sampler, Gibbs sampler). Simulation of the model of ferromagnetism. The basics of probability (probability distribution, density function, the law of large numbers, the central limit theorem). Bayesian inference,4times,Statistical inference with Bayes method. Image restoration via Bayesian inference with Markov chain Monte Carlo. Classification via Bayesian discriminant analysis with an application to spam mail filter. The error rate of Bayes classifier. The methods of least squares and maximum likelihood,5times,Theory of statistical inference including the following topics. Multiple regression analysis with least squares and weighted least squares. Logistic regression analysis via maximum likelihood and model selection. Additional topics including multivariate analysis (principal component analysis, canonical correlation analysis).										
[Course re	equiren	nents]								
None										
[Evaluatio	n meth	nods and polic	y]							
Grading is b	ased on	papers and final	exam.							
[Textbook	s]									
Handouts m	ay be di	stributed in class	i.							
[Referenc	es, etc.	.]								
(Referer C. M. Bisho		oks) rn_Recognition a	nd <u>Mac</u> hi <u>n</u> e	e Learni	ing, Spring			i10732} 確率と統計 (2) ↓↓↓		

未更新

Course nu	umbe	er	U-EN	G29 3	9028 LJ10	U-EN	G29	9 39028	LJ55		
Course title (and course title in English)			沂 al Analy:	sis			nar and	tructor's ne, job tit d departm affiliation	nent		hool of Informatics ssor,YOSHIKAWA HITOSHI
Target yea	r	2nd y	ear students (or above	Number	of cred	its	2	Yea	r/semesters	2020/Second semester
Days and perio	ods V	Ved.	3	Clas	s style	Lecture	e			Language of instruction	Japanese
[Overview	and	d pu	irpose o	f the	course]						
[Course o	bjec	ctive	es]								
[Course s	che	dule	and co	nten	ts]						
,1time,											
,6times, .3times.											
,5times, ,4times,											
,1time,											
[Course re	equi	irem	ents]								
None											
[Evaluatio	n m	eth	ods and	poli	cy]						
[Textbook	s]										
[Referenc	es, e	etc.]									
(Referer	nce	boo	ks)								
[Study ou	tsid	e of	class (r	renz	ration and	d revie	w)1				
							.,1				
(Other in	form	natio	on (offic	e ho	urs. etc.))				_		
*Please visit						hours.					

確率と統計**(2)**

未更新

T. Hastie, R. Tibshirani, and J. Friedman: The Elements of Statistical Learning, Springer. isbn{}{ 0387952845} isbn{}{9780387848570} isbn{}{9780387848587}

[Study outside of class (preparation and review)]

In addition to attending class, work at home including real data analysis is required.

(Other information (office hours, etc.))

Details of office hours will be notified at class

*Please visit KULASIS to find out about office hours.

							未更新
Course number	U-ENG29 3	9031 LJ55	U-ENG2	9 39031	LJ10		
	7理論(計算機) Theory		nai an	structor's me, job ti d departn affiliation	nent		for Computing and Media Studies ssor,MIYAZAKI SHIYUUICHI
Target year 2nd	d year students or above	Number	of credits	2	Year	/semesters	2020/Second semester
Days and periods Thu		s style	Lecture			Language of instruction	Japanese
[Overview and p We learn basic theo problems.			lications, ar	nd funda	menta	l algorithms f	or solving graph
[Course objective	ves]						
The goal of this cou for solving graph p		sic theories	s of graphs	and their	appli	cations, and f	undamental algorithms
[Course schedu	le and conten	ts]					
 and their complexit Minimum spanni Kruskal's algorith Shortest path pro Dijkstra's algorith Eurer circuits and Eurer circuits, Ha Graph coloring (2 Vertex coloring a Maximum flow p Ford-Fulkerson's 	ing trees (1 times um, Prim's algorit oblems (1 timeslo hm. d Hamiltonian cy amiltonian cycles 2 timeslots) und edge coloring problems (2 time	thm, Steiner (t) (t) (t) (t) (t) (t) (t) (t) (t) (t)	eslots) eorem. Ore'	s theore		, Konig's theo	orem. Coloring maps.
 Matching (2 time Matchings, in par 		matchings.	Hall's theo	rem, Hu	ngaria	n method.	
8. Exam (1 timeslot	t)						
					,	Continue to グラ	ラフ <u>理論</u> (計算機)(2)↓↓↓

Course title (and course title in English)	グラフ: Graph T	理論(数: 'heory	理)			nan and	ructor's ne, job tit departm ffiliation	nent		hool of Informatics AGAMOCHI HIRO
Target yea	r 2nd y	ear students o	r above I	Number	of cred	its	2	Year	semesters	2020/First semeste
Days and peri	ods Thu.	2	Class	style	Lecture	e			Language of instruction	Japanese
problems su problem are presented.	ch as the describe bjective learn the	shortest j d. Applic es] notions o	n grapl	oblem, the of these re	minimu sults and as know	um s d ex:	panning tensions ge but t	o unde	roblem and t m in discrete	ome representative he maximum flow mathematics are als to mathematical
problems su problem are connectivity digraphs are plane graphs which chara representatie introduced. graph search an algorithm, a shortest path algorithm, a trees and cu fundamental minimum sp spanning tre discussed.	etworks ch as the introduc, ltime, C defined a and dua cterizes on for gr a,2times, a for con a,2times, a for con a,2times, te descri- te-sets, lti cycles a anning t e algorit ow, 2tim	,1time,Ba Eulerian eed. iraph conr and some al graphs,2 the planar aphs,1 time The depth aputing cu ,Propertie bed. me,Import und fundar ree ,1-2tir hms, are d	sic ter trail pr nectivit proper times, graphs e, As re first se t-vertic s on sh tant pro nental nes,Kr lescribe aximu	minology oblem, the y such as l tries for th Some com s, duality o presentation earch and ices and bic ortest path operties on cut-sets ar uskal#039 ed, and dat m-flow and	Hamilt k-conne- em are o binatori of plane on for da the widt connecte as and D a spannin e descri s metho ta struct	conia ctivi deriv al a grap ata t h fin ed co ijks ng ti bed. d an ure f	in cycle ity of un yed. spects o hs, the o input rst searc omponent tra#0399 rees and d Prim# for them	proble adirecte f graph four-co graphs. h are in nts is d s metho cut-se 039s m and th	m and the gr ad graphs and as such as Kr olor theorem (matrix and a htroduced, an esigned. od, as a repre- tis, especially nethod, as rep- ter computat	d some representativ aph isomorphism I strong connectivity atowski#039s theora are described. adjacency lists are ad as their applicatio esentative shortest pa the roles of presentative minimu tional complexities a ad an algorithm for

[Course requirements]	
Basics of algorithms, data structures, and set theory.	
[Evaluation methods and policy]	
Mainly evaluated by the final exam. In some cases, exercis	
considered.	es or the number of attendance to the class may be
[Textbooks]	
宮崎修一 『グラフ理論入門 〜基本とアルゴリズム〜 85281-5(Written in Japanese)	』(森北出版株式会社)ISBN:978-4-627-
[References, etc.]	
(Reference books)	
I may show some recommended books in class.	
[Study outside of class (preparation and review)]	
Reading the textbook is effective for study. Due to time co proofs in class. I strongly recommend do it by yourself after	
(Other information (office hours, etc.))	
*Please visit KULASIS to find out about office hours.	

グラフ理論(数理)**(2)**

[Course requirements] one

[Evaluation methods and policy]

Evaluation is made based on marks on answers in exercises (30%) and score of end-term examination (70%)

[Textbooks]

[References, etc.]

(Reference books) C ni yoru Algorithms to Data Structure, Ibaraki, Shokou-do isbn{}{4785631171} isbn{}{9784274216046}

(Related URLs)

(Necessary materials are uploaded at http://www-or.amp.i.kyoto-u.ac.jp/members/nag/)

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Some exercises are conducted in each class. The answers to questions in exercises and end-term examination and the achievement attained by students to each question will be uploaded.

*Please visit KULASIS to find out about office hours.

Course nu	mbe	er U-EN	G29 3	9039 SJ12	U-EN	G29	39039	SJ13	U-ENG29 3	9039 SJ11				
	応用代数学 name, job title, Applied Algebra and department Graduate School of Informatics Associate Professor,TSUJIMOTO SATOSHI													
Target year		3rd year students	or above	Number	of cred	lits	2	Year	ar/semesters 2020/Second sen					
Days and period	is N	Aon.2	Class	s style	Lecture	е			Language of instruction	Japanese				
[Overview	and	d purpose o	of the	course]										
An introducti	on v	with applicati	ion to	basic algebi	ra in inf	orma	atics.							
[Course ob	jec	tives]												
To understan	d ba	asic ideas and	some	application	ns of alg	ebra	s (main	ly gro	up theory).					
[Course sc	hec	dule and co	ntent	s]										
Enumeration								2	0 1	n a finite set.				
Summary and acquiring kno	enta 1 ass owle	ation,3-4times sessment,1tin edge and skill	ne,Sur						of vector space. Measure the					
Summary and acquiring kno [Course re	enta 1 ass owle qui i	ation,3-4times sessment,1tin edge and skill	ne,Sur							ce.				
Summary and acquiring kno [Course re Linear algebr	enta 1 ass owle qui i a	ation,3-4times sessment,1tin edge and skill	ne,Sur	nmary and						ce.				
Summary and acquiring kno [Course re Linear algebr [Evaluation	enta 1 ass owle qui a n m	ation,3-4times sessment,1tin edge and skill irements]	ne,Sur ls.	nmary and :	supplem	nent	of this of	course	. Measure the	ce.				
Summary and acquiring known [Course real Linear algebr [Evaluation Evaluation de	enta 1 ass owle owle quin a n mo epen	ation,3-4times sessment,1tin edge and skill irements]	ne,Sur ls.	nmary and :	supplem	nent	of this of	course	. Measure the	ze. progress of students in				
Summary and acquiring kno [Course re- Linear algebr [Evaluation Evaluation de needed. [Textbooks	quin a ppen 3]	ation,3-4times sessment,1tin edge and skill irements] methods and nds mainly on	ne,Sur ls.	nmary and :	supplem	nent	of this of	course	. Measure the	ze. progress of students in				
Summary and acquiring kno [Course re- Linear algebr [Evaluation Evaluation de needed. [Textbooks [Reference	quina n more s, e	ation,3-4times sessment,1tin edge and skill irements] methods and nds mainly on etc.]	ne,Sur ls.	nmary and :	supplem	nent	of this of	course	. Measure the	ze. progress of students in				
Summary and acquiring kno [Course re- Linear algebr [Evaluation Evaluation de needed. [Textbooks	quina quina a more s, e ce l	ation,3-4time: sessment,1tin edge and skill irements] methods and nds mainly on etc.] books)	l polic	s of examin	supplem	ut m	of this of this of this of this of this of this of the thick of the	exerci	Measure the	ze. progress of students in				
Summary and acquiring kno [Course re- Linear algebr [Evaluation Evaluation de needed. [Textbooks [Reference (Reference	enta 1 ass owle quinta a metric pen s, e ce l : Jol	ation,3-4time: sessment,1tin rements] hethods and ads mainly on hetc.] books) ho no suri oy	l polic	s of examin	supplem	ut m	of this of this of this of this of this of this of the thick of the	exerci	Measure the	ze. progress of students in				
Summary and acquiring knc [Course re Linear algebr [Evaluation Evaluation de needed. [Textbooks [Reference (Referen T. Hiramatsu (Related	enta 1 ass wle quin a n m epen 5] 5] 5] Ce I Ce I UR	ation,3-4time: sessment,1tin rements] hethods and ads mainly on hetc.] books) ho no suri oy	ne,Sur s. I polic n mark	s of examin	supplem nation, b kabo) is	ut m	of this of this of this of this of this of this of the thick of the	exerci	Measure the	ze. progress of students in				
Summary and acquiring knc [Course re Linear algebr [Evaluation Evaluation de needed. [Textbooks [Reference (Referen T. Hiramatsu (Related (http://www-	enta l ass sowle quin a m pen s, e ce l : Jol UR -is.a	ation,3-4time: sessment,1tin sessment,1tin rements] hethods and ads mainly on etc.] books) ho no suri oy (Ls)	I polici n mark	s of examin ugaku (Shoi	supplem nation, b kabo) is o/appalg	bn{	of this of this of this of this of this of this of the thick of the	exerci	Measure the	ze. progress of students in				
Summary and acquiring knc [Course re: Linear algebr Evaluation Evaluation de needed. [Textbooks (Referen C. Hiramatsu (Related (http://www- [Study out:	enta assowle quina an mo epen 5] 5] 5] 5] 5] 5] 5] 5] 5] 5] 5] 5] 5]	ation,3-4time: sessment,1tin sessment,1tin rements] hethods and ads mainly on etc.] books) ho no suri oy: (LS) unp.i.kyoto-u	I polid a mark o daisu .ac.jp/	nmary and a s of examin ugaku (Shoi lab/tujimote ration and	supplem nation, b kabo) is o/appalg	bn{	of this of this of this of this of this of this of the thick of the	exerci	Measure the	ze. progress of students in				

[Textbooks]			
[References, etc.]			
(Reference books)			
[Study outside of class	s (preparation and review)]		
(Other information (ffice hours etc.)		
	find out about office hours.		
	instructors with practical wor	k experience]	
(1) Category			
(2) Details of instructors'	practical work experience related t	to the course	
(3) Details of practical cla	sses delivered based on instructors'	practical work experience	

計算機科学実験及演習4(計算機)(2)

1

												未更	新
Course n	umbe	ər	U-EN	IG29 3	9054 LB10	U-EN	G29	9 39054	LB48				
Course title (and course title in English)					習 4 (計算 atory and Ex		nan and	tructor's ne, job ti I departn ffiliation	nent	Graduate Scl Associate Pro Graduate Scl Associate Prof Graduate Scl Associate Profe Graduate Scl Assistant Profe Graduate Scl Assistant Profe Assistant Profe Assistant Profe Assistant Profe Assistant Profe Assistant Profe Assistant Profe Assistant Profe Assistant Profe Assistant Profe	fessor,TAK nool of Info ofessor,MA nool of Info (sssor,YOSHI) nool of Info fessor,Dra nool of Info fessor,SHIMIZ nool of Info fessor,INC for Computing for Computing	ASE H ormatic A QIAN ormatic I KAZU ormatic zen Brs ormatic U TOSH ormatic OUE KO and Medi A MAS and Medi	IDEKI s VG s YOSHI s scic s IIYUKI s OJI a Studies SAAKI a Studies
Target yea	r	3rd ye	ar students	s or above	Number o	of cred	its	3	Year	/semesters	2020/Sec	ond ser	nester
Days and peri	ods Th	1u.3,4	,Fri.1,2,3,	4Clas	s style	Semina	ır			Language of instruction	Japanese		
[Overview	/ and	d pu	rpose	of the	course]								
[Course o	bjec	tive	s]										
[Course s	che	dule	and co	onten	ts]								
,15times, ,15times, ,15times, ,15times, ,15times, ,15times,													
[Course r	equi	irem	ents]										
None													
[Evaluation	on m	etho	ods an	d poli	cy]								
'									c	Continue to 計算機科	学実験及演習4	(計算機)	(2)↓↓↓

Course title (and course title in English)				Academic Center for Computing and Me Associate Professor, IIYAMA M. Graduate School of Informati Associate School of Informati Associate School of Informati Associate Professor, IXAWAHA Graduate School of Informati Associate Professor, IXAWAHA Associate Professor, IX					
Target yea	r Brd y	ear students of	r above	Number	of credi	ts 2	Year	/semesters	2020/First semester
Days and peri	ods Mon.	3	Clas	s style	Lecture			Language of instruction	Japanese and English
[Overview		-							d#039s most advanced
designed to technical wr 1. English t Writing a se	convey c riting, pre echnical cientific ts in engl elevant to s of scient es between hy, proof	omplex id esentation writing paper or a ish (letter, pics: ntific pape en scientifi reading, fi	eas a and r pater anno r writ ic eng	as clearly as reading : nt proposal puncement, ting and ave glish and sc s: tools to n	possible in english speech e pidable n ientific ja naximize	. In this cla n requires a tc). We w nistakes; apanese; quality an	a differ ill sur	ee lecturers in rent skill set t vey in this see	ed version of english, atroduce English han writing other types ction of this course the
2. Technica In the prese - watching - learning th - making ar	ntation c videos of he typica	lasses, we example l organizat	good tions	/poor prese of technica	ntations; l presenta		lls by		
reading com	chnical pa prehensi	apers requi on. The ke	ires a ey is t	skill to und to grasp the	context	in English	withou	ematical expr at word-for-w l them togethe	essions, besides basic ord translation. In the er.
[Course o		-							
n ou will act	quire oas	ic knowled	age a	nu skili for	icaunig,	witting all	a prese	and the contract	al materials in English.

技術英語(計算機)(2)	Course	numh	or U-E	NG29.49	9059 L.110	U-EN	G29 49059	1.155		
	Goursei			1,027 1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	- C LI	027 17057	1000		
[Course schedule and contents] English writing.5times,Learn English technical writings.	Course title (and course title in	e 現f	代制御論(Instructor's name, job ti and departr	itle,		hool of Informatics
English reading,5times,Learn reading English technical documents. Technical presentation,5times,Learn basic / technical presentation skills in English.	English)	мо	dern Contro	of Theory			of affiliation		Associate Pro	fessor,KASHIMA KENJI
	Target ye	ear	4th year studen	nts or above	Number	of cred	its 2	Yea	r/semesters	2020/First semester
[Course requirements] None	Days and pe	eriods	Гue.2	Class	s style	Lecture	e		Language of instruction	Japanese
None	[Overvie	w an	d purpose	of the	course]					
[Evaluation methods and policy]										so-called state space
Your grade is determined by your performance of class attendance and the scores of exercises and reports. Passing grades in all topics are required.	on the trea	tment		ncepts as	controllat	oility and				 Emphasis is placed the realization problem,
[Textbooks]	[Course	obio	ctives]							
We will deliver supplemental materials in classes.	The object understand	tive is 1 desig	to study cor gn methods	such as o	optimal re					control theory, and also ides a basis for a more
[References, etc.]	advanced t	topic s	such as robu	ist contro	of theory.					
(Reference books)	[Course	sche	dule and o	content	s]					
<pre>quotSPEAKING of SPEECH (New Edition)quot, David Harrington and Charles LeBeau, MACMILLAN. isbn{}{9784777314362} [Study outside of class (preparation and review)] (Other information (office hours, etc.)) You are expected to attend class regularly. *Please visit KULASIS to find out about office hours.</pre>	We also gi Mathemati vectors an Controllab observabil Canonical Realization from transi Stability.21 give mathe State feed via state fe also discus Opimal reg	ive a s ics for ad mat bility a lity for decor n prob fer fur times, ematic back a eedbac ssed. gulato rix Rie	tate-space fr modern con- trices. Ind observab r linear dyna nposition,2t blem,2times, nctions for s We discuss cal tools for ind dynamic ck, pole alloo	Formulation ntrol, 1 tir amical systems, We intros, We intro- single-inp the stabi- checking c compen- ication ar Ve give th	on for mo me, We dis mes, We in stems, and give the oduce the put and sin ility of dyn g if a syste issators, 2tin d observe me basic co	deling dy cuss som troduce t d also dis canonical realizatio ngle-outp namical s m is stab nes,We i rrs. The r onstructio	namical sy e fundament ccuss their b l decompos n problem ut systems. ystems des le or not. ntroduce the elationships on of optime	stems. ntal pro- ental n basic p sition f that co crribed ae cons s with al regu lity and	operties of ma operties and i or linear syste mstructs state by state-space struction of dy controllability llators, in parti d observability	
									Continue to 現	1 〔刑御誦〔 銰 埋〕(2)↓↓↓

未更新

現代制御論(数理)(2) [Course requirements]

space, isomorphism.

[References, etc.]

[Textbooks] None specified.

[Evaluation methods and policy]

The grading is based on the evaluation of reports and final examination.

[Study outside of class (preparation and review)]

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

It is desirable that the student has studied classical control theory (linear control theory). Fundamental knowledge on linear algebra is assumed, e.g., matrices, determinants, rank of a matrix, dimension of a vector

(Reference books) Linear Algebra, K. Jaenich, translation by M. Nagata, Gendai-suugakusha, isbn{}{4768703194} Mathematics for Systems and Control, Y. Yamamoto, Asakura, isbn{}{4254209762}

undamental knowledge of linear algebra such as matrix manipulation is assumed.

						不又利
Course number	U-ENG29 39058 LJ72	U-ENG29	9 39058	LJ10		
Course title (and course title in English)	リズム論 of Algorithms	nai and	tructor's ne, job ti d departn affiliation	nent		nool of Informatics NATO SHINICHI
Target year Brd y	ear students or above Number	of credits	2	Year	/semesters	2020/Second semester
Days and periods Thu.2	2 Class style	Lecture			Language of instruction	Japanese
[Overview and pu	urpose of the course]					
	putation model suitable for study basic ideas and issues					xities of algorithms
[Course objective	es]					
[Course schedule	e and contents]					
equivalent machines. Decidability and Uno problems. Introduction of comp	decidability,3times,The not plexity theory,6times,Decic the achievements of studen	tion of deci	dability	of prol	olems and exa	amples of undecidable
91040						
[Evaluation meth	ods and policy]					
Two reports and a fir	nal exam.					
[Textbooks]						
Iwama, Introduction	to theory of algorithms, Sh	hoko-do, 20	01 isbn{	}{478	5631252} ist	on{}{9784254122039}.
[References, etc.]	-					
(Reference boo) KS)					
[Study outside of	f class (preparation and	d review)]				
(Other information	on (office hours, etc.))					
*Please visit KULAS	SIS to find out about office	e hours.				

Course number	U-ENG29 2	9070 LJ10	U-ENG2	9 29070	LJ11	U-ENG29 2	9070 LJ55
Course title (and course title in English)	、ステム理論(of Information		nai and	tructor's me, job ti d departn affiliation	nent		oool of Informatics sor,MASUYAMA HIROYUI
Target year 4th	year students or above	Number	of credits	2	Year	/semesters	2020/First semester
Days and periods Thu	.2 Clas	s style	Lecture			Language of instruction	Japanese
[Overview and p	urpose of the	course]				<u> </u>	
This course covers a systems, focusing o					for op	timal design o	of information/service
[Course objectiv	/es]						
This course aims to analysis for the mod							ng theory and Markov systems.
[Course schedu	le and content	ts]					
Review of fundame							
distributions, Marko Performance evalua delivered: the statio such as M/G/1 and Formulas for perfor lectured: Erlang#03 multi-server queues	ov chains etc., ar tion of semi-Ma nary queue leng GI/M/1 queues, mance evaluatio 9s loss formula,	e explained rkovian que th distributi in addition n,5~6time	l eues,5~6tin ion and wait to the loss p es,The follow	mes,The ting time probabili wing for	follow distril ity of tl mulas	ving performa bution of sem heir finite-cap for performar	i-Markovian queues, acity analogues.
distributions, Marko Performance evalua delivered: the statio such as M/G/1 and Formulas for perfor lectured: Erlang#03 multi-server queues [Course required]	ov chains etc., ar tion of semi-Ma nary queue leng GI/M/1 queues, mance evaluatio 9s loss formula, ments]	e explained rkovian quu th distributi in addition n,5~6time Little#039	l eues,5~6tii ion and wait to the loss p s,The follov s law, King	mes, The ting time probabili wing for man#039	follow distril ity of tl mulas	ving performa bution of sem heir finite-cap for performar	nce measures are i-Markovian queues, acity analogues. ace evaluation are
distributions, Marko Performance evalua delivered: the statio such as M/G/1 and Formulas for perfor lectured: Erlang#03 multi-server queues	ov chains etc., ar tion of semi-Ma nary queue leng GI/M/1 queues, mance evaluatio 9s loss formula, ments]	e explained rkovian quu th distributi in addition n,5~6time Little#039	l eues,5~6tii ion and wait to the loss p s,The follov s law, King	mes, The ting time probabili wing for man#039	follow distril ity of tl mulas	ving performa bution of sem heir finite-cap for performar	nce measures are i-Markovian queues, acity analogues. ace evaluation are
distributions, Marka Performance evalua delivered: the statio such as M/G/1 and 0 Formulas for perfor lectured: Erlang#03 multi-server queues [Course required Stochastic discrete o [Evaluation meth	ov chains etc., ar tion of semi-Ma nary queue leng GI/M/1 queues, mance evaluatio 9s loss formula, ments] event systems, ar nods and polid	e explained rkovian quo th distributi in addition n,5~6time Little#0399 nd basics of	l eues,5~6tii ion and wait to the loss p s,The follov s law, King	mes, The ting time probabili wing for man#039	follow distril ity of tl mulas	ving performa bution of sem heir finite-cap for performar	nce measures are i-Markovian queues, acity analogues. ace evaluation are
distributions, Marka Performance evalue delivered: testatio such as M/G/1 and t Formulas for perfor lectured: Erlang#03 multi-server queues [Course required Stochastic discrete of	ov chains etc., ar tion of semi-Ma nary queue leng GI/M/1 queues, mance evaluatio 9s loss formula, ments] event systems, ar nods and polid	e explained rkovian quo th distributi in addition n,5~6time Little#0399 nd basics of	l eues,5~6tii ion and wait to the loss p s,The follov s law, King	mes, The ting time probabili wing for man#039	follow distril ity of tl mulas	ving performa bution of sem heir finite-cap for performar	nce measures are i-Markovian queues, acity analogues. ace evaluation are
distributions, Marka Performance evalua delivered: the statio such as M/G/1 and 0 Formulas for perfor lectured: Erlang#03 multi-server queues [Course required Stochastic discrete o [Evaluation meth	ov chains etc., ar tion of semi-Ma nary queue leng GI/M/1 queues, mance evaluatio 9s loss formula, ments] event systems, ar nods and polid	e explained rkovian quo th distributi in addition n,5~6time Little#0399 nd basics of	l eues,5~6tii ion and wait to the loss p s,The follov s law, King	mes, The ting time probabili wing for man#039	follow distril ity of tl mulas	ving performa bution of sem heir finite-cap for performar	nce measures are i-Markovian queues, acity analogues. ace evaluation are
distributions, Marka Performance evalua delivered: the statio such as M/G/1 and Formulas for performant lectured: Erlang#03 multi-server queues [Course required Stochastic discrete of [Evaluation met] Based on the score of	vv chains etc., ar titon of semi-Ma nary queue leng GI/M/1 queues, mance evaluatio 9s loss formula, ments] event systems, al mods and polit of the term exam	e explained rkovian quo th distributi in addition n,5~6time Little#0399 nd basics of	l eues,5~6tii ion and wait to the loss p s,The follov s law, King	mes, The ting time probabili wing for man#039	follow distril ity of tl mulas	ving performa bution of sem heir finite-cap for performar	nce measures are i-Markovian queues, acity analogues. ace evaluation are
distributions, Marka Performance evalua delivered: the statio such as M/G/1 and Formulas for perfor lectured: Erlang#03 multi-server queues [Course required Stochastic discrete of [Evaluation metl Based on the score of [Textbooks]	vy chains etc., ar titon of semi-Ma nary queue leng GI/M/1 queues, mance evaluatio 98 loss formula, ments] event systems, ar nods and polit of the term exam led.	e explained rkovian quo th distributi in addition n,5~6time Little#0399 nd basics of	l eues,5~6tii ion and wait to the loss p s,The follov s law, King	mes, The ting time probabili wing for man#039	follow distril ity of tl mulas	ving performa bution of sem heir finite-cap for performar	nce measures are i-Markovian queues, acity analogues. ace evaluation are

title in English)	Logi	ical Systems			nd departr f affiliation			hool of Informat AKAGI NAOFU
Target yea	r	2nd year students	or above Num!	ber of credit	s 2	Year	/semesters	2020/First sem
Days and peri	ods V	Ved.2	Class style	Lecture			Language of instruction	Japanese
-		l purpose o		-				ter science, and
propositiona students wil	ıl log 1 gair	ic. Next, we t 1 logic function	take up Boole on simplifica		various We furthe	charact er study	eristics (prop the design a	erties); meanwh ind analysis of
[Course o	bjec	tives]						
Boolean alg 3. Students 4. Students	ebra will u will u	and logic fun inderstand an	ictions. id be able to u id be able to e	ase logic funct	ion simpl	ificatio	n methods.	us characteristic
[Course s	cheo	dule and co	ontents]					
		eparation (1 c wledge necess		course, includi	ng sets, re	elations	ships, etc.	
Symbolic lo Students lea			onal logic, to	gether with ar	overviev	v of syı	mbolic logic.	
	rn ab	and logic fun out Boolean			ns, as we	ll as ab	out logic fun	ctions and their
		logic functio) ogic functions				
	rn ab	ristics of logi- out the vario			ions and a	about le	ogic function	s that have speci
				iits (2 classes) nalysis metho		nbinatio	onal circuits.	
	in ao							

情報システム理論(数理)(2)

L. Kleinrock, Queueing Systems, Vol.2, John Wiley and Sons, 1976. isbn{}[9780471491118} D. P. Heyman and M. J. Sobel, Stochastic Models in Operations Research, Vol. 1, Dover Publications, 2003. isbn{}[0070286310].

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours.

論理システム(計算機)**(2)**

Sequential machines and sequential circuits (4 classes) Students learn about design methods for sequential circuits, and especially regarding the minimization of, and state allocation for, sequential machines.

Term-end examination (1 class)

Feedback (1 class) Review, including of the problems on the final examination, etc.

[Course requirements]

Nothing of special note.

[Evaluation methods and policy]

Evaluation is performed regarding each element of this course's end goals, namely, the final examination (approximately 95%) and exercises (approximately 5%). If an understanding is shown of 80% or higher on the final exam, then the student will pass the course.

[Textbooks]

Naofumi Takagi 『Logic circuits』 (Ohm-sha) ISBN:9784274215995

[References, etc.]

(Reference books)

(Related URLs) http://www.lab3.kuis.kyoto-u.ac.jp/~ntakagi/ls.html

[Study outside of class (preparation and review)]

Students are to read assigned textbook portions to prepare for each class. Students are to solve the problem exercises assigned during each class and to submit each week's problems at the next class.

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

Course nu	mber	U-EN	329 3	9072 LJ10	U-EN	G29	9 39072	LJ72		
Course title (and course title in English)	414 LL .	ステム(Systems	数理)			nar and	tructor's ne, job ti d departn affiliation	nent	Associate Pro Graduate Scl	hool of Informatics fessor,FUKUDA HIDEMI hool of Informatics AMASHITA NOBUO
Farget year	2nd y	ear students o	r above	Number	of cred	lits	2	Year	/semesters	2020/First semester
Days and period	ds Wed.	3	Class	s style	Lectur	e			Language of instruction	Japanese
predicate logi	ic, Bool	ean algeb							ociated to pro	positional calculus,
[Course ob	•	-								
Learn the bas [Course sc				· ·	s the pr	inci	ple of co	mputa	tional science	e.
- 5 times: dig			oinato	rial circuits	, sequei	ntial	circuits			
None										
[Evaluation			•							
One final test	, but wi	th possibi	lity o	f having a s	maller t	est	in the m	iddle o	of the semeste	er.
[Textbooks	:1					_				
Instructed du	-	55								
[Reference	s, etc.]									
(Referen 高木直史 『 天野英晴,武 4274217531	論理回	路』(オ		社)ISBN: だれにもれ				回路』	(オーム社) ISBN:978-
[Study out:										
No preparatio			-		eview o	f pr	evious c	lasses	is recommen	ded.
(Other info										
*Please visit	KULAS	SIS to find	l out a	bout office	hours.					

Course title (and course 線 title in Liu		G29 39079 LJ10	U-EN	Instr nam	39079 I uctor's e, job titl departm	le,	Professor,OC	nool of Informatics OTA YOSHITO nool of Informatics
English)				of af	filiation		Associate Pro	fessor,KASHIMA KE
Target year	3rd year students of	or above Number	of cred	its	2	Year	/semesters	2020/Second semes
Days and periods	Wed.3	Class style	Lecture	•			Language of instruction	Japanese
as drones, auto	matic driving, s	ne basics of feedb systems biology. anism design, an	We will	give	lectures	s on a	nalysis of fee	e of applications suc dback systems,
[Course obje	ectives]							
domain method	s course is to ur ls for control sy edule and co	ystems design.	sics on ar	alys	is of fee	edbacl	k systems and	to acquire frequency
Transient respo Frequency resp Stability analys Characteristics Summary,1time	onse and stabilit ponse,2times, sis of feedback : of feedback co e,	function,2times, ty,3times, systems,2times, ntrol systems,2ti						
[Course requ		uired that stude	nts take	ntro	duction	to Sv	stems Analys	is (90070) and Appli
		re taking this cou			uuenon	10 0 5	stonis i maiys	15 (90070) und rippn
[Evaluation I	methods and	l policy]						
The final grade	in this course i	is based on your	scores in	repo	orts and	the fi	nal examinati	ion.
[Textbooks]								
None.								
[References,	, etc.]							
				_				
(Reference T. Sugie and M 4339033030}	,	uction to Feedba	ick Contr	ol (ii	n Japane	ese). (Corona Publis	hing, 1999 isbn{}{

Course nu	umb	ber	U-EN	G29 3	9074 LJ55	U-EN	G29	39074	LJ10		
Course title (and course title in English)			岸(数理 al Mecha				nar anc	tructor's ne, job tit I departm iffiliation			hool of Informatics DYAGI TOSHIO
Target yea	r	2nd y	ear students (or above	Number	of cred	its	2	Year	/semesters	2020/Second semester
Days and perio					s style	Lecture				Language of instruction	Japanese
[Overview	an	id pu	rpose o	f the	course]						
[Course o	hic	otivo	el				_				
LCOULSE 0	nle	CIIVE	5]								
[Course s	oha	dula	and as	ntont			_				
,7times,	cne	aule	and co	ntem	sj						
,8times,											
,1time,											
[Course re	equ	irem	ents]								
None											
[Evaluatio	n n	neth	ods and	polic	cy]						
[Textbook	s]										
[Referenc											
(Referen	nce	boo	ks)								
I O to ba		1									
[Study ou	tsio	te of	class (p	orepa	iration and	d revie	w)]				
							_				
(Other in											
*Please visit	t KI	JLAS	IS to find	1 out a	about office	hours.					

線形制御理論(2)

未更新

[Study outside of class (preparation and review)]

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

Course numb	U-EN	G29 39080 LJ	J10 U-EN	G29 39080	LJ55			1 [
Course title (and course 数/ title in Sen English)	理工学セミナ ninar on Applied		and Physics	Instructor's name, job ti and departr of affiliation	tle, nent	Associate Pro Graduate Scl Assistant Pro Graduate Scl Assistant Profess Graduate Scl Assistant Pro Graduate Scl Assistant Prof Graduate Scl Assistant Prof Graduate Scl	tool of Informatics fessor, FUKUDA HIDEMI tool of Informatics fessor, TSUJI TETSURO hool of Informatics fessor, NINO KAZUKI tool of Informatics fessor, NINO KAZUKI tool of Informatics fessor, Ueda Masahiko tool of Informatics sesor, WASAKI ATSUSHI tool of finformatics sesor, YAMAKAWA YUYA	(a tit E Ta Da I M M m
Target year	3rd year students of	or above Numb	er of cred	lits 2	Yea	r/semesters	2020/Second semester	(al co
Days and periods	Fri.2	Class style	Lectur	e		Language of instruction	Japanese	ז
[Overview an	· ·		-					To
It is a seminar-t	ype class, relat	ted to various	topics relat	ed to Appli	ed Ma	thematics and	Physics.	ro
[Course obje	ctives]							Fu
Each student wi the topic itself, I				ice. During	the cla	iss, the studen	s will learn not only	loo M de
[Course sche	edule and co	ntents]						OI OI
 15 classes in to 6 topics, relate provided. Each student v 	ed to General N	Mathematics,		ysics, Opera	tions	Research and	Control Theory, will be	Ka the M me Co
[Course requ	irements]							pr Br
It will depend of July.	n the topic cho	osen by the stu	ident. Pleas	e read the in	nform	ation that will	be posted on Kulasis in	co Aj an
[Evaluation n	nethods and	policy]						an Su
- Each student s tell the instructor - The grades wil understanding o	or in advance. 11 be based on						classes, he/she should	ני Li Br תי
						Continue to 数理	⊑学セミナー(数理)(2)↓↓↓	

Course title (and course Beglish) 最適化 (数理) (ptimization Number of credits and epartment Graduate School of Informatics Professor, NAGAMOCHI HIROSH Graduate School of Informatics of affiliation Target year ad year students or how Number of credits 2 Year/semesters 2020/Second semest Bays and periods Wed.2 Class style Lecture year/semesters 2020/Second semest Mathematical programming or optimization is a methodology for modeling a real-world problem as a mathematical problem with an objective function and constraints, and solving it by some suitable procedure (algorithm). This course consists of lectures on basic theory and methods or primization and combinatorial optimization. If Course schedule and contents] To understand basic theory and algorithms in continuous optimization and combinatorial optimization. Second methods, such as global and local minima, convex sets and functions, gradients and Hessian matrices of multivariate functions. Second methods, such as steepest descent method, Newton#039s method, quai-Newton methods, conjugate gradient method. Optimality conditions and duality.2times,Optimality conditions for constrained optimization such as penalty methods and sequential quadratic programing encodes. Second method, Newton#1000000000000000000000000000000000000	Course nu	umber	U-ENC	329 3	9081 LJ10	U-EN	G29	9 39081	LJ72		
Days and periods Wed.2 Class style Lecture Lapage distinct Japanese [Overview and purpose of the course] Mathematical programming or optimization is a methodology for modeling a real-world problem as a mathematical problem with an objective function and constraints, and solving it by some suitable procedure (algorithm). This course consists of lectures on basic theory and methods in nonlinear optimization and combinatorial optimization. [Course objectives] To understand basic theory and algorithms in continuous optimization and combinatorial optimization. [Course schedule and contents] Fundamentals of nonlinear optimization,2times,Basic notions in continuous optimization such as global and local minima, convex sets and functions, gradients and Hessian matrices of multivariate functions. Method of unconstrained optimization,2times,Basic unconstrained optimization methods such as steepest descent method, Newton#039s method, quasi-Newton methods, conjugate gradient method. Optimality conditions and duality,2times,Doptimality conditions for constrained optimization problems, calle Karush-Kuhn-Tucker conditions, as well as the second-order optimality conditions and Lagrangian duality theory. Methods of constrained optimization, 1time,Basic methods of constrained optimization such as penalty methods and sequential quadratic programing methods. Combinatorial optimization, 1time,Pasic methods of constrained optimization such as penalty methods and sequential quadratic programing nethods. Combinatorial optimization such as phanch-and-bound method and dynamic programming, 2times,Basic exact solution strate	(and course title in						nar and	ne, job ti d departn	nent	Professor,NA Graduate Scl	AGAMOCHI HIROSHI nool of Informatics
[Overview and purpose of the course] Mathematical programming or optimization is a methodology for modeling a real-world problem as a mathematical problem with an objective function and constraints, and solving it by some suitable procedure (algorithm). This course consists of lectures on basic theory and methods in nonlinear optimization and combinatorial optimization. [Course objectives] To understand basic theory and algorithms in continuous optimization and combinatorial optimization. [Course schedule and contents] Fundamentals of nonlinear optimization,2times,Basic notions in continuous optimization such as global and local minima, convex sets and functions, gradients and Hessian matrices of multivariate functions. Method of unconstrained optimization,2times,Basic unconstrained optimization methods, such as steepest descent method, Newton#0395 method, quasi-Newton methods, conjugate gradient method. Optimality conditions and duality.2times,Optimality conditions for constrained optimization problems, calle Karush-Kuhn-Tucker conditions, as well as the second-order optimality conditions and Lagrangian duality theory. Methods of constrained optimization, 1time,Basic methods of constrained optimization such as penalty methods and sequential quadratic programming.2times,Basic exact solution strategies for combinatorial optimization userb.a-md-bound method and dynamic programming. Approximation algorithms,3times,Approximation algorithms for hard combinatorial optimization problems, and their computation of achievement level. [Course celupierments] Linear Programming (90690) recommended. [Evaluation meth	Target yea	r Brd	l year students o	r above	Number	of cred	lits	2	Yea	r/semesters	2020/Second semester
Mathematical programming or optimization is a methodology for modeling a real-world problem as a mathematical problem with an objective function and constraints, and solving it by some suitable procedure (algorithm). This course consists of lectures on basic theory and methods in nonlinear optimization and combinatorial optimization. [Course objectives] To understand basic theory and algorithms in continuous optimization and combinatorial optimization. [Course schedule and contents] Fundamentals of nonlinear optimization,2times,Basic notions in continuous optimization such as global and local minima, convex sets and functions, gradients and Hessian matrices of multivariate functions. Method of unconstrained optimization,2times,Basic unconstrained optimization methods such as steepest descent method, Newton#0395 method, quasi-Newton methods, conjugate gradient method. Optimality conditions and duality,2times,Optimality conditions for constrained optimization problems, calle Karush-Kuhn-Tucker conditions, as well as the second-order optimization publication such as penalty methods and sequential quadratic programing methods. Combinatorial optimization litme,Typical combinatorial optimization such as penalty methods and sequential quadratic programing methods. Combinatorial optimization such as branch-and-bound method and dynamic programming. Approximation algorithms,3times,Approximation algorithms for hard combinatorial optimization problems, and their computational complexity. Branch-and-bound method and dynamic programming,2times,Basic exact solution strategies for combinatorial optimization such as prantees. Summary and review, ltime,Summary and review. Confirmation of achievement level. [Course requirements] Linear Programming (90690) recommended. [Evaluation methods and policy] Based on the score of the term examination.	Days and perio	ods We	:d.2	Class	s style	Lectur	e			Language of instruction	Japanese
ICourse schedule and contents] Fundamentals of nonlinear optimization,2times,Basic notions in continuous optimization such as global and local minima, convex sets and functions, gradients and Hessian matrices of multivariate functions. Method of unconstrained optimization,2times,Basic unconstrained optimization methods, such as steepest descent method, Newton#039s method, quasi-Newton methods, conjugate gradient method. Optimality conditions and duality,2times,Optimality conditions for constrained optimization problems, calle Karush-Kuhn-Tucker conditions, as well as the second-order optimality conditions and Lagrangian duality theory. Methods of constrained optimization,1time,Basic methods of constrained optimization such as penalty methods and sequential quadratic programing methods. Combinatorial optimization,1time,Tpaical combinatorial optimization problems such as traveling salesman problem and knapsack problem, and their computational complexity. Branch-and-bound method and dynamic programming,2times,Basic exact solution strategies for combinatorial optimization such as Approximation algorithms for hard combinatorial optimization problems, and heir theoretical performance guarantees. Summary and review, Itime,Summary and review. Confirmation of achievement level. ICourse requirements] Linear Programming (90690) recommended. [Evaluation methods and policy] Based on the score of the term examination.	mathematica (algorithm). combinatori	al probl This co al optir bjecti	lem with an ourse consis mization. ves]	objec sts of	ctive function lectures on	on and c basic th	ons	traints, a y and m	ethods	lving it by sor	ne suitable procedure optimization and
Fundamentals of nonlinear optimization,2times,Basic notions in continuous optimization such as global and local minima, convex sets and functions, gradients and Hessian matrices of multivariate functions. Method of unconstrained optimization,2times,Basic unconstrained optimization methods such as steepest descent method, Newton#039s method, quasi-Newton methods, conjugate gradient method. Optimality conditions and duality,2times,Optimality conditions for constrained optimization problems, calle Karush-Kuhn-Tucker conditions, as well as the second-order optimization optimization and Lagrangian duality theory. Methods of constrained optimization, Itime,Basic methods of constrained optimization, Itime,Basic methods of constrained optimization, and their computational complexity. Branch-and-bound method and dynamic programming,2times,Basic exact solution strategies for combinatorial optimization such as branch-and-bound method and dynamic programming, Approximation algorithms,3times,Approximation algorithms for hard combinatorial optimization problems, summary and review,1time,Summary and review. Confirmation of achievement level. [Course requirements] Linear Programming (90690) recommended. [Evaluation methods and policy] Based on the score of the term examination.				0		ontinuo	us o	ptimizat	ion an	d combinator	ial optimization.
Linear Programming (90690) recommended. [Evaluation methods and policy] Based on the score of the term examination.	Optimality of Karush-Kuh theory. Methods of combinator problem and Branch-and- combinatori Approximat and their the Summary ar	condition n-Tuck constra l seque ial opti l knaps bound al optir ion alg coretica ad revie	ons and dual ker condition initial quadra mization, I ti ack problem method and mization suc yorithms, 3 tim al performan ew, 1 time, Su	lity,2t ns, as zation tic pr me,T n, and l dyna ch as l nes,A nce gu	times, Optim well as the n, I time, Bas ograming n ypical com I their comp amic progra branch-and- pproximati- tarantees.	nality co second- ic meth nethods binatori outations mming, -bound on algor	ondi ods al o al co 2tin metl rithi	tions for ler optim of const ptimizat omplexit nes,Basi hod and ms for ha	const nality o trained ion pr y. c exac dynam ard co	rained optimi conditions and d optimization oblems such a ct solution stra nic programm mbinatorial op	zation problems, called l Lagrangian duality such as penalty as traveling salesman ttegies for ing. ptimization problems,
[Evaluation methods and policy] Based on the score of the term examination.	-			acom	mended						
Based on the score of the term examination.			•••••								
[Tavthaaka]	-										
	Textbook	re]									
									,	Continue to	長適化(数理)(2)↓↓

数理工学セミナー(数理)(2)

[Textbooks]

It depends on the topic of choice.

[References, etc.]

(Reference books)

It depends on the topic of choice.

[Study outside of class (preparation and review)]

Please ask the instructor of your topic.

(Other information (office hours, etc.))

In early July, all the topics of this seminar class will be announced. Students should pay attention to Kulasis and/or to the announce board of the department office. After that, the students should follow the instructions of this announcement, which includes choosing the topic of interest.

*Please visit KULASIS to find out about office hours.

最適化(数理)(2)

[References, etc.]

(References, ou.) (Reference books) M. Fukushima, Introduction to Mathematical Programming: New Edition (in Japanese), Asakura Shoten isbn{ }{9784254280043}; M. Yagiura and T. Ibaraki, Combinatorial Optimization - Metaheuristic Algorithms (in Japanese), Asakura

Shoten isbn{}{4254275129}.

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours.

	nber	U-EN	329 390	83 LJ10	U-EN		39083	LJ57		
· · · · · · · · · ·	(and course) 力学系の数学 name, job title, Dynamical Systems and department Graduate School of Informatics Professor,YAGASAKI KAZUYUK									
Farget year	3rd ye	ear students o	or above N	umber	of cred	its	2	Yea	r/semesters	2020/First semester
Days and period	ls Thu.3	3	Class s	style	Lecture	э			Language of instruction	Japanese
[Overview	and pu	irpose o	f the co	ourse]						
phenomena in with a special	n natura focus c	l and soci	al science	ces. This						time-dependent nical systems theory
[Course ob		-								equilibria and fixed
points (2) To under (3) To maste								oifurca	tions and cha	DS
			^	-	umical s	ystei	ms			
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elementary co explained. Local Bifurca normal forms	tions,4- are disc	mical Sys such as P -5times,B cussed.	ntents] stems,5-(oincare : ifurcatio	6times,F maps, sta	undamen ability, d ailibria a	ntals lyna and f	s of diffe mics of fixed po	linear	systems and	re reviewed and invariant manifolds are d reductions and discussed.
Introduction t elementary co explained. Local Bifurca normal forms Chaos,4-5tim	to Dyna oncepts ations,4- are diso es,Hors	mical Sys such as P 5times,B cussed. eshoe ma	ntents] stems,5-(oincare : ifurcatio	6times,F maps, sta	undamen ability, d ailibria a	ntals lyna and f	s of diffe mics of fixed po	linear	systems and	invariant manifolds are d reductions and
Introduction t elementary co explained. Local Bifurca normal forms	tions,4- are disc es,Hors	mical Sys such as P 5times,B cussed. eshoe ma	ntents] stems,5-(oincare : ifurcation ps, home	6times,F maps, sta ons of equ oclinic th	undamen ability, d uilibria a neorem a	ntals lyna and f	s of diffe mics of fixed po	linear	systems and	invariant manifolds are d reductions and
Introduction t elementary co explained. Local Bifurca normal forms Chaos,4-5tim	o Dyna oncepts ations,4- are disc es,Hors quirem ear Alg	mical Sys such as P 5times,B cussed. eshoe ma ients] ebra and 1	ntents] stems,5-(oincare : ifurcatio ps, home	6times,F maps, sta ons of equ oclinic th tial Equa	undamen ability, d uilibria a neorem a	ntals lyna and f	s of diffe mics of fixed po	linear	systems and	invariant manifolds are d reductions and
Introduction to elementary cc explained. Local Bifurca normal forms Chaos,4-5tim [Course re Calculus, Lin [Evaluation Evaluation de	tions,4- are disc es,Hors quirem ear Alge methors	mical Sys such as P 5times,B cussed. eshoe ma ents] ebra and 1 ods and nainly on	ntents] stems,5-(oincare ifurcatio ps, hom Differen policy	6times,Fr maps, sta ons of equ oclinic th tial Equa	undamen ability, d uilibria a neorem a ntions	ntals lyna and f	s of diff mics of fixed po Melniko	linear pints, c	systems and center manifol 9s method are	invariant manifolds are d reductions and
Introduction to elementary cc explained. Local Bifurca normal forms Chaos,4-5tim [Course re Calculus, Lin [Evaluation Evaluation de	o Dyna: oncepts ations,4- are disc es,Hors quirem ear Algo pends r needed	mical Sys such as P 5times,B cussed. eshoe ma ents] ebra and 1 ods and nainly on	ntents] stems,5-(oincare ifurcatio ps, hom Differen policy	6times,Fr maps, sta ons of equ oclinic th tial Equa	undamen ability, d uilibria a neorem a ntions	ntals lyna and f	s of diff mics of fixed po Melniko	linear pints, c	systems and center manifol 9s method are	invariant manifolds are d reductions and discussed.
Introduction I elementary co explained. Local Bifurca normal forms Chaos,4-5tim [Course re: Calculus, Lin [Evaluation Evaluation de account wher	o Dyna: oncepts ations,4- are disc es,Hors quirem ear Algo pends r needed	mical Sys such as P 5times,B cussed. eshoe ma ents] ebra and 1 ods and nainly on	ntents] stems,5-(oincare ifurcatio ps, hom Differen policy	6times,Fr maps, sta ons of equ oclinic th tial Equa	undamen ability, d uilibria a neorem a ntions	ntals lyna and f	s of diff mics of fixed po Melniko	linear pints, c	systems and center manifol 9s method are	invariant manifolds are d reductions and discussed.
Introduction I elementary co explained. Local Bifurca normal forms Chaos,4-5tim [Course re Calculus, Lin [Evaluation Evaluation de account wher [Textbooks	o Dyna: oncepts are disc es,Hors quirem ear Alge pends r n needed 5]	mical Sys such as P -5times,B cussed. eshoe ma eents] ebra and 1 ods and nainly on 1.	ntents] stems,5-(oincare ifurcatio ps, hom Differen policy	6times,Fr maps, sta ons of equ oclinic th tial Equa	undamen ability, d uilibria a neorem a ntions	ntals lyna and f	s of diff mics of fixed po Melniko	linear pints, c	systems and center manifol 9s method are	invariant manifolds are d reductions and discussed.

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Course n	umber	U-EN	G29 3	9084 SJ11						
Course title (and course title in English)		とシステム ls and Syste				nai and	tructor's me, job ti d departn affiliation	nent	Professor,OC Graduate Sch	nool of Informatics DTA YOSHITO nool of Informatics fessor,KASHIMA KENJ
Target yea	1 r 31	d year students	or above	Number	of cred	lits	2	Yea	r/semesters	2020/First semester
Days and peri	ods W	ed.4	Clas	s style	Lectur	e			Language of instruction	Japanese
[Overview	and	purpose o	f the	course]						
[Course o	bject	ives]								
[Course s	ched	ule and co	nten	ts]		_		_		
,2times, .3times.	oneu		men	.01						
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[Evaluatio	n mo	thods and	noli	cvl		_				
[L valuatio	/ii iiie	thous and	poin	c 31						
						_				
[Textbook	(S]									
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(Refere	nce b	ooks)								
[Study ou	tside	of class (orepa	ration an	d revie	w)1				
[otady of			pe			,1				
(Other in	forma	ation (offic	e ho	urs, etc.))						
*Please visi	t KUL	ASIS to fin	l out a	about office	hours.					

9780387946771} M.W. Hirsch, S. Smale and R.L. Devaney,Differential Equations, Dynamical Systems, and an Introduction to Chaos isbn{}{9780123820105} J. Guckenheimer and P. Holmes, Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vector Fields, Springer isbn{}{0387908196} J.D. Meiss, Differential Dynamical Systems, SIAM isbn{}{9780898716351} S. Wiggins, Introduction to Applied Nonlinear Dynamical Systems and Chaos, Springer isbn{}{ [Study outside of class (preparation and review)] (Other information (office hours, etc.)) *Please visit KULASIS to find out about office hours.

力学系の数学**(2)**

										未更新
Course nu	umbe	er U-EN	G29 3	9086 LJ11	U-EN	G29	39086	LJ10		
Course title (and course title in English)		壳体力学(数 tinuum Mech				nan and	tructor's ne, job ti I departn Iffiliation	tle, nent		hool of Informatics AGUCHI Satoshi
Target yea	r	3rd year students (or above	Number	of cred	lits	2	Year	/semesters	2020/Second semester
Days and perio				s style	Lectur	e			Language of instruction	Japanese
[Overview	and	d purpose o	f the	course]						
		indamental th vior of contin			amics a	nd el	lasticity	is giv	en as an intro	duction to the theory of
[Course o										
Understandi	ng th	ne basic conce	epts in	fluid dyna	mics and	d ela	sticity.			
[Course s	che	dule and co	nten	ts]						
stress, 2times momentum of basic equation dynamics of dynamics of compressible basic equation "	s, equa ons c visc invi e flu ons i	of fluids,2-3tin ous fluids,3-4 scid fluids,1- ids and sound n elasticity,2-	nes, ltimes 2times wave	, 5, s,1time,						
[Course re				1 6 1			. 1	<u> </u>		
analysis, line	ear a	lgebra, funda	menta	ls of dynam	nics, fun	idam	ientals c	of vect	or analysis	
[Evaluatio	n m	ethods and	polie	cy]						
Evaluation i	s bas	ed on the sco	re of e	examinatior	1.					
[Textbook	s]									
No										
[Referenc	es, (etc.]								
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Introduced i	n the	lecture								
[Study ou	tsid	e of class (j	orepa	ration and	d revie	w)]				
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*Please visit	t KU	LASIS to fine	l out a	about office	hours.					

未更新

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											未更	新
Course nu	umber	U-EN	G29 29	9089 EJ10	U-EN	G29	29089	EJ55				
Course title (and course title in English)				월 3 (計算 atory and Ex		nar anc	tructor's ne, job tit I departm affiliation	nent	Graduate Scl Associate Prof Graduate Scl Associate Prof Academic Center Assistant Prof Academic Center Assistant Pro Academic Center Assistant Prof	fessor, TAK nool of Info essor, SUEN for Computing for Computing of computing of computing for Computing	ASE H ormatic AGA K and Med SHI TA and Med ani Da and Med	IIDEKI cs OUHEI ia Studies ASUKU ia Studies isuke ia Studies
Target yea	r Brd	year students	or above	Number	of cred	its	4	Year	/semesters	2020/Firs	t seme	ster
Days and perio					Semina	ar			Language of instruction	Japanese		
[Overview	and p	ourpose o	of the	course]								
[Course o	bjectiv	/es]										
[Course s	chedu	le and co	ontent	s]								
,15times, ,15times, ,15times, ,15times,												
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				,,,,								
[Textbook	s]											
								Ċ	ontinue to 計算機科	学実験及演習3	(計算機)	(2)↓↓↓

English) Farget year Days and periods [Overview an [Course objee [Course schee] Itime, 6times, 7times,	Brd year students Brd year students Tue.2 d purpose o ctives]	or above Number Class style of the course	er of credits	tructor's me, job tit d departm affiliation 2	ient j		hool of Informatics ARASHI ATSUSHI 2020/Second seme Japanese
[Overview and periods [Overview and periods] [Course objee [Course schee] [time, 6times, 7times,	Tue.2 d purpose c ctives]	Class style	Lecture	2	Year/	I I	
[Overview and [Course objee [Course schee] [time, 6times, 7times,	d purpose c ctives]	of the course				Language of instruction	Japanese
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[Study outsid	le of class (preparation a	nd review)]				
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Other Inform	nation (offic		ice hours				
(Other information) *Please visit KU		d out about offi	ice nours.				

計算機科学実験及演習 3 (計算機)(2)	Course nu	umber	U-ENG29 2
[References, etc.] (Reference books)	Course title (and course title in English)		学実験(数理: Mathematics and
[Study outside of class (preparation and review)]			
	Target yea	r 2nd y	ear students or above
(Other information (office hours, etc.))	Days and perio	odsMon.3	3,4,Tue.3,4 Clas
*Please visit KULASIS to find out about office hours.	[Overview	and pu	urpose of the
[Courses delivered by instructors with practical work experience] (1) Category	and explain various prob modeling be	the behav blems. The hind eng dents will	s and Physics is vior of systems his experiment gineering that h Il work on deve system.
(2) Details of instructors' practical work experience related to the course	[Course o	bjective	es]
(3) Details of practical classes delivered based on instructors' practical work experience	use experim	ental resu	algorithms and ults to analyze, on using the La'
	[Course s	chedule	e and conten
	• Guidance • General i • Using gm Day 3-6 -: Day 7-10 : Day 11-14: Day 15-18: descent met Day 19-22: Day 23-26: shortest pat	on the construction uplot to p Ordinary Numerica Linear ec Finding f hod, etc.) Numerica Combina problem	al solution of d atorial optimiza
	[Course re	quirem	nents]
	Acquired cr	edits for	all Basic Subje
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Course n	umber	U-ENG29 2	9091 SJ10	U-EN	G29	29091	SJ11	U-ENG29 2	9091 SJ54
Course title (and course title in English)		工学実験(数理:1 d Mathematics and			nan and	tructor's ne, job tit I departm ffiliation	nent	Assistant Profe Graduate Scl Assistant Profess Graduate Scl Assistant Pro Graduate Scl	nool of Informatics ssor,Aleksandar Shurbevski 1001 of Informatics ny,YAMAGUCHI YOSHIYUKI 1001 of Informatics fessor,TSUTSU HIROKI 1001 of Informatics sor,KAMIOKA SHIYUUHEI
Target yea	1 r 2n	d year students or above	Number o	of cred	lits	2	Year	r/semesters	2020/Second semester
Days and peri	odsMor	n.3,4,Tue.3,4 Clas :	s style	Experi	men	t		Language of instruction	Japanese
[Overview	and	ourpose of the	course]						
various prob modeling be addition, stu reports in th [Course o • Understan use experim	olems. ' ehind en idents v le LaTe bjecti nd basie	This experiment of ngineering that ha will work on deve X system.	class is a chi ive been lea cloping their develop ski understand,	ance to irrned in progra	see eler mm	in action nentary ing skill ment the ture abo	em in a	a programmin tain phenome	
-		ile and content	-						
• Guidance • General in • Using grup Day 3-6 : Day 7-10 : Day 11-14: Day 11-14: Day 15-18: descent met Day 19-22: Day 23-26: shortest path	on the nstructi uplot to Ordina Numer Linear Finding hod, et Numer Combi n proble		sses, as wel ientific rep a set of dat uations (Rui rapezoidal n ian elimina Continuous iffusion equ tion (Develo	l as usir orts a, inclu nge-Kut nethod, tion, Jac optimiz ations (op and i	ng th ding tta n , Sin cobi catio forv mpl	ae BYO g illustra hethod, o npson's n 's metho n (Binan vard Eul ement a	tions u etc.) metho od, etc. ry met ler met branc	using the LaT d, etc.) .) hod, Newton thod, Crank-N h-and-bound	method, steepest Vicolson method, etc.)
[Course r	equire	ments]							
Acquired cr	edits fo	or all Basic Subject	cts offered b	by the A	ppli	ied Matl	hemati	ics and Physic	es Course.
[Evaluation	on met	hods and polic	>y]						
topics in ord									submit reports for all rned if all reports are
submitted).							_c	Continue to 数理工学	実験(数理:H25以前入学者)(2)↓↓↓

数理工学実験(数理:H25以前入学者)(2)
addition, tardiness, absence from class, and re-submitting a report will incur reduction in the grade.
Textbooks]
n experiment manual prepared by the instructors will be distributed in class.
References, etc.]
(Reference books) upplemental materials will be introduced if deemed necessary.
Study outside of class (preparation and review)]
re-class preparation by reading the provided experiment manual, class notes, and other reference materials is ighly recommended.
(Other information (office hours, etc.))
his class is in BYOD (Bring Your Own Device) style, and it is mandatory to bring your own computer for he class.
n addition, it is necessary to prepare the necessary environment and software for conducting the class: • Prepare to use gnuplot to produce plots from data • Prepare to use the LaTeX system to produce reports Please install a LaTeX compiler, dvipdfmx, dvips, epstopdf, pdftops, etc) • Prepare a C/C++ compiler for the experiments Under MacOS please install Xcode Command Line Tools or similar software, on Windows cygwin, MS /isual Studio or similar, and on Linux, try using the c++ and g++ commands to compile) is well as a basic text editor.
Please visit KULASIS to find out about office hours.

[Reference					
(Referer	ce books)				
[Study out	side of class (preparation a	nd review)]		
	ormation (offi				
Please visit	KULASIS to fir	d out about offic	ce hours.		

基礎数理演習(数理)(2)

												未更	新
Course n	umb	er	U-EN	G29 3	9092 SJ10	U-EN	G29	39092	SJ11	U-ENG29 39	9092 SJ5	4	
Course title (and course title in English)) hematics and	Physics	nar anc	tructor's ne, job tit 1 departm affiliation	nent	Graduate Sch Senior Lecture Graduate Sch Assistant Profes Graduate Sch Assistant Prof Graduate Sch Assistant Professon	er,MIYAZ nool of In sor,KAMIO nool of In fessor,TS nool of In	AKI SHI formatic DKA SHIY formatic UTSU H formatic	YUUJI s UUHEI s IROKI s
Target yea	r	2nd y	ear students o	or above	Number o	of cred	its	2	Year	/semesters	2020/Fi	rst seme:	ster
Days and peri					s style	Semina	ar			Language of instruction	Japanes	e	
[Overview	/ an	d pı	irpose o	f the	course]								
[Course o	bje	ctive	es]										
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[Course s	che	dule	and co	nten	ts]								
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[Course r	equi	irem	nents]										
None													
[Evaluation	n m	neth	ods and	poli	cy]								
		-							,	Continue to 基础	*******	(新田) (2	
									(Jontinue to 基版	一致吐凍省	(釵理) (2	:)↓↓↓↓

Course nu	umber	U-EN	G29 3909	93 EJ10	U-EN	G29	39093	EJ72				
Course title (and course title in English)					(学者) Instructor's name, job title, and department of affiliation			nent	Graduate School of Informatics Assistant Professor,HARADA KEN Graduate School of Informatics Assistant Professor,Ueda Masahiko Graduate School of Informatics Assistant Professor,IWASAKI ATSUSI			
Target yea	r 2nd y	ear students (or above Nu	umber o	of cred	its	2	Year	/semesters	2020/First semester		
Days and peri	ods Mon	.3,4	Class s	tyle	Semina	ır			Language of instruction	Japanese		
ータ型・演 学での基礎 [Course o	るプロ 算子・I 的なア) bjective	グラミン 記列・関 ルゴリズ es]	グ実習を 数・条件 ム実装を	2行う。 分岐・ 2題材に	繰り返 して学	し奴 ぶ。	「理・多	;次元]	記列・ファィ	/グの基礎となる、デ イル操作等を、数理工		
数理工学の 術を修得す [Course s	る。				を有効	活用	するた	こめに	必要なプロク	ブラミングの知識と技 		
- 第1回 ガ~	イダンス	e and co とレポー の適切な	<u>-</u> トの書	き方	ルの活	用に	ついて	「学ぶ。	,			
第2回 手編 基 の実行方法	本的な	文法、基	本的なテ	ータ型	、基本	的な	:関数と	それ	を用いたサン	ノプルプログラミング		
	ログラ.	ムの基本	パーツて	ある条	件分岐					いて、数値積分(台形 を題材にして学ぶ。		
	次元配	列の使い							問題の数値角 を題材に学る	释法(べき乗法)、線 ^{ら。}		
などをソー	ストや	ッリーな グや動的	どのデー 計画法な	-タ構造 よどのア	:: を表現 ルゴリ	ズム	実装を	題材		/タ、動的メモリ確保 らに、ファイルからの いても学ぶ。		
		度の確認 ミング技	術の到達	達度を確	認する	D						
								_c	iontinue to プログラミ	ング演習(数理:H30以前入学者)(2)↓↓↓		

10万元ミン万字羽(物理,42011歳7 堂子)(2)	_
プログラミング演習(数理:H30以前入学者)(2)	
[Course requirements]	1
本演習はBYODで行うため、演習時には各自ノートPCを持参すること。	
[Evaluation methods and policy]	
3 項目ごとに出されるレポートと出席状況に基づき総合的に成績評価を行う。	
[Textbooks]	
Not used	
[References, etc.]	-
(Reference books)	
皆本晃弥 『やさしく学べるC言語入門』(サイエンス社)ISBN:978-4781913599	
後藤良和、高田大二、中島寛和『入門C言語』(実教出版)ISBN:978-4-407-33283-4	
柴田望洋 『新・明解C言語 入門編』(SBクリエイティブ)ISBN:978-4797377026	
[Study outside of class (preparation and review)]	
寅習時間を有効的につかうために、配布資料に基づく予習を行うこと。	
(Other information (office hours, etc.))	_
(Other Midmaton Jointe Hours, etc.)/ 別回ガイダンスへの出席を必須とする。	
カロバイメンス、いう山市を定況とする。	
Please visit KULASIS to find out about office hours.	

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ブログラミング演習(数理:H30以前入学者)(2)	数値計算演習(数理) (2)
[Course requirements]	[Course requirements]
本演習はBYODで行うため、演習時には各自ノートPCを持参すること。	Under the UNIX operating system, students have to edit a file, code and test C programs, make reports and graphs, and print them. BYOD.
[Evaluation methods and policy]	[Evaluation methods and policy]
各項目ごとに出されるレポートと出席状況に基づき総合的に成績評価を行う。	The students MUST submit all the reports for all subjects. The grading will be done based on the total scores
[Textbooks]	of reports.
Not used	[Textbooks]
	Instructed during class
[References, etc.]	
(Reference books) 皆本晃弥 『やさしく学べるC言語入門』(サイエンス社)ISBN:978-4781913599	[References, etc.]
皆本晃弥『やさしく学べるC言語入門』(サイエンス社)ISBN:978-4781913599 後藤良和、高田大二、中島寛和『入門C言語』(実教出版)ISBN:978-4-407-33283-4 柴田望洋『新・明解C言語 入門編』(SBクリエイティブ)ISBN:978-4797377026	(Reference books)
柴田望洋 『新・明解C言語 入門編』(SBクリエイティブ)ISBN:978-4797377026	Introduced during class
[Study outside of class (preparation and review)]	[Study outside of class (preparation and review)]
演習時間を有効的につかうために、配布資料に基づく予習を行うこと。	Students need to prepare by exercise documents.
(Other information (office hours, etc.))	(Other information (office hours, etc.))
初回ガイダンスへの出席を必須とする。	*Please visit KULASIS to find out about office hours.
*Please visit KULASIS to find out about office hours.	
· rease visit KOLASIS to find out about office hours.	

Course nu	umber	U-EN	G29 39094 LJ	57 U-EN	G29 39094	LJ10				Course nu	ımbe	r l	U-ENG
		算演習(e on Num	(数理) erical Analysi	S	Instructor's name, job t and depart of affiliation	itle, ment	Assistant Profe Graduate Scl Assistant Pro Graduate Scl	ool of Informatics essor,IWASAKI ATSUSHI ool of Informatics fessor,HARADA KENJI ool of Informatics fessor,Ueda Masahiko		Course title (and course title in English)		テム工当 em Ana	
Target yea	r Brd y	ear students	or above Numb	er of cree	lits 2	Yea	r/semesters	2020/First semester		Target yea	r i	3rd year st	udents or
Days and perio	ods Wed	.3,4	Class style	Semin	ar		Language of instruction	Japanese]	Days and perio	ods Th	1u.3,4,F	ri.3,4 C
[Overview	and pu	irpose c	of the course	9]					1	[Overview	and	purpo	ose of
mathematics	s. In this e progra	exercise, ms, and i		numerical				nformatics and applied computer codes,		Systems eng making stud- three real sys- control meth groups in the	ents l stems tods t	have a s s, Activ through	solid gr e Silen compu
We will lear obtaining the				imerical a	alysis with	comp	aters. Specific	ally, we aim at		[Course of	bjec	tives]	
(1) Understa (2) Coding to (3) Methodo (4) Writing a [Course so	echnique ology of ability.	es data analy					_			To understar Physics m Parameter Analyses o System sta	odeli iden of fre abiliz	ing base tificatio equency tation ar	ed on th on from respon nd optin
(a) We wi assistants. W	ill explai /e will fi ill study	n content 1rther exp how to w	to write an eff s of exercises blain how to us rite an effectiv	on numeri e compute	al simulati			ffs and teaching		To study how systems, con To precisely	nsider	ring a g	ap betw
(a) Least so (b) Statistic (c) Statistic Week 6-10 I We will so equation and Week 11-14 (a) Trapez	quare m cal infer cal hypo Diffusion tudy an o l a reacti Numeri zoidal ru ov Chain	ethod ence thesis tes a equation explicit E on-diffus cal integr le, Simps Monte C	n uler method an ion equation. ration method a on's rule 'arlo method	nd Crank-P	licolson me	thod fo	or a one-dimen	nsional diffusion		[Course se Guidance, 1 Active Silen 1. Introducti 2. Basic lect 3. Experime: 4. Analyses *The special Flexible-Lin	time, on to ure o nt on re lized	, Introdu 9 times, 9 princip 9 n DSP a 9 sponses 8 softwar 9 nipulat	ple of ac and pro s in tim- re Scila
							Continue to 数值	副"算演習〔"数理〕〔2〕↓↓↓		1. A recursiv 2. Tracking 5 3. Two-degr 4. Tracking 6 *The special Inverted Pen	step s ree-of desire lized	signals f-freedo ed signa softwar	om contr als res Scil:

title in System English)		テム工学実験(数理:H25以前入学者) em Analysis Laboratory					ructor's ne, job tit departm ffiliation	nent	Graduate School of Informatics Assistant Professor, TSUJI TETSUR Graduate School of Informatics Assistant Professor, OOKI KENTARO Graduate School of Informatics Assistant Professor, NIINO KAZUF			
Target yea	r 3	rd year students o	or above	Number	of cred	lits	2	Year	/semesters	2020/Second semeste		
Days and perio	ods Th	u.3,4,Fri.3,4	Class	style	Experi	men	t		Language of instruction	Japanese		
making stud three real sy control meth	ents h stems ods ti	ave a solid g , Active Sile hrough comp	rasp c ncer, l outer s	of systems e Flexible-Lin imulations	engineer nk Man and pilo	ring ipula ot ex	through itor, and perimer	applic l Inver its. Stu	cations of their ted Pendulun	ol. Our course aims at ir knowledge to the h. Students will master divided into three h.		
Analyses System sta To study hor systems, cor	of freabilization of freabilization of the second s		imal c al solu ween	and stability control ations for c theory and	ontrolli practice	e, an	d under	standii	ng the feature	haviors of the real of the real systems.		
1						ients	through	n prese	entations and	reports.		
[Course s		ule and co		-	idina a			^		reports.		
[Course s Guidance, 1 Active Silen 1. Introducti 2. Basic lect 3. Experime 4. Analyses	time, cer, 9 on to ure or nt on res	Introduction	active ogran	pics and div sliencer uming 1 frequency	0			^		reports.		

/ステム工学実験(数理:H25以前入学者)(2)	
. Mechanical model of inverted pendulum and parameter identification	{
. Controller by state space representation	
. Inference of state variables by observer	
. Pole-place method / optimal control method	
. Swinging up of inverted pendulum	
The specialized softwares Scilab and MATLAB/SIMULINK are used.	
[Course requirements]	
tudents are supposed to have the knowledge of Introduction to Systems Analysis (90070) and take the	
ourse of Linear Control Theory (90720).	
[Evaluation methods and policy]	
Class participation and reports are mainly evaluated. Attitude, Creativeness, and Individual work and gro	oup
work are also important during the evaluation process.	
[Textbooks]	
Each instructor will distribute his own text when necessary.	
[References, etc.]	
(Reference books)	
Doyle, Francic and Tannenbaum 『Feedback Control Theory』 (Prentice Hall) ISBN:0023300116 ((1992))
jung System Identification (Prentice Hall) ISBN:0136566952 ((1998))	
Jung "System Identification.] (Prenuce Han) ISBN:0150500952 ((1998))	
(Related LIRI s)	
(Related URLs)	
(Related URLs) (Sutudents will be informed when necessary)	
Sutudents will be informed when necessary)	
Sutudents will be informed when necessary) [Study outside of class (preparation and review)]	
(Students will be informed when necessary) [Study outside of class (preparation and review)] itudents have to prepare for presentations and reports for each subject.	
(Students will be informed when necessary) [Study outside of class (preparation and review)] [students have to prepare for presentations and reports for each subject. (Other information (office hours, etc.)) t is recommended to take the course Linear Control Theory (90720) for third-year students and take the ourses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Unde	er the
Sutudents will be informed when necessary) [Study outside of class (preparation and review)] tudents have to prepare for presentations and reports for each subject. (Other information (office hours, etc.)) t is recommended to take the course Linear Control Theory (90720) for third-year students and take the	er the
(Students will be informed when necessary) [Study outside of class (preparation and review)] [students have to prepare for presentations and reports for each subject. (Other information (office hours, etc.)) t is recommended to take the course Linear Control Theory (90720) for third-year students and take the ourses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Unde	er the
Sutudents will be informed when necessary) [Study outside of class (preparation and review)] itudents have to prepare for presentations and reports for each subject. (Other information (office hours, etc.)) It is recommended to take the course Linear Control Theory (90720) for third-year students and take the ourses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Und BYOD policy of Kyoto University, students have to bring their own device in order to participate in class	er the
Sutudents will be informed when necessary) [Study outside of class (preparation and review)] itudents have to prepare for presentations and reports for each subject. (Other information (office hours, etc.)) It is recommended to take the course Linear Control Theory (90720) for third-year students and take the ourses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Und BYOD policy of Kyoto University, students have to bring their own device in order to participate in class	er the
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Sutudents will be informed when necessary) [Study outside of class (preparation and review)] itudents have to prepare for presentations and reports for each subject. (Other information (office hours, etc.)) It is recommended to take the course Linear Control Theory (90720) for third-year students and take the ourses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Und BYOD policy of Kyoto University, students have to bring their own device in order to participate in class	er the
Sutudents will be informed when necessary) [Study outside of class (preparation and review)] itudents have to prepare for presentations and reports for each subject. (Other information (office hours, etc.)) It is recommended to take the course Linear Control Theory (90720) for third-year students and take the ourses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Und BYOD policy of Kyoto University, students have to bring their own device in order to participate in class	er the
Sutudents will be informed when necessary) [Study outside of class (preparation and review)] itudents have to prepare for presentations and reports for each subject. (Other information (office hours, etc.)) It is recommended to take the course Linear Control Theory (90720) for third-year students and take the ourses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Und BYOD policy of Kyoto University, students have to bring their own device in order to participate in class	er the
Sutudents will be informed when necessary) [Study outside of class (preparation and review)] itudents have to prepare for presentations and reports for each subject. (Other information (office hours, etc.)) It is recommended to take the course Linear Control Theory (90720) for third-year students and take the ourses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Und BYOD policy of Kyoto University, students have to bring their own device in order to participate in class	er the

物理統計学(数理)(2) [Textbooks] None

[References, etc.] (Reference books) To be announced in the lecture

[Study outside of class (preparation and review)] Reviews through solving the assigned quizzes are expected.

(Other information (office hours, etc.)) According to progress of the lecture, some topics may be omitted or added.

*Please visit KULASIS to find out about office hours.

丰面新

title in Statistic	計学 (教理)							
English)	cal Physics	十学(数理) ll Physics			s title, ment n	Graduate School of Informatics Professor,UMENO KEN		
Target year 3rd y	year students or above	Number of	f credi	its 2	Year	/semesters	2020/First semester	
Days and periods Thu.	.2 Class	style I	Lecture	;		Language of instruction	Japanese	
[Overview and pu Probability theory, s investigate systems equilibrium or statio [Course objectiv To gain firmly the fu and stochastic proce	statistical mechar with many degre onary systems an ves] fundamental skill:	ics, and theo es of freedor d some topic	m. Tech s for no	hnics for o onequilib	lescribi irium sy	ng dynamics, ystems are exp	and fluctuation in	
[Course schedul		s]						
mechanics is formul are explained. Stochastic processes explained. As examp Langevin equaitons several applications Some topics for non relaxation processes fluctuation theory, tl	atistical mechanic larized with the r s and random wa uples, Gauss proce and Fokker-Plan . Derivation of F4 s of both equation nequiliburium sys s from nonequilib thermal excitation	s,3times,Fur naximum ent lks,3times,St ess, Poisson j ck equations okker-Planck s are explain tems,2times, ourium states	ndamen tropy p tochasti process s,3times c equati ned. ,We ex t to equ	htals of th principle. A ic process s, Wiener s,Brownia ions from plain som	Applicat es, espe process in motio Langev e topics	tions to ideal ecially Marko and random on is introduce in equations s chosen from	walks are explained. ed as an example of are described and entropy production in	
[Course requiren Fundamentals of cal	-	-1						
[Evaluation meth Based on quizzes an	hods and polic	y]						

Course n	umber	U-EN	G29 39	099 LJ11						不足利
Course title (and course title in English)			te Ever	nt Systems		nar anc	tructor's ne, job ti I departr affiliatior	tle, nent		hool of Informatics sor,MASUYAMA HIROYUKI
Target yea	r Brd y	year students o	or above	Number o	of cred	its	2	Yea	r/semesters	2020/First semester
Days and peri	ods Tue.	2	Class	style	Lecture	e			Language of instruction	Japanese
	sis of sto al tools.	ochastic di This cours	screte (se cove	event syste rs the fund	lamenta	l res	ults of	Marko	v chains and	hains are useful their applications to
[Course of This course applications	aims to		e under	rstanding o	f the fu	ndaı	nental r	esults	of Markov ch	ains and their
Furthermore methods, are Discrete-tim basic notion the existenc Markov met the group of Continuous- introduced. Markov cha Exponential and-death pi stationary qu	e, basic i e explain ne Marko s of the e of its s thods for web pa time Ma Furtherr in) are e -type qu rocesses ueue len	notions, su ned. by chains, tationary a tranking/r ges. arkov chain nore, the p xplained, t leueing mon) are lectum gth distrib	ch as r 3?4time nain, su und lim ating,2 ns,3~ oroperti togethe odels,2 red, foo	andom var es, The disc uch as irred hiting distri $2\sim3$ times, I 4times, The ies of a birt er with the ~3 times, E cusing on t	iables, p crete-tin lucibilit butions Markov Poisso th-and-c derivati Exponen he deriv	ne M y, p mer n pr leatl on c tial- vatio	ability of farkov of eriod, a thods fo ocess an h process of its sta- type quon of the	distribu chain i nd recu or ranki nd con ss (a sp ttionar teueing sir perf	s introduced. urrence, as we ing/rating are tinuous-time : becial case of y distribution g models (whi	s course are outlined. nerating function Topics include the ell as the condition for lectured, focusing on Markov chain are the continuous-time ch are reduced to birth- sures, such as the
[Course re Background			babili	ty and stati	stics is	help	oful to le	earn th	is course but i	it is not prerequisite.
[Evaluatic Based on the								,	Continue to 6	霍率離散事家論[2)↓↓↓

確率離散事象論(2)

[Textbooks] Handouts are provided.

[References, etc.]

(Reference books) P. Bremaud, Markov Chains: Gibbs Fields, Monte Carlo Simulation, and Queues, Springer, 1999. isbn{}{ 9780387985091} L. Kleinrock, Queueing Systems Vol.1, John Wiley and Sons, 1975. isbn{}{9780471491101}

[Study outside of class (preparation and review)]

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

データベース(計算機)(2)

C.J. Date: An Introduction to Database Systems, Addison Wesley; 8th edition, 2003. isbn{}{0321197844} Serge Abiteboul, Richard Hull, Victor Vianu: quotFoundations of Databasesquot, Addison Wesley, 1994. isbn{}{0201537710}

[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

										小文が
Course numb	ber	U-EN	G29 3	9103 LJ11						
	ータイ tabase	ベース(:s	計算相	幾)		nar and	tructor's me, job tit d departm affiliation	nent	Professor, YOS Graduate Scl	nool of Informatics SHIKAWA MASATOSHI nool of Informatics ofessor,MA QIANG
Target year	3rd ye	ar students (or above	Number	of cred	lits	2	Yea	r/semesters	2020/First semester
Days and periods				s style	Lectur	e			Language of instruction	Japanese
[Overview ar	nd pu	rpose o	of the	course]						
[Course obje	ctive	s]								
[Course sche	edule	and co	ntent	ts]						
,1time,										
,2times, .4times.										
,4times, .2times.										
,2times,										
,3times,										
,3times,										
[Course requ	iirem	ents]								
None										
[Evaluation r	netho	ods and	polic	cy]						
[Textbooks]										
[References,	etc.]									
Reference										
				Gehrke D	Database	Ma	inageme	nt Sys	tems, 3rd edit	ion, McGraw-Hill,
2002. isbn{}{9'				and Knowl	ledge-ba	ise (Systems	Vol 1	Computer Sc	ience Press, 1988 isbn{
}{0716781581}		co or Dat	aouse	and mow			5,500115	. 01.1	,computer 50	10.000 1 10.00, 1 200 15011
Hector Garcia-	Molin									omplete Book, Pearson;
2nd Internation	nal, 20	08. isbn{	<u>}</u> {978	8013135428	89} isbn	1 <u>{</u> }{	9780131	8732	54}	 タベース (計算機) (2)↓↓↓
								(continue to $\tau -$	ダハース(計昇機)(2)↓↓↓

										未更新
Course nu	ımbe	r U-EN	G29 2	9104 LJ10	U-EN	G29	29104	LJ11		
Course title (and course title in English)		'トウェア工 ware Enginee		计算機)		nan and	tructor's ne, job tit I departm offiliation	nent	Assistant Profe	tion Management and Communication ssor,ATSUMI NORITOSHI urer,HOSHINO HIROSHI
Target yea	r	3rd year students o	or above	Number	of cred	its	2	Year	/semesters	2020/Second semester
Days and perio	ods N	lon.4	Clas	s style	Lecture	e			Language of instruction	Japanese
[Overview	anc	l purpose o	f the	course]						
[Course o	bjec	tives]								
[Course s	cheo	dule and co	nten	sl						
Software De Software Pro Software Qu Business Mo Project Man Software Mo Software Tes Formal Meth Software Mo Software Mo	quire sign ocess ality odel l agen odule ts,1ti nods, etrics ainter	ements Engin Techniques,2 ,1time, Managemen Innovation,1t nent,1time, es,1time, me, 1time,	ttimes t, 1 tim ime,	, e,						
[Course re	equi	rements]								
None										
[Evaluatio	n m	ethods and	poli	>y]						
								_c	ontinue to V7 F	- ウェア工学 (計算網) (Z)↓↓↓

フトウェア工学(計算機)(2)	
extbooks]	
extdooks	
eferences, etc.] (Reference books)	
Sommerville: quotSoftware Engineering 10th Editionquot, Pearson, 2016. isbn{}{9780133943030	}
tudy outside of class (preparation and review)]	
Other information (office hours, etc.)	
ease visit KULASIS to find out about office hours.	

										不又利
Course n	umber	U-ENC	329 3	9109 LJ11						
Course title (and course title in English)		・オートマ ages and Au		ita		nar and	tructor's ne, job ti d departn affiliation	nent		hool of Informatics AMAMOTO AKIH
Target yea	1 r 2nd	d year students o	r above	Number	of cred	lits	2	Yea	r/semesters	2020/Second seme
Days and peri	ods Mo	m.3	Clas	s style	Lectur	e			Language of instruction	Japanese
[Overview	and p	ourpose o	f the	course]						
	Ve learn	n why study								rs and pushdown pecially design and
[Course o	bjectiv	ves]								
-	-									
[Course s	chedu	le and co	nten	ts]						
,1time,										
Finite auton	nata,5ti	mes,Descrip	otion	of finite aut	tomata,	min	imizatio	n and	regular expre	ssions.
Context-free	e gramr	nars,4times	Push	-down auto	mata, co	onte	xt-free §	gramm	ars and their	equivalency.
Turing macl	hines ar	nd related is	sues,	3times,Turi	ng macl	hine	, its defi	nition	and basic pro	operties.
Hierarchy o	f langu	ages,2times	,Sum	mary of lan	guage c	lass	es. Disc	ussion	is to check the	e achievements of
students										
[Course r	equire	ments]								
None										
[Evaluatio	on met	thods and	polie	cy]						
Will be spec			-							
Textbook	(e]									
•	-	longuagas a	nd th	aomy of aon	aputatio	n (orona d	ha 20	03 isbn{}{43	200182181
Iwama, Aut	omata,	languages a	na m	eory of con	nputatio	n, c	orona-s	na, 20	05 ISDII { } { 45	5901821A}.
[Referenc	es, etc	c.]								
Refere	nce bo	ooks)								
10.										
[Study ou	tside (of class (p	repa	ration and	a revie	w)]				
(Other in	forma	tion (office	e hoi	urs, etc.))	_		_			
*Please visi	t KULA	ASIS to find	outa	about office	hours.					

										未更新
Course n	umbe	r U-EN	G29 4	9108 SJ11	U-EN	G29	49108	SJ12	U-ENG294	9108 SJ13
Course title (and course title in English)		レーティン rating System		ステム(計	算機)	nan and	ructor's ne, job ti departn ffiliation	nent	Professor, YA Graduate Scl Associate Pro Graduate Scl	hool of Informatics AMAMOTO AKIHIRO hool of Informatics fessor,KAWAHARA JUN hool of Informatics fessor,TAKASE HIDEKI
Target yea	r	8rd year students o	or above	Number	of cred	lits	2	Year	/semesters	2020/First semester
Days and peri	ods Ti	ue.2	Clas	s style	Lectur	e			Language of instruction	Japanese
[Overview	/ and	purpose o	f the	course]						
[Course o	bjec	tives]								
[Course s	ched	lule and co	nten	ts]						
,1time,										
,9times, .4times.										
,1time,										
[Course r	equir	ements]								
None										
Fvaluatio	n m	ethods and	noli	cvl						
Levaluatio	/11 1110		poin	cy]						
Textbook	re]		_					_		
TICKBOON]									
[Referenc		-								
(Refere	ncer	DOOKS								
[Study ou	tside	of class (p	orepa	ration and	d revie	w)]				
(Other in	form	ation (offic	e ho	urs, etc.))						
*Please visi	t KUI	LASIS to find	l out a	about office	hours.					

								未更新
Course nu	umber	U-ENG29	39111 LJ11					
Course title (and course title in English)		職業 ation and Busi	ness		Instructor's name, job ti and departn of affiliation	tle, nent	Professor,MI Academic Center	nool of Informatics NATO SHINICHI for Computing and Media Stuc essor,IIYAMA MASAA
Farget yea	r 4th g	year students or ab	ove Number	of cred	its 2	Year	/semesters	2020/First semester
Days and perio			iss style	Semina	r		Language of instruction	Japanese
[Overview	and p	urpose of th	e course]					
[Course o	bjectiv	es]						
-	chedul	e and conte	nts]					
1time,								
7times,								
[Course re	equirer	nents]						
None								
[Evaluatio	n meth	nods and po	licy]					
-								
[Textbook	sl							
[.0]							
[Reference	os otc	1						
(Referen		-						
(11010101								
						0	Continue to	情報と職業(2)↓↓

報と職業(2)	
Study outside of class	s (preparation and review)]
Other information (o	ffice hours, etc.)
Please visit KULASIS to	find out about office hours.
	instructors with practical work experience]
 Category an omnibus course deliver 	red by invited lecturers and guest speakers from different companies, etc.
2) Details of instructors'	practical work experience related to the course
Details of practical class	sses delivered based on instructors' practical work experience

コンピュータネットワーク(2)

Katsuo Ikeda (ed.): Computer networks (Ohmsha) isbn{ }{4274132226}

[Study outside of class (preparation and review)]

(Other information (office hours, etc.))

Please visit KULASIS to find out about office hours.

		-タネットワ Jetworks	ーク		Instructor name, job and depar of affiliation	title, tment		for Computing and Media Studies XABE YASUO
Target year	3rd year s	udents or above	Number o	of cred	its 2	Yea	/semesters	2020/First semester
Days and periods 1	lue.1	Class	style	Lecture	;		Language of instruction	Japanese
	The ide for the	a of the Inte	rnet, basic	concept				sis of the ubiquitous d the protocols are
[Course sche								
The Application level protocols\ Writing simple t The Transport L - The Transmiss The Network La (IP)\ - Routing in The Datalink La layer technologie	nes,- Se Layer,3 * The network ayer,3tin ion Cor yer,3tin 1 IP netv yer and es	rvice and pro- times,- The a Domain Nau ed applicatic nes,- Princip turol Protoco tes,- Principl works the Local Ar	otocols\ - T application me System ons\ oles of a rel l (TCP) es\ * Da ea Networ	i layer ai * El liable tra itagram a ks,2time	nd princip ectronic r insport pr and virtua es,- Princi	les - Th nail\ ptocol\ l circuit ples\ - N	* The Ĥyper T - The User Da -\\ * routing\ /\dedia Access	rvice\ - Application- Fext Transfer Protocol\ - tagram Protocol (UDP)\ ,- Internet Protocol Control\ - Datalink
The Application level protocols/ Writing simple The Transport L - The Transmiss The Network La (IP) - Routing in The Datalink La layer technologi Network Securit [Course requi	nes,- Se Layer,3 * The network ayer,3tin ion Cor yer,3tin 1 IP netv yer and es y,1time,	vice and pro- times,- The Domain Nau ed application nes,- Princip trol Protoco es,- Principl vorks the Local Ar - Informatio	otocols\ - T application me System ons\ oles of a rel l (TCP) es\ * Da ea Networ	i layer ai * El liable tra itagram a ks,2time	nd princip ectronic r insport pr and virtua es,- Princi	les - Th nail\ ptocol\ l circuit ples\ - N	* The Ĥyper T - The User Da -\\ * routing\ /\dedia Access	Fext Transfer Protocol\ - tagram Protocol (UDP)\ - Internet Protocol
level protocols\ Writing simple = The Transport L - The Transmiss The Network La (IP)\ - Routing in The Datalink La Jayer technologi Network Securit [Course requi None	nes,- Se Layer,3 * The network ayer,3tin ion Cor yer,3tin n IP netv yer and es y,1time, remen	rvice and pro times,- The a Domain Nau ed application mes,- Princip throl Protoco ies,- Principl works the Local Ar - Informatio	totcools \- T application me System yoles of a rel 1 (TCP) es\ * Da ea Networ n security a	i layer ai * El liable tra itagram a ks,2time	nd princip ectronic r insport pr and virtua es,- Princi	les - Th nail\ ptocol\ l circuit ples\ - N	* The Ĥyper T - The User Da -\\ * routing\ /\dedia Access	Fext Transfer Protocol\ - tagram Protocol (UDP)\ - Internet Protocol
The Application level protocols/ Writing simple The Transport L - The Transmiss The Network La (IP) - Routing in The Datalink La layer technologi Network Securit [Course requi	nes,- Se Layer,3 * The network ayer,3tin ion Cor yer,3tin n IP netw yer and es y,1time, remen	vice and pro times,- The a Domain Nau ed applicatic mes,- Princip trrol Protoco ies,- Principl works the Local Ar - Informatio ts] s and polic	y]	1 layer an \ * El liable tra itagram a ks,2time and netw	nd princip ectronic r insport pr and virtua es,- Princi vork secu	les - Th nail\ otocol\ l circuit ples\ - M rity\ - C	* The Hyper 1 - The User Da \ *routing\ Aedia Access yber laws	Fext Transfer Protocol \ - tagram Protocol (UDP)\ - Internet Protocol Control\ - Datalink
The Application level protocols/. Writing simple i The Transport L - The Transport L - Routing in The Datalink La layer technologie Network Securit [Course requi None [Evaluation m	nes,- Se Layer,3 * The network ayer,3tin ion Cor yer,3tin n IP netv yer and es y,1time. remen ethods on the ture著	rvice and pre- times, - The i- Domain Nai ed applicatic ness, - Princip trol Protoco vorks the Local Ar - Informatio ts] s and polic semester-enc Computer	y] Networkin, and Networkin,	1 layer ar 1 * El liable tra atagram a ks,2time and netw d partiall	nd princip ectronic 1 insport pr and virtua ss,- Princi vork secu	iles - Th nail\ potocol\ l circuit ples\ - M rity\ - C	* The Hyper T The User Da \ *routing\ Aedia Access yber laws the attendance	Fext Transfer Protocol \ tagram Protocol (UDP)\ ,- Internet Protocol Control\ - Datalink
The Application level protocols\ Writing simple The Transport L - The Transport L - The Transport L - Nouting in The Datalink La Jayer technologi Network Securit [Course requi None [Evaluation m Grading is based [Textbooks] Olivier Bonaven	nes,-Se Layer,3 * The network henetwork gyer,3tin ion Cor yer,3tin P network yer, and se y,1time. remen nethods on the ture著 :	vice and pro- times, - The - Domain Nai ed applicatic trol Protoco- tes, - Princip vorks the Local Ar - Informatio ts] s and polic semester-ence Computer .ac.be/lst/ht	y] Networkin, and Networkin,	1 layer ar 1 * El liable tra atagram a ks,2time and netw d partiall	nd princip ectronic 1 insport pr and virtua ss,- Princi vork secu	iles - Th nail\ potocol\ l circuit ples\ - M rity\ - C	* The Hyper T The User Da \ *routing\ Aedia Access yber laws the attendance	Fext Transfer Protocol \ tagram Protocol (UDP)\ ,- Internet Protocol Control\ - Datalink

土面鉱

	umber	U-ENG29	9114 LJ54	U-ENC	329 1911	4 LJ55	U-ENG29 1	9114 LJ10
Course title (and course title in English)		ステム(計算 ation Systems	機)	1	Instructor name, job and depar of affiliatio	title, tment		Liberal Arts and Sciences JIMA KEISHI
Target yea	ı r Brd	year students or abov	Number	of credit	ts 2	Yea	/semesters	2020/Second semester
Days and peri	ods Wed	l.3 Clas	s style	Lecture			Language of instruction	Japanese
renievai sys	acins, te	chinques for gr	apii uata ana	uysis, and	u aiso tiit			
technologies and semi-str	f this co s concer ructured	urse are for stud	iction of We	eb inform	an unders nation sys	tanding tems, pi	of the basics occessing of s	and the theories of tructured documents n retrieval systems, and
The goals of technologies and semi-str graph data a	f this co s concer ructured inalysis.	urse are for stud	iction of We eb informati	eb inform	an unders nation sys	tanding tems, pi	of the basics occessing of s	and the theories of tructured documents

2. Structured documents and semi-structured data processing (2 classes) XML is taken up as an example case of data formatting that are used for representing structured documents and semi-structured data. Discussion is made of general-purpose processing techniques for XML data (DOM and SAX) and echniques for querying and converting them (XPath, XQuery, and XSLT). Differences between the paradigms of each method are discussed. Also, local tree grammar, regular tree grammar, and single-type tree grammar are taken up as examples of tree grammar, used to define the schema of tree-structured data. Differences between the expressive power of each language are explained.

3. Information retrieval: Evaluation measures (2 classes) Overview explanation is made of the fundamental concepts of information retrieval, and the various measures used in performance evaluation of information retrieval systems (precision, recall, F-measure, mean reciprocal rank (MRR), mean average precision (MAP), normalized discounted cumulative gain (nDCG), average mutual information, correlation coefficient, rank correlation coefficient, kappa coefficient). The module that line habitad thera measurement will also be availation to evany investigation. nodels that lies behind these measures will also be explained in overview.

4. Information retrieval: Retrieval models (3 classes)

Overview explanation is made of the three representative basic information retrieval models, and of their various successor models (Boolean model, fuzzy set model, extended Boolean model, vector space model, Continue to 情報システム(計算機)(2)↓↓↓

情報システム(計算機) (2)	Course nur	nber	U-ENG	29 191	15 LJ10	U-EN	G29 19115	LJ11		
atent semantic indexing (LSI), latent Dirichlet allocation (LDA), word2vec, probability model, binary ndependence model, and query likelihood model). 5. Information retrieval: Other topics (1 class)			斗学概論 tion to Cor	nputer	Science		Instructor's name, job ti and departr of affiliation	itle, G ment Pr n G	rofessor,IG raduate Scl rofessor,KA raduate Scl	nool of Informati ARASHI ATSU nool of Informati AWAHARA TAT nool of Informati AKAGI NAOFU
Several other concepts related to information retrieval will be overviewed. The topics include: techniques for query modification and recommendation, information recommendation techniques such as collaborative iltering, and information retrieval for structured data.	Target year	lst ye	ar students or a	above N	umber	of cred	its 2	1	emesters	2020/First seme
5. Web analysis (2 classes) These lectures describe analysis techniques for graph structures of Web data. Taken up especially as representative analysis methods are PageRank, Topic-Specific PageRank, TrustRank, HITS, SimRank, etc.	Days and period [Overview a Introduction t	and pu	rpose of		-	Lecture	2	L	anguage of instruction	Japanese
7. Network analysis (2 classes) Fundamental concepts of network analysis are explained. Specifically explained are the concepts of scale-free properties, small-world properties, cluster properties, and analysis methods including the infection model and community extraction methods.	[Course ob	jective	es]							
3. Feedback (1 class) Evaluation is made of the extent of learning achieved in the course.	[Course sc Introduction, I Fundamentals Computer sys	time, of con	puter scier	-						
[Course requirements]	Informatics a									
It is not mandatory but desired that students have basic knowledge taught in the following courses: introduction to Algorithms and Data Structures, Language and Automata, Graph Theory, Databases, and Fundamentals of Statistical Modeling.	Examination a			,						
[Evaluation methods and policy]	None									
Evaluations will be made based on the scores of the final examination, which examine if the students anderstand the basics and the theories of technologies concerning the construction of Web information systems, information retrieval systems, graph data analysis, and processing of structured documents and semi- tructured data used in Web information systems.	[Evaluation	meth	ods and p	oolicy]]					
[Textbooks]										
Lecture notes will be used as teaching materials.	[Textbooks]								
[References, etc.]	[Reference:	s, etc.								
Introduced during class	(Reference)	e boo	ks)							
[Study outside of class (preparation and review)]	[Study outs	ide of	class (pr	epara	tion an	d revie	w)]			
Students are to use lecture notes to prepare for and review classes. Exercise problems and homework will be assigned in classes, and students are to use these also to prepare for and review classes.	(Other infe			hauss						
	(Other info *Please visit l									

	nation (office hours, etc.)
Office hours are appointment.	available with prior confirmation. Please use the following e-mail addresses to schedule an
ajima@i.kyoto-	ı.ac.jp
Please visit KU	LASIS to find out about office hours.

										未更新
Course nu	umbe	r U-E	NG29 3	9116 LJ12		_				
Course title (and course title in English) 数理工学概論 Introduction to Applied Mathematics and Physics and copartment of affiliation Graduate School of Informa Professor, UMERD XEN Graduate School of Informa Graduate School of Informa Professor, VAMASHITA N Graduate School of Informa Professor, Shimodaira, Hide								MENO KEN nool of Informatics MASHITA NOBUO nool of Informatics		
Target yea	r	l st year studen	ts or above	Number o	of cred	its	2	Year	/semesters	2020/First semester
Days and peri	ods T	ue.2	Class	s style	Lecture	e			Language of instruction	Japanese
[Overview	and	l purpose	of the	course]						
Basic ideas operation re							ced via	topics	on communic	ations and reasoning,
[Course o			1.							
Understandi	~		**		ics and	phys	sics.			
[Course s	cheo	dule and o	content	s]						
,4times,										
,4times, .4times.										
reserved,3ti	nes									
[Course re	equi	rements]								
None										
[Evaluatio	n m	ethods ar	nd polic	cy]						
Evaluated by				,						
Textbook	sl									
None										
[Referenc		-								
(Refere	nce l	books)								
None										
[Study ou	tside	e of class	(prepa	ration and	d revie	w)]				
		ation (off								
*Please visit	t KUI	LASIS to f	ind out a	bout office	hours.					

Course num	hor I		117 LJ12						
	ルゴリズ	ムとデータ o Algorithms	構造入門	-	nam and	ructor's e, job ti departn filiation	tle, nent		nool of Informatics SHIMA HISASHI
Target year	lst year stu	dents or above	Number	of cred	its	2	Year	/semesters	2020/Second semester
Days and periods	Mon.1	Class	style	Lecture	e			Language of instruction	Japanese
[Overview a	nd purpo	se of the o	course]						
									s. This course gives nputer science.
[Course obj	ectives]		-			-		-	-
	d and dyna algorithms	amic progra , approxima	mming, - c tion algor	classes o	f ha	d prob	lems a	nd solutions t	ich as divide-and- o them, and - basic
introduction.1t			2						
algorithms,2.5t data structures, algorithm desig graph algorithr maximum-flow computational advanced topic final exam,1tin	2.5times,li gn,2times,o ns,2times, v algorithm complexit s,1time,ap	ist, stack, qu livide-and c Trees and s y,3times,P, 1	eue, binar onquer, dy graphs - de NP, NP-co	ynamic j epth-/bro omplete,	orogi eadth NP-	ammin -first s hard,	ıg, earch -	- shortest path	algorithms -
	uirement								
[Course req		s]							
	anomoni	s]							
None		-	y]						
None	methods	and polic	y]						
None	methods	and polic	y]						
None [Evaluation] Mid-term and f [Textbooks]	methods inal exami	and polic	y]						
None [Evaluation Mid-term and f [Textbooks] will be specific [References	methods final exam ed in the le , etc.]	and polic	y]						
None [Evaluation Mid-term and f [Textbooks] will be specifie [References (References	methods final examined in the le , etc.] e books)	and polic; inations ctures	y]						
will be specifie	methods final examined in the le , etc.] e books) ed in the le	and polic inations ctures ctures		d revie	w)]				
None [Evaluation Mid-term and f [Textbooks] will be specifie [References (Reference) will be specifie	methods Tinal exam ad in the le , etc.] e books) ad in the le de of cla	and polic; inations ctures ctures ss (prepar	ation and	d revie	wv)]				

人工知能(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

Cand course Inglish) 人工知能 Artificial Intelligence Iname, job title, and department of affiliation Graduate School of Informatics Professor,KANDA TAKAYUKI Farget year Ind year students or above Number of credits 2 Year/semesters 2020/First semester Days and periods Wed.3 Class style Lecture anguage/instandor Japanese Coverview and purpose of the course] Introduces basic technologies of artificial intelligence. Topics will be selected from search, machine learning, and real-world agent. Gourse schedule and contents] Learning the concept of artificial intelligence and the basic models and algorithms of search, machine earning, and real-world agent. Search, 3-4times, Introducing breadth-first search, depth-first search, heuristic search, AND/OR-graph searc deversarial search, constraint satisfaction, etc. Applications of search techniques such as computer chess, Sudoku, are also introduced. Machine Learning, 7-8 times, Introducing decision tree learning, perceptron, SVM, genetic algorithm, reinforcement learning, deep learning, etc. Applications of machine learning techniques such as data minir are also introduced. Real-world agent, 3-4times, Introducing AI techniques for quotuncertainquot situation, including basic berception and robotics, and probabilistic reasoning over time. Applications of AI for robotics are also ntroduced. None Evaluation methods and policy] By reports and a final examination. (References, etc.]	Course nu	mber	U-ENO	G29 4911	8 LJ10	U-EN	G29	49118	LJ55			
Class style Lecture Impaged instruction Japanese Days and periods Wed.3 Class style Lecture Impaged instruction Japanese [Overview and purpose of the course] This lecture introduces basic technologies of artificial intelligence. Topics will be selected from search, machine learning, and real-world agent. [Course objectives] Lecture Impaged instruction Japanese [Course schedule and contents] Introduction, Itime, Introducing the history of artificial intelligence researches. Search, 3-4times, Introducing breadth-first search, depth-first search, heuristic search, AND/OR-graph sear diversarial search, constraint satisfaction, etc. Applications of search techniques such as computer chees, Stadoku, are also introduced. Machine Learning, 7-8times, Introducing decision tree learning, perceptron, SVM, genetic algorithm, reinforcement learning, ede plearning, etc. Applications of machine learning techniques such as data mining are also introduced. Real-world agent, 3-4times, Introducing AI techniques for quotuncertainquot situation, including basic perceptron and robotics, and probabilistic reasoning over time. Applications of AI for robotics are also introduced. Real-world agent, 3-4time, Checking the achievement level [Course requirements] None [Evaluation methods and policy] By reports and a final examination. [References, etc.] [References, etc.] [Re	Course title (and course title in English)		ence			nan and	ne, job ti I departn	tle, nent		Graduate School of Informatics Professor,KANDA TAKAYUKI		
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learning, and real-world agent. [Course schedule and contents] Introduction, Itime, Introducing the history of artificial intelligence researches. Search, 3-4times, Introducing breadth-first search, depth-first search, heuristic search, AND/OR-graph search adversarial search, constraint satisfaction, etc. Applications of search techniques such as computer chess, Sudoku, are also introduced. Machine Learning, 7-8times, Introducing decision tree learning, perceptron, SVM, genetic algorithm, reinforcement learning, edeep learning, etc. Applications of machine learning techniques such as data minir are also introduced. Real-world agent, 3-4times, Introducing AI techniques for quotuncertainquot situation, including basic perception and robotics, and probabilistic reasoning over time. Applications of AI for robotics are also introduced. Achievement level check, 1time, Checking the achievement level [Course requirements] None [Evaluation methods and policy] By reports and a final examination. [Textbooks] Materials will be distributed. [References, etc.] (References, etc.] (References, books) S. Russell and P. Norvig, Artificial Intelligence A Modern Approach (3rd.ed.), Prentice Hall, 2010 isbn[}]	[Course o	bjectiv	es]									
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S. Russell and P. Norvig, Artificial Intelligence A Modern Approach (3rd.ed.), Prentice Hall, 2010 isbn{}}	[Reference	es, etc.	1									
	S. Russell ar	d P. No	oks)	ficial Intel	lligence	e A Mod	ern	Approa	ch (3ro	d.ed.), Prentic	e Hall, 2010 isbn{}{	

Course n	Course number U-ENG29 49119 LJ66 U-ENG29 49119 LJ13											
Course title (and course title in English)						nar anc	tructor's ne, job ti d departn affiliation	nent	Professor,Og Academic Center Program-Specific Seni	for Computing and Media Studies or Lecturer, FLANAGAN, BrendanJohn		
										irer,YAMASHITA NAOMI		
Target yea	r Bro	l year students	or above	Number	of cred	its	2	Yea	r/semesters	2020/Second semester		
Days and peri	ods We	d.4	Class	s style	Lecture	e			Language of instruction	Japanese		
[Overview	and a	ourpose o	of the	course]								
This lecture model, usab										be selected from user		
			ernnen	it and evalu	iation, a		iesigii p	locess	•			
[Course o	-											
Learning the concepts and methods of interaction design, including user model, usability analysis, experiment and evaluation, and design process.												
[Course schedule and contents] Introduction, Itime, Introducing the history and important concepts of interaction design.												
statistical an Design proc design and s Interfaces,2- and emotion	alysis. ess,1-2 oftwar -3times al ones ing and process at level	Applicatio times,Intro e design is ,Introducin s. Then futu analysis,2: of interface check,1tin	ns of t ducing explai og vari ure inte -3time es with	hose metho g the proces ned. ous interface erfaces are s,Introducin n several ex	ods to re- ss of inte ces that of discusse ng data g amples.	al p erac enat d. gath	roblems tion des ble seve tering ar	are di ign. T ral kin	iscussed. he comparison ids of interacti	g ethnography and h between interaction ons including social in the design and		
None	equire	mentsj										
[Evaluation methods and policy]												
By reports a			-									
[Textbook	-											
Preece, Sha	rp, Rog	ers. Interac	tion D	esign. Wile	ey, 3rd e	diti	on, 201	1. isbr	n{}{97804706	65763}		
[Referenc	es, et	s.]										
Refere	nce bo	ooks)										
									Continue to Ea-	-マンインタフェース(2) ↓↓↓		

ヒューマンインタフェース(2)
[Study outside of class (preparation and review)]
Digital online learning materials will be provided. So please read it before and after lesson.
(Other information (office hours, etc.))
Please bring your notebook PC in each lesson.
*Please visit KULASIS to find out about office hours.

										不又利
Course nu	ımber	U-EN	IG25 351	47 LJ75						
Course title (and course title in English) 上命情報学 Introduction to Computational Systems Bioinformatics Bioinformatics										KUTSU TATSUYA hool of Informatics
Target year	r 4th y	ear students	or above N	lumber	of cred	its	2	Yea	r/semesters	2020/First semester
Days and perio	ds Tue.4	4	Class s	style	Lecture	e			Language of instruction	Japanese
[Overview	and pu	Irpose o	of the co	ourse]						
course expla	ins how e applied	such me to analy	thods as g ses of bi	graph the ological s	ory, ma	chin	e learni	ng, op	timization, ar	atics. In particular, this ad nonlinear differential ding neural and brain
[Course of	bjectiv	es]								
See Japanese	e page fo	or details.								
[Course so	chedul	e and co	ontents]							
Cognitive fu Overview of Sequence an Inference of Hidden Marl Analysis of p Scale-free ne Feedback ,1t	bioinfo alysis,11 phyloge kov mod protein s etworks, ime,	rmatics,1 time, enetic tree lels,1time structures 1time,	es,2times	,						
[Course re	•									
Basic knowl	edge rel	ated to bi	ology an	d brain so	cience w	/ill t	pe provi	ded in	the course.	
[Evaluatio	n meth	ods and	d policy	1						
See Japanese	e page fo	or details.								
[Textbook	s]									
Not used										
[Reference	es, etc.]								
(Referer Textbooks of		,	oooks wil	l be infor	med in	the o	course a			er part of the course, a 生命情報学(2)↓↓↓
L										

										未更新	
Course n	umber										
Course title (and course title in English)		ematic	al Science	s					Graduate School of Informatics Associate Professor, YOSHIKAWA HITOSHI		
Target yea	u r 4th y	ear students of	or above	Number	of cred	its	2	Year	/semesters	2020/First semester	
Days and peri	ods Thu.	4	Class	s style	Lecture	e			Language of instruction	Japanese	
[Overview	v and pu	urpose o	of the	course]							
[Course o	bjectiv	es]									
[Course s	chedul	e and co	ntent	s]							
,1time, ,5times, ,3times, ,1time, ,1time, ,1time, ,1time, ,1time, [Course r None [Evaluatio			polic		_		_	_			
[u		ouo unu	point	- 31							
[Textbook	ks]										
[Referenc		-									
(Refere	nce boo	oks)									
[Study ou	Itside of	f class (p	orepa	ration an	d revie	w)]					
(Other in	formati	on (offic	e hou	urs, etc.))							
*Please visi	t KULA	SIS to find	d out a	bout office	e hours.						
			_			_		_			

生命情報学(2)

recomennded book is as follows (in Japanese); 阿久津達也 著:バイオインフォマティクスの数理とア ルゴリズム, 共立出版 (2007) isbn{}{9784320121782}.

[Study outside of class (preparation and review)] See Japanese page for details.

(Other information (office hours, etc.))

The oder and contents of the course topics can be changed.

*Please visit KULASIS to find out about office hours.

Course nu	umber	r U-ENG	323 3	3180 LJ71	U-EN	G23	33180	LJ75					
Course title (and course) title in English) ビジネス数理(数理) Business Mathematics						nan and	tructor's ne, job ti I departn Iffiliation	nent	Part-time Lecturer,KAI YOSHITAKA				
Target yea	r 4	th year students o	r above	Number	of cred	lits	2	Year	/semesters	2020/First semester apanese on in understanding the finance, the idea of tess. the business strategy by marketing);			
Days and perio	ods M	ion.3	Class	s style	Lectur	e			Language of instruction	Japanese			
[Overview	and	purpose o	f the	course]									
the contemp accounting,	orary risk n	society. I int nanagement,	roduc Ramŗ	e various th D and mar	heories (keting. 1	of th Mor	e busin eover, h	ess stra ow the	ategy includin	ng the finance, nd the idea of			
[Course o	bject	tives]											
		class is to obt less of mathe				bou	t an out	ine, a	vital point of	the business strategy			
[Course s	ched	lule and co	ntent	s]									
Optimization (research ma Business rist	n tech anagei k man	inique (decisi ment); Game nagement,2tir	on of Theo nes,	business p ry (environ	ortfolio mental	and solu	sales pr tion)	ice); I		n by marketing); and real option			
[Course re	equir	ements]											
None													
[Evaluatio	n me	ethods and	polio	>y]									
Written exai	minati	ion (70%),	and a	ttendance a	nd the c	lass	particip	ation	(30%)				
[Textbook	s]												
Prints are di	stribu	ted every lec	ture.										
								(Continue to ビシ	ジネス数理(数理)(2)↓↓↓			

Course title (and course title in English)		ン認識と Recogniti	機械	6101 LJ72 学習	nan and	tructor's ne, job ti I departn affiliation	nent	Graduate School of Informatics Professor,KAWAHARA TATSUY		
Target yea	r Brd ye	ear students	or above	Number	of cred	its	2	Year	/semesters	2020/Second sem
Days and perio	ods Wed.	2	Class	s style	Lecture	e			Language of instruction	Japanese
[Overview	and pu	irpose o	f the	course]					<u> </u>	
										nation for classifica oriented for patter
[Course o	bjective	es]								
to master ba										
to be able to	design a	system f	or pat	tern classifi	cation a	nd 1	recognit	ion.		
[Course s	chedule	and co	ntent	s]						
 Discrimin Clustering DP match Bayes cla Naive Bayes Perceptroi Neural ne Perceptroi Neural ne Neural ne Support Statistica Maximu Deep lea Examina 	g and Gau ing and I ssificatio yes classi n learnin twork vector m al feature m likelih rning(1) rning(2): ttion and	ussian mi HMM (cl n g of discr achines (extractic ood estin Feedbacl	xture i assific logistic riminat SVM) on nation recogn	model ation of sec c regressior nt function and regular	quential n model rization	patt	erns)			
[Course re	equirem	ents]								
None										
[Evaluatio	n meth	ods and	polic	>y]						
The grading	is based	on the ex	amina	ation follow	ving the	cou	rse, and	some	exercises pro	vided in the course

ビジネス数理(数理)(2)
[References, etc.]
[Keleiences, etc.]
(Reference books)
[Study outside of class (preparation and review)]
[Study Suiside of class (preparation and review)]
Since prints are distributed 1,2 weeks before the lecture, read them beforehand.

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours.

[Courses delivered by instructors with practical work experience]

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

- *

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

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

パターン認識と機械学習(2)

[Textbooks]

Lecture slides are provided via PandA CMS.

[References, etc.]

(Reference books)

[Study outside of class (preparation and review)]

Excersize included in lecture slides

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

										未更新
Course nu	mber	U-EN	G20 3	2502 SE77						
Course title (and course title in English)			nam and	ructor's le, job ti departn ffiliation	nent	Graduate School of Informatics Professor,AOYAGI TOSHIO				
arget year	31	rd year students	or above	Number	of cred	lits	2	Year	r/semesters	2020/First semester
Days and period	ds Fri	i.3	Class	s style	Lectur	e			Language of instruction	Japanese
[Overview	and	purpose o	of the	course]						
[Course ob	oject	ives]								
[Course sc	hed	ule and co	ontent	sl						
1time,	a									
3times,										
3times,										
2times, 2times.										
2times, 2times.										
ltime,										
[Course re	auir	omontel								
None	quire	ementsj								
Tione										
[Evaluation	n me	thods and	l polio	>y]						
[Textbooks	5]									
[Reference		-								
(Referen	ce b	ooks)								
[Study out:	side	of class (nrena	ration an	d revie	w)]	_			
Loundy Out	onde	01 01855 (hieha		u levie	•••/]				
(Other info	orma	ation (offic	e hou	urs, etc.))	_	_	_			
*Please visit										

				_		_				
Course number	U-ENG23 3	3186 LJ73								
	学実験(数理:: Mathematics and			Instructor's name, job title, and department of affiliation			Graduate School of Informatics Assistant Professor, Aleksandar Shubevsl Graduate School of Informatics Assistant Professor, YAMAGUCHI YOSHIYUV Graduate School of Informatics Assistant Professor, TSUTSU HIROK Graduate School of Informatics Assistant Professor, KAMIOKA SHIYUUHI			
Target year 2nd	year students or above	Number	of cred	l its 4	Ļ	Year	/semesters	2020/Second semester		
Days and periodsMon.		-	Experi	ment			Language of instruction	Japanese		
[Overview and p	urpose of the	course]								
various problems. This experiment class is a chance to see in action the basic principles of mathematical modeling behind engineering that have been learned in elementary mathematics and physics courses. In addition, students will work on developing their programming skills and learn how to produce scientific reports in the LaTeX system.										
[Course objectiv	es]									
 Become familiar [Course schedul 	sults to analyze, on using the La	understand TeX writing	l, and co	njectu	ire abo	ut cert	ain phenome			
Day 1-2 : Class ge · Guidance on the · General instructio · Using gnuplot to j Day 3-6 : Ordinary Day 7-10 : Numeric Day 15-18: Finding descent method, etc. Day 19-22: Numeric Day 23-26: Combin Shortest path problet Day 27-30: Fast Fou	course of the cla ons on writing sc produce plots of y differential equi- cal integration (t quations (Gauss function roots; (.) cal solution of d atorial optimiza m in graphs)	isses, as we cientific rep f a set of da uations (Ru trapezoidal sian elimina Continuous iffusion equ tion (Devel	Il as usin ports ita, inclu inge-Kur method, ation, Jac s optimiz uations (op and i	ding i ding i tta me , Simp cobi's cation forwa mpler	BYOI Illustra ethod, e oson's i metho (Binar urd Eul ment a	tions u etc.) methoo d, etc. ry methor branch	using the LaT d, etc.)) hod, Newton hod, Crank-N h-and-bound	method, steepest		
[Course requirer	nents]									
Acquired credits for	all Basic Subje	cts offered	by the A	pplie	d Matł	nemati	cs and Physic	es Course.		
[Evaluation meth										
The evaluation will										

											未更新	
Course nu	umbe	er	U-EN	G23 2	3185 SJ48							
Course title (and course title in English)	(and course プログラミング入門 title in Introduction to Programming						nan and	tructor's ne, job tit I departm affiliation	nent	Graduate School of Informatics Professor,IGARASHI ATSUSHI		
Target yea	r	lst yea	ar students (tudents or above Number of credits 2 Year/semesters 2020/First seme							2020/First semester	
Days and periods Thu.1 Class style Lecture Languaged instructor Japanese								Japanese				
[Overview	and	d pu	rpose c	of the	course]							
[Course o	bjec	tive	s]									
[Course s	cheo	dule	and co	ntent	ts]							
,1time, ,2times, ,2-3times, ,2-3times, ,2-3times, ,2-3times, ,1time, ICourse re None IEvaluatio			-	l polic	cy]							
[Textbook	(s]											
[Referenc	es, e	etc.]										
(Referer	nce l	bool	ks)									
[Study out	tside	e of	class (j	prepa	ration and	d revie	w)]					
(Other in	form	natio	on (offic	e hou	urs, etc.))							
*Please visit	t KUI	LAS	IS to fine	d out a	ibout office	hours.						

数理工学実験(数理:H26以降入学者)(2) In addition, tardiness, absence from class, and re-submitting a report will incur reduction in the grade. [Textbooks] An experiment manual prepared by the instructors will be distributed in class. [References, etc.] (Reference books) Supplemental materials will be introduced if deemed necessary. [Study outside of class (preparation and review)] Pre-class preparation by reading the provided experiment manual, class notes, and other reference materials is highly recommended. (Other information (office hours, etc.)) This class is in BYOD (Bring Your Own Device) style, and it is mandatory to bring your own computer for the class. In addition, it is necessary to prepare the necessary environment and software for conducting the class: • Prepare to use gnuplot to produce plots from data • Prepare to use the LaTeX system to produce reports (Please install a LaTeX compiler, dvipdfmx, dvips, epstopdf, pdftops, etc) • Prepare a C/C++ compiler for the experiments (Under MacOS please install Xcode Command Line Tools or similar software, on Windows cygwin, MS Visual Studio or similar, and on Linux, try using the c++ and g++ commands to compile) as well as a basic text editor. *Please visit KULASIS to find out about office hours.

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(insh)	
get year 2nd year students or above Number of credits 2 Year/semesters 2020/Second	semester
s and periods Wed.2 Class style Lecture Language d'instruction Japanese	
verview and purpose of the course]	
s course presents an overview study of the basic organization of computers and their operation prin ructions of computers, computer arithmetic, how to design simple computers, and overview of me rarchy and I/O of computers.	
ourse objectives]	
Students will understand and be able to explain basic organization of a computer and its operation	
nciples. Students will understand and be to explain instructions of computers.	
Students will understand and be able to explain computer arithmetic.	
Students will understand and be able to explain design methods of simple processors.	
Students will understand and be able to explain overview of memory hierarchy and I/O of computer	rs.
ourse schedule and contents]	
sic computer organization and its operation principles (2 classes) dents will learn about basic computer organization and its operation principles, as well as performa luations.	ance
tructions of computers (5 classes)	
dents learn about instructions of computers.	
mputer arithmetic (3 classes)	
dents learn about computer arithmetic and floating-point arithmetic.	
sign of simple processors (3 classes)	
dents learn design methods of simple processors.	
erview of memory hierarchy and I/O of computers. (1 classes)	
dents learn about an overview of memory hierarchy and I/O of computers.	
m-end examination (1 class)	
dback (1 class) view, including of the problems on the final examination, etc.	

Course nu	umber	U-ENG	29 2	9130 LJ11	U-EN	G29	29130	LJ72		
Course title (and course title in English)				几理系 amming La	nguages	nan and	ructor's ne, job til departm ffiliation	nent		nool of Informatics essor,SUENAGA KOUHE
Target yea	r Brd y	ear students or	above	Number	of cred	lits	2	Yea	r/semesters	2020/First semester
Days and perio				s style	Lectur	e			Language of instruction	Japanese
[Overview		•		-						
This class w	ill be giv	en in Japa	nese.	For the de	tail of th	ne cl	ass, see	the Ja	panese versio	n.
[Course o	bjective	es]								
[Course s	chedule	and cor	ntent	s]						
Programmin Interpreters, Midterm exx Backend of Lexers and J Advanced to [Course ro None [Evaluatio] [Textbook	Stimes, am, I time compiler parsers, 30 ppics, I tim equirem	s, s,3times, times, ne, nents]			,					
[Referenc (Referen										
					·			(Continue to プロ:	グラミング言語処理系(2)↓↓

計昇機の構成(2)
[Course requirements]
Having knowledge on logic circuits is preferable.
[Evaluation methods and policy]
Evaluation is performed regarding each element of this course's end goals, namely, the term-end examination (approximately 95%) and exercises (approximately 5%). If an understanding is shown of 80% or higher on the term-end exam, then the student will pass the course.
[Textbooks]
David A. Patterson and John L. Hennessy, Translated in Japanese by M. Narita 『Computer Organization and Design - The Hardware/Software Interface - 5th ed. No. 1』 (Nikkei BP) ISBN:9784822298425
[References, etc.]
(Reference books)
(Related URLs)
(http://www.lab3.kuis.kyoto-u.ac.jp/~ntakagi/co.html)
[Study outside of class (preparation and review)]
Students are to read assigned textbook portions to prepare for each class.
Students are to solve the problem exercises assigned during each class and to submit each week's problems at the next class.
(Other information (office hours, etc.))
*Please visit KULASIS to find out about office hours.

プログラミング言語処理系(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

									未更新	
Course nur	mber	U-ENG29 29	9131 LJ10							
Course title fand course hitle in English) 指数符号理論 Information and Coding Theory					Instructor's name, job title, and department of affiliation			Graduate School of Informatics Professor,MINATO SHINICHI		
Target year	2nd y	ear students or above	Number	of cred	lits	2	Yea	r/semesters	2020/First semester	
Days and periods Tue.1 Class style Lecture Language distinction Japanese								Japanese		
[Overview a	and pu	Irpose of the	course]							
	on sou	rce and channel							mission and storage. neasure of information	
[Course ob	jective	es]								
Students will	be able	to understand a	and apply b	basic cor	ncep	ts and p	rincip	les of informa	tion theory.	
[Course sc	hedule	e and content	s]							
Coding Theor codes, cyclic Feedback,1tir	ry,4time codes, a ne,I wil	and BCH codes. Il answer question	general inti	roductio	n to	coding	theory	, I describe pa	arity codes, Hamming learning.	
[Course red None	quirem	nents]								
[[
-		ods and polic	<i>·</i> · ·	avamin	atio	and or	a or n	oora mini tast	e	
creat will be	awaru	cu bascu oli a li	nai wituen	i examin	anoi	i and of		nore mini-test	5.	
[Textbooks	-									
Hideki Imai:	Informa	ation Theory, Sł	10kodo (in	Japanes	e) is	bn{}{9	78427	4216015}		
[Reference	s, etc.]								
Referen	ce boc	oks)								
[Study outs	side of	class (prepa	ration an	d revie	w)]					
					_					
(Other info	ormati	on (office hou	ırs, etc.))							
*Please visit	KULAS	SIS to find out a	bout office	e hours.						

5. Digital electronic circuit (3 times) • Semiconductor switch element • Semiconductor logic circuit • Digital interface circuit 6. Feedback (1 time) • Q&A
(
[Course requirements]
 To know high school level knowledge of electric circuit, and To understand simple differential and integral calculus.
[Evaluation methods and policy]
The achievement will be evaluated through submission of exercises given in the class (20%), submission of report assignments (20%) and the result of final examination(60%).
[Textbooks]
Susumu Sugiyama, Katsuhiko Tanaka, Satoshi Konichi 『Electric and Electronic Circuit - Analog and Digital Circuit - (In Japanese)』 (CORONA PUBLISHING CO.,LTD.) ISBN:9784339045130
[References, etc.]
(Reference books)
[Study outside of class (preparation and review)]
Preparation, review and assignment will be given by each lecturer in the class.
(Other information (office hours, etc.))
*Please visit KULASIS to find out about office hours.

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未更新

電気電子回路入門(2)

Course numbe	r U-EN	G29 39	9132 EJ10	U-EN	G29	39132	EJ72			
Course title (and course title in English) 目troduction to Electric and Electronic Circu					Instructor's name, job title, and department of affiliation			Graduate School of Energy Scienc Professor,SHIMODA HIROSHI Graduate School of Energy Scienc Associate Professor,IWAO KAWAYAI		
arget year	2nd year students	or above	Number	of cred	its	2	Yea	/semesters	2020/First semester	
Days and periods W	/ed.1	Class	style	Lecture	e			Language of instruction	Japanese	
Overview and	purpose o	of the	coursel							
ur conditioning,	motive powe	r and c anatior	control, and 1 of basic k	l its fund nowled	lame ge of	ental pri f electri	nciple c and	e is electric or	exts such as lighting, electronic circuit. The cuit, to understand the	
[Course objec	tives]									
 basic way of the analysis methor principles of action principles of an 	d of simple e	electric nents su	circuits co uch as diod	onsisting es and t	of p	istors,				
 basic way of th analysis metho principles of ac principles of an basic principle 	d of simple e ctive compon nplifier circu of digital ele	electric ients su iits and ectronic	circuits co uch as diod l oscillation c circuits.	onsisting es and t	of p	istors,				
 basic way of th analysis method principles of ad principles of ad basic principle 	d of simple e ctive component nplifier circu of digital elect	electric nents su nits and ectronic	circuits co uch as diod l oscillation c circuits.	onsisting es and t	of p	istors,				
 basic way of th analysis metho principles of aa principles of aa basic principle [Course scheet]	d of simple e ctive component nplifier circu of digital elect	electric nents su nits and ectronic	circuits co uch as diod l oscillation c circuits.	onsisting es and t	of p	istors,				
 basic way of th analysis metho principles of ac principles of ar basic principle [Course scheet I. Direct current Ohm's law 	d of simple e ctive compon nplifier circu of digital ele lule and co circuit (1.5 ti	electric nents su nits and ectronic	circuits co uch as diod l oscillation c circuits.	onsisting es and t	of p	istors,				
 basic way of th analysis metho principles of aa principles of aa basic principle [Course scheet I. Direct current Ohm's law Kirchhoff's law 	d of simple e ettive compon nplifier circu of digital ele lule and co circuit (1.5 ti	electric nents su nits and ectronic ontent mes)	circuits co uch as diod l oscillation c circuits. s]	onsisting es and t	of p	istors,				
 basic way of th analysis metho principles of ac principles of ac basic principle Incert current of Ohm's law Kirchhoff's law Voltage source 	d of simple e ettive compon nplifier circu of digital ele lule and co circuit (1.5 ti	electric nents su nits and ectronic ontent mes) source	circuits co uch as diod d oscillation c circuits.	onsisting es and t	of p	istors,				
 basic way of th analysis metho principles of an basic principles of basic principle Course scheet Direct current Ohm's law Kirchhoff's law Voltage source Thevenin's the 	d of simple e ettive compon nplifier circu of digital ele lule and co circuit (1.5 ti / and current prem and No	electric ients su iits and ectronic ontent mes) source rton's t	circuits co uch as diod d oscillation c circuits. s]	onsisting es and t	of p	istors,				
 basic way of th analysis metho principles of an basic principles of basic principle Course scheet Direct current Ohm's law Kirchhoff's law Voltage source Thevenin's the 	d of simple e trive compon nplifier circu of digital ele lule and co circuit (1.5 ti and current prem and No rent circuit (electric ients su iits and ectronic ontent mes) source rton's t 3.5 tim	circuits co uch as diod d oscillation c circuits. s]	onsisting es and t	of p	istors,				
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 basic way of th analysis metho principles of at principles of at basic principles basic principles basic principles Course scheet I. Direct current Ohm's law Kirchhoff's law Kirchhoff's law Voltage source Thevenin's the Alternating cu Sinusoidal alte Inductance and Vector display Resonance circ 	d of simple of tive component mplifier circue of digital elec lule and co circuit (1.5 ti and current orem and No rent circuit (mating curre l capacitance of sinusoida	electric eetronic ectronic ectronic mes) source rton's t 3.5 tim	s)	onsisting es and t n circuit	of p	istors,				
 basic way of th analysis metho principles of at principles of at basic principle basic principle basic principle Course scheet Ohm's law Kirchhoffs law Kirchhoffs law Alternating cur Sinusoidal alte Inductance and Vector display Resonance circuit Bridge circuit 	d of simple e trive compon mplifier circu of digital ele lule and co circuit (1.5 ti , and current orem and No rent circuit (neating curre el capacitance of sinusoida uit	electric nents su its and ectronic ectronic mes) source rton's t 3.5 tim ent 1 altern	since circuits course of a solution of the sol	onsisting es and t n circuit	of p	istors,				
 basic way of th analysis metho principles of a principles of a principles of a basic principle basic principle basic principle [Course sched L. Direct current - Ohm's law Voltage source Kirchhoff's law Voltage source Thevenin's the Kirchhoff's law Voltage source Sinusoidal alte Inductance and Vector display Resonance cirr Bridge circuit Basics of semi 	d of simple e trive compon mplifier circu of digital ele lule and co circuit (1.5 ti , and current orem and No rent circuit (neating curre el capacitance of sinusoida uit	electric nents su its and ectronic ectronic mes) source rton's t 3.5 tim ent 1 altern	since circuits course of a solution of the sol	onsisting es and t n circuit	of p	istors,				
 basic way of th analysis metho principles of ar principles of ar basic principles casic principles basic principles casic principles casic	d of simple e trive compon mplifier circus of digital ele lule and co circuit (1.5 ti and current orem and No rent circuit (mating curre capacitance of sinusoida uit conductor de	electric nents su its and ectronic ectronic mes) source rton's t 3.5 tim ent 1 altern	since circuits course of a solution of the sol	onsisting es and t n circuit	of p	istors,				
 basic way of the analysis method principles of an eprinciples of an eprinciples of an eprinciples of an eprinciple state of the analysis of the a	d of simple e d of simple e trive compon pplifer circu of digital ele lule and co circuit (1.5 ti , and current remt circuit (mating curre to capacitance of sinusoida uit conductor de tor	electric nents su its and ectronic ectronic mes) source rton's t 3.5 tim ent 1 altern	since circuits course of a solution of the sol	onsisting es and t n circuit	of p	istors,				
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 basic way of the analysis methology inciples of a principles of a principles of a principles of a basic principle soft as basic principles of a basic principle soft as the analysis of the principle soft as the analysis of the principle soft as the pri	d of simple e d of simple e trive compon pplifer circu component of the e digital ele lule and co circuit (1.5 ti , and current circuit (1.5 di capacitane of sinusoida uit conductor de tor nsistor nie circuit (4 of electronic	electric ients su iits and cctronic sctronic mes) source tron's t a st a altern vices (times)	e circuits co tach as diod d oscillation c circuits. s] theorem nes) hating currer 2 times)	onsisting es and t n circuit	of p	istors,				
 basic way of th analysis metho principles of ar principles of ar principles of ar basic principles basic principles Course scheet Direct current Ohm's law Voltage source Thevenin's the Alternating cur Sinusoidal alte Inductance and Vector display Resonance circ Bridge circuit Bioloar transis Field effect tra Analog electro Basics concept Equivalent circ 	d of simple e trive compon mplifer circe. of digital ele lule and co circuit (1.5 ti , and current orem and No rent circuit (1.5 di capacitance of sinusoida uit conductor de tor nsistor nic circuit (4 of electronic uit	electric ients su iits and cctronic sctronic mes) source tron's t a st a altern vices (times)	e circuits co tach as diod d oscillation c circuits. s] theorem nes) hating currer 2 times)	onsisting es and t n circuit	of p	istors,				
 basic way of the analysis method principles of a term of principles of a term of the term of term	d of simple e trive compon mplifer circu of digital ele circuit (1.5 ti and current orem and No rent circuit (rmating curre core and No rent circuit (and current orem and No rent circuit (and current orem and No rent circuit (di capacitance of sinusoida uit	electric tents su itis and ectronic ectronic mes) source rton's t 3.5 tim at 1 altern vices (circuit	e circuits co tach as diod d oscillation c circuits. s] theorem nes) hating currer 2 times)	onsisting es and t n circuit	of p	istors,				
analysis metho principles of au principles of au basic principles [Course sched 1. Direct current Ohm's law Voltage source Thevenin's the Alternating cu Sinusoidal alte Inductance and Vector display Resonance cir Bridge circuit Bradge circuit Bradge circuit Biojolar transis Field effect tra 4. Analog electro Basics concept Equivalent circ	d of simple e trive compon mplifer circu of digital ele circuit (1.5 ti and current orem and No rent circuit (rmating curre core and No rent circuit (and current orem and No rent circuit (and current orem and No rent circuit (di capacitance of sinusoida uit	electric tents su itis and ectronic ectronic mes) source rton's t 3.5 tim at 1 altern vices (circuit	e circuits co tach as diod d oscillation c circuits. s] theorem nes) hating currer 2 times)	onsisting es and t n circuit	of p	istors,	g activ	e components		

Course n	umber	U-EN	G29 39133 LJ11	l					
Course title (and course title in English)			めの数学演習 ctice for Compute	er Science	nar anc	tructor's ne, job ti I departn affiliation	nent	Associate Prof Graduate Scl Associate Pro Graduate Scl	nool of Informatics essor,SUENAGA KOUHEI nool of Informatics fessor,KAWAHARA JUN nool of Informatics sor,KOBAYASHI YASUAKI
Target yea	r 2nd y	ear students (or above Number	of cred	lits	2	Yea	/semesters	2020/First semester
Days and peri			Class style	Lectur	e			Language of instruction	Japanese
[Overview	/ and pi	urpose o	f the course]						
[Course o	hingtiv	001							
[Course o	bjectiv	53]							
[Course s	chedul	e and co	ntents]						
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[Course r	equiren	nents]							
None									
[Evaluatio	n meth	ods and	nolicy]						
Levaluatio	/// mean	ous una	policy]						
							(Jontinue to 計算機	科学のための数学演習(2)↓↓↓

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計算機科学のための数学演習(2)	
	<u></u>
[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.	

	al model of inverted pendulum and parameter identification by state space representation
	of state variables by observer
	method / optimal control method
	up of inverted pendulum
*The speciali	ized softwares Scilab and MATLAB/SIMULINK are used.
[Course re	quirements]
-	supposed to have the knowledge of Introduction to Systems Analysis (90070) and take the
	ear Control Theory (90720).
[Evaluation	n methods and policy]
	bation and reports are mainly evaluated. Attitude, Creativeness, and Individual work and group important during the evaluation process.
[Textbooks	[6
Each instruct	or will distribute his own text when necessary.
[Reference	s, etc.]
Referen	ce books)
Doyle, Franci	ic and Tannenbaum Feedback Control Theory. (Prentice Hall) ISBN:0023300116 ((199
Ljung 『Syst	tem Identification.] (Prentice Hall) ISBN:0136566952 ((1998))
(Related	URLs)
(Sutudents w	vill be informed when necessary)
[Study out:	side of class (preparation and review)]
Students have	e to prepare for presentations and reports for each subject.
(Other inf	ormation (office hours, etc.))
	ended to take the course Linear Control Theory (90720) for third-year students and take the
	ern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Under th
BYOD policy	y of Kyoto University, students have to bring their own device in order to participate in classes.
*Dlagea visit	KULASIS to find out about office hours.
I lease visit	KOLASIS to find out about office nours.
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システム工学実験(数理:H26以降入学者)(2)

Course number U-ENG29 39136 LJ10 Course title and course ittle in English) リンステム工学実験(数理:H26以降入学者) System Analysis Laboratory					Instructor's name, job ti and departm of affiliation	tle, nent	Graduate School of Informatics Assistant Professor, TSUJI TETSURC Graduate School of Informatics Assistant Professor, OOKI KENTAROL Graduate School of Informatics Assistant Professor, NIINO KAZUKI		
Farget year	3rd year stu	dents or above	Number	of cred	lits 4	Year	r/semesters	2020/Second semester	
Days and periods	Thu.3,4,Fr	i.3,4 Class	style	Experi	ment		Language of instruction	Japanese	
[Overview an	d purpo	se of the	course]						
hree real system ontrol methods roups in the fir	ns, Active through o st guidanc	Silencer, I computer s	Flexible-Lin imulations	nk Mani and pilo	ipulator, and ot experiment	d Inver nts. Stu	rted Pendulum adents will be	ir knowledge to the n. Students will master divided into three n.	
[Course obje			11 1	1 4	1.4	. 1		the real systems:	
Parameter ide Analyses of fi									
systems, consid	ization and o obtain pr ering a ga	d optimal c actical solu p between	ontrol itions for c theory and	ontrollii practice	e, and under	standi	ng the feature	haviors of the real of the real systems. reports.	
To study how to systems, consid- To precisely exp [Course sche	ization and o obtain pr ering a ga press own	d optimal c actical solu p between understanc d content	introl utions for c theory and ling of the s]	ontrollin practice experim	e, and under	standii h prese	ng the feature entations and	of the real systems.	
To study how to systems, conside To precisely exp	ization and o obtain pr ering a ga press own edule and e, Introdu o, 9 times, to principl on DSP a responses	d optimal c actical solu p between understand ction of top e of active nd program in time and	nontrol utions for c theory and ding of the silic s and div sliencer uning d frequency	ontrollin practice experim viding st	e, and under	standii h prese	ng the feature entations and	of the real systems.	
To study how to systems, conside To precisely exp [Course sche Guidance, 1 tim Active Silencer, 1. Introduction to 2. Basic lecture 3. Experiment 4. Analyses on 1	ization and o obtain pr ering a ga press own edule and e, Introdu , 9 times, to principl on DSP a responses d software fanipulato stimation s signals of-freedon	d optimal c actical solu- p between understand d content ction of top e of active and program in time and Scilab is u r, 9 times, of frequence a controller s	ontrol ations for c theory and ding of the o s] oics and div sliencer ming A frequency ssed. cy transfer r	ontrollin practice experim viding st	e, and under tents throug tudents into	standin h prese 3 grou	ng the feature entations and ups	of the real systems.	
To study how tec systems, consid- To precisely exp [Course sche Guidance, 1 tim Active Silencer, 1. Introduction 1 2. Basic lecture 3. Experiment 4. Analyses on 1 *The specialized Flexible-Link M 1. A recursive e 2. Tracking step 3. Two-degree- 4. Tracking desi	ization and o obtain pr ering a ga press own adule and e, Introdu o DSP a responses d software fanipulato stimation o signals of-freedon ired signal	d optimal c actical solu p between understanc d content ction of top e of active nd program in time and s Scilab is to r, 9 times, of frequend a controller s s Scilab ar	ontrol ations for c theory and ding of the o s] oics and div sliencer ming A frequency ssed. cy transfer r	ontrollin practice experim viding st	e, and under tents throug tudents into	standin h prese 3 grou	ng the feature entations and ups	of the real systems.	

Course number	U-ENG29 2	9138 SJ11					
Course title (and course title in English)	アーキテクチョ er Architecture	r	Instructor's name, job title, and department of affiliation		Academic Center for Computing and Media Studie Professor, NAKASHIMA HIROSHI		
Target year Brd y	ear students or above	Number	of credit	s 2	Year	r/semesters	2020/First semester
Days and periods Thu.2 Class style Lecture Language of instruction Japanese							
[Overview and pu We learn pipelined in computers.		-	ory hierar	chy and pa	arallel	processing m	echanism in modern
[Course objective	es]						
2. Memory Hierarch 3. Parallel Processon [Course schedule Instruction Pipeline (Instruction Pipeline (Instruction Pipeline (Memory Hierarchy (Parallel Processors (Pa	a and content (1), 1time, Overv (2), 1time, Pipeli (3), 1time, Data 1 (4), 1time, Contrr (5), 1time, Instru- (5), 1time, Cache 3), 1time, Cache 3), 1time, Cache 3), 1time, Virtua 6), 1time, Virtua 6), 1time, Virtua 6), 1time, Menter 1), 1time, Overvi 2), 1time, Shared time,	iew of pipe ned data-pa nazards ol (branch) ction-level ory technol (2) 1 memory (1 memory (1 memory (concepts of ew, SIMD meading, C Memory M	ath and its hazards a parallelis logy\Cac (1) 2) f memory extension Cache cohe Multiproce	nd execpti m he (1) hierarchy , Vector p erence	ions		
[Course requiren Though not a manda Organization" for 2n	tory prerequisite		expected t	o having r	eceive	d the credit of	f "Computer
							「機アーキテクチャ(2)↓↓

計算機アーキテクチャ(2)	
[Evaluation methods and policy]	
Your achievements in end-of-term exam and per-class exercises are evaluated with respect to the "Course Goals".	2
[Textbooks]	
Computer Organization and Design - The Hardware/Software Interface - 5th ed.No. 2, by David A. Patterson and John L. Hennessy, Translated in Japanese by M. Narita, Nikkei BP isbn{}{9784822298432}	
[References, etc.]	
(Reference books) Introduced during class	
(Related URLs)	
https://panda.ecs.kyoto-u.ac.jp/portal/ (The page of quotComputer Architecturequot and its subordinates linked from the PandA portal shown above.)	
[Study outside of class (preparation and review)]	
Through the work on the weakly exercise, review what you learned in each class.	
(Other information (office hours, etc.))	
Office Hour: 16:30-17:30, every Thursday	
Office: Room 411, 4F, Research Bldg. #5	
*Please visit KULASIS to find out about office hours.	

 [References, etc.]

 (Reterence books)

 They will be given in the lectures

 (Related URLs)

 (The course website will be given in the lectures)

 [Study outside of class (preparation and review)]

 Exercises on real data analysis.

 (Other information (office hours, etc.))

 Office hours are available upon request. An appointment is needed by sending an email to kashima@i.kyoto-u.ac.jp

 *Please visit KULASIS to find out about office hours.

 [Courses delivered by instructors with practical work experience]

 (1) Category

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

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

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

統計的モデリング基礎(2)

Course num	ber	U-EN	G23 33	3240 LJ73	U-EN	G23	33240	LJ77	U-ENG23 3	不更利 3240 LJ58
Course title (and course 新 title in Fo English)				ž al Modelin	ıg	nan and	tructor's ne, job tit I departm offiliation	nent		nool of Informatics ASHIMA HISASHI
Target year	3rd y	ear students	or above	Number	of cred	lits	2	Yea	r/semesters	2020/First semester
Days and periods	Wed.	.4	Class	style	Lectur	e			Language of instruction	Japanese
[Overview a	nd pı	urpose o	of the	course]						
This course giv systems and to										rtainty in target
[Course obj	ective	es]								
The goal of thi to analyze vari				w to choos	e and a	pply	appropi	iate p	rocessing and	modeling approaches
[Course sch	edule	e and co	ntent	s]						
	dels,1 on,2tin egoric 1 caus ation, ious d	time,Line imes,Mode al data,2t ation,2tin 2times,St lata types,	ear regr el estir l select imes,P nes,Dif atistica	ression mo nation frar ion framew redictive n ference be al inference	del and neworks vorks in nodels f tween c e metho	estin s inc clud or ca orre ds b	luding r ling info ategoric: lation ar ased on	naxim ormatio al data nd cau Bayes	num likelihood on criterion a including log asation. Metho sian statistics	gistic regression ds for estimating
Basic knowled			vand	tatistics						
Dasic knowled	geor	probabilit	y and :	statistics						
[Evaluation	meth	ods and	polic	у]						
Mid-term and	inal e	xaminatio	ons							
[Textbooks]										
None								(Continue to 統言	〒49モデリング基礎(2 〕 ↓↓↓

												未更新
Course nu	umbe	er	U-EN	G23 2	3250 LJ58	U-EN	G23	23250	LJ73	U-ENG23 2	3250 L	J77
Course title (and course title in English)					(H27以降入 atory and Ex		nan and	ructor's ne, job ti departn ffiliation	nent	Graduate Sch Assistant Pro Academic Center	fessor, T hool of fessor, I' for Compu	TAKASE HIDEKI
Target yea	r	2nd y	year students (or above	Number o	of cred	its	2	Yea	r/semesters	2020/	First semester
Days and perio	ods V	Ved	.3,4	Clas	s style	Semina	ar			Language of instruction	Japane	ese
[Overview	an	d pu	urpose o	f the	course]							
[Course o	bjeo	ctiv	es]									
[Course s	che	dul	e and co	nten	s]							
,1time,												
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[Course re	ani	ren	nents]	_			_		_			
None	qui	Ten	licintoj									
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[Evaluatio	on m	etn	lods and	polic	cy]							
[Textbook	re]	_					_					
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[Referenc	AS 1	etc	1									
Referen												
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		_										
									(,ontinue to 計昇機科字	兲暁 反演習]	(H27以降入学者)(2)↓↓↓

十算機科学実験及演習1(H27以降入学者)(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	
2) Details of instructors' practical work experience related to the course	
3) Details of practical classes delivered based on instructors' practical work experience	

D	ethods and polic mination following			
based on the ex-	mination following	the course		
[Textbooks]				
Lecture slides a	e provided via Pand	A CMS.		
[References,	etc.]			
(Reference	books)			
[Study outsid	e of class (prepa	ration and rev	riew)]	
Exercises includ	ed in lecture slides.			
(Other inform	nation (office hou	urs, etc.)		

メディア情報処理(2)

Course number U-ENG23 33280 LJ77 U-ENG23 33280 LJ58 U-ENG23 33280 LJ14 Graduate School of Informatics Professor,KAWAHARA TATSUYA Course title (and course title in Instructor's name, job title, and department of affiliation メディア情報処理 Academic Center for Computing and Media Studies Associate Professor,IIYAMA MASAAKI Academic Center for Computing and Media Studies Professor,MORI SHINSUKE Mutimedia Processing English) Target year Brd year students or above Number of credits 2 Year/semesters 2020/Second semester Days and periods Wed.1 Class style Lecture anguage of instruction Japanese [Overview and purpose of the course] This course provides an overview of technologies to handle, analyze, recognize and generate a variety of information media or pattern data such as image, speech and text. [Course objectives] to master basic methods to deal with image, speech and text, and also processing of their analysis, recognition and synthesis. [Course schedule and contents] Speech processing (Kawahara) . Information in speech and music . Speech analysis . Speech recognition and synthesis 4. Spoken dialogue systems Natural language processing (Mori) 5. Natural language analysis 6. Language model and Kana-Kanji conversion 7. Machine translation and Question Answering Image Processing (Iiyama) Image Filtering Image Feature Extraction Convolutional Neural Network Convolutional return retwork Applications of Image Recognition Computer Graphics Computer Vision (1): Camera model Computer Vision (2): Shape-from-X 15. Examination and Feedback [Course requirements] None Continue to メディア情報処理(2)↓↓↓

Target year	Srd ye	ar students		Number	of crec	lits	1	real	r/semesters	2020/Intensive, First sen
Days and periods				s style	Semin	ar			Language of instruction	日本語
number of alarn role of IDS, and	ns, an 1 class	d it is dif ify norm	ficult	to analyze	them ma	anua	lly. In t	his cla	ss, students le	tes an enormous earn the mechanism iine learning.
[Course obje Students unders			6 HD 7							
the IDS. Studer advantages and	nts und disad	lerstand vantages	the me of ma	echanism o achine learr	f intrusi	on de	etection			ges and disadvatages ag, and can explain
[Course sch										
Guidance,2time Basic knowleds										
Basic knowledg detection. Intrusion Detect based IDS by s issued from IDS Intrusion Detect traffic by mach Presentation, I ti machine learnin	ge on t tion b tudyin S and tion b ine lea ime,Ba ng, and	he role of y Signati g open s commun y Machin urning al ased on t d discuss	of IDS ure-Ba ource ication ne Lea gorithm he exe	in network ased IDS,5t signature-b ns, and add urning,7tim ms and pub ercise, stude	imes,Le based ID ling sign es,Learr blic datas	y and arn t S an ature i the set fo sents	d how n the mec d attack es to del method or bench their m	hanisn hanisn ts, suci tect att l of cla marki iethod	e learning car n of intrusion h as correspor tacks. assifying norn ing intrusion c	the help the intrusion detection by signati ndence between alar nal and malicious detection performan detection using
Basic knowledg detection. Intrusion Detect based IDS by s issued from IDI Intrusion Detect traffic by mach Presentation,1ti machine learnin [Course requ	ge on t tion b tudyin S and tion b ine lea ime,Ba ng, and	the role of y Signatu g open s commun y Machin ased on t d discuss ents]	of IDS ure-Ba ource ication ne Lea gorith he exe it wit	in network ased IDS,5t signature-b ns, and add urning,7tim ms and pub ercise, stude h other stud	imes,Le based ID ling sign es,Learr blic datas ents pres dents an	y and arn t S an ature the set fo sents d ins	d how n the mec d attack es to det method or bench their m structors	hanisn ts, suc tect att l of cla marki tethod s.	e learning car n of intrusion h as correspor tacks. assifying norm ing intrusion of s of intrusion	h help the intrusion detection by signati ndence between alar nal and malicious detection performan detection using
Basic knowledg detection. Intrusion Detect based IDS by s issued from IDI Intrusion Detect traffic by mach Presentation,1ti machine learnin [Course requ	ge on t tion b tudyin S and tion b ine lea ime,Ba ng, and uirem I be at	the role of y Signati g open s commun y Machin ased on t d discuss ents]	of IDS ure-Ba ource ication ne Lea gorithi he exe it wit	in network signature-b ns, and add urning,7tim ms and pub ercise, stude h other stud	imes,Le based ID ling sign es,Learr blic datas ents pres dents an	y and arn t S an ature the set fo sents d ins	d how n the mec d attack es to det method or bench their m structors	hanisn ts, suc tect att l of cla marki tethod s.	e learning car n of intrusion h as correspor tacks. assifying norm ing intrusion of s of intrusion	a help the intrusion detection by signatu ndence between alau nal and malicious detection performan
Basic knowledg detection. Intrusion Detect based IDS by si issued from IDI Intrusion Detect traffic by mach Presentation, I ti machine learnin [Course requ Students should	ge on t tion b tudyin S and tion b ine lea ime,Ba ng, and Jirem I be ab mple p metho	he role c y Signatu g open s commun y Machin urning al _i ased on t d discuss ents] ble to hav orograms	of IDS ure-Ba ource ication ne Lea gorith he exe it wit ve bass by Py	in network ased IDS,5t signature-b ns, and add mrning,7tim ms and pub rcise, studd h other stud ic knowled, thon.	imes,Le based ID ling sign es,Learn blic datas ents pres dents and ge of Lin	y and arn t S an ature 1 the set fo sents d ins	d how n he mec d attack es to det method or bench their m structors	hachin hanisn ts, suct tect att l of cla marki tethods s.	e learning car n of intrusion h as correspon tacks. ussifying norm ing intrusion of s of intrusion liting files, etc	h help the intrusion detection by signati ndence between alar nal and malicious detection performan detection using

青報セキュリティ演習 (2)	
[Textbooks]	
[References, etc.]	
(Reference books)	
[Study outside of class (preparation and review)]	
students should be able to have basic knowledge of Linux operations and Python.	
(Other information (office hours, etc.))	

情報符号理論続論(数理)(2)

Confirmation of extent of student learning (1 class) To confirm the extent that students have learned the contents of course lectures, students will solve questions, etc., related to the course, and further advice will be provided regarding content study.

[Course requirements]

Prerequisites are knowledge of basic probability theory, and knowledge regarding the course "Information and Coding Theory." Knowledge of statistics and Markov chains is also desirable.

[Evaluation methods and policy]

Grading is performed both on the basis of reports submitted when necessary during the term and the final exam.

[Textbooks]

T. M. Cover and J. A. Thomas 『Elements of Information Theory, 2nd ed.』 (Wiley-Interscience) ISBN: 9780471241959 (The e-book version can be accessed from within the university. A Japanese translation is also available from Kyoritsu Shuppan Publishing Co.)

[References, etc.]

Course number

(Reference books) Other materials will be introduced in class as necessary.

[Study outside of class (preparation and review)]

Since a prerequisite of this class (preparation and review). Since a prerequisite of this class is the course "Information and Coding Theory," an appropriate review of that course's contents is recommended prior to attendance. Assigned pages in the course textbook should be read before each lecture. A good way to review each class is to do the problems at the end of assigned chapters.

(Other information (office hours, etc.))

*Please visit KULASIS to find out about office hours.

Course n	umber										
Course title (and course title in English)				牧理) tion and comm	unications	nam and	ructor's ne, job tit departm ffiliation	le, ient	Professor,TA Graduate Sc	hool of Informatics NAKA TOSHIYUKI hool of Informatics ssor,OBUCHI TOMOYUKI	
Target yea	r Brd y	rear students of	r above	Number o	of cred	its	2	Year/	semesters	2020/Second semester	
Days and peri	ods Tue.	3	Class	s style	Lecture	e			Language of instruction	Japanese	
[Overview	and p	urpose of	f the	course]							
referring to entropy of c	contents ontinuou	of the cou is-valued r	rse ' andoi	'Informatio m variables	n and C , Gaussi	odir an c	ig Theoi ommun	ry," le ication	ectures take channels, ra	of information. While up topics such as te-distortion theory, formation theory and	
[Course o	bjectiv	es]									
Our goal is examples in									questions a	nd issues regarding	
[Course s	chedul	e and cor	ntent	s]							
Introduction Confirmatio coding, etc.			s, incl	uding infor	mation	entro	opy, mu	tual int	formation, so	ource coding, channel	
which take of	dering w continuo ables, ar	rireless cor us values. id by takin	nmun The a g up o	ications and rgument wi concrete exa	d measu ill proce amples	rem ed b fron	ents, a t y introd Gaussi	heory i lucing an con	differential e	random variables ntropy for continuous channels, with	
	f a certa on is pe	in extent o rmitted. Le	f info cture	s focus on i						ompression than when pinning information	
Information Type theory hypothesis t	is intro	luced so as	s to di	iscuss unive	ersal info	orma	ation co	mpress	ion, large-de	eviations theory,	
information	e develo exchang or discu	opment and ges have be ssions rega	l spre en su urding	ad of inform perseded by these chan	y many- iges. Le	to-n cture	nany inf	ormati	on exchange	es, one-to-one s. There is a growing al network information	
									ontinue to 情報		

Course ni	umper									
Course title (and course title in English)		ラミング演習 se on Progi		理:H31以降) ng	〔学者〕	nan and	ructor's ne, job ti departn ffiliation	tle, nent	Assistant Pro Graduate Sc Assistant Pro Graduate Sc	hool of Informatics fessor,HARADA KEI hool of Informatics ofessor,Ueda Masahik hool of Informatics essor,IWASAKI ATSUS
Target yea	r 2nd	year students	or above	Number	of cred	its	4	Year/	semesters	2020/First semester
Days and perio	ods Mor	n.3,4	Class	s style	Semina	ar			Language of instruction	Japanese
[Overview	· ·			-						
	領子・	配列・関	数・翁	条件分岐・	繰り返	し奴				νグの基礎となる、 イル操作等を、数理
[Course o	bjectiv	/es]								
数理工学の 術を修得す		において	、コン	ノピュータ	を有効	活用	するた	:めに永	必要なプログ	ブラミングの知識と
[Course s	chedu	le and co	ntent	s]						
第1回 ガー レ				書き方 :各種ツー	ルの活	用に	ついて	学ぶ。		
第2回 手編 基 の実行方法	本的な	文法、基	本的な	マデータ型	、基本	的な	、関数と	それを	を用いたサン	ノプルプログラミン
	ログラ	ムの基本	パーツ	ノである条	件分岐					ヽて、数値積分(台 を題材にして学ぶ。
	次元配	列の使い							問題の数値角 2題材に学↓	释法(べき乗法)、 ぶ。
などをソー	ストギ ティン	ッリーな グや動的	どのう 計画活	データ構造 法などのア	 を表現 ルゴリ	ズム	実装を	題材は	学ぶ。さら	/タ、動的メモリ確 らに、ファイルから いても学ぶ。
		度の確認 ミング技	術の致	削達度を確	認する	D				
									ntinue to プログラミ	シグ演習(数理-H31以降入学者)(2)、

プログラミング演習(数理:H31以降入学者)(2)	
[Course requirements]	
本演習はBYODで行うため、演習時には各自ノ	/ートPCを持参すること。
[Evaluation methods and policy]	
各項目ごとに出されるレポートと出席状況に	重づき総合的に成績評価を行う。
[Textbooks]	
Not used	
[References, etc.]	
(Reference books) 皆本晃弥『やさしく学べるC言語入門』(サ・ 後藤良和、高田大二、中島寛和『入門C言語』 柴田望洋『新・明解C言語 入門編』(SBクリ	(実教出版) ISBN:978-4-407-33283-4
[Study outside of class (preparation and re	eview)]
演習時間を有効的につかうために、配布資料(こ基づく予習を行うこと。
(Other information (office hours, etc.))	
初回ガイダンスへの出席を必須とする。	
*Please visit KULASIS to find out about office ho	ars.

[Evaluation	methods and p	policy]			
期末試験の成	績による.				
[Textbooks]					
福島雅夫『휶	「版・数理計画)	「門」(朝倉書」	店)ISBN:97842	54280043	
[References					
(Reference) Introduced due					
Introduced du	ing class				
[Study outs	ide of class (pr	eparation and	review)]		
授業前に、必	要とする線形件	、数を復習するこ	こと.		
また,授業で	指示したスライ	「ドは一読するこ	E. E.		
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	rmation (office ULASIS to find		nours.		
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Course title (and course title in Int English)	適化入門 roduction to O	ptimizatio	n	Instructor's name, job ti and departm of affiliation	nent		nool of Informatics AMASHITA NOBUO
larget year	/ear lst year students or above		mber of cre	dits 2	Year	/semesters	2020/Second semester
Days and periods	Thu.4	Class st	yle Lectu	ire		Language of instruction	Japanese
理最適化の基準 画問題の解法は	本的な方法の について講述 形計画」の科	ひとつで する。 目名を変	ある線形計画 更したもの	画法を中心に である。「緩	、数	理最適化モラ	基礎的技術である.数 デルの構築法や線形計 習得済みの場合は、本
[Course obje 基本的な最適 法を理解する.	- 化モデルの考	え方と定	式化手法を育	習得するとと	:もに,	,線形計画問	周題の理論的性質と解
[Course sche		-		ا_ بز جل ح	. 1.55 304 -		***********
形代数につい 形代数につい 数につい れ 数で ま 部 数 の た も し の し 、 ち 品 一 の に のい 、 の の 、 の い 、 の の 、 の 、 の い 、 の い 、 の 、 の	て復習する. デル,4回,代表 適化モデル、 と基底解,2回, 的な概念を説 ス法(単体法). とその具体的	的な数理 組合せ最 線形する。 3回,線形 な計算法	最適化モデル 適化モデル 問題を標準 計画問題のさ について述	レである線飛 を、機械学習 どに定式化し 、 、 、 る。さらに	計画 など (、基) で、実	モデル、ネッ にあらわれる 底解、実行可 らシンプレッ 行可能解を見	3数学的事項,特に線 ハトワーク最適化モデ 5簡単な例を用いて紹 J能基底解、最適基底 クス法(単体法)の基 出すための二段階法 ハックス法にも言及す
総合的に分析 内点法,1回,線) 述べる。	し意思決定を 形計画問題に	行う際に 対する多	非常に有力が 項式時間アク	な手段である レゴリズムて	感度 ある	分析の考え方 内点法の考え	ご述べ、さらに問題を うを説明する。 こ方と計算法について
補足とまとめ,	1回,講義内容	のまとめ	、補足および	7学習到達度	の確認	認を行う。	
10 august a	lirements]	初レベノ	1 しんの掛け	<u>育 2×2の</u> (三面の	、光仁の目上管、	など)を履修している

	and course 特別研究 1 (計算機) Graduation Thesis 1							Graduate School of Informatics Professor,MINATO SHINICHI		
Farget year 4th year students or above Number of credits 2 Year/semesters 2020/Intensive, I								2020/Intensive, First semest		
Days and periods Intensive Class style Seminar							Language of instruction	Japanese		
教員の指導の で、その課題					に関連	する研究課	題を	設定し、研	究動向を把握したうお	
[Course obje 研究課題の設 [Course sch	定、関	連研究			十画の立:	案等を通じ	C. 1	研究活動に	必要な力を向上させる	
題の特性、研 第1~4回	究活動	連研究 の進捗 研究課	の調査 状況に 題の設	- 、研究語 応じて話 定					する。各学生の研究詞 のようになる。	
題の特性、研 第1~4回 第5~9回 第10~1 第12~1 [Course requ	究活動 1回 5回	連研究 の進捗 研究課 研究計 先行研 ents]	の訳: 題の調査に 調査に 認のの 認調 のの 立調 の の 調査 の の の の の の の の の の の の の	- 、研究語 応じて 定 査 案 査 等	十 画する:	が、授業計	画の	目安は以下		
題の特性、研 第1~4回 第5~9回 第10~1 第12~1 [Course requ 計算機科学コ	究活動 1回 5回 uireme ースの	連研究 一 御 で 御 で で で の の て の で 、 課 研 究 歌 研 究 歌 研 究 訳 研 究 訳 研 究 訳 研 究 訳 研 究 計 先 行 研 究 計 先 行 研 究 計 、 先 行 研 た 行 研 、 計 、 た 行 研 、 計 、 た 行 研 、 、 新 一 、 の 行 研 、 、 か 、 の 、 、 の 、 、 、 、 の 、 、 の の 、 の 、 の 、 の 、 の 、 の 、 の 、 の 、 の 、 の 、 の 、 の の の 、 の の の の の の の の の の の の の	の状 題究 画究 ののの の の の の の の の の の の の	- 、応 定 査 案 査 等 に 必要な	十 画する:	が、授業計	画の	目安は以下		
題の特性、研 第1~4回 第5~9回 第10~1 第12~1 [Course requ	究活動 1回 5回 uireme ースの metho	連研究渉 研究渉 課研研究 調研究 研 第 連 研 究 研 究 研 究 研 究 の 研 究 の の 研 究 物 の の の の の の の の の の の の の の の の の の	の 切 の の の の の の の の の の の の の	- 研究 定 査 案 査 「 心 要 な 「 小 じ で こ た 、 応 定 査 案 査 「 い 心 要 、 で し の の で こ う 、 の し の の の の の の の の の の の の の	†画する: な条件を;	が、授業計	画の	目安は以下		
題の特性、研 第1~4回 第5~9回 第10~1 第12~1 [Course requ 計算機科学コ [Evaluation	究活動 1回 uireme ースの metho 動の実	連の 研関研究排 課研計 た行研 ents] の研 協 な and 施 状況	の状 題究 画究 のののの 着 に 基 づ の に ま つ に し 、 の の の の の の の の の の の の の		+画する: な条件を: う。	が、授業計	画の	目安は以下		
題の特性、研 第1~4回 第5~9回 第10~1 第12~1 [Course req 計算機科学コ [Evaluation 一連の研究活 [Textbooks]	究活動 1回 uireme 一スの metho 動の実 課題に	連の 研関研究排 課研計 た行研 ents] の研 協 な and 施 状況	の状 題究 画究 のののの 着 に 基 づ の に ま つ に し 、 の の の の の の の の の の の の の		+画する: な条件を: う。	が、授業計	画の	目安は以下		
題の特性、研 第1~4回 第5~9回 第10~1 第12~1 [Course req 計算機科学コ [Evaluation 一連の研究活 [Textbooks] 各学生の研究	究活動 1回 uireme 一スの metho 動の実 課題に , etc.] e book	連研究渉 課研計研 mts] 研 協 な の 研 関 研 先 行 研 時 別 研 の の の 明 明 究 先 行 研 男 の 究 売 明 門 究 一 の の の 究 連 計 の 行 の の の の の の の の の の の の の の の の の	の状況 題究の 画の 立調 音 で 第 POIIC 「 の の 立 調 の の の 立 調 う で の う 二 、 の の の 立 調 う で の の う 立 調 う で の の う 立 調 う で の の の 立 調 ろ で の の つ 立 調 ろ で の の つ 立 調 ろ で の の つ 立 調 ろ で の の つ 立 調 ろ で の の つ 立 調 ろ で の の つ 立 調 ろ で の う つ 調 ろ で の う つ 調 ろ で の う つ 二 ろ の つ 二 の の つ 二 ろ ろ の つ 二 ろ ろ の つ 二 ろ ろ の つ 二 ろ ろ の つ 二 ろ ろ の つ 二 ろ ろ ろ ろ ろ ろ ろ ろ ろ ろ ろ ろ ろ	- 研究で言 定 査 案 査 一 、応 定 査 案 査 一 、応 定 査 案 査 「 い で 行 ・ 一 、 応 ・ で 書 、 一 い で 行 ・ ・ ・ の じ の で 、 、 、 、 、 、 、 、 、 、 、 、 、	+画する: な条件を; う。 3。	が、授業計	画の	目安は以下		
題の特性、研 第1~4回 第5~9回 第10~1 第12~1 [Course req 計算機科学コ [Evaluation 一連の研究活 [Textbooks] 各学生の研究 [References (References (References (References)]	究活動 1回 5回 山ireme 一一スの metho 動の実 課題に , etc.] は e book 認 個 で の し の の の の の の の の の の の の の の の の の	連の 研究 準、究連究計 研究 準、課 研計 特 物 間 研究 特 、 調 研究 特 、 二 、 、 、 、 、 、 、 、 、 、 、 、 、	の状 題究の 調況 の 調売 の 調 う 調 一 新 一 二 手 一 「 の 二 「 」 「 」 「 」 」 」 」 」 」 」 」 」 」 」 」 」	 (応定査案査 (必要な) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	+画する: な条件を; う。 る。 ad review	が、授業計 満たしてい	画の	目安は以下		
題の特性、研 第1~4回 第5~9回 第10~1 第12~1 [Course req 計算機科学コ [Evaluation 一連の研究活 [Textbooks] 各学生の研究 [References (References 各学生の研究	究活動 1 回 5 回 山iremen 一 スの 朝の実 課題に ctc.] ctc.] de of d 課題に	連の 研究 準、究連究計 研究 準、課 研計 特 、 部 に じ て 、 、 、 、 、 、 、 、 、 、 、 、 、	の状 題究画の調査 a c c 立 の 調究 の の 調査 の 調 つ 調 の 調 の 調 の 二 の の の の の の の の の の の の の	研究で 定査案査 に 必要な がいて行き 指 示すする ation ar る れ に お で れ に の で れ で の の の の の の の の の の の の の	+画する: な条件を; う。 る。 ろ。 d revie	が、授業計 満たしてい	画の	目安は以下		

Course nu	umber	U-EN	G20 12108	LJ77					
Course title (and course title in English)		究 1 (計 tion Thesi			Instructor's name, job ti and departn of affiliation	nent	Graduate School of Informatics Professor,MINATO SHINICHI		
Target yea	arget year 4th year students or above Number of credits 2 Year/semesters 2020.Intensive, Sec								
Days and perio	ods Inte	ensive	Class styl	e Semin	ar		Language of instruction	Japanese	
[Overview 教員の指導 で、その課	のもと	· 、情報学	(計算機科		する研究講	題を	設定し、研タ	『動向を把握したうえ	
[Course o 研究課題の	-		の調査、研	「究計画の立	案等を通し	て、	研究活動に必	必要な力を向上させる。	
題の特性、 第1~4 第5~9 第10~	設定、 研究活 回 (11回	関連研究 動の進捗 研究課 関連研 研究計	- の調査、研 状況に応じ 題の設定 究の調査	て計画する				⁺る。各学生の研究課)ようになる。	
[Course re 計算機科学	· ·		究着手に必	、要な条件を	満たしてい	るこ	と。		
[Evaluatio	on meth	nods and	policy]						
一連の研究	活動の	実施状況	に基づいて	行う。					
[Textbook 各学生の研		に応じて	教員が指示	する。					
[Referenc (Referen 各学生の研	nce bo	oks)	教員が指示	する。					
- /			•	n and revie	w)]				
各学生の研 (Other in			教員が指示 e hours, e				_		
				office hours.					

English) 本山 Target year 本山 Days and periods Inter [Overview and pr Jago 指導のもと、 次日の治療のたと、 アンクリングロングロングロングロングロングロングロングロングロングロングロングロングロン	tition The year student ensive wurpose い情報会 向上を目 関連研3 目と面目 関連研3 動の進非 研究語	isis 1 ts or above 1 Class of the c 学(数理 目指す。 究の調査 究の調査 案の調査 案の設調 変明の設調	course] (工学)に 、研究計 に応じて計 に定 査	Semina 関連す 画の立	and de of affil lits 2 ar る研究 案等を 案等に	, job title, epartmen liation Y Y ぞ課題を を通じて こついて	nt P Year/s 2設定 て、教	Professor,TA semesters Laguage distution にし、研究重 空突活動に必 に目が指導す	が 加向を把握したうえ、 3要な力を向上させ、 よる。各学生の研究
Days and periods Inter [Overview and pr ズ の課題解決力の) [Course objective 研究課題の設定、] [Course schedul 研究課題の設定、] [Course schedul 研究課題の設定、] 週の特性、研究活 第1~4回 第5~9回 第1~4回 第5~9回 第1~4回 第2~15回 [Course requiren 数理工学コースの) [Evaluation meth 一連の研究活動の): [Textbooks] 名学生の研究課題([References, etc. (Reference boo	· ensive urpose 、情報会 向上を目 /es] le and c 関連研3 le and c 関連研3 研究語	Class of the c 学(数理 目指す。 充の調査 充の調査 来状況に 課題の設調 研究の調	style course] (工学)に 、研究計 5] に、研究計 応じて計 定 査	Semina 関連す 画の立	ar る研空 案等を 案等に	で課題を を通じて こついて	 設定 、研 、教 	Language of instruction こし、研究動 で究活動に必 に見が指導す	pemester Japanese 加向を把握したうえ、 必要な力を向上させ、 たる。各学生の研究。
教員の指導のもと、 教員の指導のもと、 その課題解決力の [Course objective 研究課題の設定、! [Course schedul, 研究課題の設定、! 「Course schedul, 研究課題の設定、! 「B」の特性、研究活動 第1~4回 第1~471回 第1~471回 第1~11回 第1~11回 第2~15回 [Course requiren 数理工学コースの [Evaluation meth- 一連の研究活動の? [Textbooks] 各学生の研究課題 [References, etc.]	wrpose 、情報合 向上を目 関連研3 le and c 関連研3 動の進 新 研究	of the c 学(数理 目指す。 究の調査 contents 究の調査 課題の設調 研究の調	course] (工学)に 、研究計 に応じて計 に定 査	- 関連す - 画の立 - 画の立	る研究 案等を 案等に	を通じて こついて	.、研	2し、研究動 で究活動に必 に員が指導す	が 加向を把握したうえ、 3要な力を向上させ、 よる。各学生の研究
教員の指導のもと、 その課題解決力の [Course objectiv, 研究課題の設定、 [Course schedul] 研究課題の設定、 [Course schedul] 研究課題の設定、 [Course schedul] 研究課題の設定、 [Course schedul] 第1~4回 第5~9回 第1~11回 第1~15回 [Course requiren 数理工学コースの [Evaluation meth- 一連の研究活動の: 「Textbooks] 各学生の研究課題 [References, etc.] (References bot)	、情報4 (南上を目 関連研3 目e and c 関連研3 研究語 研究	 学(数理 目指す。 究の調査 contents 究の調査 たの調査 たの調査 たの 第 3 3 5	工学) に 、研究計 5] たじて計 定 査	·画の立 ·画の立	案等を	を通じて こついて	.、研	究活動に必	2要な力を向上させ、 する。各学生の研究;
 研究課題の設定、 [Course schedul 研究課題の設定、I 題の特性、研究活 第1~4回 第5~9回 第10~11回 第12~15回 [Course requiren 数理工学コースの? [Evaluation meth 一連の研究活動の? [Textbooks] 各学生の研究課題 [References, etc. (Reference boot) 	関連研9 le and c 関連研9 動の進射 研究話	contents 充の調査 歩状況に 課題の設 研究の調	5] i、研究計 :応じて計 :定]査	・画の立	案等に	こついて	、教	員が指導す	「る。各学生の研究
[Course schedul] 研究課題の設定、「 週の特性、研究活 第1~4回 第5~9回 第10~11回 第12~15回 [Course requiren 数理工学コースの [Evaluation meth- 一連の研究活動の? [Textbooks] 各学生の研究課題 [References, etc.] (Reference book)	le and c 関連研9 動の進持 研究話	contents 充の調査 歩状況に 課題の設 研究の調	5] i、研究計 :応じて計 (定]査	・画の立	案等に	こついて	、教	員が指導す	「る。各学生の研究
研究課題の設定、「 題の特性、研究活」 第1~4回 第5~9回 第10~11回 第12~15回 [Course requiren 数理工学コースの [Evaluation meth 一連の研究活動のご [Textbooks] 各学生の研究課題 [References, etc.] (Reference boot)	関連研3 動の進持 研究話	究の調査 渉状況に 課題の設 研究の調	- E、研究計 応じて計 定 査						
題の特性、研究活 第1~4回 第5~9回 第10~11回 第12~15回 [Course requiren 数理工学コースの] [Evaluation meth 一連の研究活動の] [Textbooks] 各学生の研究課題[[References, etc. (Reference boo	動の進持 研究語	渉状況に 課題の設 研究の調	:応じて計 定 査						
ー連の研究活動の [Textbooks] 各学生の研究課題 [References, etc. (Reference boo	研究語 先行码 ments]	研究の調	渣等	件を満	たして	いるこ	と。		
ー連の研究活動の [Textbooks] 各学生の研究課題 [References, etc. (Reference boo	hods an	nd policy	vl						
各学生の研究課題 [References, etc. (Reference boo				0		_			
(Reference boo	に応じて	て教員が	指示する	0					
(Reference boo	.]								
	oks)	て教員が	指示する	0					
[Study outside of					w)]				
各学生の研究課題		て教員が		0					
(Other informati *Please visit KULA									

Course nu	ımbe	r U-EN	G20 1	2108 LJ77							
Course title (and course title in English)	e 特別研究 1 (数理) Graduation Thesis 1					Instructor's name, job title, and department of affiliation			Graduate School of Informatics Professor,TANAKA TOSHIYUKI		
Target year 4th year students or above Number of credits 2 Year/semester								r/semesters	2020/Intensive, First semester		
Days and perio	eriods Intensive Class style Semin					ar			Language of instruction	Japanese	
[Overview and purpose of the course] 教員の指導のもと、情報学(数理工学)に関連する研究課題を設定し、研究動向を把握したうえで、 その課題解決力の向上を目指す。											
[Course ol 研究課題の			の調査	查、研究計	画の立	案等	序を通じ	て、	研究活動に。	必要な力を向上させる	
[Course se	chec	lule and co	onten	ts]							
第12~ [Course re	1 1 1 5 equir	回 研究計 回 先行研	面の立	立案 調査等	、件を満	たし	している	ってと、	0		
[Evaluatio	n m	ethods and	Inoli	cvl		_					
-		の実施状況	•		0						
[Textbooks] 各学生の研究課題に応じて教員が指示する。											
[Reference	es, e	tc.]									
	[References, etc.] (Reference books) 各学生の研究課題に応じて教員が指示する。										
		e of class (w)]					
		題に応じて			-						
		ation (offic									
"Piease visit	KUI	LASIS to fin	a out a	about office	e nours.						

Course nu	umber	U-EN	G20 22401 SJ77						
Course title (and course title in English)		f究 2 (計 ation Thesi		1	nstructor's name, job ti nd departn of affiliation	tle, nent	Graduate School of Informatics Professor,MINATO SHINICHI		
Farget yea	r 4th	year students	or above Number	of credit	s 3	Year	r/semesters	2020/Intensive, First semeste	
Days and perio	and periods Intensive Class style Semin						Language of instruction	Japanese	
- 教員の指導	のもと	、特別研	of the course] 究1で設定した 報告書としてま					快力を向上させるとと	
[Course o	bjectiv	/es]							
- 研究の実施 向上させる		研究報告	書の作成、特別	川研究試問	会での発	表等	を通じて、斫	肝究活動に必要な力を	
[Course s			-					る。各学生の研究課題	
の特性、研究活動の進捗状況に応じて計画するが、授業計画の目安は以下のようになる。 第1~12回 研究の実施 第13~14回 報告書の作成 第15回 試問会での発表準備									
[Course re									
特別研究	1」を	修得済み	であること。						
[Evaluatio	n metl	hods and	l policy]						
一連の研究	活動の	実施状況	、特別研究報告	言書の内容	ド、特別研	究試	問会の発表内	内容に基づいて行う。	
[Textbook 各学生の研	-	に応じて	教員が指示する						
[Referenc	es, etc	.]							
- (Refere 各学生の研			教員が指示する						
[Study ou	tside c	of class (preparation an	d review)]				
	. I I and before								
	究課題	に応じて	教員が指示する	> _					
各学生の研			教員が指示する :e hours, etc.))						

Course number	U-ENG	20 22401 SJ77						
	sourse 有 Graduation Thesis 2 和 department Graduate Sch Professor,MIN							
Target year 4th	get year thy year students or above Number of credits 3 Year/semesters 2020/Intensive, Se emester							
Days and periods Int	ensive C	lass style	Semin	ar		Language of instruction	Japanese	
[Overview and	purpose of	the course]				·		
教員の指導のもと もに、研究成果を							快力を向上させるとと	
[Course objecti	ves]							
研究の実施、特別 向上させる。	则研究報告書	「の作成、特別	研究試	問会での新	表等	を通じて、斫	F究活動に必要な力を	
[Course schedu	le and con	tents]						
研究の実施,報告書の作成、試問会での発表準備等について、教員が指導する。各学生の研究課題 の特性、研究活動の進捗状況に応じて計画するが、授業計画の目安は以下のようになる。 第1~12回 研究の実施 第13~14回 報告書の作成 第15回 試問会での発表準備								
[Course require	ements]							
「特別研究1」を	を修得済みて	ぎあること。						
[Evaluation me	thods and p	olicy]						
			書の内	容、特別研	F究試I	問会の発表内	肉容に基づいて行う。	
[Textbooks]								
各学生の研究課題	夏に応じて教	な員が指示する	0					
[References, et	c.]							
(Reference be								
各学生の研究課題	UE に応じて教	(貝が指示する	0					
[Study outside	of class (pr	eparation and	d revie	w)]				
各学生の研究課題	重に応じて教	対員が指示する	0					
(Other informa	tion (office	hours, etc.))						
*Please visit KUL	ASIS to find	out about office	hours.					

			IG20 22401 S							
Course title (and course title in English)		完2(数 tion Thes			Instructor's name, job t and departs of affiliation	itle, ment	Graduate School of Informatics Professor,TANAKA TOSHIYUKI			
Target year 4th year students or above Number of credits 3 Year/semest								2020/Intensive, Second semester		
Days and peri	ods Inte	nsive	Class style	e Semin	ar		Language of instruction	Japanese		
[Overview	and p	urpose	of the cours	se]						
							い、課題解決 で発表する。	快 力を向上させると。		
[Course o	bjectiv	'es]								
- 研究の実施 向上させる		研究報告	書の作成、	特別研究試	問会での発	老表等	を通じて、斫	肝究活動に必要な力		
[Course s	chedu	e and co	ontents]							
		報告書								
-	equirer	試問会 nents]	の作成 での発表準 であること	U112						
[Course re 「特別研究	equirer 1」を	試問会 ments] 修得済み	での発表準	U112	_	_				
[Course r 「特別研究 [Evaluatio	equirer 1」を on meth	試問会 ments] 修得済み nods and	での発表準 であること d policy]	0	容、特別碩	开究試	間会の発表す	9容に基づいて行う。		
[Course ro 「特別研究 [Evaluatic 一連の研究 [Textbook	equirer 1」を on meth 活動の (s]	試問会 ments] 修得済み nods and 実施状況	での発表準 であること d policy]	。 報告書の内	容、特別碩	开究試	間会の発表す	内容に基づいて行う。		
[Course r 「特別研究 [Evaluatio 一連の研究 [Textbook 各学生の研	equirer 1」を on metf 活動の (S] (究課題	試問会 nents] 修得済み nods and 実施状況 に応じて	なでの発表準 なであること d policy] し、特別研究	。 報告書の内	容、特別和	开究試	間会の発表ア	内容に基づいて行う。		
[Course r 「特別研究 [Evaluatic 一連の研究 [Textbook 各学生の研 [Referenc (Referenc	equirer 1」を m meth 活動の (S] (究課題 es, etc nce bo	試問会 nents] 修得済み nods and 実施状況 に応じて .] oks)	なでの発表準 なであること d policy] し、特別研究	。 報告書の内 する。	容、特別所	开究試	間会の発表の	内容に基づいて行う。		
[Course rn 「特別研究 [Evaluatico 一連の研究 [Textbook 各学生の研 [Referenc (Referenc 各学生の研 [Study ou	equirer 1」を on meth 活動の (S] (究課題 es, etc nce bo 院課題 tside o	試問会 ments] mods and 実施状況 に応じて .] oks) に応じて f class (eでの発表準 にであること d policy] 以、特別研究 教員が指示 preparation	。 報告書の内 する。 する。		开究試	間会の発表内	内容に基づいて行う。		
[Course rn 「特別研究 [Evaluatico 一連の研究 [Textbook 各学生の研 [Referenc (Referenc 各学生の研 [Study ou	equirer 1」を on meth 活動の (S] (究課題 es, etc nce bo 院課題 tside o	試問会 ments] mods and 実施状況 に応じて .] oks) に応じて f class (マでの発表準 マであること オ policy] 1、特別研究 教員が指示 教員が指示 	。 報告書の内 する。 する。		开究試	間会の発表に	9容に基づいて行う。 		
[Course r 「特別研究 [Evaluatic →連の研究 [Textbook 各学生の研 [Referenc (Referenc 名学生の研 [Study ou 各学生の研	equirer 1」を on meth 活動の (S] (究課題 es, etc nce bo (究課題 tside o	試問会 ments] 修得済み nods and 実施状況 に応じて] oks) に応じて f class (に応じて	eでの発表準 にであること d policy] 以、特別研究 教員が指示 preparation	。 報告書の内 する。 する。 nand revie する。		开究試	間会の発表に	内容に基づいて行う。		

Course nur	nber	U-EN	G20 2:	2401 SJ77							
Course title (and course title in English)		究 2 (数 ion Thesi				Instructor's name, job ti and departr of affiliatior	tle, nent		hool of Informatics ANAKA TOSHIYUKI		
Target year	4th y	ear students or above Number of credits 3 Year/semesters 2020/Intensi							2020/Intensive, First semester		
Days and period				s style	Semina	ar		Language of instruction	Japanese		
- 教員の指導の	Overview and purpose of the course] 改員の指導のもと、特別研究 1 で設定した課題について研究を行い、課題解決力を向上させるとと らに、研究成果を特別研究報告書としてまとめ、特別研究試問会で発表する。										
[Course ob	jective	es]									
研究の実施、 向上させる。		研究報告	書の作	乍成、特別	研究試	問会での発	表等	を通じて、斫	肝究活動に必要な力を		
[Course sc	hedule	e and co	ntent	s]							
第1~12 第13~1	研究の実施、報告書の作成、試問会での発表準備等について、教員が指導する。各学生の研究課 の特性、研究活動の進捗状況に応じて計画するが、授業計画の目安は以下のようになる。 第1~12回 研究の実施 第13~14回 報告書の作成 第15回 試問会での発表準備								、 フ に なる。		
[Course red 「特別研究」	·		である	ること。							
[Evaluation 一連の研究活			•		書の内	容、特別研	[究試]	問会の発表体	内容に基づいて行う。		
[Textbooks			147								
各学生の研究	:課題(こ応じて	教員な	が指示する	0						
[Reference	s, etc.]									
(Referend 各学生の研究			教員な	が指示する	0						
[Study outs	ide of	class (p	orepa	ration and	d revie	w)]					
各学生の研究	で課題の	こ応じて	教員な	が指示する	0						
(Other info	ormati	on (offic	e hou	ırs, etc.))							
*Please visit]	KULAS	SIS to find	l out a	bout office	hours.						

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