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									Co	ontinue to		1			

工業数学A1(2) [Textbook] Not used [Reference books, etc.] (Reference books) Lars V. Ahlfors [®]Complex Analysis₂ (McGraw-Hill Education) ISBN:978-0070006577 (Related URLs) (KULASIS) [Regarding studies out of class (preparation and review)] Students need to solve exercises. (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

s AITSURU	Course title <english></english>	工業数 Applie	(学A 2 d Mathem	atics A2		Affi dep Job	iliated partment, p title,Nam	e Gr Gr As	aduate Scho ofessor,NAK aduate Scho sociate Profess	ool of Informatics AMURA YOSHIM ool of Informatics sor,TSUJIMOTO SA
emester	Target ye	ear Brd	year students	or above Number	of cred	lits	2	Cours /ear/p	e offered eriod	2019/First semes
	Day/perio	d Mo	n.2	Class style	Lecture	е			Language	Japanese
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工業数学A 2 (2)

[Textbook]

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

[Reference books, etc.]

(Reference books)

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

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

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Course title <english></english>	C業数 Appleid	学A 3 d Mathema	tics A	A3		Aff de Jo	iliated partment, b title,Nar	me Gr	rac of	luate Scho essor,YAC	ol of Informatics GASAKI KAZUYUK
Target yea	r 3rd	year students o	or above	Number	of cred	its	2	Cour: year/	se pe	offered riod	2019/First semester
Day/period	Wed	1.1	Cla	ss style	Lecture	e			I	Language	Japanese
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To understand to concrete pr	l the fu oblem	andamenta s.	l theo	ries of Fou	rier and	Lap	lace ana	lysis a	nd	l develop a	in ability to apply the
[Course Sc	hedu	le and Co	onten	its]							
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[Textbook]										_	
S. Nakamura:	Fouri	er analysis	, Asal	kura shoten	isbn{}{	978	4254115	5741}			
[Reference	book	s, etc.]			_						
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工業数学A3(2) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

H.Fukawa: Mathematics of control and vibration, KORONA-SHA ibid{}{TW86010572}

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[Outline and	Purpose of	the C	ourse]							
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[Course Goa	ls]									
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工学倫理(2)

Continue to 工業数学A 3 (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) 1time. This course will teach the students about 1) patent systems which protect inventions and research results and 2) ethical issues in patents. The first class, in preparation for the next subject of patent ethics, introduces Japan 's patent system with comparisons to the patent systems in the world 's major countries and international framework. (M. Nakagawa: Electrical and Electronics Engineering)

Patents and ethics (Part 2). (6/13) 1time. Students, equipped with the basic knowledge of patent systems by the previous lecture, will get familiar with actual case studies on ethical and legal issues in patents. (M. Nakagawa: Electrical and Electronics Engineering)

Ethics required for advanced science. (6/27) 1 time. Engineers and researchers are at the forefront of preventing harm caused by advanced chemistry. Think about social roles and ethics required by engineers and researchers through relationships between chemical substances and environmental problems, efforts to avoid hazards of nanomaterials. (K. Miura: Industrial Chemistry)

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

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

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

[Class requirement]

Jon

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

[Textbook]

Lecture materials will be distributed.

[Reference books, etc.]

(Reference books) ^POmnibus Engineering Ethics a (Kyoritsu Shuppan Co., Ltd.) ISBN:978-4320071964 ^PPractical Engineering Ethics - A Short Course, New Edition a (Kagaku-Dojin Publishing Company,INC) ISBN:9784759811551

[®]Engineering Ethics (Revised Edition) a (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)

[Regarding studies out of class (preparation and review)]	
The assignment of the report will be given for each lesson.	
(Others (office hour, etc.))	
The class order is subject to change.	
Please visit KULASIS to find out about office hours.	
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Target year	2nd y	ear students o	r above	Number	of credi	its 1	Co ye	ourse offered ar/period	2019/Intensive, year-round
Day/period	Inten	sive	Cla	ss style	Semina	r		Language	Japanese
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Target ye	ar	1st year students o	r above	Number	of cred	lits	1	Co yea	urs ar/p	e offered eriod	2019/Intensive, First semester
Day/perio	d I	ntensive	Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd P	urpose of t	he C	ourse]							
10											
[Course G	ioals	5]									
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,1~2times, ,6times,											
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GLセミナーI(企業調査研究)(2)

[Reference books, etc.]

(Reference books)

(Related URLs)

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

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

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

(Others (office hour, etc.))

How to register will be announced later. Students who want to join this course is requested to attend the first class. Students are prohibited to skip hands-on training. Evaluation will be based on presentation.

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Numbering c	ode						
Course title <english> Tage Factor</english>	学部国際イン culty of Engineeri	ターンシップ1 ng International Inte	ernship 1	Affiliated lepartment lob title,Na	, me App	proved	
Target year	3rd year students	or above Number	of credit	s 1	Cours year/p	e offered eriod	2019/Intensive, year-round
Day/period	Intensive	Class style	Seminar			Language	Japanese and English
[Outline and	Purpose of t	he Course]					
Acquisition of hosted by the U	international sk Jniversity, the I	ills with the train Faculty of Engine	ing of for ering, or t	eign langu he underg	age thr raduate	ough the int school the	ernship programs applicant belongs to.
[Course Goa	als]						
The acquisition hosted by the U	of international University is the	al skills with the t major expectation	raining of on to the s	foreign la udents.	anguage	through the	e to internship programs
[Course Sch	edule and Co	ontents]					
program. Final Presentat	ion,1time,A pre	esentation by the	student is	required f	followed	d by discuss	ion among participants.
[Class requi	rement]						
Described in th language skills	e application b for the particip	ooklet for each in ation.	ternship p	rogram. 7	The regi	strant is req	uested to have enough
[Method, Po	int of view, a	nd Attainment	levels of	Evaluat	ion]		
Marit rating is responsible to i credit is not inc the Global Lead determined dep	done based on a dentify if the ca cluded in the un dership Education bending on the ca	the presentation of redit earned by the dergraduate scho on Center as a op- contents and the c	or reports a is subject ol in whic otional cre luration of	fter each to be incl h the part dit. The n f the prog	internsl uded as icipant umber o ram that	hip program mandatory belongs to, of credits, ei t the particip	. Each Department ones or not. If the the credit is granted by ther 1 or 2, will be pant has participated in.
[Textbook]							
[Reference b	ooks, etc.]						
(Reference	e books)						
[Regarding s	studies out o	f class (prepara	ation and	d review)]		
(Others (off	ice hour, etc	.)					
It is required for mandatory cred school or educa get in touch wit	or students to cl lits or not and c ational program th the Global L	eck if the interns ould earn how m the student in en eadership Engine	hip progra any credit rolled. If ering Edu	um to part s before t the credit cation Ce	icipate i he parti could n nter.	in could be cipation to t ot be treated	evaluated as part of he undergraduate l as mandatory ones,

*Please visit KULASIS to find out about office hours.

Course title Englishty G L セミナーI I (課題解決演習) Affiliated department, Job title,Name Graduate School of Engineering Senior Lecturer,MAEEDA MASAHIRG (Graduate School of Engineering Senior Lecturer,MAEEDA MASAHIRG (Graduate School of Engineering Senior Lecturer,MAEEDA MASAHIRG) Target year Pad year students or abov Number of credits 1 Course offered year/period D19/Intensive, Second conserved Day/period Intensive Class style Seminar Language Japanese [Outline and Purpose of the Course] This course is a small-group workshop program where students are supposed to extract or set up challenges by themselves aiming at creating new social values. In concrete, abilities of planning and problem-solving are trained through group works in residential training and skills of presentation and communication are enhanced through oral presentations regarding contents of the proposal at each step of the process from a preliminary draft to its completion. ICourse Goals] Molily of planning, from extraction or setting up challenges to proposal of solutions aiming at creating new social values, is trained through group works. ICourse Schedule and Contents] Course study of planning, from extraction of problems, collecting information, and group works are dones, 3times,Lectures by experts are given. Group owerks, 3times,Setting up challenges, extraction of problems, collecting information, and group works are done, a draft report is made, and a few presentations are made. Preliminary review meeting, is held and discussions are made. Report meeting, Itime, A preliminary re	Numbering	g code	2								
Target year Ind year students or above Number of credits 1 Course offered year/period Otherwise Second emester Day/period Intensive Class style Seminar Language Japanese [Outline and Purpose of the Course] Seminar Language Japanese [Duttine and Purpose of the Course] In concrete, abilities of planning and problem-solving are trained through group workshop program where students are supposed to extract or set up challenges by themselves aiming at creating new social values. In concrete, abilities of planning, and problem-solving are trained through group works in residential training and skills of presentation and communication are enhanced through oral presentations regarding contents of the proposal at each step of the process from a preliminary draft to its completion. [Course Goals]	Course title <english></english>	G L 1 Globa	セミナー I Il Leadershij	I(書 p Sem	果題解決演 inar II	習)	Aff de Jo	filiated partmen b title,Na	, Gi me Gi	raduate Scho enior Lecture raduate Scho enior Lecture	ool of Engineering r,MAEDA MASAHII ool of Engineering r,KANEKO KENTAR(
Day/period Intensive Class style Seminar Language Japanese JOUtline and Purpose of the Course] This course is a small-group workshop program where students are supposed to extract or set up challenges by themselves aiming at creating new social values. In concrete, abilities of planning and problem-solving are trained through group works in residential training and skills of presentation and communication are enhanced through oral presentations regarding contents of the proposal at each step of the process from a preliminary draft to its completion. Course Goals Ability of planning, from extraction or setting up challenges to proposal of solutions aiming at creating new social values, is trained through group works. Course Schedule and Contents Orientation , Itime, A brief overview and a schedule of the course are explained and working groups are organized. Lectures, 2,times, Lectures by experts are given. Group works, 3times, Setting up challenges, extraction of problems, collecting information, and group works are done. Residential training.7,times, Through intensive group works based on discussion, a proposal for solving problems is planned, a draft report is made, and a few presentations are made. Preliminary review meeting, Itime, Final presentations are made and reports are submitted. IDANNE IDANNE IDANNE The sequired to join the residential training. A report meeting is held and comprehensive evaluation concorening abilities in group discussion to extract or set up ch	Target ye	ar 2n	d year students (or above	Number	of cred	its	1	Cours year/	se offered period	2019/Intensive, Second semester
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Ability of planning, from extraction or setting up challenges to proposal of solutions aiming at creating new social values, is trained through group works. [Course Schedule and Contents] Orientation,1time,A brief overview and a schedule of the course are explained and working groups are organized. Lectures,2times,Lectures by experts are given. Group works,3times,Setting up challenges, extraction of problems, collecting information, and group works are done. Residential training,7times,Through intensive group works based on discussion, a proposal for solving problems is planned, a draft report is made, and a few presentations are made. Preliminary review meeting,1time,A preliminary review meeting is held and discussions are made. Report meeting,1time,Final presentations are made and reports are submitted. [Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] It is required to join the residential training. A report meeting is held and comprehensive evaluation concerning abilities in group discussion to extract or set up challenges and to propose solutions for achieving a goal is made through presentation of the proposal as well as a submitted report. [Fextbook] Will be indicated as necessary.	[Course G	ioals]									
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[Method, Point of view, and Attainment levels of Evaluation] It is required to join the residential training. A report meeting is held and comprehensive evaluation concerning abilities in group discussion to extract or set up challenges and to propose solutions for achieving a goal is made through presentation of the proposal as well as a submitted report. [Textbook] Will be indicated as necessary.	None										
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Will be indicated as necessary.	[Textbook]									
	Will be indic	cated a	as necessary								
Continue to G L セミナ−ⅠⅠ(課題解決演習)(2)									_c	ontinue to G L セ	ミナーII(課題解決演習)(2)

GLセミナーII(課題解決演習)(2)

[Reference books, etc.]

(Reference books) Will be indicated as necessary.

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

(Others (office hour, etc.))

Course open period: October to January How to register the course will be instructed. *It depends on divisions which students belong to whether the earned credits are admitted as credits required for graduation. Please refer to the syllabus of your division.

*Please visit KULASIS to find out about office hours.

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Numbering	g code									
Course title <english></english>	工学部 Faculty o	国際イン f Engineeri	ター) ng Inte	ンシップ 2 ernational Inte	ernship 2	Aff dep Job	iliated partment p title,Na	t, ime Apj	proved	
Target ye	ear Brd y	ear students (or above	Number	of credi	its	2	Cours year/p	e offered eriod	2019/Intensive, year-round
Day/perio	d Inter	nsive	Cla	ss style	Semina	r			Language	Japanese and English
[Outline a	nd Pur	oose of t	he C	ourse]						
Acqusition of international	of interna l internsl	ational ski 1ip progra	lls wi ms he	th wth the t d by the F	raining o aculty of	of fo En	oreign la gineerii	anguage ng or its	e through the subsidiary	e participation to the bodies.
[Course G	ioals]									
The acquisit programs is	ion of in expected	ternationa 1. Detaileo	ıl and l obje	foreign lan ctives of th	guage sk e particip	ills patio	througl on shou	h the pa ld be id	rticipation to entified by o	o international each program.
[Course S	chedul	e and Co	onten	ts]						
Overseas In program. Final Presen	ternship, tation,11	1time,The	e conte esenta	ents to be a tion by the	cquired s student i	shou s re	ıld be d quired f	escribe followe	d in the broc d by discuss	hure of each internship ion among participants.
[Class red	luireme	nt]								
Described in language sk	the app ills for th	lication b le particip	ooklet ation.	for each in	nternship	pro	gram. 7	The regi	strant is req	uested to have enough
[Method,	Point of	f view, a	nd At	tainment	levels o	of E	valuat	ion]		
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[Textbook	[]									
[Referenc	e book	s, etc.]								
(Referen	nce boo	oks)								
[Regardin	g studi	es out o	f clas	s (prepar	ation ar	nd	review)]		
(Others (office h	our, etc.))							
It is required mandatory of school or ed get in touch	d for stuc redits or ucationa with the	lents to ch not and c l program Global L	ould of the sectors	the interns earn how m tudent in er ship Engine	ship prog any cred rolled. If eering Ed	ran lits l f the luca	to part before t credit tion Ce	icipate he parti could n nter.	in could be cipation to t ot be treated	evaluated as part of he undergraduate d as mandatory ones,

Numbering	code										
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Target ye	ar 3rd	ear students	or above	Number	of cred	its 2	(Cours /ear/p	e offered eriod	2019/First ser	nester
Day/perio	d Fri.2		Clas	s style	Lecture	•			Language	Japanese	
Outline a	nd Pur	pose of	the Co	ourse]							
Quantum the which can no he fundame	ory is t ver bee ntal ma	he most si n underst hematica	ood in structi	l theory in the classic tre of the	n the moo cal theory quantum	lern ph . An in theory	nysics. mporta /.	It exp nt pur	lains a lot o pose of this	f peculiar pheno course is to uno	omena derstand
[Course G	oals]										
An importan	t purpo	se of this	course	is to unde	rstand the	e funda	amenta	l math	nematical st	ructure of the qu	antume
uantum me	chanica	l particle	on one-	dimensio	nal space			nculat	e some basi	ic properties of a	a
					-						
Course S	chedu	e and C	ontent	sl							
. Introducti	on. Wa	e mechar	nics and	matrix n	nechanics						
. Mathemat	ical stru	cture of q	luantun	theory (1) State a	nd obs	ervabl	e.			
 Mathemat Mathemat 	ical stru	cture of q	juantun mantun	1 theory (Hilber Operation 	t space	and st abser	ate ve vables	ctors.		
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. One partie	le on o	ne-dimens	sional s	pace (1) c	lassical t	heory a	and its	quant	ization		
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 Learning 	achiev	ement eva	aluation								
Class req	uirem	ent]									
Classical me	chanics	, Linear a	lgebra								
[Method, I	oint o	f view, a	nd Att	ainment	levels	of Eva	aluatio	on]			
xamination	(100)										
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[Textbook] Not used

[Reference books, etc.]

(Reference books)

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

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

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

Course title <english></english>	量子物 Quanti	勿理学 2 (材 tum Physics	材原5 2	宇) 情報	l	Affi dep Joh	iliated partment p title,Na	, Gr me	aduate Scho sociate Profess	ool of Engineering or,MIYADERA TAB	
Target yea	ar Brd	d year students o	or above	ove Number of credi			2	Cours year/p	e offered eriod	2019/Second sem	
Day/period	I Tue	e.1	Cla	ss style	Lecture	e			Language	Japanese	
Quantum the mathematical An important	ory is form purpo	an astonishi ulation.	ing th	oursej eory. It des is to under	cribes p stand th	erfe e for	ctly a lo	t of phone the state of the sta	enomena ins o become ca	pite of its peculia	
[Course Go	oals]										
To understan To be able to	d the f calcu'	fundamental ilate some p	l struc ropert	ture of qua	ntum th tum me	eory chan	⁷ . nical par	ticle in	three dimer	isional space.	
[Course So	hedu	ule and Co	onten	ts]							
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量子物理学2(材原宇) 情報 (2)

[Textbook]

Not used

[Reference books, etc.]

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

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

Solve a distributed problem set.

(Others (office hour, etc.))

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Numbering	g cod	le					_		_			
Course title <english></english>	エレ Intro	クト duct	ロニクス ion to El	ス入門 ectror	(機宇) nics	情報	Aff dej Jol	iliated partment p title,Na	, me	Gra Pro	duate Scho fessor,MOI	ol of Informatics RIKURA MASAHIRO
Target ye	ar	2nd ye	ar students (or above	Number	of cred	lits	2	Cou yea	ırse r/p	e offered eriod	2019/First semester
Day/perio	d T	ue.5		Cla	ss style	Lectur	e				Language	Japanese
[Outline a	nd P	urp	ose of t	he C	ourse]							
[Course G	ioals	1					_					
-		-										
[Course S	chec	dule	and Co	onten	ts]							
,2times,					-							
,5times,												
,2times, 5times												
,1time,												
[Class rec	luire	men	nt]									
None												
[Method, I	Point	t of	view, a	nd At	tainment	levels	of E	valuat	ion]			
[Textbook]											
[Referenc	e bo	oks	, etc.]									
(Refere	nce k	000	(S)									
[Regardin	g sti	udie	s out o	f clas	s (prepa	ration a	nd	review)]			
(Others (offic	e ho	our, etc.))								
*Please visit	KUI	LAS	IS to find	l out a	bout offic	e hours.						

Numbering	g co	de										
Course title <english></english>	電: Ele	子回日 ctror	格 iic Circuit	s			Aff dej Jol	iliated partment p title,Na	, me	Gra Ass	aduate Scho ociate Professo	ol of Engineering or,SUGIYAMA KAZUHIKO
Target ye	ar	2nd y	ear students (or above	Number	of cred	lits	2	Co yea	ours ar/p	e offered eriod	2019/First semester
Day/perio	d	Fri.2		Cla	ss style	Lectur	e				Language	Japanese
[Outline a	nd	Purp	oose of t	he C	ourse]							
Following th Circuitsquot negative fee supplies, and	ne le , m dba d no	ecture odeli ck in oise v	e of funda ng of acti circuits, ould be i	menta ve dev operat nclude	ls of active rises, fundational ampli ed in the co	device mentals fiers, ar urse, wł	circ of t id os ien t	uits in th ransisto scillator he lectu	he c r cii s are ire t	ours cuit e lec ime	e quotElect s, various a tured. Nonl remains.	ric and Electronic mplifier circuits, inear circuits, power

[Course Goals]

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 transistor, and operational amplifiers, as well as the fundamental concepts.

[Course Schedule and Contents]

Modeling of active devices,3times,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. Fundamentals of transistor circuits,3times,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 viasing circuits are lectured with somewhat practical circuits.

Various amplifier circuits,3times,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,2times,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.

Oscilators,2times,The principle of the oscillator circuit is lectured as a concept of the positive feedba Various oscillator circuits are introduced with their characteristics.

Others, I time, 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. Examination, 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.

[Class requirement]

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.)

Continue to 電子回路(2)

電子回路(2)

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

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

[Textbook]

Masao Kitano [@]Fundamentals of Electronic Circuits ₂ (Reimei Publishing, Kyoto) (ibid:BB04087527)

[Reference books, etc.]

(Reference books) In 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/2019-110-6010-000) or (https://panda.ecs.kyoto-u.ac.jp/portal/). Sorry for Japanese version only.)

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

In case you need

(Others (office hour, 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. 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

Numbering	g code	•									
Course title <english></english>	通信 Modul	trical Commu	inication	Aff dej Jol	Affiliated department, Job title,Name			Graduate School of Informatics Professor, MORIKURA MASAHIRC Graduate School of Informatics Associate Professor, MURATA HIDEKAZ			
Target ye	ar Br	Number	of crec	lits	2	Co yea	urs ar/p	e offered eriod	2019/First semester		
Day/perio	Day/period Wed.1 Class style Lectu					e				Language	Japanese
[Outline a	nd Pu	irpose of t	he C	ourse]							
This course pulse modu!	discus lations	ses all types , as well as !	of m	odulation m inciples of r	nethods, nodulat	that ion/	is, the demodu	theor latio	ries n. F	of amplitud further focus	e, frequency, phase, s is made on signal

processing basics, sampling theory, etc., including of related applications.

[Course Goals]

Students will gain an understanding of the fundamentals of communication theory, used in mobile telephone wireless local area networks (LAN), optical fiber communications, etc. Specifically, students will master signal expression and signal processing (modulation/demodulation) within time axis and frequency axis of communication signals, chiefly in the physical layers of communication signals.

[Course Schedule and Contents]

"Signal processing (4-5 classes)

Clarification is made of the concept of " frequency," and students learn of tools for handling frequency, amely, Fourier series and Fourier transforms and their practical applications. Discussion is next made specially of the basics of random signals and theories regarding the standardization and quantization of andom signals.

Analog modulation and demodulation methods (5-6 classes)

Discussion is made of the principles of amplitude modulation and angle modulation and their generation and modulation methods, with comparison of their respective characteristics, including occupied bandwidth and signal-to-noise ratio, etc.

Digital modulation and demodulation methods (4-5 classes)

After description of various methods of pulse modulation, there is discussion of principles and methods of digital modulation types, including modulation phase shift keying (PSK), etc., plus the basics of signal space. Confirmation is made of the extent of student understanding, with supplementary discussion to further mprove levels of understanding.

Confirmation of extent of student learning (1 class)

Confirmation is made of the extent that students have learned the contents of this course. Additional xplanation is provided for those students whose understanding remains incomplete or imperfect.

Continue to 通信基礎論(2)

[Class requirement]
Students are required to have taken the course Industrial Mathematics (Fourier Analysis) and Electronic Circuits.
[Method, Point of view, and Attainment levels of Evaluation]
Evaluation is made of extent of student's understanding of course contents via written examination.
[Textbook]
守倉他 『通信方式』(オーム社)ISBN:9784274214738
[Reference books, etc.]
(Reference books) 寺田他: 情報通信工学 (オーム社) isbn{ } {4274129322}
[Regarding studies out of class (preparation and review)]
Students are required to have taken the course Industrial Mathematics (Fourier Analysis) and Electronic Circuits.
(Others (office hour, etc.))
After classes, from 10:30-12:00
*Please visit KULASIS to find out about office hours.

潘信甘琳验/9

Numbering code

システム解析入門(数理)**(2)**

(Related URLs)

 $(http://www.bode.amp.i.kyoto-u.ac.jp/member/yoshito\{\}_ohta/system/index.html)$

[Regarding studies out of class (preparation and review)] Read the handouts in advance. Solve problems in the houdouts and exercise problems.

(Others (office hour, etc.))

Contact the instructor using email. Address: yoshito{}_ohta@i.kyoto-u.ac.jp

*Please visit KULASIS to find out about office hours

* Numbering code ∆ffiliated プログラミング言語(計算機) Course title Graduate School of Informatic departm <English> Programming Languages Professor.IGARASHI ATSUSHI Job title.Nam Course offered vear/period 2nd year students or above Number of credits 2 Target year 2019/Second semester Day/period Mon.2 Language Japanese Class style Lecture [Outline and Purpose of the Course] [Course Goals] [Course Schedule and Contents] .1time. 2times, 4times. 2times, 2times 3times, .1time. [Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] [Textbook] [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours

Affiliated システム解析入門(数理) Course title Graduate School of Informatics departr <English> Introduction to Systems Analysis Professor,OOTA YOSHITO Job title.Nam Course offered Target year 2nd year students or above Number of credits 2 2019/First semester Dav/period Wed.2 Class style Lecture Language Japanese [Outline 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 nodeling and the implication of system control based on mathematical models. [Course Goals] We will learn examples of dynamical systems and the rudiments of dynamical systems and approximated inearized systems. This course will be the basics of Linear Control Theory (90720) and Modern Control Theory (90580). [Course Schedule and Contents] Introduction to system analysis, 2times, Overview of the course. Linear dynamical systems, 3times, First and second order systems such as electric circuits consisting of a capacitor and an inductor and mechanical systems consisting of a spring and a dumper. State equation and linear approximation, 1 times, Linearized systems at an operating point. Linear dynamical systems and their responses Laplace transform and transfer function, 2 times, Laplace transform and linear differential equations. Transfer functions of first and second order systems. Examples of system modeling, 2 times, Examples of system modeling including mechanical systems, iological systems, and social infrastructures. Discrete-time systems,1time,Discrete-time systems described by difference equations System identification, 1 time, System modeling using input-output data Exercises.3 times.Excercises. [Class requirement] Linear Algebra (A and B) and Calculus (A and B) are recommended. [Method, Point of view, and Attainment levels of Evaluation] The grade is determined by the final examination [Textbook] Handouts are given. [Reference books, etc.] (Reference books) Shimemura, What is automatic control?, Korona (in Japanese) isbn{}{9784339031409} Continue to システム解析入門(数理)(2)

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Numbering	g code	Ð								
Course title <english></english>	計算様 Comp	^{幾科学} 実験及 outer Science	演習 1 Labora	(H26以前) atory and Ex	入学者) kercise 1	Aff de Jo	filiated partment b title,Na	i, me	Graduate Scho Associate Profess Academic Center fo Associate Profes Graduate Scho Assistant Profess Part-time Lecturer	ol of Informatics or,MATSUBARA SHIGEO r Computing and Media Studies ssor,IIYAMA MASAAKI ol of Informatics or,SHIMIZU TOSHIYUKI ,YAMAMOTO TAKEHIRO
Target ye	ear 21	nd year students	or above	Number	of cred	its	1	Co yea	urse offered ar/period	2019/First semester
Day/perio	od W	ed.3,4	Cla	ss style	Semina	ır			Language	Japanese
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*Please visi	t KUL	ASIS to fin	d out a	bout office	e hours.					

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Numbering	g code					_					
Course title <english></english>	計算機 Compute	科学実験; er Science l	習2(計算 atory and Ex	機) ercise 2	Affiliated department, Job title,Name			Graduate School of Informatics Associate Professor,MATSUBARA SHIGEO Graduate School of Informatics Associate Professor,NAKAZAWA ATSUSH Graduate School of Informatics Associate Professor,YAMADA MAKOTO Graduate School of Informatics Assistant Professor,TAKASE HIDEKI Academic Center for Computing and Media Studies Assistant Professor,Kotani Daisuke Part-time Lecturer,TAKAGI KAZUYOSHI Part time Lecturer,TAMAKI SUGUPUI			
Target ye	ar 2nd y	/ear students o	r above	Number	of cred	lits	2	Co yea	ourse ar/p	e offered eriod	2019/Second semester
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									Cor	tinue to 計算機科	学実験及演習 2 (計算機) (2)
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計算機科学実験及演習2(計算機)(2)

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

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

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Numbering	g cod	le									
Course title <english></english>	数値 Nun	重解析 nerical Analy	sis			Affi dep Job	iliated partment p title,Na	, me	Gra Pro	duate Scho fessor,NISI	ol of Informatics HMURA NAOSHI
Target ye	ar	2nd year students	or above	Number	of cred	its	2	Co yea	urse ar/p	e offered eriod	2019/Second semester
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崔率と統計 (2)	
Regarding studies out of class (preparation and review)]	
addition to attending class, work at home including real data analysis is required.	
Others (office hour, etc.))	
etails of office hours will be notified at class.	
Please visit KULASIS to find out about office hours.	

Course title <english></english>	グラフ Graph	7理論(計 Theory	算機)		Aff dep Job	iliated partment p title,Na	, me	Academic Center Associate Profes	for Computing and Media S ssor,MIYAZAKI SHIYUU
Target ye	ear 2nd	d year students	or above	Number	of cred	its	2	Co yea	urse offered ar/period	2019/Second sem
Day/perio	d Thu	1.4	Cla	ss style	Lecture	e			Language	e Japanese
[Outline a	nd Pu	rpose of	the C	ourse]						
We learn ba problems.	isic theo	ories of gra	phs an	id their app	lications	, an	d funda	men	tal algorithms	for solving graph
[Course 0	Goals]									
The goal of	this cou	urse is to le	arn ba	sic theories	s of grap	hs a	nd their	· app	olications, and	fundamental algorith
for solving	graph p	roblems.								
[Course S	Schedu	le and C	onten	ts]		_		_		
I explain o and their co 2. Minimun Kruskal's 3. Shortest y	definition mplexit n spanni algorith	on of graph ty. ing trees (1 um, Prim's oblems (1 t	times and times	basic prope dot) hm, Steine	rties of g	grap oble	hs. I als m.	io bi	riefly review t	he basics of algorithm
Dijkstra's 4. Eurer circ Eurer circ	algorith cuits and uits, Ha	nm. d Hamiltor amiltonian	iian cy cycles	cles (2 tim , Dirac's the	eslots) eorem. C	Dre's	theorem	n.		
5. Graph co Vertex co	loring (loring a	2 timeslots and edge co) oloring	. Brooks's t	heorem,	Viz	zing's th	eore	em, Konig's th	eorem. Coloring map
 Maximur Ford-Fulk 	n flow p erson's	problems (algorithm.	2 time	slots)						
 Matching Matching 	; (2 time s, in par	eslots) ticular, bip	artite	matchings.	Hall's th	neor	em, Hui	ngar	ian method.	
8. Exam (1	timeslo	t)								
[Class red	quirem	ent]								
Basics of al	gorithm	ns, data stru	ctures	, and set th	eory.					
		of view a	۸۸ ام م						-	
[Method.	Point of		na Ai	tainment	levels (of E	valuat	ion	1	
[Method, Mainly eval	Point of uated b	y the final	exam.	tainment In some ca	levels (of E	Evaluat es or the	ion e nu	mber of attend	lance to the class may

グラ	フ理論	(計算機) ((2)
		•			·-/

L_____ considered.

[Textbook] 宮崎修一 『グラフ理論入門 ~基本とアルゴリズム~』(森北出版株式会社)ISBN:978-4-627-85281-5 (Written in Japanese)

[Reference books, etc.]

(Reference books) I may show some recommended books in class.

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

Reading the textbook is effective for study. Due to time constraints, I do not give complete description of the proofs in class. I strongly recommend do it by yourself after the class.

(Others (office hour, etc.))

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Numbering	cod	le											
Course title <english></english>	グラ Graj	ラフ理論(数 ph Theory	理)			Aff dep Job	iliated partment p title,Na	, (me	Graduate School of Informatics Professor,NAGAMOCHI HIROSHI				
Target ye	ar	2nd year students o	or above	Number	of credi	its	2	Cou year	r/p	e offered eriod	2019/First semester		
Day/perio	d T	'hu.2	Cla	ss style	Lecture					Language	Japanese		
[Outline a	nd F	Purpose of t	he C	ourse]									
After basic notations and properties on graphs and networks are given, algorithms to some representative problems such as the shortest path problem, the minimum spanning tree problem and the maximum flow problem are described. Applications of these results and extensions of them in discrete mathematics are also presented.													
[Course G	oals	5]											
Not only to l properties or	earn dis	the notions o crete structure	n graj es and	h structure logical me	as know chanisms	led s in	ge but t comput	o unc ation	ler al	stand proofs methods	s to mathematical		
[Course S	che	dule and Co	onten	ts]									
connectivity digraphs are plane graphs which charac representatio introduced. graph search an algorithm, ar trees and cut fundamental minimum sp spanning tree discussed. maximum-fl finding a ma	1tin defi and cteri: n fo ,2tin for ,2tin for ,2tin e de -sets cycl anni e alg ow , xim	the Graph conn ned and some dual graphs, zes the planar r graphs, 1 time nes, The depth computing cu mes, Propertie s, orribed. the stribed. the str	nectivi prope 2times graph e,As r first : t-verti s on s tant p menta nes,K lescrib aximu	ty such as l rrties for the Some com is, duality o epresentation search and lic ces and bic hortest path roperties on i cut-sets ar ruskal#039 wed, and dat um-flow and ed.	k-connec em are de binatoria of plane g on for da the width connectee is and Di a spannin e describ s method ta structu d minimu	etivi eriv al as grap ta t n fir d cc ijks ijks ig tr bed. l an ure f	ity of un red. spects o ohs, the i o input i rst searc omponentra#039 rees and d Prim# for them -cut theo	direct f grap four graph h are nts is s met cut-s cut-s cut-s i and orem	nteco phs col ns, int de ho sets m the in	I graphs and such as Kr or theorem matrix and a troduced, ar signed. d, as a repre- s, especially ethod, as re- pir computa- networks ar	d strong connectivity of atowski#039s theorem, are described. adjacency lists are ad as their applications, esentative shortest path the roles of presentative minimum tional complexities are ad an algorithm for		
[Class req	uire	ementj											
									Co	ntinue to グ	ラブ理論(数理) (2) - ·		

クラノ理論(数理)(2)
[Method, Point of view, and Attainment levels of Evaluation]
Evaluation is made based on marks on answers in exercises (30%) and score of end-term examination (70%)
[Textbook]
[Reference books, 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/)
[Regarding studies out of class (preparation and review)]
(Others (office hour, 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 title 応 <english> Ap</english>	同代数学	ora			Affiliated departmer Job title,N	nt, ame	Graduate Scho Associate Profess	ol of Inform sor,TSUJIMOT
Target year	3rd year stude	ents or above	Number	of credi	ts 2	Cou yea	rse offered r/period	2019/Seco
Day/period	Mon.2	Cla	ss style	Lecture			Language	Japanese
[Outline and	Purpose of	of the C	ourse]					
An introduction	n with applie	cation to	basic algeb	ora in info	rmatics.			
Course Goa	als1							
To understand	basic ideas a	and some	applicatio	ns of alge	bras (mai	nlv gr	oup theory).	
[Course Sch	nedule and	Conten	its]				1	
Structure of gro Symmetric gro Enumeration pr Group represer Summary and a acquiring know	oups, 4-5time oup and enum roblem. ntation, 3-4tin assessment, 1 vledge and s	mear g es,Subgro neration p mes,Grou ltime,Sur kills.	proup and s pup, coset, problem,3- ups in terms nmary and	normal su 4times,Ac s of linear suppleme	bgroup, q tion of th transform ent of this	uotiei e sym nation cours	nt group, the is metric group o s of vector spa e. Measure the	omorphism t on a finite set ce. progress of
[Class requi	irement]							
Linear algebra								
[Method, Po	int of view	, and At	tainment	levels c	f Evalua	tion]		
Evaluation dep needed.	ends mainly	on mark	s of exami	nation, bu	t marks o	f exer	cises are taken	into accoun
[Textbook]								
[Reference b	books, etc.	.1						
(Reference	e books)	-						
T. Hiramatsu: J	Joho no suri	oyo daisi	ugaku (Sho	okabo) ist	n{}{4785	531504	40}	
(Related U	JRLs)							
(http://www-is	s.amp.i.kyot	o-u.ac.jp/	lab/tujimo	to/appalg/)			
[Regarding s	studies ou	t of clas	s (prepa	ration ar	d reviev	v)]		
(Othors (off	fice hour, e	etc.))						
(Unlers (Un								
*Please visit K	ULASIS to	find out a	about offic	e hours.				

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Numbering	g cod	de									
Course title <english></english>	e title 計算機科学実験及演習 4 (計算機) Sh> Computer Science Laboratory and Exercise 4						Aff dej Jol	iliated partment b title,Na	, me	Graduate Scho Associate Profess Graduate Scho Associate Profe Graduate Scho Associate Profes Graduate Scho Associate Profes Assistant Profess Academic Center fo Assistant Profess Part-time Lecturer Part-time Lecturer	ol of Informatics or,MATSUBARA SHIGEO ol of Informatics essor,MA QIANG r Computing and Media Sudies ssor,IIYAMA MASAAKI ol of Informatics sor,YOSHII KAZUYOSHI ol of Informatics or,SHIMIZU TOSHIYUKI r Computing and Media Sudies sor,HIRAISHI TASUKU ,YAMAMOTO TAKEHIRO arer,UMATANI SEJII
Target ye	et year Brd year students or above Number of credits 3								Co yea	urse offered r/period	2019/Second semester
Day/perio	ay/period Thu.3,4,Fri.1,2,3, Class style Seminar Language Japanese								Japanese		
[Outline and Purpose of the Course]											
[Course Goals]											
[Course S	iche	dule	and Co	onten	ts]						
,15times, ,15times, 15times											
,15times,											
,15times, ,15times,											
[Class red	quire	me	nt]								
None											
[Method,	Poin	t of	view, a	nd At	tainment	levels	of E	Evaluat	ion]		
		-								Continue to 計算機利	(学宝) 学宝) 登宝) 登宝) 登宝) 登) (2)

計算機科学	実験及演習4(計	算機)	(2)						
[Textbool	<u></u>			<u> </u>					
-	•						_		
[Referenc	e books, etc.]								
(Refere	nce books)								
[Regardin	ig studies out o	of clas	s (prepar	ation a	nd re	eview)]		
(Others (office hour of						_		
Please visi	t KULASIS to fir	nd out a	bout office	e hours.					
i icuse iisi		iu our i	loour onnot	nouisi					
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Numberin	g code					_	_		
Course title	 アルゴリズム話	À			Affili	ated		Graduate Scho	ol of Informatics
<english></english>	Theory of Algor	ithms			Job 1	title,Na	, me	Professor,MIN	IATO SHINICHI
Target ve	ar Brd year students	or above	Number	of cred	lits 2	,	Со	Irse offered	2010/Second competer
- anget ye	pru year siddelits		Rumber		110 2	-	yea	r/period	2019/Second semeste
Day/perio	d Thu.2	Cla	ss style	Lecture	e		_	Language	Japanese
Outline a	nd Purpose of	the C	ourse]						

We introduce a computation model suitable for discussing both time and space complexities of algorithms and problems, then study basic ideas and issues of computational complecity theory.

[Course Goals] [Course Schedule and Contents] review of language and automata theory,2times Turing machines,4times,Basic properites of Turing machites including their computation power and several equivalent machines Decidability and Undecidability, 3 times, The notion of decidability of problems and examples of undecidable problems. Introduction of complexity theory,6times,Decidable but intractable problems and NP-completeness. Discussion to check the achievements of students [Class requirement] 91040 [Method, Point of view, and Attainment levels of Evaluation] Two reports and a final exam [Textbook] wama, Introduction to theory of algorithms, Shoko-do, 2001 isbn{}{4785631252} isbn{}{9784254122039}. [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours

Numbering code Affiliated 現代制御論(数理) Course title Graduate School of Infor departmen Job title,Na Associate Professor, KASHIMA KENJI <English> Modern Control Theory Course offered Number of credits 2 Target year 4th year students or abo 2019/First semester year/p eriod Class style Day/period Tue.2 Lecture Language Japanes [Outline and Purpose of the Course] This course provides the fundamentals in modern control theory - centered around the so-called state space methods - as a continuation of classical control theory taught in Linear Control Theory. Emphasis is placed on the treatment of such concepts as controllability and observability, pole allocation, the realization problem observers, and linear quadratic optimal regulators. [Course Goals] The objective is to study controllability and observability that are the basis of modern control theory, and also understand design methods such as optimal regulators. It is hoped that the course provides a basis for a more advanced topic such as robust control theory. [Course Schedule and Contents] Introduction to modern control, ltime, We give real examples for which the modern control theory are applied. We also give a state-space formulation for modeling dynamical systems. Mathematics for modern control,1time,We discuss some fundamental properties of mathematics, in particular, vectors and matrices. Controllability and observability,2times,We introduce the fundamental notions of controllability and observability for linear dynamical systems, and also discuss their basic properties and their criteria. Canonical decomposition, 2times, We give the canonical decomposition for linear systems. Realization problem, 2times, We introduce the realization problem that constructs state space representations from transfer functions for single-input and single-output systems. Stability,2times,We discuss the stability of dynamical systems described by state-space equations. We also give mathematical tools for checking if a system is stable or not. State feedback and dynamic compensators,3times,We introduce the construction of dynamic compensators via state feedback, pole allocation and observers. The relationships with controllability and observablity are also discussed. Opimal regulators,2times,We give the basic construction of optimal regulators, in particular, the introduction of the matrix Riccati equation, its solvability, relationship to stability and observability, and root loci. [Class requirement] 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 space, isomorphism. Continue to 現代制御論(数理)(2)

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現代制御論(数理)**(2)**

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

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

[Textbook]

None specified.

[Reference books, etc.]

(Reference books)

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

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

(Others (office hour, etc.))

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Numbering	g cod	e				_		_	_		
Course title <english></english>	情報 Theo	システム理 ry of Informa	論(ition	数理) Systems		Aff de Joi	iliated partment b title,Na	, me	Gra Asso	duate Scho ciate Professo	ol of Informatics r,MASUYAMA HIROYUK
Target ye	ar 4	th year students o	r above	Number	of crec	lits	2	Co yea	urse ar/pe	e offered eriod	2019/First semester
Day/perio	d Tł	nu.2	Cla	ss style	Lectur	е				Language	Japanese
[Outline a	nd P	urpose of t	he C	ourse]							
This course systems, foc	cover using	s modeling a on queueing	nd pe theo	rformance or ry and Marl	evaluati kov anal	on n ysis	nethods	for	optir	nal design	of information/service
[Course G	oals]									
This course analysis for	aims the m	to deepen the odeling and p	unde	erstanding c mance eval	of the fu luation i	ndar neth	nental r lods of i	esul nfoi	ts of rmati	both queui ion/service	ng theory and Markov systems.
[Course S	ched	lule and Co	nter	its]							
distributions Performance delivered: th such as M/C Formulas fo lectured: Erl multi-server	, Mar e evalue stat /1 and r perfo ang#(queu	kov chains et uation of sem ionary queue d GI/M/1 que ormance eval 039s loss forr es.	i-Ma leng ues, uatio nula,	e explained rkovian que th distributi in addition n,5 ~ 6time Little#0399	to the lo s law, K	6tir wait oss p ollov ingr	nes,The ing time robabili ving for nan#039	foll e dis ty o mul: 9s in	owir tribu f the as fo iequa	ng performa ition of sen ir finite-caj or performa ality, and ap	ance measures are ii-Markovian queues, sacity analogues. nce evaluation are sproximate formulas fo
[Class red	uire	ment]									
Stochastic d	iscret	e event syster	ns, a	nd basics of	f queuei	ng tl	heory.				
[Method, I	Point	of view, ar	nd At	tainment	levels	of E	Evaluat	ion]		
Based on the	e scor	e of the term	exan	nination							
[Textbook]										
Handouts ar	e prov	vided.									
[Referenc	e boo	oks, etc.]									
(Referent P. Bremaud, 9780387985 L. Kleinroc	n ce b Mark 091} k, Qu	ooks) ov Chains: C	dibbs ns V	Fields, Mo ol.1, John V	nte Carl Viley an	o Si d So	mulatio	n, ai '5. is	nd Q sbn{	ueues, Spri	inger, 1999. isbn{}{

D.P. Heyman and M.J. Sobel, Stochastic Models in Operations Research, Vol. 1, Dover Publications, 2003. Continue to 情報システム理論(数理) (2)

isbn{}{0070286310}. [Regarding studies out of class (preparation and review)] (Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

情報システム理論(数理)(2)

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Numbering c	ode									
Course title <english> Li</english>	釈計画 inear Programn	ning	A d J	ffiliated epartment ob title,Na	, Gr me ^{Pro}	Graduate School of Informatics Professor, YAMASHITA NOBUO				
Target year	1st year students	t year students or above Number of credits 2 Course offered year/period					2019/Second semester			
Day/period	Tue.1	Class style	Lecture			Language	Japanese			
[Outline and Purpose of the Course]										
which is the most fundamental subject in system optimization. [Course Goals]										
To learn the ba solution metho	asic ideas of for ods of linear pro	mulating optimiz ogramming.	ation mode	els, and to	under	stand theoret	ical properties and			
[Course Sch	nedule and C	ontents]								
[Course Schedule and Contents] Introduction to Mathematical Optimization, Itime, Introduction to Mathematical Optimization. Reviews of some mathematics for linear programming, in particular, linear algebras. Mathematical Programming Models, 4times, Representative mathematical programming models such as linear programming models, network programming models, noninear programming models, and combinatorial programming models, with simple illustrative examples. Linear Programming and Basic Solutions, 2times, Formulation of linear programs in the standard form, and basic concepts of basic solutions, basic feasible solutions, and optimal basic solutions. Simplex Method, 3times, Basic ideas and concrete procedures of the simplex method that is a classical method for linear programming. Topics include two-stage linear programming, variables with upper bounds, and network simplex methods.										

analysis as a useful technique in decision making. Interior Point Methods, 1time, Interior point methods as polynomial-time algorithms in linear programming. Review and Summary, 1time, Review and Summary. Confirmation of achievement level.

[Class requirement]

None

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

Based on the score of the term examination.

[Textbook]

Fukushima, M.: Introduction to Mathematical Programming: New Edition (in Japanese), Asakura Shoten isbn{}{9784254280043}.

[Reference books, etc.]

(Reference books)

_____Continue to 線形計画(2)

線形計画**(2)**

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

(Others (office hour, etc.))

Numbering	g cod	e									
Course title <english></english>	論理 Logi	システム (al Systems	計算相	幾)		Aff dej Jol	iliated partment b title,Na	t, ime	Gra Pro	aduate Scho ofessor,TAK	ol of Informatics AGI NAOFUMI
Target ye	ear 2	nd year students o	or above	Number	of cred	its	2	Co yea	urs ar/p	e offered eriod	2019/First semester
Day/peric	od W	red.2	Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd P	urpose of t	he C	ourse]							
In this cours logic circuit propositiona students wil combinatior	se, we s, the al logi l gain nal log	learn about s basis of digit c. Next, we t logic function gic circuits, as	symbo tal ma ake uj on sim s well	blic logic an chine confi b Boolean a plification as sequent	nd Boole iguratior algebra, methods ial circu	ean a is. V its v s. W its a	algebra, Ve first various o 'e furthe ind their	the stud char er sti r mo	basi ly sy acte udy dels	is of compu /mbolic logi ristics (prop the design a s, sequential	ter science, and about ic, especially perties); meanwhile, and analysis of machines.
[Course G	Goals]									
2. Students Boolean alg 3. Students 4. Students combination	will u ebra a will u will u nal log	nderstand and and logic fund nderstand and nderstand and gic circuits and	d be a ctions d be a d be a nd seq	ble to expla ble to expla ble to use l ble to expla uential circ	ogic fun ain the fi ain the fi cuits.	unda ctio unda	amental n simpl amental	con ifica con	cept tion cept	ts and varion methods. ts and desig	us characteristics of n methods of
[Course S	chec	Jule and Co	onten	ts]							
Mathematic	al pre	paration (1 cl	lass)								
A review of	know	ledge necess	ary fo	or this cours	se, inclu	ding	g sets, re	elatio	onsh	nips, etc.	
Symbolic lo Students lea	gic (1 Irn abo	class) out propositio	onal lo	ogic, togeth	er with	an o	verview	v of	sym	bolic logic.	
Boolean alg Students lea expressions,	ebra a irn abo , etc.	and logic fund out Boolean a	ctions algebr	(2 classes) a and logic	express	ions	s, as we	ll as	abo	ut logic fun	ctions and their
Simplificati Students lea	on of irn abo	logic function out the simpli	ns (2 o ificati	classes) on of logic	function	15.					
Various cha Students lea characteristi	racter irn abo ics.	istics of logic out the variou	c func 1s pro	tions (2 cla perties of le	usses) ogic fun	ctio	ns and a	ıbou	t log	gic function	s that have special
Design and Students lea	analy: irn abo	sis of combin out design me	ation: ethods	al circuits (and analy	2 classes sis meth	s) ods	for con	ıbina	atio	nal circuits.	
Sequential r Students lea	nachii irn abo	nes and seque out design me	ential ethods	circuits (4 s for seque	classes) ntial circ	uits	, and es	peci	ally	regarding t	he minimization of, and
									- Co	ntinue to 論理	システム(計算機)(2)

Townet week	had an and a dard	Number	- f and li	Job title,Na	Cours	e offered	
	zitu year student			15 2	year/p	eriod	2019/First sem
Day/period	Wed.3	Class style	Lecture			Language	Japanese
[Outline and	Purpose of	the Course]					
[Course Goa	als]						
[Course Sch	edule and C	Contents]					
,3times,							
6times, 6times							
ounico,							
[Class requi	rement]						
None							
Method, Po	int of view.	and Attainment	levels o	f Evaluat	ion1		
Lune une a, . e							
[Textbook]			_	_			
[Textbook]							
[Textbook]							
[Textbook] [Reference I	pooks, etc.]						
[Textbook] [Reference I (Reference	pooks, etc.] e books)						
[Textbook] [Reference I (Reference	books, etc.] e books)						
[Textbook] [Reference I (Reference [Regarding :	books, etc.] e books) studies out (of class (prepar	ation an	d review))]		
[Textbook] [Reference (Reference [Regarding :	oooks, etc.] e books) studies out (of class (prepar	ation an	d review)	0]		
[Textbook] [Reference I (Reference [Regarding : (Others (off	books, etc.] e books) studies out (of class (prepar	ation an	d review))]		
[Textbook] [Reference (Reference [Regarding : (Others (off *Please visit K	books, etc.] e books) studies out (fice hour, etc ULASIS to fii	of class (prepar c.)) nd out about office	ation an	d review)	0]		

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論理システム(計算機) (2)	
L	{
Term-end examination (1 class)	
Feedback (1 class) Review, including of the problems on the final examination, etc.	
[Class requirement]	
Nothing of special note.	
[Method, Point of view, and Attainment levels of Evaluation]	
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 the final exam, then the student will pass the course.	n on
[Textbook]	
Naofumi Takagi [®] Logic circuits _a (Ohm-sha) ISBN:9784274215995	
[Reference books, etc.]	
(Related URLs)	
nup://www.tabb.kuis.kyoto-u.ac.jp/~makagi/is.num	
IRegarding studies out of class (preparation and review)]	
[Regarding studies out 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 problem the next class.	ms at
[Regarding studies out 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 problem the next class. (Others (office hour, etc.))	ms at

論理システム(計算機)(2)

Numbering	g cod	e									
Course title <english></english>	解析 Anal	力学(数理 ytical Mecha) nics			Affi dep Job	iliated partment p title,Na	, me	Gra Pro	duate Scho fessor,AO	ool of Informatics YAGI TOSHIO
Target ye	ar 2	nd year students o	or above	Number	of cred	its	2	Co yea	urs ar/p	e offered eriod	2019/Second semester
Day/perio	d W	/ed.2	Clas	ss style	Lecture	e				Language	Japanese
[Outline a	nd P	urpose of t	he Co	ourse]							
10											
[Course G	ioals	1									
[Course S	chec	dule and Co	nten	ts]							
7times, 8times, 1time,											
[Class req	luire	ment]									
None											
[Method, I	Point	t of view, ar	nd At	tainment	levels	of E	valuat	ion	1		
[Textbook	4										
[Referenc	e bo	oks, etc.]									
(Referei	nce k	books)									
[Regardin	g stı	udies out of	clas	s (prepara	ation a	nd ı	review)]			
(Others (offic	e hour, etc.))		_		_				
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											*
Numbering	g code										
Course title <english></english>	線形制 Linear	J御理論 Control Th	ieory			Aff de Jo	iliated partment b title,Na	t, ime	Gra Ass	aduate Scho sociate Prof	ool of Informatics essor,KASHIMA KENJI
Target ye	ar Brd	i year students o	or above	Number	of cred	its	2	Co yea	urs ar/p	e offered eriod	2019/Second semester
Day/perio	d We	d.3	Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd Pu	rpose of t	he C	ourse]							
In this cours as drones, au stability crite	e, we v itomati erion, s	vill learn th c driving, s ervo mecha	e bası ysten anism	cs of feedb is biology. design, and	ack cont We will I so on,	rol giv base	theory v e lecture ed on La	whic es or aplac	h ha 1 an ce tr	as wide rang alysis of fee ansform.	ge of applications such edback systems,
[Course G	ioals]										
The goal of domain met	this counced	irse is to un r control sy	derst stems	and the bas design.	ics on ar	naly	sis of fe	edba	ack	systems and	d to acquire frequency-
[Course S	chedu	le and Co	onten	ts]							
Introduction	,1time,										
Laplace tran	sform,	2times,									
System mod	eling a	nd transfer	funct	ion,2times,							
Transient res	sponse	and stabilit	y,3tir	nes,							
Frequency re	espons	e,2times,									
Stability ana	lysis o	f feedback	syster	ns,2times,							
Characterist	ics of f	eedback co	ntrol s	systems,2tii	nes,						
Summary,1t	ime,										
[Class req	luirem	ent]									
It is recomm Mathematics	ended, s A3 (2	but not rec 0700) befo	uired re tak	, that studer ing this cou	nts take rse.	Intr	oduction	n to	Syst	tems Analy	sis (90070) and Applied
[Method, I	Point	of view, a	nd At	tainment	levels	of E	valuat	tion]		
The final gra	ade in t	his course i	s base	ed on your s	scores in	ı rep	oorts and	d the	fin	al examinat	tion.
[Textbook]										
None.											
[Referenc	e boo	ks, etc.]									
(Referen	nce bo	oks)							_		
F. Sugie and 4339033030	M. Fu }	jita: Introd	uctior	to Feedbad	ck Contr	ol (in Japar	iese)). Co	orona Publi	shing, 1999 isbn{}{
T. Katayam {425420111	a: Fun 7}	damentals of	of Fee	dback Cont	rol: Nev	v ed	ition (ir	ı Jap	ane	se). Asakur	a Publisher, 2002 isbn{}
Regardin	a stud	lies out o	f clas	s (prepar	ation a	nd	review)1			
	.			(P P.u.				/1			
(Others (office	hour, etc.))								
*Please visit	KUL	ASIS to find	lout	bout office	hours.						

数理工学セミナー(数理)	(2)
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[Reference books, etc.] (Reference books)

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

(Others (office hour, etc.)) In early July, all the themes of seminars are announced. Students are asked to give application forms. It is assumed that students are looking at the announce board of the department office carefully.

*Please visit KULASIS to find out about office hours.

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											*	
Numbering c	ode											
Course title <english> 数理工学セミナー(数理) Seminar on Applied Mathematics and Physi Target year 3rd year students or above Day/period Number of cr</english>							Affiliated department, Job title,Name Graduate School of Inform. Assistant Professor,OKI K Graduate School of Inform. Assistant Professor,HARA Graduate School of Inform. Assistant Professor,TSUTS Graduate School of Inform. Assistant Professor,Tkeksanda Graduate School of Inform. Assistant Professor,FUKUI Graduate School of Inform. Assistant Professor,FUKUI Graduate School of Inform.				ol of Informatics UCHI Satoshi Jo of Informatics ssor,OOKI KENTAROU Jo of Informatics ssor,HARADA KENJI Jo of Informatics ssor,TSUTSU HIROKI Jo of Informatics ssor,FUKUDA HIDEMI Jo of Informatics Jo of Informatics	
Target year	3rd ye	ar students of	above	Number	of cred	lits	2	Co yea	urse ar/pe	e offered eriod	2019/Second semester	
Day/period	Fri.2		Cla	ss style	Lectur	e				Language	Japanese	
[Outline and	l Purp	ose of th	ne Co	ourse]								
Having semina	irs on v	arious the	emes	related to a	pplied r	nath	ematics	and	l phy	vsics.		
[Course Goa	als]											
	[Course Schedule and Contents]											
[Course Sch	nedule	and Co	nten	ts]								
Seminars,time:	s,Eight	themes a	re pro	ovided.								
[Class requi	reme	nt]										
None												
[Method, Po	int of	view, an	d At	tainment	levels	of E	Evaluat	ion]			
Attendances ar	e requ	ested. Pre	senta	tion and dis	cussion	s are	e evalua	ted.				
[Textbook]												
									Cor	ntinue to 数理	エ学セミナー(数理)(2)	

Numbering c	ode								
Course title 最 <english> 〇]</english>	·適化(数理) ptimization				Aff de Jo	iliated partmen b title,Na	t, ime	Graduate Scho Professor,NAC Graduate Scho Professor,YAM	ol of Informatics GAMOCHI HIROSHI ol of Informatics MASHITA NOBUO
Target year	3rd year students	or above	Number	of cred	lits	2	Co yea	urse offered r/period	2019/Second semester
Day/period	Wed.2	Cla	ss style	Lecture	e			Language	Japanese
[Outline and	Purpose of	the C	ourse]						
(argorithm). The combinatorial of [Course Goa To understand	als course consi optimization. als] basic theory an	ists of id algo	rithms in co	ontinuou	eor	y and m	etho	as in nonlinear	rial optimization.
[Course Sch Fundamentals local minima, of Method of unco descent method Optimality con	edule and Co of nonlinear op convex sets and onstrained optin d, Newton#039 ditions and dua	onten timiza l funct mizations s meth ality,2t	ts] tion,2times ions, gradie on,2times,E iod, quasi-N imes,Optim	Basic n ents and Basic un Newton 1 nality co	otic Hes con metl ndit	ons in co sian ma strained hods, co tions fo	ontin atrice opti onjug r con	uous optimizat s of multivaria mization metho ate gradient mo strained optimi	ion such as global and te functions. ods such as steepest ethod. ization problems, called
Karush-Kuhn- theory. Methods of cor	Fucker condition	ons, as	well as the	second-	-ord ods	er optin of cons	nality train	 conditions an ed optimization 	d Lagrangian duality 1 such as penalty
Combinatorial problem and ki	optimization,1t napsack proble	time,T m, and	ypical com	binatoria binatoria	al oj al co	ptimiza mplexi	tion j ty.	problems such	as traveling salesman
Branch-and-bo combinatorial of Approximation	und method an optimization su algorithms,3ti	d dyna ich as l mes,A	umic progra pranch-and- pproximati	mming, -bound r on algor	2tin neth rithr	nes,Basi nod and ns for h	ic ex dyna ard c	act solution str amic programn combinatorial c	ategies for ning. ptimization problems,
and their theore Summary and	etical performative review,1time,S	nce gu umma	arantees. ry and revie	ew. Con	firm	nation o	f ach	ievement level	

[Method, Point of view, and Attainment levels of Evaluation] Based on the score of the term examination

____Continue to 最適化 (数理) (2)

最適化(数理)**(2)**

[Textbook] [Reference books, etc.] (Reference books) M. Futushima, Introduction to Mathematical Programming: New Edition (in Japanese), Asakura Shoten isbn. [19784254280043]; M. Yagiura and T. Ibaraki, Combinatorial Optimization - Metaheuristic Algorithms (in Japanese), Asakura Shoten isbn. Shoten isbn.] [4254275129]. [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours.

Affiliated 力学系の数学 Course title Graduate School of Informatic <English> Dynamical Systems Professor, YAGASAKI KAZUYUKI Job title.Nam Course offered Target year 3rd year students or above Number of credits 2 2019/First semester Dav/period Thu.3 Language Japanese Class style Lecture [Outline and Purpose of the Course] Dynamical systems represent general mathematical models such as differential equations for time-dependent henomena and a mathematical field having originated in the work of the greatest mathematician in 19th century, Poincare. Dynamical systems theory provides tools to treat nonlinear phenomena such as bifurcations and chaos, and its application range is very wide since there are numerous time-dependent phenomena in natural and social sciences. This course provides fundamentals of dynamical systems theory with a special focus on differential equations. [Course Goals] (1) To understand dynamics of differential equations and maps near neighborhoods of equilibria and fixed (2) To understand mechanisms for nonlinear phenomena such as bifurcations and chaos (3) To master fundamental techniques for dynamical systems [Course Schedule and Contents] Introduction to Dynamical Systems, 5-6times, Fundamentals of differential equations are reviewed and elementary concepts such as Poincare maps, stability, dynamics of linear systems and invariant manifolds are explained Local Bifurcations,4-5times,Bifurcations of equilibria and fixed points, center manifold reductions and normal forms are discussed. Chaos,4-5times,Horseshoe maps, homoclinic theorem and Melnikov#039s method are discussed. [Class requirement] Calculus, Linear Algebra and Differential Equations [Method, Point of view, and Attainment levels of Evaluation] Evaluation depends mainly on marks of examination, but marks of exercises and homework are taken into account when needed [Textbook] Handouts

*

[Reference books, etc.]

Numbering code

(Reference books)

 K.T. Alligood, T. Sauer and J.A. Yorke, Chaos: An Introduction to Dynamical Systems, Springer isbn{}{ 9780387946771}
 M.W. Hirsch, S. Smale and R.L. Devaney, Differential Equations, Dynamical Systems, and an Introduction

Continue to 力学系の数学(2)

力学系の数学**(2)**

to Chaos isbn{}{9780123820105} J. Guckenheimer and P. Holmes, Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vector Fields. Springer isbn{}100387008196}

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{}{0387001778}

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours

Numbering code Graduate School of Informatics 信号とシステム Course title Professor.OOTA YOSHITO departm <English> Signals and Systems Graduate School of Informatics Associate Professor, KASHIMA KENJI Job title Nan Course offered year/period Target year Brd year students or above Number of credits 2 2019/First semester Language Japanese Day/period Wed.4 Class style Lecture [Outline and Purpose of the Course] [Course Goals] [Course Schedule and Contents] 2times 3times, 2times 2times, 2times 3times 1time, [Class requirement] None [Method, Point of view, and Attainment levels of Evaluation] [Textbook] [Reference books, etc.] (Reference books) [Regarding studies out of class (preparation and review)] (Others (office hour, etc.)) *Please visit KULASIS to find out about office hours

Numbering	g code										
Course title <english></english>	連続体 Continu	力学(数 um Mech	理) anics			Aff de Joi	filiated partment b title,Na	, me	Gra Pro	aduate Scho ofessor,TAC	ool of Informatics GUCHI Satoshi
Target ye	ar Brd y	ear students of	or above	Number	of cred	lits	2	Co yea	ours ar/p	e offered eriod	2019/Second semester
Day/perio	d Tue.	2	Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd Pur	oose of t	he C	ourse]							
The lecture mechanical	on funda behavior	mental th of contin	eory c uous i	of fluid dyn media.	amics ar	nd e	lasticity	is g	giver	n as an intro	oduction to the theory of
[Course G	ioals]										
Understandi	ng the b	asic conce	pts in	fluid dyna	mics and	d ela	asticity.				
[Course S	chedul	e and Co	onten	its]							
concept of c stress,2times momentum basic equati dynamics of dynamics of compressibl basic equati ",	ontinuou s, equation ons of fl viscous invisció e fluids ons in el	s media, l ,1time, uids,2-3tin fluids,3-4 fluids,1-/ and sound asticity,2-	time, nes, ltimes 2times wave 3time	s, s, s,1time, s,							
[Class red	luireme	nt]									
analysis, lin	ear alget	ora, funda	menta	ls of dynan	nics, fun	dan	ientals o	of ve	ector	r analysis	
[Method, I	Point o	i view, a	nd At	tainment	levels	of E	Evaluat	ion]		
Evaluation i	s based	on the sco	re of e	examinatio	n.						
[Textbook]										
No											
[Referenc	e book	s, etc.]									
(Referent Introduced i	nce boo	oks) ture									
[Regardin	g studi	es out o	f clas	s (prepar	ation a	nd	review)]			
(Others (office h	our, etc.))		_						
*Please visit	KULA	SIS to find	l out a	about office	e hours.						

											~
Numbering	g code										
Course title <english></english>	Course title 計算機科学実験及演習 3 (計算機 Computer Science Laboratory and Exercised and year students or above Number of 40 Target year 3rd year students or above Number of 40 Day/period Thu3.4,5,Fri1.2,3,4,5 Class style Se Course and Purpose of the Course Se Se								Associate Professor,MATSUBARA SHIGEO Graduate School of Informatics Associate Professor,SUENAGA KOUHEI Graduate School of Informatics Assistant Professor,TXAASE HIDEKI Graduate School of Informatics Associate Professor,YAMADA MAKOTO Graduate School of Informatics Assistant Professor,OOMOTO YOSHIMASA Part-time Lecturer,TAKAGI KAZUYOSHI Part-time Lecturer,UMATANI SEIJI Part-time Lecturer, 2019/First semester		
Target ye	ear 3rd y	ear students o	r above	Number	of cred	lits	4	Co yea	urse ar/pe	e offered eriod	2019/First semester
Day/perio	d Thu.3,4	,5,Fri.1,2,3,4,5	Cla	ss style	Semina	ar				Language	Japanese
[Outline a	nd Pur	pose of t	he C	ourse]							
[Course G	ioals]										
[Course S	chedul	e and Co	onten	its]							
,15times, ,15times, ,15times, ,15times,											
[Class red	uireme	ent]									
None		-									
[Method.]	Point o	f view, ar	nd Af	tainment	levels	of F	valuat	ion	1		
[, u.					- unuu				
[Textbook	(]										
-											
[Referenc	e book	s, etc.]	_			_					
(Refere	nce boo	oks)									
L											
									Con	itinue to 計算機科	1学実験及演習 3 (計算機) (2)

計算機科学実験及演習3(計算機)(2)

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

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

										*
Numbering	g cod	de								
Course title <english></english>	計算 Logi	[と論理 ic and Compu	itation	Ļ		Affiliated departme Job title,N	nt, lame	Gra Pro	duate Scho fessor,IGA	ol of Informatics RASHI ATSUSHI
Target ye	ear	Brd year students o	or above	Number	of credit	ts 2	Co yea	ourse ar/p	e offered eriod	2019/Second semester
Day/perio	od T	ue.2	Cla	ss style	Lecture				Language	Japanese
[Outline a	nd F	urpose of t	he C	ourse]						
[Course G	Soals	š]								
[Course S	che	dule and Co	onten	ts]						
1time, 6times, 7times, 1time.										
Class rec	wire	ement]	_		_	_	_	_		
Jone	14		_							
tone										
[Method, I	Poin	t of view, a	nd At	tainment	levels o	f Evalua	ation]		
[Textbook	(]									
[Referenc	e bo	oks, etc.]								
(Refere	nce	books)								
[Regardin	g st	udies out of	clas	s (prepara	ation an	d review	v)]			
(Others (offic	e hour, etc.))		_	_				
Please visi	t KU	LASIS to find	l out a	bout office	hours.					

											*
Numbering Course title <english></english>	code 数理工: Applied	 学実験(Mathemati	数理:1 cs and	H25以前入 I Physics Lal	学者) boratory	Aff de Jol	iliated partment b title,Na	, me	Gra Ass Gra Ass Part	duate Schoo istant Profess duate Schoo ociate Profe	ol of Informatics sor,Aleksandar Shurber ol of Informatics ssor,FUKUDA HIDE
Target ye	ar 2nd y	ear students o	r above	Number	of cred	lits	2	Co yea	urse ar/p	e offered eriod	2019/Second semes
Day/perio	d Mon.3	3,4,Tue.3,4	Cla	ss style	Experi	men	t			Language	Japanese
solving. For we will tack communicat [Course G Acquire an u networks, as	of and p the purp e severation network oals] inderstation	nysicar pr pose of acc al experim vork.	uirin ent th	the fundar emes prepa nental algor rogramming	ithms ir	tenns skill: n fie n fie n the ques	s and m elds such	of op	ods o oper perat	f applied m ations researc ions researc ng such alg	the and communication or the and communication
[Course S Guidance, 1 Continuous argument, w	chedul times,E Optimiz e call the	e and Co xplanation ation,9tim e problem	onten of ex es,Gi ¹ of fir	ts] periment g ven an obje iding a valu	uideline ctive fu ie for the	nctio	on and s gument	ome	e cor tor th	nstraints that that minimize	t take a vector as an es (or maximizes) th
experiment, optimal solu observe and needed to re Discrete Opti where the fe	students tion (cal discuss ach to th imizatio asible sc	will impl- led an iter the approp is solution on,9times,0	emen ative oriater n. Comb	t a procedur method) of ness of a sol inatorial, or discrete, an	re that g a given lution d r Discre d can be	ener opt elive te, o	rates a s imizatic ered by ptimiza fined by	eque on pr their tion	ence roble r imj	of points th em. Further, plementation blems are op ombinatoria	the students should n, as well as the time ptimization problems a structures such as
orders or par efficiently u the difficulty Subset Sum Programmin	titions. ' nless one of com or Short g as one	These type e grasps the binatorial est Path pre- of the sol	es of p le stru optim robler ution	problems of acture of the nization pro ns. Further, methods fo	ten occu e proble blems th , will stu or combi	nr in m. I hrou idy nate	many a n this ex gh som and imp orial opt	treas tper e rej lem imiz	s, bu imer prese ent t zatio	t it is difficu- nt, students entative pro- he method on n problems.	ult to solve them will get familiar with blems, such as the of Dynamic
communicat communicat design meth to evaluate t design of an Confirmatio writing or th	tion networks of a network of a	vork Desi vork. Thro voice netw rmance of network u rning Ach tts of the c	gn,9ti ugh tv vork a a net inder ieven ourse	imes, As an wo simple c and a data n work as a d given const nents, 2times	applicat case stuc etwork. esign in traints. s,Provid	ion lies, Fur dica	exampl student ther, stu ttor. As edback	e of s wi iden an a to st	que ill ex its w issig tude	ung theory, plore the di ill learn hov nment, stud nts on basic	consider designing : ifferences between the w to use queuing the ents will also tackle topics such as repor
									Con	tinue 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)		
L		 	
[Class requirement]			

Acquired credits for all Basic Subjects offered by the Applied Mathematics and Physics Course.

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

Evaluation will be based on class attendance and a report for each of the class themes. The minimum passing criterion is attendance to all class sessions and submitted reports for each theme, however this does not guarantee a passing mark and obtained credit. Late arrivals, absence and report re-submission will influence negatively on the final evaluation score.

[Textbook]

An experiment manual prepared by the instructors will be distributed in class.

[Reference books, etc.]

(Reference books) Supplemental materials will be introduced if deemed necessary.

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

Pre-class preparation by reading the provided experiment manual, class notes, and other reference materials is highly recommended.

(Others (office hour, etc.))

The number of credits that students can obtain through this course has changed for students who have entered It is mandatory to attend the guidance at the first class in October.

Details of the guidance time and place will be announced in September on the notice board in front of the administration office in General Research Building 8. At the guidance, explanation about the BYOD (Bring Your Own Device) system will be given, so please

bring your PC at the guidance.

*Please visit KULASIS to find out about office hours.

												*	
Numbering	g coc	le											
Course title <english></english>	基礎 Exer	些数 tise	里演習(on Applie	数理〕 d Math	里) athematics and Physics			Affiliated department, Job title,Name			aduate Scho nior Lecturer aduate Scho istant Professo aduate Scho sistant Profe aduate Scho sistant Professor	ol of Informatics MIYAZAKI SHIYUU ol of Informatics or, KAMIOKA SHIYUUH ol of Informatics essor, TSUTSU HIROK ol of Informatics (YAMAGUCHI YOSHIYU)	JI EI JI
Target ye	ar	2nd y	ear students o	or above	Number o	of cred	lits	2	Co yea	urs ar/p	e offered eriod	2019/First semester	
Day/perio	d T	ue.3	3,4	Cla	ss style	Semina	ır				Language	Japanese	
Outline a	nd P	Purp	oose of t	he C	ourse]								
[Course G	ioals	5]											
[Course S	che	dule	e and Co	onten	ts]								
ltime,													

基礎数理演習(数理)(2)

[Class requirement]

[Textbook]

1time 1time, ltime, 1time, .1time. 1time, .1time. 1time, .1time. ,1time, ,1time, 1time, .1time.

None

[Reference books, etc.]

(Reference books)

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

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

Continue to 基礎数理演習(数理)(2)

(Others (office hour, etc.))

Numbering	g code											
Course title <english></english>	プログ Exerci	ブラミング ise on Pro;	ブ演習 grammi	(数理) ^{ng}		Aff dep Job	iliated partment p title,Na	:, me	Part-t Grad Assoc	ime Lecture luate Scho tiate Professo	r,MATSUMOTO YU ol of Informatics ør,MASUYAMA HIR	UTAKA ROYUKI
Target ye	ar 2n	d year student	s or above	Number	of credi	its	2	Co yea	urse ar/pe	offered riod	2019/First seme	ester
Day/perio	d Mo	on.3,4	Cla	ss style	Semina	r			L	anguage	Japanese	
[Outline a	nd Pu	rpose of	the C	ourse]								
practice the arrays, string method as o Applied Ma participation	fundar gs, poin ne of a themat a) will	nental syn nters, func pplication ics and Ph be introdu	tax of C tions, s exercis ysics C ced and	C language, tructures, fi ses. Besides course (may l explained	ile I/O, e s the exer not be h to have a	data tc. l cis eld a ch	Further, Further, es in the dependition to	ope the cla ling cha	rators y will uss, th on ci llenge	s, condition l study the le ldquoPro rcumstanc e more adv	nal statements, lo computer simula ogram Contest of es)rdquo (arbitrar vanced programm	ops, tion the y iing.
ICourse G	ioals]											-
Acquire the	knowl	edge and s	skills of	programm	ing to be	abl	le to ma	ke a	n prog	ram (or so	urce code) as one	
wants when	seekin	g a solutio	on in an	y field of th	he applie	d m	athema	tics	and p	physics by	computer program	nming
[Course S	chedu	ule and C	Conten	ts]								
Guidance,1t	ime,Ex	planation	of exer	cise guidel	ine and h	low	to prog	ress	with	programn	ning.	
Fundamenta	ls of C	,9times,Pi	ractice of	of C syntax	from da	ta ty	pes to	file	I/O th	rough the	textbook.	
Simulation 1	Method	1,2times,H	low to r	nake simula	ation pro	gra	ms by u	sing	g rand	lom numbe	er generators, Mo	nte
Carlo metho	d, Run	ige-Kutta i	method	, etc.						. Satur da a		
Program Co	ntest,2	times,Exp	lanation	n of this yea	arrsquos Confirm	con	test the	me a	and it	s introduct	fory exercise.	
comminatio		annig Ac	lineven	ients, runne	,comm	i uic	e actilev	mg	level	or program	inning abinty.	
[Class rec	luiren	nent]										
None												
[Method, I	Point	of view,	and At	tainment	levels o	of E	valuat	ion]			
Evaluation v attendance v evaluation s	vill be vill be core.	based on s emphasize	submitt ed, and	ed program late arrival,	is (source , absence	and	des) for d early	709 leav	% and e will	l a report f l influence	or 30%. Class negatively on the	e final
[Textbook]											
「やさしく	学べる	ら C言語入	門[第	[2版]」(皆本晃	弥著	音, サ1		ンス	社,2015) isbn{}{	
9784781913	599}											
												(<u>-</u>)
									Cont		/ フミノワ 演習 (釼理)	(2)

ж.

	プログラ	ミング演習	(数理)	(2)
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[Reference books, etc.]

(Reference books) None

(Related URLs)

(URL: Program Contest of the Applied Mathematics and Physics Course

http://infosys.sys.i.kyoto-u.ac.jp/~contest/)

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

Students will be asked to prepare specified pages of the textbook every time.

(Others (office hour, etc.))

The attendance of guidance is requisite for taking this class. Each student is required to have obtained an ECS ID (account for the education computer system) and the textbook by the start of the class.

*Please visit KULASIS to find out about office hours.

Target year 3rd Day/period Wee [Outline and Pui The numerical appr mathematics. In this executing the progr [Course Goals] We will learn funda obtaining the follow (1) Understanding a (2) Coding techniqu (3) Methodology of (4) Writing ability. [Course Schedu Week 1, Guidance a (a) We will expla- assistants. We will 1 (b) We will study Week 2-5 Numerica (a) Trapezoidal rr (b) Markov Chai Week 6-10 Diffusio We will study an equation and a reace	ind year students of /ed.3,4 urpose of f urpose of f proach with his exercise, grams, and ir grams, and ir ig diadamental tec owing four te g algorithm f igues of data analy y. dule and CC e and "How to plain contents Il further exp	or above Number Class style the Course] computers is use we will learn nu therpreting result chniques for num echniques. for numerical and /sis ontents] to write an effect s of exercises on	of credits Seminar ful when we merical meth is. erical analysi ulysis	2 Cou year	rse offered /period Language I problems in i implementing uters. Specific	2019/First seme Japanese informatics and a computer codes, ally, we aim at
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数値計算演習(数理)(2)

[Class requirement]

Under the UNIX operating system, students have to edit a file, code and test C programs, make reports and graphs, and print them. BYOD.

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

The students MUST submit all the reports for all subjects. The grading will be done based on the total scores of reports.

[Textbook]

Instructed during class

[Reference books, etc.]

(Reference books)

Introduced during class

[Regarding studies out of class (preparation and review)] Students need to prepare by exercise documents.

(Others (office hour, etc.))

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Target ye	ar 3rd y	ear students o	r above Number	of cred	lits 2	Cour year/	se offered period	2019/Second semester
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						· (ontinue to システム]	字実験(最佳H25以前人学者)(2)

ィステム工学実験(数理:H25以前入学者)(2)	
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[Class requirement]

Students are supposed to have the knowledge of Introduction to Systems Analysis (90070) and take the course of Linear Control Theory (90720).

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

Class participation and reports are mainly evaluated. Attitude, Creativeness, and Individual work and group vork are also important during the evaluation process

[Textbook]

Each instructor will distribute his own text when necessary.

[Reference books, etc.]

(Reference books)

Doyle, Francis and Tannenbaum: Feedback Control Theory, Prentice Hall (1992) isbn{}{0023300116} Ljung: System Identification, 2nd edition, Prentice Hall (1998) isbn{}{0136566952}

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

Students have to prepare for presentations and reports for each subject.

(Others (office hour, etc.))

It is recommended to take the course Linear Control Theory (90720) for third-year students and take the courses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Under the BYOD policy of Kyoto University, students have to bring their own device in order to participate in classes

*Please visit KULASIS to find out about office hours

Numbering code Affiliated 物理統計学(数理) Course title Graduate School of Informatics Job title,N <English> Statistical Physics Professor, UMENO KEN Course offered Brd year students or above Number of credits Target year 2019/First semester riod vear/p Class style Dav/period Thu.2 Lecture Language Japanese [Outline and Purpose of the Course] Probability theory, statistical mechanics, and theory of stochastic processes are explained as methods to investigate systems with many degrees of freedom. Technics for describing dynamics, and fluctuation in equilibrium or stationary systems and some topics for nonequiliburium systems are explained. [Course Goals] To gain firmly the fundamental skills for understanding various phenomena with the use of probability theory and stochastic process. [Course Schedule and Contents] Fundamentals of probability and entropy,3times,Continuous and discrete stochastic variables are introduced and entropy, KL entropy and mutual information are explained. Fundamentals of statistical mechanics, 3 times, Fundamentals of thermodynamics are reviewed and statistical mechanics is formularized with the maximum entropy principle. Applications to ideal gases and spin systems are explained. Stochastic processes and random walks, 3times, Stochastic processes, especially Markov processes are explained. As examples, Gauss process, Poisson process, Wiener process and random walks are explained. Langevin equaitons and Fokker-Planck equations, 3times, Brownian motion is introduced as an example of Langevin equations. Derivation of Fokker-Planck equations from Langevin equations are described and several applications of both equations are explained. Some topics for nonequiliburium systems, 2times, We explain some topics chosen from entropy production in relaxation processes from nonequiliburium states to equilibrium states, the linear responce theory, the fluctuation theory, thermal excitation, diffusion and so on [Class requirement] Fundamentals of calculus and linear algebra [Method, Point of view, and Attainment levels of Evaluation] Based on quizzes and the semester final exam [Textbook] None [Reference books, etc.] (Reference books) To be announced in the lecture

[Regarding studies out of class (preparation and review)] Reviews through solving the assigned quizzes are expected (Others (office hour, etc.))

According to progress of the lecture, some topics may be omitted or added.

*Please visit KULASIS to find out about office hours

* Numbering code ∆ffiliated 確率離散事象論 Course title Graduate School of Informatics departm <English> Stochastic Discrete Event Systems ssociate Professor.MASUYAMA HIROYUK Job title.Nam Course offer Target year Brd year students or above Number of credits 2019/First semester Dav/period Tue.2 Class style Lecture Language Japanese [Outline and Purpose of the Course]

In the analysis of stochastic discrete event systems, the theoretical results on Markov chains are useful nathematical tools. This course covers the fundamental results of Markov chains and their applications to anking/rating methods and to the analysis methods of basic queuing models.

[Course Goals]

This course aims to deepen the understanding of the fundamental results of Markov chains and their applications

[Course Schedule and Contents]

Outline of this course and review of fundamental notions, 1?2times, The contents of this course are outlined. Furthermore, basic notions, such as random variables, probability distributions and generating function nethods, are explained.

Discrete-time Markov chains,3?4times,The discrete-time Markov chain is introduced. Topics include the basic notions of the Markov chain, such as irreducibility, period, and recurrence, as well as the condition for the existence of its stationary and limiting distribution

Markov methods for ranking/rating,2 ~ 3times, Markov methods for ranking/rating are lectured, focusing on

the group of web pages. Continuous-time Markov chains,3 ~ 4times,The Poisson process and continuous-time Markov chain are introduced. Furthermore, the properties of a birth-and-death process (a special case of the continuous-time

Markov chain) are explained, together with the derivation of its stationary distribution. Exponential-type queueing models, 2 ~ 3times, Exponential-type queueing models (which are reduced to birth-and-death processes) are lectured, focusing on the derivation of their performance measures, such as the stationary queue length distribution and the waiting time distribution

[Class requirement]

Background knowledge on probability and statistics is helpful to learn this course but it is not prerequisite.

[Method, Point of view, and Attainment levels of Evaluation] Based on the scores of the term examination

[Textbook]

Handouts are provided.

[Reference books, etc.]

(Reference books) P. Bremaud, Markov Chains: Gibbs Fields, Monte Carlo Simulation, and Queues, Springer, 1999. isbn{}{

Continue to 確率離散事象論(2)

確率離散事象論(2)

1		1
	9780387985091}	
	L. Kleinrock, Queueing Systems Vol.1, John Wiley and Sons, 1975. isbn{}{9/804/1491101}	
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[Regarding studies out of class (preparation and review)]

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

データベース(計算機)**(2)**

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

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

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2002. isbn{}{ J.D.Ullman: F	978007246563 rinciples of Da	1} tabase and Know	ledge-ba	ise S	ystems	Vol	l.1,C	omputer Sc	cience Press, 1988 isbn
Hector Garcia	}. -Molina, Jeffre	y D. Ullman, Jen	nifer Wi	don	: Datab	base	Syst	ems: The C	Complete Book, Pearson
2nd Internatio	nal, 2008. isbn	{}{97801313542	89} isbn	{}{	978013	1873	3254	}	
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(Reference books) an Sommerville: quotSoftware Engineering 10th Editionquot, Pearson, 2016. isbn{}{9780133943030} Regarding studies out of class (preparation and review)] Cothers (office hour, etc.)) Please visit KULASIS to find out about office hours.	Reference b	ooks, etc.]
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コンピュータネットワーク**(2)**

[Reference books, etc.]

(Reference books)

Norio Shiratori (ed.): Information Network (Kyoritsu) isbn{}{9784320123038} Katsuo Ikeda (ed.): Computer networks (Ohmsha) isbn{}{4274132226}

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

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ering, and information retrieval for structured data.

. Web analysis (2 classes)

These lectures describe analysis techniques for graph structures of Web data. Taken up especially as
Continue to 情報システム (計算機) (2)

情報システム(計算機)**(2)**

representative analysis methods are PageRank, Topic-Specific PageRank, TrustRank, HITS, SimRank, etc.

6. 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.

7. 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 techniques 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 treestructured data. Differences between the expressive power of each language are explained.

8. Feedback (1 class)

Evaluation is made of the extent of learning achieved in the course.

[Class requirement]

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.

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

Evaluations will be made based on the scores of the final examination, which examine if the students understand 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 semistructured data used in Web information systems.

[Textbook]

Lecture notes will be used as teaching materials.

[Reference books, etc.]

(Reference books) Introduced during class

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

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.

∮報システム(計算機) (3)
Others (office hour, etc.))
office hours are available with prior confirmation. Please use the following e-mail addresses to schedule an
ppointment.
ıjima@i.kyoto-u.ac.jp
Please visit KULASIS to find out about office hours.

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Target ye	ear	lst year s	students o	r above	Number	of cred	lits	2	Cours year/p	e offered eriod	2019/First semes		
Day/peric	d 1	ue.2		Cla	ss style	Lecture	e			Language	Japanese		
[Outline a	Ind F	Purpos	se of t	he Co	ourse]								
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Target ye	ar 1st ye	ear students o	r above	Number	of cred	lits	2	Coi yea	rse offered r/period	2019/First semester	
Day/perio	d Wed.	5	Cla	ss style	Lectur	e			Language	Japanese	
[Outline a	nd Purp	oose of t	he C	ourse]							
Introduction	to Comp	puter Scie	nce.								
[Course G	oals]										
[Course S	chedul	e and Co	onten	its]							
Introduction	,1time,										
Fundamenta	ls of con	nputer sci	ence,3	3-4times,							
Computer sy	stems,6	7times,									
Informatics a	and AI,3	-4times,									
Examination	amp rev	/iew,1tim	e,								
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Target ye	ar	1st ye	ear students of	or above	Number	of cred	lits	2	Co yea	ourse offered ar/period	2019/Second semester	
Day/perio	d I	Mon.	1	Cla	iss style	Lecture	e			Language	Japanese	
[Outline a	nd	Purp	oose of t	he C	ourse]							
Algorithms and data structures are two fundamental components of computer programs. This course gives their basic concepts, design principles, techniques, and other important concepts in computer science.												
[Course Goals]												
The goals of complexity, conquer met ideas of graj	The goals of the course is to understand: - mathematical models of computers and concepts of computational complexity, - basic algorithms and data structures, - design principles of algorithms, such as divide-and- conquer method and dynamic programming, - classes of hard problems and solutions to them, and - basic ideas of graph algorithms, approximation algorithms, and online algorithms.											
[Course S	che	dule	e and Co	onter	nts]							
algorithms,2 data structur algorithm de graph algori maximum-fl computation advanced to final exam,1	5tin es,2 esign thm low nal c pics time	mes,s 5tim n,2tim s,2tir algor ompl ,1tim e,	sorting, se nes,list, st nes,divide mes,- Tree rithms lexity,3tir ne,approxi	arch, ack, q 2-and 25 and nes,P, imatic	 [ueue, binar conquer, dy l graphs - de , NP, NP-co on and onlin	y search ynamic p epth-/bre omplete, ne algori	ı, he prog eadtl NP- thm	ap, hash rammin h-first so -hard, s	n, Ig, earc	 h - shortest patl	n algorithms -	
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[Outline an	d F	Purpose of t	he C	ourse]									
his lecture introduces basic technologies of artificial intelligence. Topics will be selected from search, achine learning, and real-world agent.													
[Course Goals]													
Learning the concept of artificial intelligence and the basic models and algorithms of search, machine earning, and real-world agent.													
[Course So	he	dule and Co	onten	its]			_						
Machine Lea reinforcemen are also intro Real-world a; perception an introduced. Achievement [Class requ None	niso rnir t lea duc gen d ro lev uire	nitroduced. ng,7-8times,In arning, deep l ed. t,3-4times,Int pobotics, and p vel check,1tim	trodu earnir roduc robab e,Che	cing decision ng, etc. App ing AI techni ilistic reaso tecking the a	on tree les lications niques fo ning ove chieveme	arn of or q er til	ing, per- machine uotunce me. App level	ceptron e learni rtainqu olication	, SVM, gen ng techniqu ot situation, ns of AI for	etic algorithm, es such as data mining including basic robotics are also			
[Method, P	oin	nt of view, a	nd At	tainment	levels c	of E	Evaluat	ion]					
By reports an	d a	final examina	tion.										
[Textbook]													
Materials wil	l be	distributed.											
[Reference	bc	ooks, etc.]											
(Reference books) S. Russell and P. Norvig, Artificial Intelligence A Modern Approach (3rd.ed.), Prentice Hall, 2010 isbn{}{ 9780136042594}.													
[Regarding studies out of class (preparation and review)]													
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Target ye	ar Brd	year students of	or above	Number	of cred	lits	2	Co ye	ours ar/p	e offered eriod	2019/Second semester		
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This lecture model, usab	This lecture introduces basic concepts and methods of interaction design. Topics will be selected from user model, usability analysis, experiment and evaluation, and design process.												
[Course G	ioals]												
Learning the concepts and methods of interaction design, including user model, usability analysis, experiment and evaluation, and design process.													
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Target ye	ar	4th year students o	r above	Number	of cred	lits	2	Co yea	ourse offere ar/period	d	2019/First semester
Day/perio	d	Tue.4	Cla	ss style	Lecture	e			Langua	ge	Japanese
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See Japanes	e pa	ge for details.									
[Course S	che	edule and Co	onten	ts]							
Neural infor Visual infor Visual attent Cognitive fu Overview of Sequence an Inference of Hidden Mari Analysis of Scale-free ne Feedback, 1	mat mat ion inct bic aly phy kov prot etwo	ion processing, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2times, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2time, ,2ti	in bra 2time ime, s,2tim 1time,	ain,1time, s, es,							
[Class req	luir	ement]									
Basic knowl	edg	e related to bio	logy	and brain s	cience w	/ill t	pe provi	ded	in the cours	e.	
[Method, I	Poi	nt of view, ar	nd At	tainment	levels	of E	Evaluat	ion]		
See Japanes	e pa	ge for details.						_			
Not used											
[Reference	e b	ooks, etc.]									
(Reference books) Textbooks or recommended books will be informed in the course as required. The latter part of the course, a recomended 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).											
[Regardin	g s	tudies out of	clas	s (prepar	ation a	nd	review)]			
See Japanes	e pa	ge for details.									
(Others (offi	ce hour, etc.))								
The oder and	d co	ntents of the co	ourse	topics can	be chang	ged.					
*Please visit	KI	ILASIS to find	l out a	bout office	e hours						

Numbering	g cod	le										
Course title <english></english>	Course title ビジネス数理(数理) denglish> Business Mathematics Affiliated department, Business Mathematics Course offered											
Target ye	ar	4th yea	ar students	or above	Number	of cred	its	2	Co yea	ourse offered ar/period	ł	2019/First semester
Day/perio	d M	lon.3	;	Cla	ss style	Lecture				Languag	ge	Japanese
[Outline a	nd P	urp	ose of	the C	ourse]							
the contemp accounting, mathematica	orary risk 1 al eng	soci mana ginee	iety. I in gement, ring are	troduc Ramp used i	b of the set of and mar n the phase	heories a heories of keting. 1 of vario	of the Mor	e busine eover, h decision	ess s ow ma	strategy inclu the technique kings of the	din e ar bus	d the idea of iness.
The target o	f the	class	is to ob	tain ei	nough knov	vledge a	bou	t an outl	ine.	a vital point	of	the business strategy
and the effect	ctiver	ness	of mathe	ematic	al methods						-	85
[Course S	che	dule	and Co	onten	ts]							
Business ris Summary ar [Class rec	k mai nd rev quire	nage view, mer	nent,2ti 1time,S	mes, umma	ry and revi	ew; Con	firm	nation of	faci	hievement lev	vel.	
None												
[Method, I	Poin	t of	view, a	nd At	tainment	levels	of E	Evaluat	ion]		
Written exa	minat	tion ((70%),	and a	ttendance a	ind the c	lass	particip	atic	on (30%)		
[Textbook	(]											
Prints are di	stribu	ited (every lea	cture.								
[Referenc	e bo	oks	, etc.]									
(Referei	nce l	bool	(S)									
[Regardin	g sti	udie	s out o	f clas	s (prepar	ation a	nd	review)]			
Since prints	are d	listril	buted 1,2	2 week	s before th	e lecture	,rea	d them	befo	orehand.		
(Others (offic	e ho	our, etc	.))								
*Please visit	t KUl	LAS	IS to fin	d out a	bout office	e hours.						

パターン認識と機械学習(2)

<u>----</u> [Textbook] Lecture slides are provided via PandA CMS.

[Reference books, etc.]

(Reference books)

[Regarding studies out of class (preparation and review)] Excersize included in lecture slides

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

Numberin	g code												
Course title <english></english>	パター Pattern	·ン認識と n Recogniti	機械 [:] on	学習		Aff dej Jol	iliated partment b title,Na	t, me	Gra Pro	duate Scho fessor,KAV	ol of Informatics VAHARA TATSUYA		
Target ye	ar 3rd	year students	or above	Number	of cred	lits	2	Co yea	ourse ar/pe	e offered eriod	2019/Second semester		
Day/perio	d We	d.2	Cla	iss style	Lecture	e				Language	Japanese		
[Outline a	nd Pu	rpose of t	he C	ourse]					_				
This course provides foundations of modeling and systems, which extract useful information for classification and prediction from real-world data. It covers a variety of machine learning techniques oriented for pattern recognition.													
[Course Goals]													
to master ba to be able to	to master basic approaches and major techniques of machine learning. to be able to design a system for pattern classification and recognition.												
	-	, 				_		_	_				
[Course S	cheau	le and Co	onter	itsj									
 Discrimir Discrimir Obiscrimir Clustering DP match Bayes cla Naive Ba Perceptro Neural ne Support Statistic Maximu Deep lea Examina [Class records)	ant fun lant fun ant fun g and G ing and ssificat yes clas n learni twork vector al featu m likel urning(1 arning(2 ation an	ction and r ction based aussian mi l HMM (cl isin sifier and l ing of discr machines (re extractic ihood estin l) 2); Pattern n d Feedback	nachii 1 on C xture assific imina SVM on nation recogn	ne capacity Jaussian dis model :ation of sec ic regressior int function) i and regular nition syster	atributior quential n model rization ms	n patt	erns)						
None	Juneti	ong											
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[Method,	Point	of view, a	na A	ttainment	leveis		valuat	1011	IJ		11. The discourse		
		u on uie ca			/ing uic -					ripue to 18	vided in the course.		
									CO	ntinue to バタ	ーノ認識と懱槻子首(2)		

Numbering	g cod	e											
Course title <english></english>	purse title English> 非線形動力学(数理) Nonliner Dynamics Affiliated department, Job title, Name Graduate School of Informatics Professor, AOYAGI TOSHIO												
Target ye	ar	Brd year students o	r above	Number	of cred	its	2	Co yea	urse ar/p	e offered eriod	2019/First semester		
Day/perio	d Fi	ri.3	Clas	ss style	Lecture	•				Language	Japanese		
[Outline a	nd P	urpose of t	he Co	ourse]									
		-											
[Course G	ioals	1											
[Course S	chec	dule and Co	onten	ts]			_						
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3times.													
3times,													
2times,													
2times,													
2times,													
,1time,													
[Class red	quire	ment]											
None													
[Method,]	Poin	t of view, ar	nd At	tainment	evels	of E	valuat	ion	1				
[Textbook	d]												
[Referenc	e bo	oks, etc.]											
(Refere	nce k	oooks)											
[Regardin	g stu	udies out of	i clas	s (prepara	ation a	nd ı	review)]					
(Others (offic	e hour, etc.))										
*Please visi	t KUI	ASIS to find	l out a	bout office	hours.								

Numbering c	ode											
Course title ブ <english> In</english>	ログ troduo	ラミング xtion to Pr	入門 rogran	nming		Aff dej Jol	iliated partment b title,Na	, me	Gra Pro	duate Scho fessor,IGAl	ol of Informatics RASHI ATSUSHI	
Target year	1st y	ear students o	or above	Number	of cred	its	2	Co yea	urse ar/p	e offered eriod	2019/First semester	
Day/period	Thu.	1	Cla	ss style	Lecture	e				Language	Japanese	
[Outline and	Pur	oose of t	he C	ourse]								
[Course Goa	als]											
[Course Sch	edul	e and Co	onten	its]								
,lume, ,2times, ,2-3times, ,2-3times, ,2-3times, ,2-3times, ,1time, [Class requi None [Method, Po	reme	nt] f view, a	nd At	ttainment	levels	of E	Ēvaluat	ion]			
[Textbook]						_			_			
[
[Reference I	book	s, etc.]										
(Referenc	e boo	iks)										
[Regarding	studi	es out o	f clas	s (prepar	ation a	nd	review)]				
(Others (of	ice h	our, etc.	.))									
*Please visit K	ULA	SIS to find	l out a	about office	e hours.							

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Numbering	g cod	de									
Course title <english></english>	数珇 App	L工学実験(lied Mathemati	数理:1 cs and	H26以降入 l Physics Lab	学者) boratory	Aff de Jol	iliated partment b title,Na	, me	Grad Assis Grad Asso	duate Schoo stant Profess duate Schoo ociate Profes time Lecturer	ol of Informatics or,Aleksandar Shurbevsk ol of Informatics ssor,FUKUDA HIDEM MATSUMOTO YUTAKA
Target ye	ar	2nd year students o	r above	Number of	of cred	its	4	Co yea	ourse ar/pe	offered eriod	2019/Second semester
Day/perio	od M	ion.3,4,Tue.3,4	Cla	ss style	Experin	men	t		I	Language	Japanese
[Outline a	nd F	Purpose of t	he C	ourse]							

Applied mathematics and physics as an academic discipline gives a theoretical interpretation and explanation to the behavior and physical phenomena of various systems around us, and provides a means of problem solving. For the purpose of acquiring the fundamental skills and methods of applied mathematics and physic ve will tackle several experiment themes prepared from fields such as operations research and ommunication network.

[Course Goals]

Acquire an understanding of fundamental algorithms in the fields of operations research and communication networks, as well as acquire basic programming techniques for implementing such algorithms, perform experiments, and analyze experiment data to draw conclusions and insights.

[Course Schedule and Contents]

Guidance, Itime, Explanation of experiment guideline. \\ Explanation about the BYOD (Bring Your Own Device) system will be given, so please bring your PC at the guidance.

Continuous Optimization.9times.Given an objective function and some constraints that take a vector as an argument, we call the problem of finding a value for the argument vector that minimizes (or maximizes) the value of the objective function under the given constrains an ldquoOptimization Problemrdquo. In this experiment, students will implement a procedure that generates a sequence of points that converge to an optimal solution (called an iterative method) of a given optimization problem. Further, the students should bserve and discuss the appropriateness of a solution delivered by their implementation, as well as the time needed to reach to this solution.

Discrete Optimization,9times,Combinatorial, or Discrete, optimization problems are optimization problems where the feasible solution space is discrete, and can be defined by some combinatorial structures such as orders or partitions. These types of problems often occur in many areas, but it is difficult to solve them efficiently unless one grasps the structure of the problem. In this experiment, students will get familiar with he difficulty of combinatorial optimization problems through some representative problems, such as the Subset Sum or Shortest Path problems. Further, will study and implement the method of Dynamic

Programming as one of the solution methods for combinatorial optimization problems. Communication Network Design,9times,As an application example of queuing theory, consider designing a communication network. Through two simple case studies, students will explore the differences between the design methods of a voice network and a data network. Further, students will learn how to use queuing theory to evaluate the performance of a network as a design indicator. As an assignment, students will also tackle the lesign of an optimal network under given constraints Confirmation of Learning Achievements. 2 times. Provide feedback to students on basic topics such as report

vriting or the contents of the course.

数理工学実験(数理:H26以降入学者)(2)

[Class requirement]

*

Acquired credits for all Basic Subjects offered by the Applied Mathematics and Physics Course,

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

Evaluation will be based on class attendance and a report for each of the class themes. The minimum passing criterion is attendance to all class sessions and submitted reports for each theme, however this does not guarantee a passing mark and obtained credit. Late arrivals, absence and report re-submission will influence egatively on the final evaluation score.

[Textbook]

An experiment manual prepared by the instructors will be distributed in class.

[Reference books, etc.]

(Reference books) upplemental materials will be introduced if deemed necessary.

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

Pre-class preparation by reading the provided experiment manual, class notes, and other reference materials is highly recor nended

(Others (office hour, etc.))

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It is mandatory to attend the guidance at the first class in October.

Details of the guidance time and place will be announced in September on the notice board in front of the administration office in General Research Building 8.

At the guidance, explanation about the BYOD (Bring Your Own Device) system will be given, so please bring your PC at the guidance.

*Please visit KULASIS to find out about office hours

<english></english>	計算 Cor	章機の構 nputer or	巻の構成 uter organization				Affi dep Job	illated bartment b title,Na	, me	Gra Pro	duate Scho fessor,TAK	ool of Informatics KAGI NAOFUMI				
Target year Ind year students or above Number of credits 2 Courses											e offered eriod	2019/Second semest				
Day/perio	d \	Wed.2		Clas	ss style	Lecture	e				Language	Japanese				
This course instructions hierarchy an	pres of co nd I/O	ents an c omputers O of com	overview s, compu nputers.	v stu uter	dy of the b arithmetic	asic org , how to	aniz desi	ation of gn simp	f con ple c	npu com	ters and the puters, and	ir operation principles overview of memory				
principles. 2. Students 3. Students 4. Students 5. Students	will will will will	understa: understa: understa: understa:	nd and t nd and t nd and t nd and t	be to be al be al be al	explain in ble to expla ble to expla ble to expla	 Students will understand and be able to explain basic organization of a computer and its operation principles. 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 computers. 										
[Course Schedule and Contents]																
Basic computer organization and its operation principles (2 classes) Students will learn about basic computer organization and its operation principles, as well as performance																
Basic comp Students wil evaluations.	uter (ll lea	edule ar organiza arn about	tion and basic c	ten i its omp	ts] operation j outer organ	principle ization a	es (2 and i	classes ts opera) ation	ı pri	nciples, as	well as performance				
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Basic comp Students wil evaluations. Instructions Students lea Computer au Students lea Design of si Students lea	of co rn at rithn rn at mple	edule an organiza irrn about omputers bout instri- netic (3 c bout com- e process esign me	tion and basic co s (5 clas ructions classes) nputer an sors (3 c ethods of	tent d its comp sses) s of c class f sin	ts] operation p outer organ computers. netic and f es) nple proces	orinciple ization a loating-j	es (2 and i	classes ts opera t arithm) ation	ı pri	nciples, as v	well as performance				
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term-end examination of 80% or higher on
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Course title englishb 情報符号理論 Information and Coding Theory Affiliated department, Job title,Name Graduate School of Informatics Professor,NISHIDA TOYOAKI 2019/First seme Target year Ind year students or above Mon.1 Number of credits 2 Course offered year/period 2019/First seme Day/period Mon.1 Class style Lecture Language Japanese [Outline and Purpose of the Course] This course information theory, an foundation for reliable information transmission and stor. We elaborate on source and channel models, source and channel coding, quantitative measure of inform and entropy, and coding theory. Information formation theory, and coding theory. [Course Goals] Students will be able to understand and apply basic concepts and principles of information theory. Information source. Introduction, Itime.I briefly overview the history, goal, techniques and applications of information theory. Coling and its Limitation, Stimes,I introduce source coding, Markov sources, the source coding theorem, and entropy of information source. Channel Coding and its Limitation, and mercel aborate on mutual information and entropy, channel capa maximum likelihood decoding, random coding, and the channel coding theorem. Coding Theory,4times,Following a general introduction to coding theory. I describe parity codes, Hame codes, cyclic codes, and BCH codes. Feedback, Itime,I will answer questions arising from the lecture and advise on further learning. [Class requirement] None <tr< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr<>														
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Day/period Mon.1 Class style Lecture Language Japanese JOutline and Purpose of the Course] This course introduces information theory, an foundation for reliable information transmission and stor. We elaborate on source and channel models, source and channel coding, quantitative measure of inform and entropy, and coding theory. Image: Comparison of the Course of theory. Journal entropy, and coding theory. Image: Comparison of the course of the course. Coding and its Limitation, ftimes, I elaborate on mutual information and entropy of the code	Target ye	ear 2	2nd yea	r students	or abov	Numb	er of cre	dits	2	Cou yea	rse /pe	e offere eriod	d	2019/First ser
[Outline and Purpose of the Course] This course introduces information theory, an foundation for reliable information transmission and stor. We elaborate on source and channel models, source and channel coding, quantitative measure of inform and entropy, and coding theory. [Course Goals] Students will be able to understand and apply basic concepts and principles of information theory. [Course Schedule and Contents] Introduction, Itime, I briefly overview the history, goal, techniques and applications of information theors Source Coding and its Limitation, Stimes, I introduce source coding, Markov sources, the source coding theorem, and entropy of information source. Channel Coding and its Limitation, 4times, I elaborate on mutual information and entropy, channel capa maximum likelihood decoding, random coding, and the channel coding theorem. Coding Theory, 4times, Following a general introduction to coding theory. I describe parity codes, Hami codes, cyclic codes, and BCH codes. Feedback, Itime, I will answer questions arising from the lecture and advise on further learning. [Iclass requirement] None [Method, Point of view, and Attainment levels of Evaluation] Credit will be awarded based on a final written examination and one or more mini-tests. [Reference books, etc.] [Reference books, etc.] (Reference books, etc.]	Day/perio	d M	lon.1		Cla	ass style	e Lectu	re				Langua	ige	Japanese
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Numbering c	ode										
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Target year	Target year 2nd year students or above Number of credits 2 Course offered year/period 2019/First semester										
Day/period	Wed.1	Class style	Lecture			Language	Japanese				
[Outline and	Purpose of	the Course]									
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[Course Goa	lls]										
 basic way of analysis met principles of principles of basic princip 	thinking and p hod of simple e active compor amplifier circu le of digital ele	principles of electric electric circuits co lents such as diod lits and oscillation ectronic circuits.	ric circuit, onsisting of es and tran n circuits e	power s sistors, mploying	applies gactive	and passive	components, s, and				
[Course Sch	edule and C	ontents]									
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 Digital electric Semiconduction 	onic circuit ((3 times) tent									
					c	ontinue to T	。 氦電子回路入門(2)				

電気電子回路入門()	2)
Semiconductor los	
 Digital interface ci 	ircuit
6. Feedback (1 time)	
• Q&A	
[Class requireme	nt]
To know high scho	bol level knowledge of electric circuit, and
To understand sim	ple differential and integral calculus.
[Method, Point of	view, and Attainment levels of Evaluation]
The achievement wil	l be evaluated through submission of exercises given in the class (20%), submission of
report assignments (2	20%) and the result of final examination(60%).
[Textbook]	
Susumu Sugiyama, K	Katsuhiko Tanaka, Satoshi Konichi ^P Electric and Electronic Circuit - Analog and
Digital Circuit - (In J	apanese) (CORONA PUBLISHING CO., LTD.) ISBN:9784339045130
[Reference books	s etc.]
(Poforonoo hoo	(; c:c:]
(Reference boo	K3)
[Regarding studie	es out of class (preparation and review)]
Preparation, review a	nd assignment will be given by each lecturer in the class.
(Others (office h	our, etc.))
*Please visit KULAS	SIS to find out about office hours.

計算機科学のための数学演習**(2)**

_ _ _ _ [Textbook]

[Reference books, etc.] (Reference books)

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

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

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Numbering	g co	de				_			-		
Course title <english></english>	se title 計算機科学のための数学演習 Mathematics in Practice for Computer Science Affiliated department, Job title,Name Craduate School Associate Professo Graduate School Assistant Professo Graduate School									ol of Informatics sor,SUENAGA KOUHE ol of Informatics or,KOBAYASHI YASUAE	
Target ye	at year 2nd year students or above Number of credits 2 Course offered year/period 2019/First semester										
Day/perio	d 1	ſhu.4	Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd F	Purpose of t	he C	ourse]							
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									Co	ntinue to 計算機	戦科学のための数学演習(2)

Numbering co	de											
Course title シン <english> Sy:</english>	ステム stem	A工学実験 Analysis 1	1號(数理:H26以降入学者) is Laboratory			Aff de Jo	filiated partment b title,Na	t, ime	Graduate School of Informatics Assistant Professor,LIU YAN Graduate School of Informatics Assistant Professor,OOKI KENTAROU Graduate School of Informatics Assistant Professor,NIINO KAZUKI			
Target year	Fraget year Brd year students or above Number of credits 4 Course offered year/period 2019/Second semester											
Day/period	Thu.3	,4,Fri.3,4	Cla	ss style	Experi	mer	nt			Language	Japanese	
[Outline and	Purp	oose of t	he C	ourse]								
making students different real sy Pendulum. Stud experiments. To three groups du	s have stems ents ents expe	e a solid g s. Three r will maste erience th he Guidar	rasp of eal system of the e cont nce cl	of systems e stems are A control met trol of all th ass.	engineer ctive Si hods th ree diff	ring ilenc roug eren	through cer, Flex gh the co it systen	the tible ompu	appl -Linl uter s	lication of t k Manipula simulation h, students v	heir knowledge to three tor, and Inverted and the pilot will be divided into	
[Course Goa	ls]											
Analyses of r System stabil To obtain the pr consideration of To precisely exp	espor izatio actic the press	nses and s on and opt al solution gap betwe own unde	tabilit imal o n to th en the erstan	ties control he problem t eory and pra ding of the	through actice, a experim	the and a nents	observa indersta s throug	ition indin h pro	of th ng the esent	he behavior e feature of tations and	of the real system, the the systems. reports.	
[Course Sch	edule	e and Co	onten	its]								
Guidance, Itime Active Silencer programming[\ Scilab is used. Flexible-Link N identification[\] The specialized Inverted Pendul Controller by st optimal control MATLAB/SIM	,Intro 9time 3. Ex Ianip 2. Tra softv um,9 ate sp meth ULIN	oduction of periment/ ulator,9tin acking ste vares Scil times,1. N pace repre od/\ 5. Sv VK are use	of topi oduction (4. A) mes,1 p sign ab and Mecha sentation vingin ed.	ics and Grou on to princi nalyses on r . A recursiv hals\\ 3. Two d MATLAE unical mode tion\\ 3. Infe g up of invo	up divis ple of a respons e estima o-degree 8/SIMU l of inve erence o erted pe	ion ctive e in ation e-of LIN erteo of sta	e slience time an n of free- freedor IK are u l pendul ate varia lum\\ *7	er\\ 2 d fre quene n con sed. lum a ables The s	2. Ba equer cy tra ntrol and i by c speci	sic lecture ncy\\ *The ansfer func ller\\ 4. Tra- identificatio observer\\ 4 ialized soft	on DSP and specialized software tion and parameter cking desired signals* on of its parameters\\2. . Pole-place method / wares Scilab and	
										inue to システィブ	- 学幸餐(教達· H26 以隆),学者(10)	

システム工学実験(数理:H26以降入学者)(2)

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Students are supposed to have the knowledge of Introduction to Systems Analysis (90070) and take the course of Linear Control Theory (90720).

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

Class participation and reports are mainly evaluated. Attitude, Creativeness, and Individual work and group work are also important during the evaluation process.

[Textbook]

Each instructor will distribute his own text when necessary.

[Reference books, etc.]

(Reference books)

Ljung: System Identification, 2nd edition, Prentice Hall (1992) isbn{}{0023300116} Ljung: System Identification, 2nd edition, Prentice Hall (1998) isbn{}{0136566952}

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

Students have to prepare for presentations and reports for each subject.

(Others (office hour, etc.))

It is recommended to take the course Linear Control Theory (90720) for third-year students and take the courses Modern Control Theory (90580) and Signals and Systems (90810) for fourth-year students. Under the BYOD policy of Kyoto University, students have to bring their own device in order to participate in classes.

*Please visit KULASIS to find out about office hours.

計算機アーキテクチャ(2)

[Textbook]

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}

[Reference books, 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.)

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

Through the work on the weakly exercise, review what you learned in each class.

(Others (office hour, 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.

Numbering	, code											
Course title 計算機アーキテクチャ Affiliated department, Job title,Name Academic Center for C Professor,NAKA						or Computing and Media Stuc KASHIMA HIROSHI	lie					
Target ye	ar 3rd y	year students o	or above	Number	of cred	lits	2	Co yea	urse ar/p	e offered eriod	2019/First semester	
Day/perio	d Thu.	.2	Cla	ss style	Lectur	e				Language	Japanese	
[Outline a	nd Pur	pose of t	he C	ourse]								
We learn pip computers.	elined i	instruction	exect	ution, mem	ory hier	arch	y and p	arall	el pi	rocessing n	nechanism in modern	
[Course G	oals]											
Understandi 1. Instructio 2. Memory 3. Parallel P	ng the fe n Pipeli Hierarcl Processo	ollowing to ine hy ors	opics	so that you	explain	the	n to oth	ier p	eopl	e.		
[Course S	chedul	le and Co	onten	its]								
Instruction F Instruction F Instruction F Instruction F Memory Hie Memory Hie Memory Hie Memory Hie Parallel Proc Parallel Proc Parallel Proc End-of-term Feedback, Iti	'ipeline 'ipeline 'ipeline rarchy (rarchy (rarchy (rarchy (easons (eessors (eessors (Exam,1 ime,Exp	(2),1time, (3),1time, (4),1time, (5),1time, (2),1time, (2),1time, (3),1time, (5),1time, (5),1time, (6),1time, (2),1time, (3),1time, (3),1time, planatoin o	Pipeli Data I Contro Instru- Meom Cache Cache Cache Virtua Other Overvi Multitl Shared	ned data-pr nazards ol (branch) ction-level orory techno (2) (3) Il memory (dimenory (concepts of iew, SIMD hreading, C I Memory M n problems	ath and i hazards paralleli logy\\ C 1) 2) f memor extensio ache co Multipro	ts co and ism ache on, V here cess	erarchy vector p nce ors	ech: ions	anisi	m		
[Class req	uireme	ent]										
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[Method, F	oint o	f view, a	nd At	tainment	levels	of E	Evaluat	tion]			
Your achieve Goals".	ements	in end-of-	term e	exam and pe	er-class	exer	cises ar	e ev	alua Co	ted with re ntinue to 計	spect to the "Course 算機アーキテクチャ(2)	_

Numbering	y code										
Course title <english></english>	統計的 [:] Foundat	モデリン ions of St	グ基G atistic	濋 cal Modelin	ġġ	Affi dep Job	iliated partment p title,Na	, me	Graduate Professo	e Scho r,KAS	ol of Informatics HIMA HISASHI
Target ye	ar Brd y	ear students of	or above	Number	of cred	its	2	Co yea	urse offe ar/perioc	ered I	2019/First semester
Day/perio	d Wed.	.4	Cla	ss style	Lecture	•			Lang	guage	Japanese
[Outline a	nd Purp	oose of t	he C	ourse]							
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[Course G	ioals]										
The goal of to analyze v	this cour arious ty	se is to le pes of dat	arn ho a.	ow to choos	e and ap	ply	appropi	riate	processi	ng and	modeling approaches
[Course S	chedul	e and Co	onten	its]							
Itime, Regression n Model estim Model selec Models for c Correlation causality. Bayesian est Models for v	nodels, 1 ation, 2ti tion, 2tim ategoric and caus timation, various d	time,Line imes,Model al data,2ti ation,2tim 2times,St lata types,	ar reg el esti selec imes,I nes,Di atistic 2time	ression mo mation frame tion frame Predictive n fference be cal inference s,Models fo	del and oneworks works indenodels for tween co e method or variou	estin incl clud or ca orrel ds ba is da	nation r luding r ing info itegorica ation ar ased on ita types	neth naxi orma al da nd ca Bay s inc	nods imum lik ation crite ata includ ausation. vesian sta cluding ti	elihooo erion ling log Metho tistics me seri	d estimation gistic regression ds for estimating ies and texts
[Class req	juireme	nt]									
Basic knowl	edge of	probabilit	y and	statistics							
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Mid-term an	d final e	xaminatio	ons								
[Textbook	1										
None											
[Referenc	e books	s, etc.]									
(Referent They will be	s given in	oks) n the lectu	res								
(Related	URLs)									
(The course	website	will be g	iven i	n the lectur	es)						
[Regardin	g studi	es out o	f clas	s (prepar	ation a	nd r	review)]			
Exercises or	ı real dat	a analysis									
(Others (office h	our, etc.))								
Office hours u.ac.jp	are avai	ilable upo	n requ	lest. An app	oointmei	nt is	needed	by s	sending a	in emai	il to kashima@i.kyoto-
*Please visit	KULAS	SIS to find	l out a	about office	hours.						

Numbering	g cod	le									
Course title <english></english>	burse title 計算機科学実験及演習1(H27以降入学者) Computer Science Laboratory and Exercise 1 Graduate School of Informatics department, Job title,Name Graduate School of Informatics Associate Professor,MATSUBARA SHIGEO Associate Professor,IIYAMA MASAAKI Graduate School of Informatics Associate Professor,SHIMIZU TOSHIYUKI Part-time Lecturer,YAMAMOTO TAKEHIRO										
Target ye	ar	2nd year student:	or above	Number	of cred	lits	2	Cou	Irse of r/perio	ffered	2019/First semester
Day/perio	od V	Ved.3,4	Cla	ss style	Semina	ar		,	Lan	nguage	Japanese
[Outline a	nd F	urpose of	the C	ourse]							
[Course G	oals	5]									
[Course S	che	dule and C	onter	nts]							
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None											
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[Textbook	(]										
[Referenc	e bo	oks, etc.]									
(Refere	nce l	books)									
[Regardin	g st	udies out o	of clas	ss (prepar	ation a	nd r	eview)]			
(Others (offic	e hour, etc	:.))								
*Please visit KULASIS to find out about office hours.											

Numbering	g code												
Course title <english></english>	urse title nglish> メディア情報処理 Mutimedia Processing arget year Fid year students or above Number of credits 2 Affiliated department, Job title,Name Academic Center for Computing and Media Studies Associate Professor,IIYAMA MASAAKI Course offered 2019/Second semester												
Target ye	ear Brdy	year students o	r above	Number	of cred	its	2	Cou year	rse /p	e offered eriod	2019/Second semester		
Day/perio	d Wed	l.1	Cla	ss style	Lecture					Language	Japanese		
[Outline a	nd Pur	pose of t	he Co	ourse]									
This course information	provide: media o	s an overvi ør pattern d	ew of ata su	technolog ch as imag	ies to hai e, speech	ndle 1 an	e, analy: d text.	ze, rec	cog	gnize and ge	enerate a variety of		
[Course G	ioals]												
to master ba	sic meth	nods to dea	l with	image, sp	eech and	tex	t, and a	lso pr	oce	essing of th	eir analysis, recognition		
and synthesi	is.			0 • 1						U			
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[Course S	chedu	le and Co	nten	ts]									
 Introducti 	ion; spee	ech and mu	sic										
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Speech re	cognitio	on and synt	hesis										
 Spoken di 	ialogue :	systems											
5. Natural la	inguage	processing	(1)										
5. Natural la	inguage	processing	(2)										
/. Fundamer	ntal of L	Digital Imag	ges										
8. Image Pro	ocessing	(1): Image	e Filte	ring									
9. Image Pro	ocessing	(2): Image	e Feat	ure Extract	ion								
10. Image R	.ecogniti	on (1): Co	nvolu	tional Neu	ral Netwo	ork							
II. Image R	ecogniti	on (2): Ap	plicat	ions of Ima	ige Reco	gnı	tion						
12. Compute	er Graph	ncs											
13. Compute	er Visioi	n (1): Cam	era m	odel									
14. Compute	er visioi	n (2): Snap	e-froi	n-A									
15. Examina	ation and	1 Feedback											
[Class rec	quireme	ent]											
None													
[Method, I	Point o	f view, ar	nd At	tainment	levels o	of E	Evaluat	tion]					
Based on the	e examii	nation follo	owing	the course									
[Textbook	(]				_								
Lecture slide	es are pr	ovided via	Pand	A CMS.									
[Referenc	e book	s, etc.]											
(Refere	nce bo	oks)											
		·							Co	ntinue to X	ディア情報処理 (2)		

メディア情報処理**(2)**

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[Regarding studies out of class (preparation and review)] Exercises included in lecture slides.

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

Numbering	1 0 0	6										*
Course title <english></english>	情報 Prac	tice i	Fュリテ in Inform	イ演 iation	펼 Security		Affi dep Job	iliated partment p title,Na	, me	Acad Prot Acad Asso Acad Ass	emic Center for fessor, OKA emic Center for ciate Professo emic Center for istant Profe	Computing and Media Studies BE YASUO Computing and Media Studies r,MIYAZAKI SHIYUUICHI Computing and Media Studies ssor,Kotani Daisuke
Target ye	ar	3rd ye	ar students o	r above	Number	of cred	its	1	Co yea	ourse ar/pe	e offered eriod	2019/Intensive, First semester
Day/perio	dI	nten	sive	Cla	ss style	Semina	ır				Language	日本語
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[Course G	ioals	5]										
Students und Students un the IDS. Stu advantages a	dersta derst dents and d	and t and s und isad	he role of the mech lerstand t vantages	f IDS anisn he me of ma	in network of signatur echanism of achine learn	security re-based intrusic ing appi	IDS on de oacl	S, and c etection h.	an e by	expla macl	in advantag hine learnin	es and disadvatages of g, and can explain
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Guidance,2t Basic knowl detection. Intrusion De based IDS b issued from Intrusion De traffic by ma Presentation machine lear	imes, ledge tection y stu- IDS tection achinon ,1tim rning	Guid on t on b dyin and c on b e lea ne,Ba a, and	dance on he role o y Signatu g open so communi y Machin rrning alg ased on th l discuss	how f IDS are-Ba ource cation le Lea gorithm e exe it wit	this class is in network ased IDS,5ti signature-ba ns, and addi urning,7time ms and publ ercise, stude h other stud	operated security mes,Lea ased ID! ng signa es,Learn lic datas nts pres ents and	d, ar and arn t S an ature the et fo ents l ins	nd how m d how m he mech d attack es to det method or bench their m tructors	to u nach nani s, si ect of e imai etho	ism c ism c uch a attac class rking ods c	omputing fa- earning can of intrusion as correspon- ks. ifying norm ; intrusion d of intrusion of	cility for this class.\\ help the intrusion detection by signature- idence between alarms hal and malicious letection performance. detection using
[Class req	luire	mer	nt]									
Students sho able to write	ould t e simj	pe ab ple p	le to hav rograms	e basi by Py	ic knowledg thon.	e of Lir	ux o	operatio	ns (editi	ng files, etc). Students should be
[Method, I	Poin	t of	view, aı	nd At	tainment	levels	of E	valuat	ion]		
The achieve	ment	of th	he tasks a	und th	e content of	the pre	sent	ations v		in the	e class. ntinue to 情報	ませーコリティ演習(2)

情報セキュリティ演習(2)

[Textbook]

[Reference books, etc.] (Reference books)

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

Students should be able to have basic knowledge of Linux operations and Python.

(Others (office hour, etc.)) *Please visit KULASIS to find out about office hours. 情報符号理論続論(数理)(2)

etc., related to the course, and further advice will be provided regarding content study.

[Class requirement]

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.

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

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

[Textbook]

T. M. Cover and J. A. Thomas ⁹ Elements of Information Theory, 2nd ed. *a* (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.)

[Reference books, etc.]

(Reference books)

Other materials will be introduced in class as necessary.

[Regarding studies out of 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.

(Others (office hour, etc.))

Course title 特別研究1(計算機)

<English> Graduation Thesis 1

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*Please visit KULASIS to find out about office hours.

Numbering	g code	*									
Course title <english></english>	情報 Mathem	符号理論続 natical theory of	i 論(著 informa	数理) ation and comm	unications	Aff dep Job	iliated partment p title,Na	, me	Gra Pro	aduate Scho ofessor,TAN	ol of Informatics AKA TOSHIYUKI
Target ye	ar 3r	d year students	or above	Number	of cred	its	2	Co yea	ours ar/p	e offered eriod	2019/Second semester
Day/perio	d Tu	e.3	Cla	ss style	Lecture	e				Language	Japanese
[Outline a	nd Pu	irpose of	the C	ourse]							
Lectures discuss information theory, a basic theory related to storing and transmission of information. While referring to contents of the course "Information and Coding Theory," lectures take up topics such as entropy of continuous-valued random variables, Gaussian communication channels, rate-distortion theory, universal coding, etc. More advanced topics are also introduced, including network information theory and more.											
[Course G	ioals]										
Our goal is t examples in	o gain troduc	an understa ed during le	anding	that enables, topics set	s appro for writ	pria ten 1	te respo reports,	nse: etc.	s to	questions ar	id issues regarding
[Course S	ched	ule and Co	onten	its]							
Introduction Confirmatio coding, etc. Information When consider which take of random vari discussion of December 2010	(1 cla n of ba theory dering continu ables, of the in	ss) asic concept v of continu- wireless co lous values, and by takin nformation	ous-va ommur . The a ng up transn	luding infor lued random nications and argument wi concrete ex- nission capa	mation of n variate d measu ill proce amples t ibilities of	oles rem ed b from of su	opy, mu (4 class ents, a t oy introc n Gauss uch chai	tual es) heo luci ian o nnel	ry is ng d com	ormation, so s needed for lifferential e munication	random variables ntropy for continuous channels, with
Rate-distorti Toleration o no degradati compressior	f a cer f a cer f on is p with	ory (3 class tain extent permitted. L degradation	es) of info ecture tolera	ormation deg es focus on 1 ation.	gradatio rate-dist	n en ortic	ables m on theor	iore y, tl	effi he th	cient data co neory under	ompression than when pinning information
Information Type theory hypothesis t	theory is intr esting,	/ and statisti oduced so a , and other a	ics (4 1 1s to di applica	times) iscuss unive ations.	ersal info	orma	ation co	mpi	ressi	on, large-de	eviations theory,
Network information theory (2 classes) Thanks to the development and spread of information and communications technologies, one-to-one information exchanges have been superseded by many-to-many information exchanges. There is a growing need, then, for discussions regarding these changes. Lectures will focus on fundamental network information theory, necessary for proceeding with such discussions.											
Confirmatio To confirm	n of ext	stent of stud	ient le dents l	arning (1 cl have learned	ass) 1 the cor	nten	ts of co	urse	lect	tures, studer	nts will solve questions.

Tanget year	Fai year studelits	a abord rumber	or creatts	~ ye	ar/period	sor simensive, rust seme
Day/period	Intensive	Class style	Seminar		Language	Japanese
[Outline and	Purpose of	the Course]				
教員の指導の で、その課題	もと、情報学 解決力の向上	² (計算機科学) -を目指す。	に関連する	5研究課題	を設定し、研究	^{役動向を把握したう}
[Course Goa	als]					
研究課題の設	定、関連研究	この調査、研究計	画の立案等	芽を通じて	、研究活動に	必要な力を向上させ
[Course Sch	edule and C	ontents]		~		
研究課題の設 期の特性 研	正、関連研究	じの調査、研究計 は状況に応じて計	「囲の立案∛ - 画するが	FCついて 授挙計画	、教員が指導すの日安は以下の	する。各字生の研究 Dようになる
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第1~4回	研究課	関の設定				
第5~9回	関連研	一究の調査				
第10~1	1回 研究計	回の立案				
第12~1	5回 先行研	究の調査寺				
[Class requi	rementl		_			
計算機科学コ	ースの特別研	「究着手に必要な	条件を満た	-している	こと、	
	- ( 10/JJ W				0	
					-	
[Method, Po	int of view, a	and Attainment	levels of l	Evaluation	n]	
一連の研究活	動の実施状況	記に基づいて行う	) _o			
[Textbook]						
各学生の研究	課題に応じて	教員が指示する	»			
[Reference	books, etc.]					
	a haaka )					
(Referenc	e DOOKS )					
( <b>Referenc</b> 各学生の研究	e books ) 課題に応じて	「教員が指示する	•			
(Referenc 各学生の研究 [Regarding	まましての まtudies out o	、教員が指示する of class (prepar	ation and	review)]		
(Referenc 各学生の研究 [Regarding 各学生の研究	に 課題に応じて studies out o 課題に応じて	教員が指示する of class (prepar 教員が指示する	o. ration and	review)]		
(Referenc 各学生の研究 [Regarding 各学生の研究 (Others (off	課題に応じて studies out d 課題に応じて ice hour, etc	教員が指示する of class (prepar 教員が指示する こ))	oo ation and oo	review)]		

Numbering code U-ENG29 49991 GJ10 U-ENG29 49991 GJ11 U-ENG29 49991 GJ12

Affiliated

department, Job title.Name Graduate School of Informatics Professor,YOSHIKAWA MASATOSHI

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Numbering	code	U-ENO	G29 4	9991 GJ10	U-ENG	29 499	991 (	GJ11	U-ENG29	49991 GJ12		
Course title < <english></english>	特別研: Graduat	究1(計 ion Thesis	算機〕 5 1	)		Affiliate lepartn lob title	ed nent, e,Nar	ne Gra	aduate Scho fessor,YOSI	ol of Informatics HIKAWA MASATOSHI		
Target yea	<b>ar</b> 4th y	ear students o	r above	Number o	of credit	<b>s</b> 2		Cours year/p	e offered eriod	2019/Intensive, Second semester		
Day/perior	d Inter	nsive	Cla	ss style	Seminar				Language	Japanese		
[Outline ar	nd Purj	pose of t	he C	ourse]								
教員の指導のもと、情報字(計算機科字)に関連する研究課題を設定し、研究動向を把握したつえ で、その課題解決力の向上を目指す。												
[Course G	oals]											
研究課題の	設定、	関連研究(	の調査	£、研究計	画の立案	等をi	通じ	て、研	究活動に必	必要な力を向上させる。		
[Course So	chedul	e and Co	onten	ts]								
研究課題の 題の特性、	設定、  研究活	関連研究( 動の進捗)	の調査 状況に	≦、研究計 □応じて計	画の立案 画するが	等に、授調	つい 業計	て、教 画の目	ししび指導す 安は以下の	する。各学生の研究課 りようになる。		
第1~4  第5~9  第10~ 第12~	回 回 1 1 回 1 5 回	研究課題 関連研究 研究計画 先行研究	題の記 究の記 画のご	設定 周査 立案 周査等								
[Class req 計算機科学	uireme コース(	ent] の特別研究	究着手	Fに必要な	条件を満	たし	てい	ること	•			
[Method, P	Point of	f view, ar	nd At	tainment	levels of	Eval	uati	on]				
一連の研究	活動の	実施状況I	こ基:	づいて行う	0							
[Textbook]												
各学生の研究	究課題	に応じて	敗員 <i>†</i>	が指示する	•							
[Reference	book	s, etc.]										
(Referen 各学生の研	ice boo 究課題	<b>bks</b> ) に応じて	敗員 <i>†</i>	が指示する	•							
[Regarding	g studi	es out of	clas	s (prepara	ation and	d revi	iew)	]				
各学生の研究	究課題	に応じて	<u>教員</u> た	が指示する	•							
(Others (c	office h	our, etc.	))									
*Please visit	KULA:	SIS to find	l out a	bout office	hours.							

Course title <english> Gr</english>	別研究1(数 aduation The	改理) sis 1	/// 0310	A1	filiated partment b title,Na	t, Gi me Pr	raduate Scho ofessor, YAM	ol of Informatics
Target year	4th year student	s or above	Number	of credits	2	Cours year/	se offered period	2019/Intensive, Secon semester
Day/period	Intensive	Cla	ss style	Seminar			Language	Japanese
[Outline and	Purpose of	the C	ourse]					
教員の指導の [:] その課題解決:	もと、情報学 力の向上を目	学(数理 目指す。	里工学)に	関連する	开究課題	を設え	<b>官し、研究</b> 重	助向を把握したう
[Course Goa	lls]							
研究課題の設定	定、関連研究	この調査	<b>査、研究</b> 計	画の立案領	穿を通じ	じて、石	开究活動にが	必要な力を向上さ
[Course Sch	edule and C	Conten	ts]					
研究課題の設	定、関連研究	の調査	査、研究言 こ 広じてき	†画の立案等	手につい		数員が指導す 3 安けいての	する。各学生の研 Dトラになる
453、171日、1171	ノレロヨリマノ生化	21/1/610		「国 à らい、	汉禾司		- XIAW FU	いのノにはる。
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第1~4回	研究調	果題の記	殳定					
第1~4回 第5~9回	研究詞 関連研	果題のii 开究のii	殳定 周査					
第1~4回 第5~9回 第10~1	研究調 関連破 1回研究言	果題の記 开究の記 十画の1	役定 周査 2案					
第1~4回 第5~9回 第10~1 第12~1	研究調 関連 1回研究 5回先行	果題の記 开究の記 十画の立 开究の記 开究の記	殳定 周査 之案 周査等					
第1~4回 第5~9回 第10~1 第12~1	研究調 関連 1回研究 5回先行	果題の詰 开究の詰 †画のゴ 开究の詰	殳定 周査 之案 周査等					
第1~4回 第5~9回 第10~1 第12~1	研究記 関連码 1回研究言 5回先行码	果題の記 研究の記 十画の立 研究の記 研究の記	设定 周査 立案 周査等					
第1~4回 第5~9回 第10~1 第12~1 <b>[Class requin</b> 数理工学 <b>1</b> -	研究記 関連码 1回研究記 5回先行码 rement] スの特別研究	果題の語 研究の語 十回のゴ 研究の語 デ着手は	役定 間査 立案 周査等 一 必要な名	その生産	17117			
第1~4回 第5~9回 第10~1 第12~1 <b>[Class requit</b> 数理工学コー	研究記 関連 1回研究記 5回先行 rement] スの特別研究	果題の語 研究の 「一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一一	役定 周査 立案 画 ご 必要な 余	ミ件を満た	している	っこと。		
第1~4回 第5~9回 第10~1 第12~1 <b>[Class requin</b> 数理工学コー	研究 関連 1回研究 5回先行 rement] スの特別研究	果題の記述 新一次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次のの記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次の記述 第二次 第二次 第二次 第二次 第二次 第二次 第二次 第二次	役定 周査 立案 周査 等 こ必要な 分	条件を満たし	している	っこと。		
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ポ1~4回 第5~9回 第10~1 第12~1 [Class requin 数理工学コー [Method, Poi 一連の研究活] [Textbook] 各学生の研究 [Reference b (Reference b	研究通 関連低 関連 5回 5回 た行 で rement] スの特別研 int of view, 動の実施状が 課題に応じて pooks, etc.]	果用 用 用 用 用 用 の の 記 記 二 和 一 名 着 手 に の の 記 記 の の 記 記 の の の 記 記 の の の 記 記 の の の の 記 の の の の 記 に の の の の	Ag定 周査 文案 同査 等 tainment づいて行う が指示する	条件を満た : levels of う。 う。	っている Evaluat	っこと。 iion]		
ポ1~4回 第5~9回 第10~1 第12~1 [Class requil 数理工学コー [Method, Poi 一連の研究活] [Textbook] 音学生の研究活] [Reference b (Reference b 合学生の研究	研究通 関連 、 す す す す す す す か で で で で で で で で で で で で で	果研究のSaintana 現究のSaintana 定着手に and At こて 教員が て な 教員が	安定 日本 シネ な ま で 必要な な す で が 指示する が 指示する が 指示する が れ い で れ で 、 、 、 、 、 、 、 、 、 、 、 、 、	条件を満た」 は levels of 500000000000000000000000000000000000	っている Evaluat	っこと。 iion]		
第1~4回 第5~9回 第10~1 第12~1 [Class requil 数理工学コー [Method, Poi 一連の研究活] [Textbook] 各学生の研究 [Reference b (Reference b 合学生の研究]	研究通 関連の 第 5回 先行の rement] スの特別研列 int of view, 動の実施状況 課題に応じて pooks, etc.] き books) 課題に応じて	果題究の創立が 開究のの創 の の の の の 前 の の 前 の の 前 い の の の 前 い の の の 前 い の の の 前 い の の の 前 い の の の 前 い の の の 前 い の の の 前 い う い の の の 前 い う い の の い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い う い 、 う い う い う い 、 う い う い う い 、 、 う い う い 、 、 う い う い 、 、 う い 、 、 う い 、 、 う 、 、 う 、 、 う 、 、 う い 、 、 う い 、 、 う い 、 、 う 、 う い 、 、 う 、 、 う 、 、 う 、 う の う い 、 う 、 、 う 、 、 う 、 、 う 、 、 う 、 う 、 、 う 、 、 う 、 、 う い 、 、 う 、 う 、 、 う 、 、 う 、 、 う 、 、 、 う 、 、 う 、 う 、 う 、 、 う 、 う 、 う 、 う 、 、 う 、 、 う 、 う 、 う 、 う 、 、 う 、 う 、 う 、 う 、 う 、 う 、 う 、 、 、 、 、 、 う 、 う 、 う 、 、 う 、 、 う 、 、 、 、 、 、 、 、 、 、 、 、 、	安定 日本 大案 同査 で必要な tainment びいて行う が指示する いが指示する	そ件を満た   : levels of う。 う。 う。	っている Evaluat	iion]		
<ul> <li>第1~4回</li> <li>第5~9回</li> <li>第10~1</li> <li>第10~1</li> <li>第12~1</li> <li>[Class requitive]</li> <li>[Class requitive]</li> <li>[Class requitive]</li> <li>[Class requitive]</li> <li>[Method, Poident Component of the second second</li></ul>	研究部 関連の ア 第 5回 た行 で mement] スの特別研 調 mt of view, 動 の実施状 激 課題に応じて pooks, etc.] き books) 課題に応じて studies out	果野究のの割い 開究のの割い の い い 、 、 教員 た 、 教員 た 、 、 教員 た 、 教員 た 、 、 教員 た 、 、 、 、 、 、 、 、 、 、 、 、 、 、 、 、 、 、	安定 日本 シネ 大案 周査 で必要な tainment づいて行う が指示する い指示する い指示する	€件を満た」 i levels of 5. 5.	्रत्ताड Evaluat	)]		
第1~4回 第1~4回 第1○~1 第12~1 [Class requil 数理工学コー- [Method, Poi 一連の研究活] [Reference b 合学生の研究] [Reference b 合学生の研究] [Reference b 合学生の研究] [Reference b 合学生の研究]	研究 開連 開連 5回 5回 た行 700 た行 700 た行 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 た 700 700	果野究の 同 部 の の 部 い 、 教 員 た 、 教 員 た 、 教 員 た 、 教 員 た 、 教 員 た 、 、 教 員 た 、 、 、 、 、 、 、 、 、 、 、 、 、	_{受定} 周査 之案 電力 で必要な tainment づいて行う が指示する s (prepa が指示する	e件を満たし i levels of う。 う。 う。	っている Evaluat	iion] )]		
第1~4 回 第5~9回 第10~1 第12~1 第12~1 [Class requin 数理工学コー [Method, Poi 一連の研究活] [Textbook] 合学生の研究: [Reference b (Reference b (Reference b (Reference s 音学生の研究: [Regarding s 音学生の研究: (Others (off)	研究 研究 関連 同研 で	果野究の前式 開究の前式 の前式 の前式 の前式 の前式 の前式 の前式 の前式 の前式 の前式	ACC ACC ACC ACC ACC ACC ACC ACC	e件を満た」 i levels of う。 5。 5。 5。	っている Evaluat	iion]		

Numberin	g code	U-EN	G29 49991 C	GJ10 U	J-ENC	329 49991	GJ11	U-ENG29 4	19991 GJ12		
Course title <english></english>	特別研 Gradua	別研究1(数理) aduation Thesis 1 Affiliated department, Job title,Name Graduate School of Informatics Professor, YAMASHITA NOBUO									
Target ye	ear 4th;	year students (	or above <b>Num</b>	ber of (	credi	<b>ts</b> 2	Cours year/	se offered period	2019/Intensive, First semester		
Day/perio	d Inte	nsive	Class sty	r <b>le</b> Se	eminar	r		Language	Japanese		
[Outline a 教員の指導 その課題解	ind Pur のもと 決力の	pose of t 、情報学 向上を目	he Course (数理工学 指す。	] )に関う	連する	3研究課題	を設た	宦し、研究重	か向を把握したうえで、		
[Course G	ioals]										
研究課題の	)設定、	関連研究	の調査、研	究計画(	の立筹	素等を通じ	て、福	开究活動に必	が要な力を向上させる。		
[Course S	Schedu	le and Co	ontents]								
- 研究課題の 題の特性、	)設定、 研究活	関連研究 動の進捗	の調査、研 状況に応じ 	究計画( て計画 ⁻	の立寮 するか	§等につい が、授業計	て、 ず 画の目	改員が指導す 目安は以下の	「る。各学生の研究課 )ようになる。		
第1~4 第5~9 第10~ 第12~	回 11回 15回	研究課 関連研 研究計 先行研	題の設定 究の調査 画の立案 究の調査等								
[Class red	quirem	ent]	**	<b>.</b>			- 1				
剱埋⊥字_	ースの	特別研究	看手に必要	な余件の	を両た	20(113	<u>с</u> Е.				
[Method,	Point o	f view, a	nd Attainm	ent lev	/els o	f Evaluat	ion]				
一連の研究	活動の	実施状況	に基づいて	行う。							
[Textbool	<]										
各学生の研	F究課題	に応じて	教員が指示	する。							
[Reference	e book	s, etc.]									
(Refere 各学生の研	nce bo 「究課題	oks) に応じて	教員が指示	する。							
[Regardin	g stud	ies out o	f class (pre	eparatio	on an	d review	)]				
谷字生の研	▶ 光課題	に応じて	教員が指示	9'5.							
( Utner's (		SIS to fire	., )	ffice bo	are						
1 10450 1151	, NULA	515 10 1110	a oar about 0	THE HO	-u13.						

Numbering	code	U-EN0	G29 49992 GJ10	U-EN	G29 49992	GJ1	1 U-ENG29 4	19992 GJ12			
Course title <english> (</english>	寺別研 Graduat	制研究2(計算機) raduation Thesis 2 Affiliated department, Job title,Name Professor,YOSHIKAWA MASATOSHI									
Target yea	ı <b>r</b> 4th y	ear students o	or above <b>Number</b>	of cred	its 3	Cou yea	urse offered r/period	2019/Intensive, First semester			
Day/period	Inter	nsive	Class style	Semina	ır		Language	Japanese			
[Outline an	d Purj	oose of t	he Course]								
教員の指導( もに、研究)	Dもと、 成果を	特別研究	究1で設定した 報告書としてま	課題に とめ、	ついて研究 特別研究詞	におけていた。	テい、課題解決 ≷で発表する。	わを向上させるとと			
[Course Go	oals]										
研究の実施、 向上させる。	特別	研究報告	書の作成、特別	研究試	問会での発	表等	<b>穿を通じて、</b> 研	F究活動に必要な力を			
[Course Sc	hedul	e and Co	ontents]								
- 研究の実施、 の特性、研 第1~1〕 第13~	報告 (記動) (2回 14回	書の作成 の進捗状 研究の 報告書	- 、 試問会での発 況に応じて計画 実施 の作成 での発表準備	表準備 するが	等について 、授業計画	こ、教 iの目	ጲ員が指導する ∃安は以下のよ	。各学生の研究課題 うになる。			
[Class requ	lireme	mt]	(0元衣牛桶								
「特別研究	1 . を	修得済み	であること								
10100120		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~									
[Method, P	oint of	i view, a	nd Attainment	levels	of Evaluat	ion]					
一連の研究ネ	舌動の	実施状況.	、特別研究報告	書の内	容、特別研	F 究 訂	ば問会の発表内	9容に基づいて行う。			
[Textbook]											
各学生の研究	?課題	こ応じて	教員が指示する	۰							
[Reference	book	s, etc.]									
( <b>Referen</b> 各学生の研ジ	ce boo ?課題	<b>oks</b> ) こ応じて	教員が指示する	0							
[Regarding	studi	es out of	f class (prepar	ation a	nd review	)]					
各学生の研究	に課題	こ応じて	教員が指示する	•							
( Others (o	ffice h	our, etc.	))								
*Please visit	KULAS	SIS to find	l out about office	hours.							

Numbering	j code	U-EN	G29 49	992 GJ10	U-EN	G29	9 49992	GJ1	1	U-ENG29	49992 GJ	12
Course title <english></english>	特別研 Gradu	軒究 2 (計 ation Thesi	算機) s 2			Aff de Joi	filiated partment b title,Na	, me	Gra Pro	aduate Sch fessor,YOS	ool of Info HIKAWA	rmatics MASATOSHI
Target ye	ar 4th	year students of	or above	Number	of cred	lits	3	Co yea	urse ar/p	e offered eriod	2019/Intens semester	ive, Second
Day/perio	d Int	ensive	Clas	s style	Semina	ar				Language	Japanese	;
[Outline a	nd Pu	rpose of t	he Co	ourse]								
教員の指導 もに、研究	のもと 成果を	:、特別研 :特別研究	究 1 で 報告書	設定した としてま	課題に とめ、 ⁵	つい特別	1て研究 1研究試	を行われていた。	_{テい} 会で	、課題解 発表する。	決力を向_ ,	Lさせるとと
[Course G	oals]											
研究の実施 向上させる	、特別 。	J研究報告	書の作	「成、特別	研究試	問会	きでの発	表	等を	通じて、	研究活動I	こ必要な力を
[Course S	chedı	le and Co	ontent	s]								
研究の実施 の特性、研	、報告 究活動	音書の作成 うの進捗状	、試問 況に応	会での発 じて計画	表準備 するが	等に 、 拷	こついて 受業計画	、 ず の目	敗員 目安	が指導す は以下の	る。各学会 ようになる	もの研究課題 る。
第1~1 第13~ 第15回	2回 14回	研究の 1 報告書 試問会	実施 の作成 での発	表準備								
[Class req 「特別研究	uirem 1」を	<mark>ent]</mark> そ修得済み	である	こと。								
[Method, F	Point	of view, a	nd Att	ainment	levels	of E		ion]	]		上向に甘	
一連の研究	活動().	)美施状况	、特別	研究報告	音の内	谷、	特別份	行言	山同	会の発表	内谷に奉	いて行つ。
[Textbook	]											
各学生の研	究課題	夏に応じて	教員が	指示する	۰							
[Reference	e boo	ks, etc.]	_				_					
( <b>Referer</b> 各学生の研	nce bo 究課題	ooks) 夏に応じて	教員が	指示する	•							
[Regardin	g stuc	lies out o	f class	s (prepar	ation a	nd	review	)]				
各学生の研	究課題	記に応じて	教員が	指示する	•							
(Others (	office	hour, etc.	))									
*Please visit	KUL	ASIS to find	l out al	out office	hours.							

( <b>Refere</b> 各学生の研	nce bo 究課題	oks) に応じて	教員が指示する	•					
[Regardin	g stud	ies out o	f class (prepar	ation an	d review)	]			
各学生の研	究課題	に応じて	教員が指示する	•					
(Others (	office I	nour, etc	.))						
Please visit	t KULA	SIS to fine	d out about office	hours.					
									1
		LUEN	C20 40002 C110	LI ENG	720 40002	CIII	LI ENCOO	40002 CH12	1
Numbering	g code	U-EN	G29 49992 GJ10	U-ENC	329 49992	GII	U-ENG294	49992 GJ12	-
Course title	特別研	究2(数	理)		Affiliated department	Gi	aduate Scho	ol of Informatics	
<english></english>	Gradua	tion Thesi	is 2		Job title,Na	me Pr	ofessor,YAN	ASHITA NOBUO	
Target ye	ar 4th	year students (	or above Number	of credi	<b>ts</b> 3	Cours year/	se offered period	2019/Intensive, First semester	]
Day/perio	d Inte	nsive	Class style	Seminar	r		Language	Japanese	
[Outline a	nd Pur	pose of t	the Course]						1
もに、研究	成果を	特別研究	報告書としてま	とめ、特	時別研究試	問会で	で発表する。		
[Course G	ioals]								1
研究の実施 句上させる	i、特別 。	研究報告	書の作成、特別	研究試問	『会での発	表等を	を通じて、私	研究活動に必要な力を	
[Course S	chedu	le and Co	ontents]						
研究の実施 の特性、研	、 報告 究活動	書の作成 の進捗状	、試問会での発 況に応じて計画	表準備領 するが、	等について 授業計画	、教員 の目3	しが指導する とは以下のよ	る。各学生の研究課題 ようになる。	
第1~1	2 🛛	研究の	実施						
第13~ 第15回	14回	報告書 試問会	の作成 での発表準備						
ж. о Ц		1241-524	C 00 / 0-02 1m						
[Class red	wirem	entl							
「特別研究	1」を	い。 修得済み	であること。						
	_								
[Method	Point o	f view a	nd Attainmont	امريما	f Evaluat	ionl			-
一連の研究	活動の	実施状況	. 特別研究報告	書の内容	S. 特別研	究試問	引会の発表の	内容に基づいて行う。	
Toythook	1	_		_	_				-
	」 究課題	に応じて	教員が指示する						
	> DIMINISCO	C		•					
[Referenc	e book	s, etc.]							1
(Referei 各学生の研	nce bo 究課題	oks) に応じて	教員が指示する	•					
[Regardin	g stud	ies out o	f class (prepara	ation an	d review)	]			1
各学生の研	究課題	に応じて	教員が指示する	•					]
(Others (	office I	nour, etc	.))						
Please visit	KULA	SIS to find	d out about office	hours.					

Numbering	code	U-EN	G29 4	9992 GJ10	U-EN	IG29	49992	GJ	11	U-ENG29	49992 GJ12	2
Course title <english> G</english>	寺別研ず Graduati	え2(数 on Thesi	理) s 2			Affi dep Job	liated artment title,Na	, me	Gra Pro	duate Scho fessor,YAM	ol of Inform MASHITA I	natics NOBUO
Target yea	<b>r</b> 4th ye	ar students o	or above	Number	of cred	lits	3	Co yea	ourse ar/p	e offered eriod	2019/Intensiv semester	e, Second
Day/period	Inten	sive	Cla	ss style	Semin	ar				Language	Japanese	
[Outline and	d Purp	ose of t	he C	ourse]								
教員の指導の もに、研究成	)もと、 成果を特	特別研 別研究	究 1 7 報告書	で設定した 書としてま	:課題に とめ、	つい 特別	て研究  研究討	にたる	行い 会で	、課題解注 発表する。	央力を向上	させるとと
[Course Go	als]											
研究の実施、 向上させる。	特別研	F究報告 [:]	書の作	乍成、特別	研究試	問会	での発	表	等を	通じて、積	开究活動に	必要な力を
[Course Sc	hedule	and Co	onten	ts]								
研究の実施、 の特性、研究	報告書 『活動の	の作成。 )進捗状	、試問 況に帰	問会での発 むじて計画	表準備 するが	等に 、授	:ついて 業計画	、 iの	教員 目安	が指導する は以下の。	る。各学生 ようになる	の研究課題 。
第1~12	2回	研究の	実施									
第13~1 第15回	4回	報告書	の作ら での引	戊 発表準備								
101												
[Class requ	iremer	Itj z/但:文···	7 = 7	7 - 6								
* 村別切九	1.618	行府の	රහර	<i>□∟⊂</i> ₀								
[Method, Po	oint of	view, a	nd At	tainment	levels	of E	valuat	ion	]			
一連の研究活	「動の実	『施状況	、特別	削研究報告	書の内	容、	特別研	究	試問	会の発表に	内容に基づ	いて行う。
[Textbook]												
各学生の研究	『課題に	応じて	教員/	が指示する	0							
[Reference	books	, etc.]										
( <b>Referenc</b> 各学生の研究	<b>e boo</b> l 記課題に	<b>ks</b> ) に応じて	教員/	が指示する	0							
[Regarding	studie	s out of	f clas	s (prepar	ation a	nd r	eview	)]				
各学生の研究	『課題に	応じて	教員.	が指示する	•			_				
( Others (of	fice ho	our, etc.	))									
*Please visit I	KULAS	IS to find	l out a	about office	hours.							