Syllabus

International Master's Degree Program (2012-Spring Term)

(M40030010)Management Science[Management Science]

Subject name[English]	Management Scie	Management Science[Management Science]						
Schedule number	M40030010	Subject area General		Required or	Elective			
			courses	elective				
Time of starting a course	Spring term	Day of the	Fri.3~3	Credit(s)	2			
		week,period						
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~2			
Department Offered	Beggining grade							
Charge teacher name[Roman	宮田 譲,藤原 孝男 MIYATA Yuzuru, FUJIWARA Takao							
alphabet mark]								
Numbering								

Objectives of class

In Management Science 1, the class objective is to learn the introductory finance on the firm value and capital cost from the management point of view.

In Management Science 2, the lecture will focus on the statistical methodology frequently applied in management science. In particular, multivariate analysis will be emphasized in the lecture.

In addition, this subject is lectured in English for foreign students in English course.

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In addition, this subject is lectured in English for foreign students in English course.

Contents of class

In Management Science 1, the class content will be explained about the fundamental ideas of pricing options in financial derivatives, based on the basic probability, normal random variables, geometric Brownian motion, interest rate, arbitrage, Black-Scholes formula, valuing by expected utility, exotic options, and so on.

In Management Science 2, the lecture includes mathematical expression of multivariate statistical data, multivariate regression analysis, principal component analysis, and so on.

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In Management Science 2, the lecture includes mathematical expression of multivariate statistical data, multivariate regression analysis, principal component analysis, and so on.

Self Preparation and Review

Related subjects

Nothing in particular

Nothing in particular

Notes for textbook

In Management Science 1: Sheldon M. Ross, An Introduction to Mathematical Finance, Cambridge University Press, 1999.

(Reference)

1st part: David G. Luenberger, Investment Science, Oxford University Press, 1998.

In Management Science 2, the lecture materials will be distributed to students at the class. In Management Science 1: Sheldon M. Ross, An Introduction to Mathematical Finance, Cambridge University Press, 1999.

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Reference URL http://pm.hse.tut.ac.jp/kakenA/ http://pm.hse.tut.ac.jp/kakenA/ Office hours Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	
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http://pm.hse.tut.ac.jp/kakenA/ Office hours Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	http://pm.hse.tut.ac.jp/kakenA/
Office hours Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	http://pm.hse.tut.ac.jp/kakenA/
Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	Office hours
Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 1: Takao Fujiwara,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	Management Science 1: Takao Fujiwara.Office Hour: 4:00 to 5:00 PM, on Wednesdays
Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	
Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	Management Spinnes 2: Yuzuru Miyota Office Haur 4 s'alagi ta 5 s'alagi in the offerneen Tuesday
Management Science 1: Takas Fujiwara,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	Management Science 2. Tuzuru Miyata, onice Hour. 4 0 clock no 0 0 clock in the alternoon, Tuesday
Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	Management Science 1. Takao Fujiwara,Office nour: 4.00 to 3.00 PM, on wednesdays
Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	
Relations to attainment objectives of learning and education Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday
Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	Relations to attainment objectives of learning and education
Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	
Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	
Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	
Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	
Key words finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	
finance, stochastic process, multivariate analysis finance, stochastic process, multivariate analysis	Key words
finance, stochastic process, multivariate analysis	finance, stochastic process, multivariate analysis
	finance, stochastic process, multivariate analysis

(M40030050)Japanese Life Today[Japanese Life Today]

Subject name[English]	Japanese Life To	day[Japanese Life T	oday]						
Schedule number	M40030050	Subject area	General	Required or	Elective				
		=	courses	elective					
Time of starting a course	Spring term	Day of the week,period	Wed.4~4	Credit(s)	2				
Faculty	Graduate Progran	Graduate Program for Master's Degree Subject grade 1~2							
Department Offered				Beggining grade					
Charge teacher name[Roman alphabet mark]	林 孝彦 HAYASH	林 孝彦 HAYASHI Takahiko							
Numbering									
Objectives of class									
Course Objective: To learn about	Japanese society a	and culture in order	to understand Jap	pan and the Japanes	e				
Course Objective: To learn about	Japanese society a	and culture in order	to understand Jap	pan and the Japanes	e				
Contents of class									
Course Content;「日本事情」(Japa	anese Life Today):								
「日本の社会と文化」(Japanese Se	ociety and Culture)								
No. 1 Introduction to Japanese S	ociety and Culture								
Nature and the Seasons in Japan									
No. 2 The Life of the Japanese (Clothing, Food, Hou	sing, Recreation,							
Life in the Workplace)									
No. 3 Festivals									
No. 4 Japanese Culture (Tradition	nal Culture, Conterr	porary Culture, The							
world of Ghildren)									
No. 3 Japanese Sports	1)								
No. 7 Japanese Education (Part 9	2)								
No. 8 Religion in Janan	_/								
Japanese Government									
No. 9 The Japanese Economy									
Japanese Industry									
Transportation System									
No.10 Pollution and the Environm	ient (Part 1)								
No.11 Pollution and the Environm	ient (Part 2)								
No.12 Japanese History (Part 1)									
No.13 Japanese History (Part 2)									
No.14 Other issues about Japane	ese Society and Cul	ture (Part 1)							
No.15 Other issues about Japane	ese Society and Cul	ture (Part 2)							
This course is taught in English.	There will be limited	l Japanese language	support.						
Course Content:「日太東信」(loss	nese Life Today)								
「日本の社会と文化」(Jananese Sa	ociety and Culture)								
	concey and outlure)								
No. 1. Introduction to Japanese S	ociety and Culture								
No. 1 Introduction to Daparlese S	oolety and Oulture								
No. 2 The Life of the Japanese (Clothing, Food, Hou	sing, Recreation.							
Life in the Workplace)									
No. 3 Festivals									
No. 4 Japanese Culture (Tradition	nal Culture, Conterr	porary Culture, The							
World of Children)									
No. 5 Japanese Sports									
No. 6 Japanese Education (Part 1	1)								
No. 7 Japanese Education (Part 2	2)								
No. 8 Religion in Japan									
Japanese Government									

No. 9 The Japanese Economy
Japanese Industry
Transportation System
No.10 Pollution and the Environment (Part 1)
No.11 Pollution and the Environment (Part 2)
No.12 Japanese History (Part 1)
No.13 Japanese History (Part 2)
No.14 Other issues about Japanese Society and Culture (Part 1)
No.15 Other issues about Japanese Society and Culture (Part 2)

This course is taught in English. There will be limited Japanese language support.

Self Preparation and Review

Related subjects

Related Courses:

Japanese Cultural Review, Language and Culture, Language and Society, etc. Prerequisite:

Students must be able to read in English or Japanese.

Related Courses:

Japanese Cultural Review, Language and Culture, Language and Society, etc. Prerequisite:

Students must be able to read in English or Japanese.

Notes for textbook

Textbook:

「日本タテヨコ(JAPAN AS IT IS) (FOURTH EDITION)」(学習研究社)(Published by Gakken)

Reference Books:

THE JAPAN BOOK Published by Kodansha International

「日本事情入門」(View of Today's Japan) アルク 編 (Edited by ALC)、佐々木瑞枝 著 (Written by Mizue Sasaki) (アルク) (Published by ALC)

An Introduction to Japanese Society Second Edition (Series: Contemporary Japanese Society) Written by Yoshio Sugimoto, Published by Cambridge University Press

Transcending Stereotypes: Discovering Japanese Culture and Education Edited by Barbara Finkelstein, Anne E. Imamura, Joseph J. Tobin, Published by Intercultural Press

Inside the Japanese System: Readings on Contemporary Society and Political Economy Edited by Daniel Okimoto, Thomas Rohlen, Published by Stanford University Press

「英語で話す「日本の文化」Japan as I See It」 NHK 国際局文化プロジェクト 編 (Edited by NHK Overseas Broadcasting Department)、ダン・ケニー 訳 (Translated by Don Kenny) (講談社インターナショナル)(Published by Kodansha International) 「日本事情(第2版)JAPAN A LA CARTE」 佐々木瑞枝 著 (Written by Mizue Sasaki) (北星堂)(Published by The Hokuseido Press)

Textbook:

「日本タテヨコ(JAPAN AS IT IS) (FOURTH EDITION)」(学習研究社)(Published by Gakken)

Reference Books:

THE JAPAN BOOK Published by Kodansha International

「日本事情入門」(View of Today's Japan) アルク 編 (Edited by ALC)、佐々木瑞枝 著 (Written by Mizue Sasaki) (アルク) (Published by ALC)

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Notes for reference

Goals to be achieved

Learning Goals: (1) To understand Japanese society and culture (2) To understand the background of modern Japanese life

Learning Goals: (1) To understand Japanese society and culture (2) To understand the background of modern Japanese life

Evaluation of achievement

Grading: In-class reports: 30% Final report: 50% Class participation and presentations: 20% In-class reports must be written in English. The final report can be written in English or Japanese.

Grading: In-class reports: 30%

Final report: 50% Class participation and presentations: 20% In-class reports must be written in English. The final report can be written in English or Japanese.

Examination

Details of examination

Other information

Office: 国際交流センター (Center for International Relations) 相談室 (Consulting Room) Telephone: 0532-44-6866 (Extension: 6866) E-mail: hayashi@las.tut.ac.jp

Office: 国際交流センター (Center for International Relations) 相談室 (Consulting Room) Telephone: 0532-44-6866 (Extension: 6866) E-mail: hayashi@las.tut.ac.jp

Reference URL

Office hours

Office Hours: Anytime during regular working hours

Office Hours: Anytime during regular working hours

Relations to attainment objectives of learning and education

Key words 日本 (Japan)、社会 (society)、文化 (culture) 日本 (Japan)、社会 (society)、文化 (culture)

(M40030060)Intercultural Communication[Intercultural Communication]

Subject name[English]	Intercultural Co	mmunication[Intercult	ural Communicati	on]					
Schedule number	M40030060	Subject area	Required or	Elective					
			courses	elective					
Time of starting a course	Spring term	Day of the week period	Mon.2~2	Credit(s)	2				
Faculty	Graduate Program for Master's Degree Subject grade 1~2								
Department Offered	Beggining grade								
Charge teacher name[Roman alphabet mark]	村松 由起子 MURAMATSU Yukiko								
Numbering									
Objectives of class									
This is a Japanese conversation	n class mixed wit	h the international a	and Japanese s	students of the rea	ular course. The				
students will learn basic Japanes	e grammar to spe	ak Japanese.							
This is a Japanese conversation students will learn basic Japanes	n class mixed wit se grammar to spe	h the international a ak Japanese.	and Japanese s	students of the reg	gular course. The				
Contents of class									
This class has the following three	parts.								
Japanese grammar points for g	roup activities								
②Group activities (conversation	practice & discuss	sion)							
③Elementary Japanese lessons									
You will learn the following lesson	s in Japanese tex	tbook [″] Minna no Niho	ongo".						
1. Pronunciation of Japanese & L	esson 1								
2. Pronunciation of Japanese & L	_esson 2								
3. Lesson 3,4									
4. Lesson 5,6									
5. Lesson 7,8									
6. Lesson 9,10									
7. Lesson 11,12									
8. Lesson 13,14									
9. Lesson 15,16									
10.Lesson 17,18									
11.Lesson 19,20									
12.Lesson 21, Nonverbal communi-	cation								
14 Lesson 22 23									
15.Lesson 24.25									
This class has the following three	parts.								
Delananese grammar points for g	roup activities								
2 Group activities (conversation	practice & discuss	sion)							
③Elementary Japanese lessons		- /							
You will learn the following lesson	s in Japanese tex	tbook "Minna no Niho	ongo".						
1. Pronunciation of Japanese & 1	esson 1								
2. Pronunciation of Japanese & L	Lesson 2								
3. Lesson 3,4									
4. Lesson 5,6									
5. Lesson 7,8									
6. Lesson 9,10									
7. Lesson 11,12									

8. Lesson 13,14
9. Lesson 15,16
10.Lesson 17,18
11.Lesson 19,20
12.Lesson 21.Nonverbal communication
13.Nonverbal communication
14.Lesson 22,23
15.Lesson 24,25

Self Preparation and Review

Related subjects

Extra-Curricular Japanese Classes (Nihongo Hokoo): If you want to know more details, please contact the International Affairs Division (Kokusaikooryuuka).

Extra-Curricular Japanese Classes (Nihongo Hokoo): If you want to know more details, please contact the International Affairs Division (Kokusaikooryuuka).

Notes for textbook

みんなの日本語 初級 I 翻訳・文法解説 英語版 (Minnna no Nihongo 1 Translation & Grammatical Notes English) ¥2,000 みんなの日本語 初級 I 翻訳・文法解説 英語版 (Minnna no Nihongo 1 Translation & Grammatical Notes English) ¥2,000 Notes for reference

Goals to be achieved

Evaluation of achievement Homework 40% The term examination (L.1~L.22)60% Homework 40% The term examination (L.1~L.22)60% Examination

Details of examination

Other information office: B-513 e-mail: yukiko@las.tut.ac.jp phone: 44-6962 office: B-513 e-mail: yukiko@las.tut.ac.jp phone: 44-6962

Reference URL

Office hours

Relations to attainment objectives of learning and education

(M41610010)Seminar on Mechanical Engineering I[Seminar on Mechanical Engineering I]

Subject name[English]	Seminar on Mech	anical Ei	ngineer	ing I[Seminar on Mecha	anical Engineering	I]
Schedule number	M41610010	Subjee	ct area		Advanced	Required o	r Required
					Mechanical	elective	
					Engineering		
Time of starting a course	Year	Day	of	the	Experiment	Credit(s)	4
		week,	period				
Faculty	Graduate Progran	n for Ma	ster's l	Degre	e	Subject grade	1~2
Department Offered						Beggining	
Charge teacher name[Pomen	久 お吕 01 五 数 3	⋩禾吕 ⊮	(VKIIK)		N Kakukuouin 1ka	i kvomu lin-S	
sinhahet mark]	石狄貝, 51 木狄/	方女貝「	ANUN	1001	in Nakukyouin, ike	r kyönnu iin-3	
		C 11					
The seminar aims to provide a t	broad understanding	of the	mecna	nical	engineering availa	ble for the resea	rch work of his/her
The seminar aims to provide a h	road understanding	of the	mecha	nical	engineering availa	ble for the resea	rch work of his/her
master thesis		, or the	meena	mear	crigineering availa		ch work of his/her
Contents of class							
The class provides both of funda	mental knowledge o	n the re	search	work	of master thesis	and the most adv	anced results in the
related field by reading research	papers and monogr	aphs. Co	ontents	of th	ne class depend or	the supervisor.	To be announced by
individual supervisors.							
The class provides both of funda	mental knowledge o	n the re	search	work	of master thesis	and the most adv	anced results in the
related field by reading research	papers and monogra	aphs. Co	ontents	of tł	ne class depend or	n the supervisor. T	∫o be announced by
individual supervisors.							
Self Preparation and Review							
Related subjects							
Notes for textbook							
Textbook or material will be made	e available from the	supervis	sors.				
Textbook or material will be made	e available from the	supervis	sors.				
Notes for reference							
Goals to be achieved							
To acquire fundamental knowledg	ge on individual rese	arch fiel	lds.				
To acquire the ability of finding a	problem, the ability	of solvi	ing the	prob	lem and presentat	ion skill.	
To acquire fundamental knowledg	ge on individual rese	arch fiel	lds.				
To acquire the ability of finding a	problem, the ability	of solvi	ing the	prob	lem and presentat	ion skill.	
Evaluation of achievement							
Coursework, presentation and/or	report.						
Coursework, presentation and/or	report.						
Examination							
Details of examination							
Other information							
Reference LIRI							
Office hours							
	Office hours						
Relations to attainment objective	es of learning and e	ducation	ו				

(M41610020)Seminar on Mechanical Engineering II[Seminar on Mechanical Engineering II]

Subject name[English]	Seminar on Mecha	anical E	nginee	ring II	[Seminar on Mech	anical Engineering I]
Schedule number	M41610020	Subje	ct are	a	Advanced	Required or	Required
					Mechanical	elective	
					Engineering		
Time of starting a course	Year	Day	of	the	Experiment	Credit(s)	2
		week,	period				
	Graduate Program	n for Ma	ster's	Degre	e	Subject grade	2~2
Department Offered						Beggining	
Charge teacher name[Roman		& 禿 昌 レ			N Kakukvouin 1ka	i kvomu lin-S	
alphabet mark]	百秋頁, 51 未我在	カ女良・		(1001	IN Nakukyouili, ike		
Numbering							
The seminar aims to provide a c	road understanding	or the	mecn	anicai	engineering availa	ible for the researc	n work of his/her
The seminar aims to provide a h	road understanding	of the	mech	anical	engineering availa	ble for the recearc	h work of his/her
master thesis			meen	anicai	crigineering availa		
Contents of class							
The class provides both of funda	mental knowledge o	n the re	searc	h worl	of master thesis	and the most advar	iced results in the
related field by reading research	papers and monogra	aphs. Co	ontent	s of tl	ne class depend or	n the supervisor. To	be announced by
individual supervisors.			-	-			-,
The class provides both of funda	mental knowledge o	n the re	searc	h worl	of master thesis	and the most advar	iced results in the
related field by reading research	papers and monogra	aphs. Co	ontent	s of tl	ne class depend or	n the supervisor. To	be announced by
individual supervisors.							
Self Preparation and Review							
Related subjects							
Notes for textbook							
Textbook or material will be made	e available from the	supervi	sors.				
Textbook or material will be made	e available from the	supervi	sors.				
Notes for reference							
Goals to be achieved							
To acquire fundamental knowledg	ge on individual rese	arch fie	lds.				
To acquire the ability of finding a	problem, the ability	of solv	ing the	e prob	lem and presentat	ion skill.	
To acquire fundamental knowledg	ge on individual rese	arch fie	lds.				
To acquire the ability of finding a	problem, the ability	of solv	ing the	e prob	lem and presentat	ion skill.	
Evaluation of achievement							
Coursework, presentation and/or	report.						
Coursework, presentation and/or	report.						
Examination							
Details of examination							
Other information							
Reference LIRI							
Office hours							
Relations to attainment objective	s of learning and e	ducatio	า				

(M41610030)Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]

Subject name[English]	Thesis Research o	on Mechanica	al Engir	neering[Thesis Rese	arch on Mechanica	[Engineering]
Schedule number	M41610030	Subject are	18	Advanced	Required or	Required
				Mechanical	elective	
	 	L		Engineering	ļI	
Time of starting a course	2Years	Day of	the .	Intensive	Credit(s)	6
		week,perio	d			
Faculty	Graduate School	ot Engineerin	g		Subject grade	1~1
Department Offered	I				Deggining	
Charge teacher name[Paman	S1系教務未昌 11	(ei kyomu lin	-8		BIGUO	<u> </u>
alphabet mark]	- 小水切女貝	yomu Inf	5			
Numbering						
Objectives of class	L					
The thesis research aims to prov	vide a practical evo	erience of m	search	n work, and to acc	lire his/her research	h skill with deep
understanding of the relevant kno	wledge.		Jung	, and to acq		ueep
The thesis research aims to prov	vide a practical exp	erience of re	esearcl	h work, and to accu	uire his/her researc	h skill with deep
understanding of the relevant kno	wledge.			· •		
Contents of class						
The research subject depends	on the supervisor	and the res	earch	group you join. Inc	lividual students w	ill have different
research subjects. Contact with y	our supervisor.	-				
The research subject depends	on the supervisor	and the res	earch	group you join. Inc	ividual students w	ill have different
research subjects. Contact with y	our supervisor.					
Sen Preparation and Review						
						
Related subjects						
Notes for textbook						
Reference and material will be av	ailable from the sup	ervisor.				
Reference and material will be av	ailable from the sup	ervisor.				
Notes for reference			_			
Goals to be achieved			_			
To get something new on individu	al research fields.					
To develop his/her research skill	including the planni	ing and the p	resent	ation.		
l_						
To get something new on individu	al research fields.					
I o develop his/her research skill	including the planni	ing and the p	resent	ation.		
Evaluation of achievement			_			
Presentation(10%), Abstract of th	e thesis(10%), Thesi	is(20%), Cours	sework	(30%), Outcomes(30	J%).	
Presentation(10%), Abstract of th	e thesis(10%), Thesi	is(20%), Cours	sework	(30%), Outcomes(30	J%).	
⊏xamination						
D-4 11 0						
Details of examination						
A.1						
Other information	_	_	_	_	_	1
Reference URL						
Office hours						
Relations to attainment objective	s of learning and e	ducation				

(M41610030)Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]

Subject name[English]	Thesis Researc	h on Mechanical Engi	neering[Thesis Res	earch on Mechani	cal Engineering]		
Schedule number	M41610030	Subject area	Advanced	Required or	Required		
		Subject alou	Mechanical	elective	i toquii ou		
			Engineering	0100040			
Time of starting a course	2Years	Day of the	Experiment	Credit(e)	6		
Time of starting a course	210013	week period	Experiment	Ci Bullis/	0		
Faculty/	Craduata Brage	am for Mostor's Dorr		Subject grade	1~2		
Paculty Department Offered	Graduate Frogr	ann for Master's Degr	66	Beggining	1.02		
Department Offered				Deggining			
Charge teacher neme[Berren	友 掛吕 ○1 衣 ≭		IN Kaludu auto 1kai	grade			
			in Nakukyouin, ike	kyoinu iin-3			
Numbering							
Objectives of class							
The thesis research aims to pro-	vide a practical e	xperience of researc	h work, and to acq	uire his/her resea	rch skill with deep		
understanding of the relevant kno	owledge.						
The thesis research aims to pro-	vide a practical e	xperience of researc	h work, and to acq	uire his/her resea	rch skill with deep		
understanding of the relevant kno	owledge.						
Contents of class							
The research subject depends	on the superviso	r and the research	group you join. In	dividual students	will have different		
research subjects. Contact with y	our supervisor.						
The research subject depends	on the superviso	r and the research	group you join. In	dividual students	will have different		
research subjects. Contact with	our supervisor.		-				
Self Preparation and Review							
Related subjects							
Noiatou subjects							
Notes for textbook							
Reference and material will be av	ailable from the s	upervisor.					
Reference and material will be av	ailable from the s	upervisor.					
Notes for reference							
Goals to be achieved							
To get something new on individu	al research fields						
To develop his/her research skill	including the plar	ning and the present	ation.				
To get something new on individu	al research fields						
To develop his/her research skill	including the plar	ning and the present	ation.				
Evaluation of achievement							
Presentation(10%), Abstract of th	e thesis(10%), The	esis(20%), Courseworl	(30%), Outcomes(3	0%).			
Presentation(10%), Abstract of th	e thesis(10%). The	esis(20%), Courseworl	(30%), Outcomes(3	0%).			
Examination	,						
Details of examination							
Other information							
Reference URL							
Office hours							
Polations to attainment objectives of learning and advantion							
	o u loarning and	ouuvauvii					
Key werde							
ney words							

(M4161003T)Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]

Subject name[English]	Thesis Researc	h on Mechanical Engi	neering[Thesis Res	earch on Mechanic	al Engineering]		
Schedule number	M4161003T	Subject area		Required or	Required		
	1010001		Mechanical	elective	rtequireu		
			Engineering	01000140			
Time of starting a source	Vear	Day of the	Experiment	Cradit(a)	6		
Time of starting a course	i cai	Day Of Ulo	Experiment	Oredit(s)	0		
Faculty	Graduate Progr	am for Master's Degr		Subject grade	2~2		
Department Offered		ani toi mastei s Degi		Reggining			
				grade			
Charge teacher name[Roman		₩ 務 森 器 K A K I K V O I I K V O I I K V O I I K V O I K V O I K V O I K V O I K V O I K V O N S S S S S S S S S S S S S	IN Kakukvouin 1ke	i kvomu lin-S			
elabetet merk]							
Numbering							
Objectives of class							
The thesis research aims to pro-	vide a practical e	xperience of researc	h work, and to acc	quire his/her resea	rch skill with deep		
understanding of the relevant kno	owledge.						
The thesis research aims to pro-	vide a practical e	xperience of researc	h work, and to acc	uire his/her resea	rch skill with deep		
understanding of the relevant kno	owledge.						
-	-						
Contents of class							
The research subject depends	on the superviso	r and the research	group you join In	dividual students y	will have different		
research subjects Contact with	our supervisor		Broad for John In	arriddai Stadents I	in nave unrerent		
The research subjects. Contact with	on the supervisor.	r and the recearch	group you join. In	dividual students y	will have different		
research subject depends		i and the research	group you join. In				
Self Preparation and Review							
Related subjects							
Notes for textbook							
Reference and material will be av	ailable from the s	upervisor.					
Reference and material will be av	ailable from the s	upervisor.					
Notes for reference							
Goals to be achieved							
To get something new on individu	al research fields						
To develop his/her research skill	including the plar	ning and the present	ation				
To get something new on individu	al research fields						
To develop his/her research skill	including the plar	Ining and the present	ation.				
Evaluation of achievement	······································						
Presentation(10%). Abstract of th	e thesis(10%). The	esis(20%), Courseworl	(30%), Outcomes(3	80%).			
		,	,				
Proportation (10%) Abot state	a theorie (100) The	nin(20%) Courses	(20%) 0	n M			
Fresentation (10%), Abstract of th	e mesis(10%), The	SIS(20%), COURSEWOR	(JUM), Outcomes(J	00/0).			
Examination							
Details of examination							
Other information							
Peference LIPI							
Office hours							
Relations to attainment objective	s of learning and	education					

(M41610040)Seminar on Mechanical Engineering[Seminar on Mechanical Engineering]

Subject name[English]	Seminar on Mecha	anical E	nginee	ring[S	eminar on Mechar	nical Engineering]	
Schedule number	M41610040	Subje	ct area	a	Advanced	Required or	Required
					Mechanical	elective	
					Engineering		
Time of starting a course	Year	Day	of	the	Experiment	Credit(s)	6
		week,	period	_			
	Graduate Program	n for Ma	aster's	Degre	e	Subject grade	2~2
Department Offered						Beggining	
Charge teacher name[Roman		& 禿 昌 レ			N Kakukvouin 1ke	i kvomu lin-S	
alphabet mark]	百铁頁, 51 未获在	カ女員・		(1001	IN INAKUKYOUIII, IKe		
Numbering							
The seminar aims to provide a c	road understanding	of the	mech	anicai	engineering availa	able for the researc	n work of his/her
The seminar aims to provide a h	road understanding	of the	mech	anical	engineering availa	ble for the researc	h work of his/her
master thesis		or the	meen	anicai	engineering availa		
Contents of class							
The class provides both of funda	mental knowledge o	n the re	esearcl	h worl	of master thesis	and the most advan	ced results in the
related field by reading research	papers and monogra	aphs. Co	ontent	s of tl	ne class depend o	n the supervisor. To	be announced by
individual supervisors.		-	-	-			.,
The class provides both of funda	mental knowledge o	n the re	esearcl	h worl	of master thesis	and the most advan	ced results in the
related field by reading research	papers and monogra	aphs. Co	ontent	s of tl	ne class depend o	n the supervisor. To	be announced by
individual supervisors.							
Self Preparation and Review							
Related subjects							
Notes for textbook							
Textbook or material will be made	e available from the	supervi	sors.				
Textbook or material will be made	e available from the	supervi	sors.				
Notes for reference							
Goals to be achieved							
To acquire fundamental knowledg	e on individual rese	arch fie	lds.				
To acquire the ability of finding a	problem, the ability	of solv	ing the	e prob	lem and presentat	ion skill.	
To acquire fundamental knowledg	e on individual rese	arch fie	lds.				
To acquire the ability of finding a	problem, the ability	of solv	ing the	e prob	lem and presentat	ion skill.	
Evaluation of achievement							
Coursework, presentation and/or	report.						
Coursework, presentation and/or	report.						
Examination							
Details of examination							
Other information							
Reference LIRI							
Office hours							
Relations to attainment objective	es of learning and e	ducatio	n				
1							

(M41630010)Vibration and Impact Mechanics[Vibration and Impact Mechanics]

Subject name[English]	Vibration and Imp	oact Mechanic	s[Vibr	ation and Impact M	echanics]	
Schedule number	M41630010	Subject are	a	Advanced	Required or	Elective
				Mechanical	elective	
				Engineering		
Time of starting a course	Spring1 term	Day of	the	Tue.2~2	Credit(s)	1
		week,period	ł			
Faculty	Graduate Progra	m for Master's	s Degre	e	Subject grade	1~2
Department Offered					Beggining	
					grade	
Charge teacher name_Roman	河村 庄造 KAW	AMURA Shozo	D			
alphabet mark						
Numbering						
Objectives of class						
The class aims to give basic kn	owledge on vibrati	on engineerin	g, in p	articular, on the m	odeling of multi-de	gree-of-freedom
system and modal analysis, and c	ontact, impact and	some of their	^r analy	tical methods.		
The class aims to give basic kn	owledge on vibrati	on engineerin	g, in p	articular, on the m	odeling of multi-de	gree-of-freedom
system and modal analysis, and c	ontact, impact and	some of their	^r analy	tical methods.		
Contents of class						
Vibration Engineering(Kawamura)						
1. Modeling of multi-degree-of-fr	eedom system(MD	OF system)				
2. Modal analysis of MDOF system	n (eigenvalue analy	vsis, etc.)				
3. Modal analysis of MDOF system	n (Component moo	le synthesis m	nethod)		
Impact Mechanics(Minamoto)						
1.Rigid body impact						
Collinear impact of spheres, Impu	lse-momentum rel	ation, Coeffici	ent of			
restitution						
2.Contact of elastic body						
Hertz theory of contact, Contact	pressure, Contact	between two	sphere	es,		
Boussinesq problem						
3.Elastic and inelastic impact						
Hertz theory of impact, Contact	duration, Impact be	tween two spl	heres			
Initiation of yielding, Fully plastic	deformation, Coeff	icient of				
restitution						
4.Axial impact						
Wave propagation, Longitudinal w	ave, Split Hopkinso	n-bar test				
Vibration Engineering(Kawamura)						
1. Modeling of multi-degree-of-fr		OF system)				
2. Modal analysis of MDOF system	n (Component mor	isis, etc.) la cunthacic m	athod)		
o. modal analysis of MDOF Syster		ao aynunesis fi	iscribu	/		
Impact Mechanics(Minameta)						
1 Rigid body impact						
Collinear impact of spheres. Impu	lse-momentum rel	ation Coeffici	ent of			
restitution						
2 Contact of elastic body						
Hertz theory of contact. Contact	pressure Contact	between two	sphere	es.		
Boussinesg problem	p. 0000.0, 00110000		opnon	,		
3.Elastic and inelastic impact						
Hertz theory of impact. Contact	duration, Impact be	tween two spl	heres			
Initiation of yielding, Fully plastic	deformation, Coeff	icient of				
restitution						
4.Axial impact						
Wave propagation, Longitudinal w	ave, Split Hopkinso	n-bar test				
Self Preparation and Review						
Related subjects						
Fundamental knowledge on vibra	tion engineering a	and mathemat	ics on	linear algebra and	d ordinary different	ial equation, and

engineering mechanics, theory of elasticity and plasticity.

Fundamental knowledge on vibration engineering and mathematics on linear algebra and ordinary differential equation, and engineering mechanics, theory of elasticity and plasticity.

Notes for textbook

Handouts will be prepared Handouts will be prepared Notes for reference

Notes for reference

Goals to be achieved

get the basic knowledge on vibration engineering, contact, impact and some of their analytical methods. get the basic knowledge on vibration engineering, contact, impact and some of their analytical methods.

Evaluation of achievement

Some short reports during the class (30%) and a comprehensive report after final class (70%) Some short reports during the class (30%) and a comprehensive report after final class (70%) **Examination**

Details of examination

Other information

Shozo Kawamura: room (D-404), E-Mail: kawamura@me.tut.ac.jp Hirofumi Minamoto: room (D-405), e-mail: minamoto@me.tut.ac.jp

Shozo Kawamura: room (D-404), E-Mail: kawamura@me.tut.ac.jp Hirofumi Minamoto: room (D-405), e-mail: minamoto@me.tut.ac.jp

Reference URL

Office hours

ask me by E−Mail ask me by E−Mail

Relations to attainment objectives of learning and education

Key words

vibration, impact, contact vibration, impact, contact

(M41630070)Joining and Surfacing of Materials[Joining and Surfacing of Materials]

Subject name[English]	Joining and Surfa	acing of Materials[.lo	ining and Surfacing	of Materials]			
Schedule number	M41630070	Subject area	Advanced	Required or	Flective		
	1111000070	Cubject al ca	Mechanical	elective	LICOLIVE		
			Engineering	01000140			
Time of starting a course	Spring1 term	Day of the		Credit(e)	1		
Time of starting a course	Spring r term	Day Of Ule	100.101	Or Buil(s)	1		
Facultar	Cuaduata Duarua	week,perioa		Subject mede	10.2		
Pacuity Department Offered	Graduate Program	m for master's Degre	e	Subject grade	1~2		
Department Offered				grada			
Charge teacher name[Barran	垣木 밀史 디내	IMOTO Magabira		grauo			
alphabet mark]							
Numbering							
Numbering							
Objectives of class							
To understand fundamentals of	advanced technolo	ogy in materials join	ing, especially both	in high performar	nce thick coating		
formation by Thermal Spraying, C	old Spraying, Aero	-sol Deposition, in n	on-melting diffusion	bonding by Frictio	n Stir Welding.		
To understand fundamentals of	advanced technolo	ogy in materials join	ing, especially both	in high performar	nce thick coating		
formation by Thermal Spraying, C	old Spraying, Aero-	-sol Deposition, in n	on-melting diffusion	bonding by Frictio	n Stir Welding.		
Contents of class							
1. Fundamental of surface modifi	cation process and	technology					
2. Fundamentals of thermal spray	y process, Splat for	rmation problem					
3. Process control with Transitio	n temperature & T	ransition pressure					
4. Cold spraying and Aero-s	ol deposition proc	cess, Functional ma	aterials coating: ph	otocatalyst, SOF	C, nano coating,		
intermetallic compound coating, e	etc.		· · ·				
5. Fundamental of Friction Stir W	/elding						
6. Joining between disimillar mat	erials by FSW						
7 Friction spot welding practica	l applications of FS	SW					
1 Fundamental of surface modifi	cation process and	technology					
2 Fundamentals of thermal spray	v process Splat for	rmation problem					
3 Process control with Transitio	n temperature & T						
4 Cold spraving and Aero-si	al deposition proc	ransición pressure	sterials costing ph	otoostalvet SOE	nano coating		
intermetallia compound costing of		Sess, i unctional ma	ateriais coating. pr	lotocatalyst, SOI	o, nano coating,		
5 Eundomental of Eristion Stir W	lolding						
5. Fundamental of Friction Stir W	eriala hy ESW						
 Joining between disimilar mat Triation on standard disimilar mat 	erials by FSW	NA/					
7. Friction spot weiding, practica	applications of FS	500					
Sell Freparation and Review							
Basic knowledge on materials joir	ing process is desi	irable.					
Basic knowledge on materials joir	ing process is desi	irable.					
Notes for textbook							
Handouts will be prepared for par	ticipants.						
(Reference)							
Required readings will be taken fr	om a variety of ref	erence books and re	search papers.				
Handouts will be prepared for par	ticipants.						
(Reference)							
Required readings will be taken fr	om a variety of ref	erence books and re	search papers.				
Notes for reference							
Goals to be achieved							
Understand following items.							
-Joining mechanism between dise	similar materials						
-Features and mechanism of vari	ous joining method	s					
-Features and mechanism of this	k and thin film coat	- ting					
-Features of functionally gradient	material and com	oosite material					
Understand following items							
- loining mechanism between dis	similar matariala						
-Features and machanism of veri	ous joining mathed	c					
-Features and mechanism of Vari	ous joining method	5					
–reatures and mechanism of thic	к and thin film coat	ting					

-Features of functionally gradient material and composite material
Evaluation of achievement
Interim report & presentation (40%) and term-end report (60%).
Interim report & presentation (40%) and term-end report (60%).
Examination
Details of examination
Other information
Masahiro Fukumoto:
Room: D–503, ext.: 6692, e-mail: fukumoto@tut.jp
Masahiro Fukumoto:
Room: D-503, ext.: 6692, e-mail: fukumoto@tut.jp
Reference URL
http://isf.me.tut.ac.jp/
http://isf.me.tut.ac.jp/
Office hours
Masahiro Fukumoto: Wednesday 17:00–18:00
Masahiro Fukumoto: Wednesday 17:00-18:00
Relations to attainment objectives of learning and education
Key words
Joining in dissimilar maretials, Surface modification, Thermal spraying, Cold spraying, FSW
Joining in dissimilar maretials, Surface modification, Thermal spraying, Cold spraying, FSW

(M41630130)Modeling and Analysis of Dynamical Control Systems[Modeling and Analysis of Dynamical Control Systems]

Subject name[English]	Modeling and An	alysis of Dyr	namical	Control Systems	Modeling and Analy	sis of Dynamical
	Control Systems					-
Schedule number	M41630130	Subject an	ea	Advanced	Required or	Elective
				Mechanical	elective	
Time of starting a source	Spring1 torm	Day of	the		Credit(a)	1
Time of starting a course	Springi term	week perio	d The	Thu.2~2	Great(s)	1
Faculty	Graduate Program	n for Master'	s Degr	e	Subject grade	1~2
Department Offered			0		Beggining	
					grade	
Charge teacher name[Roman	寺嶋 一彦 TERA	SHIMA Kazu	hiko			
alphabet mark]						
Numbering						
Objectives of class						
Modeling and Analysis of dynar	mical control syste	ems is lectu	red.In	particular, physica	I modeling of vario	ous processes is
explained and identification meth	nod is also explaine	ed by means	of exp	eriment data and	information techniq	ue when physical
modeling is impossible. Then, a	nalysis of systems	s is lectured	conce	erning state vecto	r equation, solutior	n, controllability ,
observability, staility and realizati	on. Modeling is ver	ry important o	enginee	ering for control de	sign, and is indispen	sable to become
advanced engineer.						
Modeling and Analysis of dynar	nical control syste	ems is lectu	red.In	particular, physica	I modeling of vario	ous processes is
explained and identification meth	iod is also explaine	ed by means	of exp	eriment data and	information techniq	ue when physical
modeling is impossible. Then, a	nalysis of systems	s is lectured	conce	erning state vecto	r equation, solutior	n, controllability ,
observability, stallity and realizati	on. Modeling is ver	ry important o	enginee	ering for control de	sign, and is indispen	sable to become
Contents of class						
1 Physical Medaling						
(1) Process system						
(1) Hocess system (2)Mechanical system						
(3) Electric system						
2.System Identification of Linear	Systems					
(1) Time series model such as A	ARMA model and AF	RX model				
(2) Time series identification by	Least square meth	nod				
(3) Transfer function identificati	ion by FFT					
(4) Realization problem						
3.System Identification of Nonline	ear Systems					
(1)Neural network modeling						
(2)Fuzzy modeling						
4.System Analysis						
(1)State vector equation and an	alytical solution of	system				
(2)Controllability and Observabil	lity of system					
(3)Stability of systems						
(1) Process system						
(1) Process system (2)Mechanical system						
(3) Electric system						
2 System Identification of Linear	Systems					
(1) Time series model such as A	ARMA model and AF	RX model				
(2) Time series identification by	Least square meth	nod				
(3) Transfer function identificati	ion by FFT					
(4) Realization problem						
3.System Identification of Nonline	ear Systems					
(1)Neural network modeling						
(2)Fuzzy modeling						
4.System Analysis						
(1)State vector equation and an	alytical solution of	system				
(2)Controllability and Observabil	lity of system					
(3)Stability of systems						
Sell Preparation and Review						

Related subjects
Mathematical ability for Matrix theory and Laplace transformation
Mathematical ability for Matrix theory and Laplace transformation
Notes for textbook
(Reference)
Modern control design with MATLAB and SIMLINK by Ashish Tewari, Wiley
Print prepared by lecturer
(Reference)
Modern control design with MATLAB and SIMLINK by Ashish Tewari Wiley
Notes for reference
Goals to be achieved
We study and understand how to build the mathmatical model in order to predict and control the natural phenomena and the
real processes.
We study and understand how to build the mathmatical model in order to predict and control the natural phenomena and the
real processes.
Evaluation of achievement
Test: 90, Report 10
Test: 90, Report 10
Examination
Details of examination
Details of exemination
Details of examination Other information
Details of examination Other information Email address: terasima@me.tut.ac.jp
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jn/
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ http://www.syscon.pse.tut.ac.jp/
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ http://www.syscon.pse.tut.ac.jp/ Office hourse
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Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00 Relations to attainment, objectives of learning and education
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00 Relations to attainment objectives of learning and education
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00 Relations to attainment objectives of learning and education
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ Mttp://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00 Relations to attainment objectives of learning and education
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00 Wed.13:00-15:00 Relations to attainment objectives of learning and education
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00 Wed.13:00-15:00 Relations to attainment objectives of learning and education
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00 Relations to attainment objectives of learning and education
Details of examination Other information Email address: terasima@me.tut.ac.jp Email address: terasima@me.tut.ac.jp Reference URL http://www.syscon.pse.tut.ac.jp/ Office hours Wed.13:00-15:00 Wed.13:00-15:00 Relations to attainment objectives of learning and education Key words

(M41630200)Advanced Environmental Engineering for Metals[Advanced Environmental Engineering for Metals]

Metail Metail Metail Metail Advanced Required of Elective Schedule number Metail Spring2 term Day of the Mon.3~3 Gradita) 1 The of starting a course Spring2 term Day of the Mon.3~3 Gradita) 1 Pacutore Graduate Program for Master's Degree Subject grade 2~-2 Department Offreed Graduate Program for Master's Degree Begding 2~-2 Objectives of oles "Advanced Environmental Engineering for Metals" includes physical chmistry and transport phenomena for environment. In this course students will learn about fundamentals of physical chmistry of metals mainly in metallurgical processing, such as recycling, reaction between gaseous spoise and metals. Focus is put on motan metals. Class will be given in a seminar style. "Advanced Environmental Engineering for Metals" includes physical chmistry of metals mainly in metallurgical processing, such as recycling, reaction between gaseous spoise and metals. Focus is put on metan metals. Class will be given in a seminar style. "Advanced Environmental Engineering for Metals" Introduction. Septimetal Septimetal Septimetal Septimetal Septimetal Septimetal Septimetal Septimetal Septimetal	Subject name[English]	Advanced Enviro	nmental Enginee	ering	for Metals[Adva	nced Environmenta	I Engineering for	
Contractor nambor Information Control of Engineering Description Section Time of starting a course Spring2 tarm Day of the Mon3~3 Credit(a) 1 Faculty Craduate Program for Master's Degree Baggining grade 2~2 Department Offred Buil ME_TVKOVAMA Seji Baggining grade 2 Value Set Transmitter Buil ME_TVKOVAMA Seji Baggining grade 2 Value Set Transmitter Buil ME_TVKOVAMA Seji Baggining grade 2 Value Set Transmitter Buil ME_TVKOVAMA Seji Baggining grade 2 Value Set Transmitter Baggining for Matals" includes physical chmistry and transport phenomena for environment. In this course students will learn about fundamentals of physical chmistry of metals mainly in metallurgical processing, such as recycling, reaction between gase paceus spcies and metals. Focus is put on molten metals. Class will be given in a seminar style. Contrast of class 1 1 1 2 1 Deprecision between gase paceous spcies and metals. Focus is put on molten metals. Class will be given in a seminar style. 2 2 Thermochemistry (fundamentals of Evaporation) 3.2.2.1 Thermochemistry (fundamentals of Evaporation) 3.2.2.1 Thermochemistry (Schedule number	Metals M41630200	Subject area		Advanced	Required or	Flective	
Imme of starting a course Spring2 term Day Engineering Mon.3 ~3 Credit(s) 1 Faculty Graduate Program for Master's Degree Subject grade 2~2 Department Offered Bageining grade 2~2 Otarge teacher name[Roman schubet mark] Ital Ital Ital Objectives of class "Advanced Environmental Engineering for Matals" includes physical chemistry and transport phenomena for environment. In this course students will learn about fundamentals of physical chemistry of metals mainly in metallurgical processing, such as recycling; reaction between gaseous spcies and metals. Focus is put on molen metals. Class will be given in a seminar style. Other of class "Advanced Environmental Engineering for Matals" includes physical chemistry of metals mainly in metallurgical processing, such as recycling; reaction between gaseous spcies and metals. Focus is put on molen metals. Class will be given in a seminar style. Outstard of class 1. 1. 1.1 2.2 Thermochemistry (fundamentals of physical chemistry of metals mainly in metallurgical processing, such as recycling; reaction between gaseous spcies and metals. 2.3 2.1 Thermochemistry (Fundamentals of Physical chemistry of metals 3.2 3.2 3.1 Recycling of hyperoduct in iron and steelmaking (Slag and dust) 4.2.3<		WI41000200			Mechanical	elective	LICCIVE	
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<reference> "Principles of Extractive Metallurgy", Terkel Rosenqvist(McGrowhill) <reference> "Principles of Extractive Metallurgy", Terkel Rosenqvist(McGrowhill) Notes for reference Goals to be achieved To understand 1) Chemical equilibrium</reference></reference>	Notes for textbook							
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<reference> "Principles of Extractive Metallurgy", Terkel Rosenqvist(McGrowhill) Notes for reference Goals to be achieved To understand 1) Chemical equilibrium</reference>	"Principles of Extractive Metallurgy", Terkel Rosenqvist(McGrowhill)							
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Notes for reference Goals to be achieved To understand 1) Chemical equilibrium	Principles of Extractive Metallur	gy , Terkel Rosenq	vist(McGrowhill)					
Goals to be achieved To understand	Notes for reference							
To understand 1) Chemical equilibrium								
1) Chemical equilibrium	To understand							
	1) Chemical equilibrium							

2) Reaction rate
3) Transport phenomena
4) Evaporation
5) liquid-liquid extraction
6) Recycling of viecle
To understand
1) Chemical equilibrium
2) Reaction rate
3) Transport phenomena
4) Evaporation
5) liguid-liguid extraction
6) Recycling of viecle
Evaluation of achievement
Evaluation: Score calculated from report (50 %) and exam. (50 %)
(you must submit all reports)
A : You must understand all items as listed above, and you ger score of 80 and above.
B:You must understand four of all items as listed above, and you ger score of 65 and above.
C:You must understand four of all items as listed above, and you ger score of 55 and above.
Evaluation: Score calculated from report (50 %) and exam. (50 %)
(you must submit all reports)
A : You must understand all items as listed above, and you ger score of 80 and above.
B:You must understand four of all items as listed above, and you ger score of 65 and above.
C:You must understand four of all items as listed above, and you ger score of 55 and above.
Examination
Details of examination
Other information
D-507 TEL:0532-44-6696
D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp
D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507
Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696
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Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp Reference URL http://martens.pse.tut.ac.jp/
Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp Reference URL http://martens.pse.tut.ac.jp/ http://martens.pse.tut.ac.jp/
Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp Reference URL http://martens.pse.tut.ac.jp/ http://martens.pse.tut.ac.jp/ Office hours
Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp Reference URL http://martens.pse.tut.ac.jp/ http://martens.pse.tut.ac.jp/ Office hours Monday 16:00-18:00
Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp Reference URL http://martens.pse.tut.ac.jp/ http://martens.pse.tut.ac.jp/ Office hours Monday 16:00-18:00 Monday 16:00-18:00
Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp Reference URL http://martens.pse.tut.ac.jp/ http://martens.pse.tut.ac.jp/ Office hours Monday 16:00-18:00 Monday 16:00-18:00 Relations to attainment objectives of learning and education
Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp Reference URL http://martens.pse.tut.ac.jp/ http://martens.pse.tut.ac.jp/ Office hours Monday 16:00-18:00 Monday 16:00-18:00 Relations to attainment objectives of learning and education
Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp Reference URL http://martens.pse.tut.ac.jp/ http://martens.pse.tut.ac.jp/ Office hours Monday 16:00-18:00 Monday 16:00-18:00 Relations to attainment objectives of learning and education
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Other information D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp D-507 TEL:0532-44-6696 E-mail:yokoyama@me.tut.ac.jp Reference URL http://martens.pse.tut.ac.jp/ Office hours Monday 16:00-18:00 Monday 16:00-18:00 Relations to attainment objectives of learning and education

(M41630220)Advanced Mechanical Systems Design II[Advanced Mechanical Systems Design II]

Subject name[English]	Advanced Mechar	nical Syster	ns Desig	n II[Advanced Mec	hanical Systems De	sign II]
Schedule number	M41630220	Subject a	rea	Advanced	Required or	Elective
				Mechanical	elective	
				Engineering		
Time of starting a course	Spring term	Day of	the the	Mon.4~4	Credit(s)	2
		week,peri	od			
Faculty	Graduate Program	n for Maste	r's Degre	e	Subject grade	1~2
Department Offered					Beggining	
grade						
charge teacher name_Roman	谷秋貝, 31 木秋作	为安良 NAN		in Kakukyouiri, Tkei	kyomu im-S	
Objectives of class		6 . 1				
This lecture aims to provide a	broad understandin	ig of the n	nechanic	al systems design	available for the i	research work of
his/her master thesis.				-1		
his lecture aims to provide a	broad understandin	ig of the n	rechanic	al systems design	available for the I	research work of
Contents of class						
The class provides both of fundar	mental knowledge o	n tha racas	rch worl	of master thesis	and the most advan	ced results in the
related field by reading research	naners and monogra	anhs Conte	ents of th	ne class depend on	the supervisor. To	be announced by
individual supervisors.		aprilo. Ooritte				20 announded by
The class provides both of fundar	mental knowledge o	n the resea	rch worl	of master thesis a	and the most advan	ced results in the
related field by reading research	papers and monogra	aphs. Conte	ents of t	ne class depend on	the supervisor. To	be announced by
individual supervisors.						-
Self Preparation and Review						
Related subjects						
-						
Notes for textbook						
Textbook or material will be made	available from the	supervisor	-			
Textbook or material will be made	available from the	supervisor	s.			
Notes for reference						
Goals to be achieved						
To acquire fundamental knowledg	e on individual rese	arch fields.				
To acquire the ability of finding a	problem, the ability	of solving	the prob	lem and presentation	on skill.	
		0	•	·		
To acquire fundamental knowledg	e on individual rese	arch fields				
To acquire the ability of finding a	problem, the ability	of solving	the prob	lem and presentation	on skill.	
Evaluation of aphiavement						
Lyanauon or admovement.						
Coursework presentation and/or report						
Examination						
Details of exemination						
Other information						
Other Information						
D. fammer UDI						
Reference URL						
Office hours						
Relations to attainment objectives of learning and education						

(M41630240)Advanced Materials and Manufacturing Process II[Advanced Materials and Manufacturing Process II]

		ST TOODSS MEADVallot				
Subject name[English]	Advanced Mater	rials and Manufactur	ring Process IILA	ivanced Materials a	nd Manufacturing	
	Process II	1	T		T	
Schedule number	M41630240	Subject area	Advanced	Required or	Elective	
			Mechanical	elective		
			Engineering			
Time of starting a course	Spring term	Day of the	Tue.4~4	Credit(s)	2	
		week,period				
Faculty	Graduate Program for Master's Degree Subject grade 1~2					
Department Offered	-	Beggining				
				grade		
Charge teacher name[Roman	各教員 S1系教	務委員 KAKUKYOUI	N Kakukvouin, 1ke	i kvomu lin-S		
alphabet mark]						
Numbering						
Ramboring						
Objectives of class						
This lecture aims to provide a bro	oad understanding	of the materials and	l manufacturing pr	ocess available for t	he research work	
of his/her master thesis.						
This lecture aims to provide a bro	oad understanding	of the materials and	l manufacturing pr	ocess available for t	he research work	
of his/her master thesis.						
Contents of class						
The class provides both of fundar	mental knowledge	on the research worl	of master thesis	and the most advan	ced results in the	
related field by reading research	papers and monog	raphs. Contents of t	ne class depend o	n the supervisor. To	be announced by	
individual supervisors					b	
The class provides both of funder	mental knowledge	on the research worl	of master thesis	and the most adver	cad results in the	
related field by reading reacting	nonical knowledge	ranha Contanta af 1	on master triesis	n the cupervisor T-	be appounded by	
individual automicant	papers and monog	apris. Contents of th	ie class depend 0	in the supervisor. To	se announced by	
Solf Dress and Low de Deuder						
Sen Preparation and Review						
Related subjects						
Notes for textbook						
Textbook or material will be made	e available from the	e supervisors.				
Textbook or material will be made	e available from the	e supervisors.				
Notes for reference						
Goals to be achieved						
To acquire fundamental knowledg	e on individual res	earch fields.				
To acquire the ability of finding a problem, the ability of solving the problem and presentation skill.						
To acquire fundamental knowledge	e on individual res	earch fields				
To acquire the ability of finding a	problem the abilit	v of colving the prob	lom and procentat	ion skill		
To acquire the ability of finding a		y of solving the prop	iem and presental	ION SAIII.		
Evaluation of achievement						
Coursework, presentation and/or	report.					
Coursework, presentation and/or report.						
Examination						
Details of examination						
Other information						
Reference URL						
Office hours						
Deletione to attainment attain		- du antion				
relations to attainment objective	s of learning and o	Baucation				

(M41630260)Advanced System, Control and Robotics II[Advanced System, Control and Robotics II]

Subject name[English]	Advanced System	n. Control and Robo	tics II[Advanced Sy	vstem. Control and	Robotics II]	
Schedule number	M41630260	Subject area	Advanced	Required or	Flective	
		Sugeet uivu	Mechanical	elective		
			Engineering	01000140		
Time of starting a course	Spring term	Day of the	Thu 4~4	Credit(s)	2	
		week period	ind.i i		-	
Faculty	Graduate Progra	m for Master's Degr	ee .	Subject grade	1~2	
Department Offered				Beggining		
				grade		
Charge teacher name[Roman	各教員, S1系教	務委員 KAKUKYOU	IN Kakukyouin, 1ke	i kyomu Iin-S		
alphabet mark]	ark]					
Numbering						
Objectives of class						
This lesture sime to provide a l	arood understandin	a of the control o	ad robation availab	la far tha radarak	work of his/hor	
moster thesis	broad understandin	ig of the control a		ie for the research	I WORK OF HIS/HER	
This lecture sime to provide a h	aroad understandir	or of the control a	ad robotion availab	le for the receard	work of his/her	
master thesis						
Contents of class						
The class provides both of fundar	mental knowledge (on the research wor	of master thesis	and the most advan	ced results in the	
related field by reading research	naners and monor	ranhs Contents of t	he class depend or	the supervisor. To	be appounced by	
individual supervisors		apris. Contents Of t			se announced by	
The class provides both of fundar	nental knowledge o	on the research wor	k of master thesis	and the most advan	ced results in the	
related field by reading research	papers and monoge	aphs. Contents of t	he class depend or	the supervisor To	be announced by	
individual supervisors					20 announded by	
Self Preparation and Review						
Delete d autorete						
Related subjects						
Notes for textbook						
Textbook or material will be made	e available from the	supervisors.				
Textbook or material will be made	e available from the	e supervisors.				
Notes for reference						
Goals to be achieved						
To acquire fundamental knowledg	e on individual rese	earch fields.				
To acquire the ability of finding a problem, the ability of solving the problem and presentation skill.						
To acquire fundamental knowledg	e on individual rese	earch fields.				
To acquire the ability of finding a	problem, the ability	y of solving the prob	lem and presentati	on skill.		
Evaluation of achievement						
Coursework presentation and/or	report					
Coursework, presentation and/or	report.					
Examination						
Details of examination						
Other information						
Reference URL						
Office hours						
Relations to attainment objectives of learning and education						

(M41630280)Advanced Energy and Environmental Engineering II[Advanced Energy and Environmental Engineering II]

Subject nemo[Endich]	Advenced Energy			Advenced Energy ev	nd Environmental	
Subject name[English]	Advanced Energy	y and Environment	ai Engineering IIL	Advanced Energy a	nd Environmental	
Schedule number		Subject area	Advanced	Required or	Flective	
Schedule Humber	10141030280	Subject area	Machanical	elective	LIECTIVE	
			Engineering	0000140		
Time of starting a course	Spring term	Day of the	Fri.4~4	Credit(s)	2	
		week,period				
Faculty	Graduate Program	n for Master's Degr	ee	Subject grade	1~2	
Department Offered				Beggining		
	夕北日 01万北			grade		
Charge teacher name[Roman	谷软貝, 51 杀软	務安員 KAKUKYUU	IN Kakukyouin, Tke	ei kyomu lin-S		
Numbering						
Objectives of class						
This lecture aims to provide a bro	and understanding (of the energy and e	wironmontal ongin	aaring available for t	ha racaarah wark	
of his/her master thesis		of the energy and e	ivironmentai engin		ne research work	
This lecture aims to provide a bro	oad understanding o	of the energy and e	nvironmental engin	neering available for t	he research work	
of his/her master thesis.	U		0	-		
Contents of class						
The class provides both of fundation	mental knowledge o	on the research wor	k of master thesis	and the most advan	ced results in the	
related field by reading research	papers and monogr	aphs. Contents of t	he class depend o	n the supervisor. To	be announced by	
individual supervisors.						
The class provides both of fundation	mental knowledge c	on the research wor	k of master thesis	and the most advan	ced results in the	
related field by reading research	papers and monogr	aphs. Contents of t	he class depend o	n the supervisor. To	be announced by	
Individual supervisors.						
Ser Preparation and Review						
Palatad aubiaata						
Notao far taythaak						
Textbook or material will be made	a available from the	supervisors				
Lextbook or material will be made available from the supervisors.						
Notes for reference						
Goals to be achieved						
To acquire fundamental knowledg	e on individual rese	earch fields.				
To acquire the ability of finding a	problem, the ability	/ of solving the prob	lem and presentat	tion skill.		
To acquire fundamental knowledg	e on individual rese	earch fields.				
To acquire the ability of finding a	problem, the ability	/ of solving the prob	lem and presentat	tion skill.		
Evaluation of achievement						
Coursework, presentation and/or	report.					
Coursework, presentation and/or	report.					
Examination						
Details of overviewtion						
Other information						
Delations as an increased of the		d				
Relations to attainment objective	es of learning and e	ducation				
(M42610010)Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and Electronic Information Engineering]

Subject name[English]	Seminar on Elec	trical and Electroni	ic Information Eng	gineering[Seminar	on Electrical and		
	Electronic Inform	Electronic Information Engineering]					
Schedule number	M42610010	Subject area	Advanced	Required or	Required		
			Electrical and	elective			
			Electronic				
			Information				
Time of starting a summer	0)/	Dava of the	Engineering	0	2		
lime of starting a course	2 Years	Day of the	Intensive	Gredit(s)	3		
Foouth	Graduate School	of Engineering		Subject grade	1~1		
Paculty Department Offered	Graduate School	of Engineering		Subject grade	1.01		
				grade			
Charge teacher name[Roman	S2系教務委員 2	kei kvomu Iin-S		Biado			
alphabet mark]							
Numbering							
Objectives of class							
The comingr sime to provide a h	road understanding	r of theoretical and	experimental appr	ochec related to t	the electrical and		
electronic information engineering	of for the research y	york of his/her mast	ter thesis	Journes related to	une electrical and		
The seminar aims to provide a h	proad understanding	of theoretical and	experimental appro	oches related to t	the electrical and		
electronic information engineering	g for the research y	work of his/her mast	ter thesis.				
Contents of class							
The class provides both of funda	mental knowledge o	on the research worl	<pre>< of master thesis a</pre>	nd the most advan	ced results in the		
related field by reading research	papers and monogr	aphs. Contents of t	he class depend on	the supervisor. To	be announced by		
individual supervisors.				·			
The class provides both of funda	mental knowledge c	on the research worl	k of master thesis a	nd the most advan	ced results in the		
related field by reading research	papers and monogr	aphs. Contents of t	he class depend on	the supervisor. To	be announced by		
individual supervisors.							
Self Preparation and Review							
Related subjects							
Notes for textbook							
Textbook or material will be made	e available from the	supervisor. To be a	nnounced by individ	lual supervisors.			
Textbook or material will be made	Textbook or material will be made available from the supervisor. To be announced by individual supervisors.						
Notes for reference							
Goals to be achieved							
To acquire fundamental knowledge on individual research fields.							
To acquire the ability of finding a	problem, the ability	/ of solving the prob	lem and the present	tation skill.			
To acquire fundamental knowledg	e on individual rese	earch fields.					
To acquire the ability of finding a	problem, the ability	/ of solving the prob	lem and the present	tation skill.			
Evaluation of achievement							
Coursework, presentation and/or	report.						
Coursework, presentation and/or	report.						
Examination							
Details of examination							
Other information							
Reference URL							
Office hours							
Relations to attainment objective	s of learning and e	ducation					

(M42610010)Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and Electronic Information Engineering]

Subject name[English]	Seminar on Elec	trical and Electroni	c Information Eng	gineering[Seminar o	on Electrical and
	Electronic Inform	nation Engineering]	1	1	1
Schedule number	M42610010	Subject area	Advanced	Required or	Required
			Electrical and	elective	
			Electronic		
			Information		
			Engineering		
Time of starting a course	Year	Day of the	Experiment	Credit(s)	3
		week,period			
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~2
Department Offered				Beggining grade	
Charge teacher name[Roman	各教員, S2系教	務委員 KAKUKYOUI	N Kakukyouin, 2kei	kyomu Iin-S	
alphabet mark					
Numbering					
Objectives of class					
The seminar aims to provide a b	oroad understanding	g of theoretical and	experimental appro	ooches related to t	he electrical and
electronic engineering for the res	earch work of his/ł	ner master thesis.			
The seminar aims to provide a b	oroad understanding	g of theoretical and	experimental appro	ooches related to t	he electrical and
electronic engineering for the res	earch work of his/ł	ner master thesis.			
Contents of class					
The class provides both of funda	mental knowledge o	on the research work	of master thesis a	nd the most advan	ced results in th
related field by reading research	papers and monogr	aphs. Contents of t	ne class depend on	the supervisor. To	be announced b
individual supervisors.					
The class provides both of funda	mental knowledge o	on the research work	of master thesis a	nd the most advan	ced results in th
related field by reading research	papers and monogr	aphs. Contents of t	ne class depend on	the supervisor. To	be announced b
individual supervisors.				·	
Self Preparation and Review					
Notes for textbook Textbook or material will be made Textbook or material will be made	e available from the e available from the	supervisor. To be a supervisor. To be a	nnounced by indivic nnounced by indivic	lual supervisors. lual supervisors.	
Notes for reference					
Goals to be achieved					
To acquire fundamental knowledg	e on individual rese	earch fields.			
To acquire the ability of finding a	problem, the ability	of solving the prob	lem and the present	tation skill.	
To acquire fundamental knowledg	e on individual rese	earch fields.			
To acquire the ability of finding a	problem, the ability	of solving the prob	lem and the present	tation skill.	
Evaluation of achievement					
Coursework, presentation and/or	report.				
Coursework, presentation and/or	report.				
Examination	•				
Details of examination					
Other information					
Reference URL					
Office hours					
Office hours					

(M42610020)Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on				esis Research on
	Electrical and Electronic Information Engineering]				
Schedule number	M42610020	Subject area	Advanced	Required or	Required
			Electrical and	elective	
			Electronic		
			Information		
			Engineering		
Time of starting a course	2Years	Day of the	Intensive	Credit(s)	6
P	Overducete Calesel	week,period		Outlast made	1 1
	Graduate School	of Engineering		Subject grade	1~1
Department Offered				Beggining	
Charma tasahar nama[Baman	C0 云	kai kuomu lin-S		grade	
charge teacher name_Roman	32 宋 秋 彻 女 貝 乙	kei kyönnu ini-3			
				1. //	1.11. 1.1. 1
The thesis research aims to prov	ide a practical expe	rience of research	work, and to acquire	e his/her research	skill with deep
The these is a second size to anothe	d electronic inform	ation engineerinng.		h:- /h	1.11
The thesis research aims to prov	ide a practical expe	erience of research	work, and to acquire	e nis/ner research	skill with deep
Contents of class	a electronic inform	ation engineerinng.			
			· · •		
The research subject depends	on the supervisor	and the research	group you join. Ind	ividual students w	ill have different
The management subjects. Contact with y	our supervisor.				
The research subject depends	on the supervisor and the research group you join. Individual students will have different				
research subjects. Contact with y	n your supervisor.				
Self Preparation and Review					
D I I I I I I I I I I					
Related subjects					
Notes for textbook					
Reference and material will be av	vailable from the supervisor.				
Reference and material will be av	vailable from the supervisor.				
Notes for reference	Notes for reference				
Goals to be achieved					
To get something new on individu	al research fields				
To develop his/her research skill including the planning and the presentation.					
To get something new on individu	al research fields				
To develop his/her research skill	including the plann	ing and the present	ation.		
Evaluation of achievement					
Presentation, Thesis,Coursework,	and Outcomes are	e evaluated generally	<i>ı</i> .		
Presentation, Thesis,Coursework,	and Outcomes are	e evaluated generally	<i>.</i>		
Examination					
Details of examination					
Other information					
Reference URL					
Office hours					
Delaterate and the state	61	4			
Relations to attainment objective	s of learning and e	ducation			

(M42610020)Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on				
	Electrical and Ele	ctronic Information	Engineering]		
Schedule number	M42610020	Subject area	Advanced	Required or	Required
			Electronic	0100040	
			Information		
			Engineering		
Time of starting a course	2Years	Dav of the	Experiment	Gredit(s)	6
· · · · · · · · · · · · · · · · · · ·		week,period	•		
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~2
Department Offered				Beggining	
Charge teacher name[Roman alphabet mark]	各教員, S2系教剥	務委員 KAKUKYOUI	N Kakukyouin, 2kei	kyomu Iin-S	
Numbering					
Objectives of class					
The thesis research aims to pro understanding of the electrical ar	vide a practical exp nd electronic engine	perience of researcl pering.	n work, and to acqu	uire his/her resear	ch skill with deep
The thesis wassersh sizes to sup	vide e puestical ave			una hia/hau waaaau	مه ماينال سنغله ماممه
understanding of the electrical ar	nd electronic engine	ering.	i work, and to acqu	are his/her researd	ch skill with deep
Contents of class					
The research subject depends	on the supervisor	and the research	group you join. Ind	lividual students w	vill have different
research subjects. Contact with	your supervisor.				
The research subject depends	on the supervisor	and the research	group you join. Ind	lividual students w	vill have different
research subjects. Contact with	your supervisor.				
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference and material will be av	ailable from the sup	pervisor.			
Reference and material will be av	ailable from the sup	pervisor.			
Notes for reference					
Goals to be achieved					
To get something new on individu	al research fields				
To develop his/her research skill	including the plann	ing and the present	ation.		
To get something new on individu	ial research fields				
To develop his/her research skill	including the plann	ing and the present	ation.		
Evaluation of achievement					
Presentation, Thesis, Coursework	, and Outcomes are	e evaluated generally	<i>.</i>		
Presentation, Thesis, Coursework	, and Outcomes are	e evaluated generally	<i>.</i>		
Examination					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objective	s of learning and e	ducation			

(M42630020)Physics for Electronics[Physics for Electronics]

Subject name[English]	Physics for Electr	Physics for Electronics[Physics for Electronics]			
Schedule number	M42630020	Subject area	Advanced	Required or	Elective
			Electrical and	elective	
			Electronic		
			Information		
			Engineering		
Time of starting a course	Spring term Day of the Wed.2~2		Wed.2~2	Credit(s)	2
		week,period			
Faculty	Graduate Program	Graduate Program for Master's Degree			1~2
Department Offered				Beggining	
				grade	
Charge teacher name[Roman	福田 光男, 井上 光輝, 松田 厚範 FUKUDA Mitsuo, INOUE Mitsuteru, MATSUDA Atsun			TSUDA Atsunori	
alphabet mark]					
Numbering					

Objectives of class

Objectives of this subject are to understand the fundamental aspects on functional materials, photonics and spin electronics and have overall knowledge on the latest technologies on these physical phenomena.

Objectives of this subject are to understand the fundamental aspects on functional materials, photonics and spin electronics and have overall knowledge on the latest technologies on these physical phenomena.

Contents of class

"Physics for Electronics" is composed of three topics of functional materials, photonics and spin electronics, which will be delivered for three times for each by three professors whose expertise lie on the individual categories.

The category of "Functional materials" is made to learn preparation, characterization and applications of functional materials for electronics based on physics and chemistry. The contents are 1) Fundamentals of amorphous and crystal, 2) Structure and property of glasses, 3) New preparation techniques of advanced materials, 4) Functional materials for ionis including Li-ion battery and fuel cell, and 5) Functional materials for optics including coatings, micro-optical components, and photonic devices.

The course of photonics is devoted to the understanding of interactions

between photon (light wave) and materials based on the quantum theory and also to industrial applications of photonic devices. 1) Physics and photonic devices, 2) dielectric function, plasmon, and polariton, 3) optical processes in semiconductors and exciton, 4) absorption and stimulated emission, 5) light wave modulation, 6) photonic devices update.

The category of "spin electronics" covers a wide area from fundamentals to applications of magnetic materials and magnetics. 1) Origin of magnetics, 2) Soft and hard magnetic materials, 3) Major applications of magnetics and magnetic materials, 4) Interaction phenomena among spins and various physical quantities, 5) Micro-magnetic devices and systems, 6) Spintronics and spin photonics

"Physics for Electronics" is composed of three topics of functional materials, photonics and spin electronics, which will be delivered for three times for each by three professors whose expertise lie on the individual categories.

The category of "Functional materials" is made to learn preparation, characterization and applications of functional materials for electronics based on physics and chemistry. The contents are 1) Fundamentals of amorphous and crystal, 2) Structure and property of glasses, 3) New preparation techniques of advanced materials, 4) Functional materials for ionis including Li-ion battery and fuel cell, and 5) Functional materials for optics including coatings, micro-optical components, and photonic devices.

The course of photonics is devoted to the understanding of interactions

between photon (light wave) and materials based on the quantum theory and also to industrial applications of photonic devices. 1) Physics and photonic devices, 2) dielectric function, plasmon, and polariton, 3) optical processes in semiconductors and exciton, 4) absorption and stimulated emission, 5) light wave modulation, 6) photonic devices update.

The category of "spin electronics" covers a wide area from fundamentals to applications of magnetic materials and magnetics. 1) Origin of magnetics, 2) Soft and hard magnetic materials, 3) Major applications of magnetics and magnetic materials, 4) Interaction phenomena among spins and various physical quantities, 5) Micro-magnetic devices and systems, 6) Spintronics and spin photonics

Self Preparation and Review

Related subjects

Notes for textbook

None None

Notes for reference

Goals to be achieved

(1) To understand fundamental aspects on functional materials, photonics and spin electronics.

- (2) To get the knowledge on the latest technologies on these physical phenomena.
- (1) To understand fundamental aspects on functional materials, photonics and spin electronics.

(2) To get the knowledge on the latest technologies on these physical phenomena.

Evaluation of achievement

Examination results 30% for each categories (functional materials, photonics, spin electronics) and 10% report, then the final evaluation will be the sum of these marks.

Examination results 30% for each categories (functional materials, photonics, spin electronics) and 10% report, then the final evaluation will be the sum of these marks.

Examination

Details of examination

Other information

Spin electronics; Mitsuteru Inoue: inoue@ee.tut.ac.jp

Photonics; Mitsuo Fukuda: fukuda@ee.tut.ac.jp

functional materials; Atsunori Matuda: matsuda@ee.tut.ac.jp

Spin electronics; Mitsuteru Inoue: inoue@ee.tut.ac.jp

Photonics; Mitsuo Fukuda: fukuda@ee.tut.ac.jp

functional materials; Atsunori Matuda: matsuda@ee.tut.ac.jp

Reference URL

Office hours

one hour after every classes one hour after every classes

Relations to attainment objectives of learning and education

Key words

functional materials, photonics and spin electronics functional materials, photonics and spin electronics

(M42630080)Advanced Electronic Information System[Advanced Electronic Information System]

Subject name[English]	Advanced Electro	Advanced Electronic Information System[Advanced Electronic Information System]				
Schedule number	M42630080	Subject area	Advanced	Required or	Elective	
			Electrical and	elective		
			Electronic			
			Information			
			Engineering			
Time of starting a course	Spring term	Day of the	Thu.2~2	Credit(s)	2	
		week,period				
Faculty	Graduate Program for Master's Degree			Subject grade	1~2	
Department Offered				Beggining		
				grade		
Charge teacher name[Roman	市川 周一 ICHIKAWA Shuichi					
alphabet mark]						
Numbering						
Objectives of class						

The aims of this lecture:

(1) To understand various hardware algorithms for computer arithmetic,

(2) To understand various designs for computer arithmetic units.

The aims of this lecture:

(1) To understand various hardware algorithms for computer arithmetic,

(2) To understand various designs for computer arithmetic units.

Contents of class

Algorithm is a procedure for solving a mathematical problem in a finite number of steps. The required calculation time and memory space depend on the algorithm, even for the same problem. Thus, it is essential to select the best algorithm for a given set of conditions.

In digital hardware, an algorithm is realized as a logic design. This lecture aims to understand various hardware algorithms for computer arithmetic, together with the corresponding designs of arithmetic hardware.

Week 1: Introduction
Week 2, 3: Algorithms for addition
Week 4,5,6: Algorithms for multiplication
Week 7,8,9: Algorithms for division and square root
Week 10,11: Algorithms for elementary functions
Week 12: Floating-point arithmetic
Week 13: Pipelining
Week 14, 15: Custom computing hardware

Algorithm is a procedure for solving a mathematical problem in a finite number of steps. The required calculation time and memory space depend on the algorithm, even for the same problem. Thus, it is essential to select the best algorithm for a given set of conditions.

In digital hardware, an algorithm is realized as a logic design. This lecture aims to understand various hardware algorithms for computer arithmetic, together with the corresponding designs of arithmetic hardware.

Week 1: Introduction
Week 2, 3: Algorithms for addition
Week 4,5,6: Algorithms for multiplication
Week 7,8,9: Algorithms for division and square root
Week 10,11: Algorithms for elementary functions
Week 12: Floating-point arithmetic
Week 13: Pipelining
Week 14, 15: Custom computing hardware

Self Preparation and Review

Related subjects

Prerequisite: Fundamental knowledge and skills of logic design, algorithms, and computer structure.

Prerequisite:

Fundamental knowledge and skills of logic design, algorithms, and computer structure.

Notes for textbook

The lecturer will provide the handouts of slides. References are given for each topic whenever necessary.

The lecturer will provide the handouts of slides. References are given for each topic whenever necessary.

Notes for reference

Goals to be achieved

(1) To understand various hardware algorithms for computer arithmetic,

(2) To understand various designs for computer arithmetic units.

To understand various hardware algorithms for computer arithmetic,
 To understand various designs for computer arithmetic units.

Evaluation of achievement

Reports on specific items given in the lecture (50%). Term examination on general items shown in the lecture (50%).

Reports on specific items given in the lecture (50%). Term examination on general items shown in the lecture (50%).

Examination

Details of examination

Other information

Room F-506 ext. 6897 E-mail: ichikawa@tut.jp

Room F-506 ext. 6897 E-mail: ichikawa@tut.jp

Reference URL

http://meta.tutkie.tut.ac.jp/~ichikawa/lecture/ http://meta.tutkie.tut.ac.jp/~ichikawa/lecture/

Office hours

Please make an appointment for consultation with the lecturer via e-mail or direct communication in classroom. Please make an appointment for consultation with the lecturer via e-mail or direct communication in classroom.

Relations to attainment objectives of learning and education

(M43610010)Seminar on Computer Science and Engineering I[Seminar on Computer Science and Engineering I]

Subject nome[English]	Saminan an Can	anutau Salanaa an	d Engineering IS	uninen en Commu	- Low Colombo and
Subject name[English]		nputer Science an	a Engineering 1156	eminar on Compu	ter Science and
	Engineering I				
Schedule number	M43610010	Subject area	Advanced	Required or	Required
			Computer	elective	
			Science and		
			Engineering		
Time of starting a course	Year	Day of the	Experiment	Credit(s)	4
		week,period			
Faculty	Graduate Progran	n for Master's Degre	ee	Subject grade	1~2
Department Offered				Beggining	
Ohenne teachan name[Demon	タ お 昌 い つ 衣 お 羽	这禾吕 V A V U V O UI	N Kakularania 2kai	grade	
Charge teacher name_roman	谷秋貝, こ3木秋4	防安員 NANUN TUUI	in Kakukyouin, skei	kyomu im-S	
Numbering					
Objectives of class					
The course is intended for stud	dents to study bas	sic materials in dep	oth, related to his/	her research subje	ects in computer
science and engineering.					
It is also aimed for students to a	acquire various skil	ls. required in gene	ral research work.	such as those for o	oral presentation.
and technical discussion and writ	ing.		,		
	0				
The course is intended for stur	dents to study bas	ia matariala in dan	th related to hic/	ber recearch cubic	ate in computer
The course is intended for stud	dents to study bas	sic materials in dep	in, related to his/	ner research subje	ects in computer
Science and engineering.		I			
It is also almed for students to a	acquire various skii	is, required in gene	ral research work, s	such as those for o	oral presentation,
and technical discussion and writ	ing.				
Contents of class					
While specific contents depend	on the research ar	reas students are i	nvolved in, it is us	ually the case for	students to read
relevant textbooks/research pape	ers and report on th	nem, as well as to p	resent and discuss	on the research wo	ork of their own.
While specific contents depend	on the research ar	reas students are i	nvolved in, it is us	ually the case for	students to read
relevant textbooks/research pape	ers and report on th	nem, as well as to p	resent and discuss	on the research wo	ork of their own.
Self Preparation and Review					
Related subjects					
Consult with your advisor.					
Consult with your advisor.					
Notes for textbook					
Consult with your advisor					
Consult with your advisor					
Notes for reference					
Or als to be each or a					
To acquire abilities for technical i	readings in English,	logical thinking/exp	lanation, and clear p	presentation.	
I o acquire abilities for technical i	readings in English,	logical thinking/exp	lanation, and clear p	presentation.	
Evaluation of achievement					
Will be evaluated by taking into	accout various fact	tors overall, such a	s technical explana	tion, question ansv	vering, discussion
involvements and so on.					
Will be evaluated by taking into	accout various fact	tors overall, such a	s technical explana	tion, question ansv	vering, discussion
involvements and so on.					
Examination					
Details of examination					

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

(M43610020)Seminar on Computer Science and Engineering II[Seminar on Computer Science and Engineering II]

Subject name[English]	Seminar on Computer Science and Engineering II[Seminar on Computer Science ar					ter Science and
Schedule number	M43610020	Subject area		Advanced	Required or	Required
				Science and	elecuve	
				Engineering		
Time of starting a course	Year	Day of	the	Experiment	Credit(s)	2
Faculty	Graduate Program	n for Master's [Degre	e	Subject grade	2~2
Department Offered			8	•	Beggining	
					grade	
Charge teacher name[Roman	各教員, S3系教教	务委員 KAKUK	YOUIN	N Kakukyouin, 3kei I	kyomu Iin−S	L
Objectives of class		6 .1				
The seminar aims to provide a br	oad understanding	of the compute	r scie	ence and engineerin	g available for the	research work of
his/her master thesis.		- f 4				
the seminar aims to provide a br	oad understanding	of the compute	r scie	ence and engineerin	g available for the	research work of
Contents of class						
The class provides both of fundar	mental knowledge o	n the recearch	work	of master thesis a	ad the most advan	and results in the
related field by reading research	naners and monogr	anhs Contents	of th	e class depend on	the supervisor. To	be appounced by
individual supervisors			or ur			be announced by
The class provides both of funda	mental knowledge o	n the research	work	of master thesis a	nd the most advan	ced results in the
related field by reading research	papers and monogra	aphs. Contents	of th	e class depend on	the supervisor. To	be announced by
individual supervisors.						
Self Preparation and Review						
Related subjects						
Textbook or material will be made	available from the	supervisor To	he ar	nounced by individ	ual supervisors	
Textbook or material will be made	available from the	supervisor. To	he ar	nounced by individ	ual supervisors.	
Notes for reference	<u> </u>		DO UI			
Goals to be achieved						
To acquire fundamental knowledge on individual research fields, to acquire the ability of finding a problem, the ability of solving						
the problem and the presentation skill.						
To acquire fundamental knowledg	To acquire fundamental knowledge on individual research fields, to acquire the ability of finding a problem, the ability of solvin					e ability of solving
the problem and the presentation	skill.					
Evaluation of achievement						
Coursework, presentation and/or	report.					
Evemination	report.					
Examination						
Details of examination						
Other information						
Reference URL						
Office hours						
Relations to attainment objective	es of learning and e	ducation				

(M43610030)Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer				
	Science and Engin	neering]			
Schedule number	M43610030	Subject area	Advanced	Required or	Required
			Computer	elective	
			Science and		
			Engineering		
Time of starting a course	2Years	Day of the	Intensive	Credit(s)	6
		week,period			
Faculty	Graduate School	of Engineering		Subject grade	1~1
Department Offered				Beggining	
				grade	
Charge teacher name[Roman	S3系教務委員 3	kei kyomu Iin−S			
alphabet mark]					
Numbering					

Objectives of class

The course is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies.

It is also aimed for students to acquire, through thesis research, cooperativeness, a sense of responsibility, abilities for problem solving, research planning, decision making, outcome presentation and subject investigation, and to enhance their creativity and persistency, among others.

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It is also aimed for students to acquire, through thesis research, cooperativeness, a sense of responsibility, abilities for problem solving, research planning, decision making, outcome presentation and subject investigation, and to enhance their creativity and persistency, among others.

Contents of class

It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.

Consult with your advisor for any further details.

It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.

Consult with your advisor for any further details.

Self Preparation and Review

Related subjects

Consult with your advisor for them. Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

Consult with your advisor for them.

Notes for reference

Goals to be achieved

To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.

To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.

Evaluation of achievement

Three faculty members will be assigned to prepare the evaluation for your thesis research, based on publication records,
master thesis, and oral presentation. It will be then finalized by the faculty meeting.
Three faculty members will be assigned to prepare the evaluation for your thesis research, based on publication records,
master thesis, and oral presentation. It will be then finalized by the faculty meeting.
Examination
Details of examination
Other information
Reference URL
Office hours
Relations to attainment objectives of learning and education
Key words

(M43610030)Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer				
	Science and Engir	neering]			
Schedule number	M43610030	Subject area	Advanced	Required or	Required
			Computer	elective	
			Science and		
			Engineering		
Time of starting a course	2Years	Day of the	Experiment	Credit(s)	6
		week,period			
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~2
Department Offered				Beggining	
				grade	
Charge teacher name[Roman	各教員, S3系教科	务委員 KAKUKYOUI	N Kakukyouin, 3kei	kyomu Iin−S	
alphabet mark]					
Numbering					

Objectives of class

The course is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies.

It is also aimed for students to acquire, through thesis research, cooperativeness, a sense of responsibility, abilities for problem solving, research planning, decision making, outcome presentation and subject investigation, and to enhance their creativity and persistency, among others.

The course is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies.

It is also aimed for students to acquire, through thesis research, cooperativeness, a sense of responsibility, abilities for problem solving, research planning, decision making, outcome presentation and subject investigation, and to enhance their creativity and persistency, among others.

Contents of class

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It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.

Consult with your advisor for any further details.

Self Preparation and Review

Related subjects

Consult with your advisor for them. Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

Consult with your advisor for them.

Notes for reference

Goals to be achieved

To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.

To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.

Evaluation of achievement

Three faculty members will be assigned to prepare the evaluation for your thesis research, based on publication records,
master thesis, and oral presentation. It will be then finalized by the faculty meeting.
Three faculty members will be assigned to prepare the evaluation for your thesis research, based on publication records,
master thesis, and oral presentation. It will be then finalized by the faculty meeting.
Examination
Details of examination
Other information
Reference URL
Office hours
Relations to attainment objectives of learning and education
Key words

(M43630010)Technical English Presentation[Technical English Presentation]

Subject name[English]	Technical English	Presentation	Tech	nical English Presen	tation]		
	MA3630010	Subject ore		Advanced	Pequired or	Flective	
	10143030010	Subject are	a	Computer		LIECTIVE	
				Solonoo and	01000100		
				Engineering			
Time of starting a course	Vear	Day of	the	Mon 4~4	Credit(e)	2	
Time of scarcing a course	1 Cal	week period			Ol Guil(3)	2	
Faculty	Graduate Program	m for Master's	Degre	e	Subject grade	1~2	
Department Offered			8.		Beggining		
					grade		
Charge teacher name[Roman	各教員, S3系教	務委員 KAKUP	YOUI	N Kakukyouin, 3kei	kyomu Iin-S		
alphabet mark]							
Numbering							
Objectives of class							
The aim of this course is to allo	w the student to	achieve a lev	el of	success and ability	whereby he or st	ne will he able to	
effectively perform technical Engl	lish reading writing	speaking and	listen	ing tasks	whereby he of si		
The aim of this course is to allo	w the student to	achieve a lev	el of	success and ability	whereby he or sh	ne will be able to	
effectively perform technical Engl	ish reading, writing	speaking and	listen	ing tasks			
Contents of class							
Content: Fach class session will	consist of a set	number of tex	thook	pages listening an	d dictation exerci	ses, and daily in-	
class vocabulary building assigned	by the instructor.			pugoo, nocorning un		ooo, and daily in	
······································	· - ,						
Procedure: Each of the lessons a	ra vacabularu baca	d with increas	sing lo	vels of difficulty on	d have a set of la	nguage functions	
that are commonly used in a '	e vocabulary base	u, with increas		ist of a set numb	or of toythook not	anguage functions	
distation exercises and in-slass	eal-life format. L	ach class will	CONS	ist of a set numb	er of textbook pa	ges, listening and	
Contant: Each along appoint will	activities.	number of to	(thool	narra listoning or	d distation avarai	and daily in-	
class vocabulary building assigned	by the instructor	number of tex	CLDOOK	pages, insterning an	iu dictation exercis	ses, and daily in-	
	T by the instructor.						
						c	
Procedure: Each of the lessons and	e vocabulary base	d, with increas	sing le	vels of difficulty, an	id have a set of la	anguage functions	
that are commonly used in a r	eal-life format. E	ach class will	cons	ist of a set numb	er of textbook pa	ges, listening and	
dictation exercises, and in-class a	activities.						
Self Preparation and Review							
Related subjects							
Notes for textbook							
Notes for reference							
Goals to be achieved							
At the end of one year, the stu	dent should be ab	ole to success	fully	communicate in a s	set of 'real life'	functions and to	
attractively present his/her own's	s research topic.						
At the end of one year, the stu	dent should be ab	ole to success	fully	communicate in a s	set of 'real life'	functions and to	
attractively present his/her own's research topic.							
Evaluation of achievement							
Will be evaluated by taking into accout various factors overall, such as technical explanation, question answering, discussion							
involvements and so on.	rolvements and so on.						
Will be evaluated by taking into a	accout various factors overall, such as technical explanation, question answering, discussion						
involvements and so on.							
Examination							
Details of examination							
Other information							
B-1E Dart time lasture room							
B-1F Part time lecture room							
Reference LIRI							

Office hours Before and after lecture

Before and after lecture

Relations to attainment objectives of learning and education

(M43630020)System Design Project[System Design Project]

Subject name[English]	System Design Project[System Design Project]						
Schedule number	M43630020	Subject are	a	Advanced	Required or	Elective	
				Computer	elective		
				Science and			
				Engineering			
Time of starting a course	Spring term	Day of	the	Tue.4 ~ 5,Fri.4	Credit(s)	2	
		week,period		~4			
Faculty	Graduate Program	m for Master's	Degre	e	Subject grade	1~2	
Department Offered		Beggining					
Channe teachan name[Baman	タ あ 合 の る あ う る あ う む う む う む う む う む う む う む う む う む う	grade grade grade					
sinhahet mark]	百双頁, 55末秋	ビ牧貝, こ3 木秋防安貝 NANUN I UUIN Nakukyouin, 3kei kyomu lin−S					
Numbering							
Ubjectives of class						and the section of the second	
to acquire ability for independent	ents to foster their	interests in r	eseard	in problems on con	iputer science and	engineering and	
It is also aimed for students to a	studies. cauire design ability	y for their the	sis res	earch such as the	nurnose the hackg	round knowledge	
the research topic the plan/sche	dule and to prese	nt the progress	s 103		purpose, the backg	iouna knowieage,	
The project is intended for stude	ents to foster their	interests in n	esear	h problems on con	muter science and	engineering and	
to acquire ability for independent	studies.	111010313 1111	cocard		ipater solerice and	ongineering allu	
It is also aimed for students to a	cquire design ability	v for their the	sis res	earch such as the	purpose the backg	round knowledge	
the research topic, the plan/sche	dule and to prese	nt the progres	s.				
	•	1 0					
Contents of class							
It is usually the case that the p	roiect is carried o	ut on individua	al bas	es with specific co	ntents differing fro	om on student to	
another.	5			·	0		
Consult with your advisor for any	further details.						
It is usually the case that the p	roject is carried o	ut on individua	al bas	es with specific co	ntents differing fro	om on student to	
another.							
Consult with your advisor for any	further details.						
Self Preparation and Review							
Related subjects							
Consult with your advisor for the	m.						
Consult with your advisor for the	m.						
Notes for textbook							
Consult with your advisor.							
Consult with your advisor.							
Notes for reference							
I o acquire design abilities for doi	ng research and de	evelopment at t	techni	cally high level and	leading large scale		
research projects							
I o acquire design abilities for doi	ng research and de	evelopment at t	techni	cally high level and	ieading large scale		
research projects							
Evolution of achievenet							
Evaluation of achievement	r procontation	المعمد المعادد	dine t	ha raaareh	o bookground has	owlodgo recent	
tonic plan / schoduling and are moster	r presentation and	a report inclu	ung t	ne research purpo	se, dackground kn	owieage,research	
copic,pian/scrieduling and progres							
Will be evaluated by the poster	r presentation and	a report includ	ding t	he research purpo	se, background kn	owledge,research	
topic,pian/scheduling and progres	S.						

Examination					
Details of examinat	on			 	
Other information					
Reference URL					
Office hours					
Relations to attainr	ient objectives	of learning an	nd education		

(M43630030)Speech and Language Processing[Speech and Language Processing]

				D : 1		
Subject name[English]	Speech and Lang	uage Processing[Sp	eech and Language	Processing	E 1	
Schedule number	M43630030	Subject area	Advanced	Required or	Elective	
			Computer	elective		
			Science and			
			Engineering			
Time of starting a course	Spring term	Day of the	Thu.2~2	Credit(s)	2	
		week,period				
Faculty	Graduate Program	m for Master's Degre	e	Subject grade	1~2	
Department Offered				Beggining		
				grade		
Charge teacher name[Roman	中川 聖一,秋葉	友良 NAKAGAWA	Seichi, AKIBA Tomo	oyoshi		
alphabet mark]						
Numbering						
Objectives of class						
Important topics on spoken / nat	ural language proce	essing will be discuss	ed			
Important topics on spoken / nat	ural language proce	essing will be discus	sed.			
Contents of class			jou.			
(Nakagawa)						
Racio of chokon longuago proces	sing / Basia of a	and reconsision /	Algorithm for acat	nuque cheach read	mition / Hiddan	
Markov Model / Language proces	parsing and docad	er/ Spoken dialog -	reteme /	nuous speech reco	smillion / midden	
Markov Model / Language model,	parsing and decou	er/ Spoken dialog sy	/stems/			
(Akiba)						
Basic of information retrieval /	Basic of natural l	anguage processing	/ Algorithms for s	tring matching and	d text indexing /	
Modeling methods for sentences	and documents / A	Automatic machine t	ranslation			
(Nakagawa)						
Basic of spoken language proces	ssing / Basic of sp	beech recognition /	Algorithm for conti	nuous speech reco	ognition / Hidden	
Markov Model / Language model.	parsing and decod	er/ Spoken dialog sv	/stems/	·	0	
······································						
(Akiba)						
(Akiba)	Deale of waternal I		/ Al		l to the lands of the land	
Basic of information retrieval /	Basic of natural is	anguage processing	/ Algorithms for s	tring matching and	a text indexing /	
Modeling methods for sentences	and documents / P	Automatic machine t	ranslation			
Self Preparation and Review						
Related subjects						
Information theory, Formal langua	ige theory					
Information theory, Formal langua	ige theory					
Notes for textbook						
 M.Gales & S.Young 						
The application of hidden markov	models in speech	recognition,				
World Scientific						
I B Babiner BW Schafer						
Introduction to Digital Speech Pr	opersing					
World Scientific	Introduction to Digital Speech Processing					
Richado Baeza-Yates, Berthier	Bibeiro-Neto					
Modern Information Retrieval						
Addison Wesley						
•M.Gales & S.Young						
The application of hidden markov	models in speech	recognition,				
World Scientific						
•L.R. Rabiner, R.W. Schafer						
Introduction to Digital Speech Pro	ocessing					
World Scientific						
World Scientific						

• Richado Baeza-Yates, Berthier Bibeiro-Neto Modern Information Retrieval Addison Wesley

Notes for reference

Goals to be achieved

Basics: Understand the role of spoken language as an human interface / Understand hierarchical structure of spoken language / Understand the basic speech analysing methods. / Understand the basic concepts of information retrieval and natural language processing

Speech Recognition: Understand the relation between speech recognition and information theory / Understand the algorithm for speech recognition using DP matching / Understand the Hidden Markov Model.

Natural Language Processing: Understand the role of language model / Understand the parser for context free language. / Understand the character encoding scheme for the world wide letters. / Understand the string matching methods and text indexing methods. / Understand the computational models for sentences, documents, and cross-language relations.

Applications: Understand the dictation system and the speedh dialog system / Understand the applications of speech technology including computer aided language learning system. / Understand the machine translation system.

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Speech Recognition: Understand the relation between speech recognition and information theory / Understand the algorithm for speech recognition using DP matching / Understand the Hidden Markov Model.

Natural Language Processing: Understand the role of language model / Understand the parser for context free language. / Understand the character encoding scheme for the world wide letters. / Understand the string matching methods and text indexing methods. / Understand the computational models for sentences, documents, and cross-language relations.

Applications: Understand the dictation system and the speedh dialog system / Understand the applications of speech technology including computer aided language learning system. / Understand the machine translation system.

Evaluation of achievement

Marks are based on final examination (50%) and reports (50%).

Marks are based on final examination (50%) and reports (50%).

Examination

Details of examination

Other information

Seiichi Nakagawa: C-506, 44-6759, nakagawa@slp.ics.tut.ac.jp Tomoyosi Akiba: C-505, 44-6758, akiba@cs.tut.ac.jp

Seiichi Nakagawa: C-506, 44-6759, nakagawa@slp.ics.tut.ac.jp Tomoyosi Akiba: C-505, 44-6758, akiba@cs.tut.ac.jp

Reference URL

http://www.cl.ics.tut.ac.jp/~akiba/ http://www.cl.ics.tut.ac.jp/~akiba/

Office hours

16:25–17:40, Tuesday and Wednesday

16:25-17:40, Tuesday and Wednesday

Relations to attainment objectives of learning and education

spoken language processing, natural language processing, human language technology spoken language processing, natural language processing, human language technology

(M43630060)Web Data Engineering[Web Data Engineering]

	BLIVOD Data Engin						
Subject name[English]	Web Data Engine	ering_Web Data Engi	neering	[
Schedule number	M43630060	Subject area	Advanced	Required or	Elective		
			Computer	elective			
			Science and				
Time of starting a source	Spring torm	Day of the	Thu 1~1	Credit(a)	2		
Time of starting a course	Spring term	week period	Thu. I * • T	Great(s)	2		
Faculty	Graduate Progra	m for Master's Degre	e	Subject grade	1~2		
Department Offered				Beggining			
				grade			
Charge teacher name[Roman	青野 雅樹,栗山	I 繁 AONO Masaki,	KURIYAMA Shigerı	<u> </u>			
alphabet mark]							
Numbering							
Objectives of class							
Massive data analysis on the Web	and visualization [.]	from archives will be	discussed.				
This lecture is composed of thr	ree parts. Part I d	deals with data anal	ysis algorithms for	huge data sets. F	Part II deals with		
information visualization techniqu	ues for massive da	ta. Part III shows so	ome practical tech	niques for implemer	nting a system of		
Web-services.							
Massive data analysis on the Web	and visualization	from archives will be	discussed.				
This lecture is composed of thr	ree parts. Part I d	leals with data anal	ysis algorithms for	huge data sets. F	Part II deals with		
information visualization techniqu	les for massive da	ita. Part III shows so	ome practical tech	niques for implemer	nting a system of		
Web-services.							
Contents of class							
1. Data mining for huge Web-data	ı (Part I)						
Mainly focuses on Web mining teo	chnologies including	g Web link analysis, V	Veb contents minin	g, and Web commun	nity mining.		
2. Information Visualization for ma	assive data (Part II	[)					
Mainly focuses on graphical mode	Is and visualizatior	n methods for handli	ng multi-variable da	ita			
3. Construction of Web-based da	ta service systems	s (Part III)					
Mainly focuses on Web programm	Ing methodologies	through exercises					
1. Data mining for huge web-data	I (Part I) shaslasisa inaludia	- Mah link analysia V	Vah aantanta minin	a and Wab as more un	ity minimum		
2 Information Visualization for m	annoiogies including	g wed link analysis, v	ved contents minin	g, and web commun	ircy mining.		
Aginty focuses on graphical mode	assive uata (Fart II	, n methods for handli	og multi-variable da	12			
3 Construction of Web-based da	ta service systems	(Part III)		ita			
Mainly focuses on Web programm	ing methodologies	through exercises					
Self Preparation and Review							
-							
Related subjects							
Information Mathematics II, Medi	a Engineering						
Information Mathematics II, Medi	a Engineering						
Notes for textbook							
Materials will be prepared by lect	urers						
References:							
(1) S. Chakrabati, Mining the Web, Morgan Kaufmann (2) Colin Ware, Information Visualization: Perception for Design, Morgan							
Kaufmann							
Materials will be prepared by lect	urers						
References:	References:						
(1) S. Chakrabati, Mining the We	b, Morgan Kaufmar	nn (2) Colin Ware, Ir	tormation Visualiza	ation: Perception fo	r Design, Morgan		
Kaufmann							
Notes for reference							
Goals to be achieved							
Obtain the following capabilities t	hat can						
1. Implement Web-service system	ns for handling a la	rge data set.					
2. Implement visualization tools for	or massive multi-v;	ariable data.					

3. Design, analyze, and evaluate the Web-based system for mining huge data. Obtain the following capabilities that can

1. Implement Web-service systems for handling a large data set.

2. Implement visualization tools for massive multi-variable data.
3. Design, analyze, and evaluate the Web-based system for mining huge data.
Evaluation of achievement
(Part I & Part III , Aono) exercise (20%), presentation (40%), and final exam (40%)
(Part II & Part III , Kuriyama) reports (50%) and exercise & presentation (50%)
(Part I & Part III , Aono) exercise (20%), presentation (40%), and final exam (40%)
(Part II & Part III , Kuriyama) reports (50%) and exercise & presentation (50%)
Examination
Details of examination
Other information
Aono,Masaki(C-511)aono@tut.jp
Kuriyama,Shigeru(C-504)kuriyama@cs.tut.jp
Aono,Masaki(C-511)aono@tut.jp
Kuriyama,Shigeru(C-504)kuriyama@cs.tut.jp
Reference URL
(Part I & Part III , Aono) http://www.kde.cs.tut.ac.jp/~aono/WebDataEngineering.html
(Part I & Part III , Aono) http://www.kde.cs.tut.ac.jp/~aono/WebDataEngineering.html
Office hours
Anytime.
Anytime.
Relations to attainment objectives of learning and education
Capability of designing Web application systems.
Capability of designing Web application systems.
Key words

(M43630080)Computers and Education[Computers and Education]

Subject name[English]	Computers and E	Education[Computer	s and Education]		
Schedule number	M43630080	Subject area	Advanced Computer Science and	Required or elective	Elective
Time of starting a course	Spring term	Day of the	Mon.5~5	Credit(s)	2
Faculty	Graduate Progra	m for Master's Degr	ee	Subject grade	1~2
Department Offered		Beggi mada			
Charge teacher name[Roman alphabet mark]	河合 和久 KAW	AI Kazuhisa		9	
Numbering					
Objectives of class					
The Purpose of the class is to c	deepen and broaden	students' knowledge	of their own exper	tise in relation to th	ne societv.
The Purpose of the class is to c	deepen and broaden	students' knowledge	of their own exper	tise in relation to th	ne society.
Contents of class					
Students will be offered some of	overviews of compu	ters and education.	Students will give s	some presentations	on the following
problems: (1) to make the teach	ning plan of their ow	n research subjects	for pupils or junior	high school studen	ts, (2) to make a
simulated class based on the pl	lan, (3) to discuss t	he simulated class.	At the end of term,	students are requi	red to submit a
essay on computers and educat	ion.				
1.Guidance, Lecture#1(Introduct	tion to subject "Info	rmation".)			
2.Lecture#2(Computer system f	or education. and So	oftware as course m	aterial.)		
3.Lecture#3(Cooperation with th	ne period of integrat	ed study.)			
4.Lecture#4(Simulated class: pla	an and evaluation.)				
5.Lecture#5(Keep an "Information	on" teacher. and Te	aching plan.)			
6.Lecture#6(Information sending	g and presentation.)				
7.Lecture#7(Group work by colla	aboration and preser	ntation.)			
8.Lecture#8(Media literacy., Info	ormation ethics educ	ation. and Network.)			
9.Presentations of Teaching Pla	ns #1				
10.Presentations of Teaching Pl	ans #2				
11.Lecture#9(Expression of info	rmation and multime	dia.and lopics in in	formation society.)		
12. Circulate d Olasses #1	ogramming, and info	rmation retrieval and	I database.)		
14 Simulated Classes #1					
15 Simulated Classes #2					
16 Presentations of Final Paper	to				
Students will be offered some of	overviews of compu	ters and education.	Students will give s	some presentations	on the following
problems: (1) to make the teach	ning plan of their ow	n research subjects	for pupils or junior	high school studen	ts, (2) to make a
simulated class based on the pl	lan, (3) to discuss t	he simulated class.	At the end of term,	students are requi	red to submit a
essay on computers and educat	ion.				
1.Guidance, Lecture#1(Introduct	tion to subject ″Info	rmation".)			
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f	tion to subject "Info for education. and So	rmation".) oftware as course m	aterial.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th	tion to subject "Info or education. and So ne period of integrat	rmation″.) oftware as course m ed study.)	aterial.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class pla	tion to subject "Info for education. and So he period of integrat an and evaluation.)	rmation".) oftware as course m ed study.)	aterial.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class: pla 5.Lecture#5(Keep an "Informatic	tion to subject "Info for education. and So ne period of integrat an and evaluation.) on " teacher. and Te	rmation".) oftware as course m ed study.) aching plan.)	aterial.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class: pla 5.Lecture#5(Keep an "Information 6.Lecture#6(Information sending 2.Lecture#7(Cooperation sending	tion to subject "Info for education. and So ne period of integrat an and evaluation.) on" teacher. and Te g and presentation.)	rmation".) oftware as course m ed study.) aching plan.)	aterial.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class: pla 5.Lecture#5(Keep an "Information 6.Lecture#6(Information sending 7.Lecture#7(Group work by colla 8.Lecture#8(Madia literation) in the sending 8.Lecture#8(Madia literation) in the sending 1.Lecture#8(Madia literation) in the sending 1.Lecture#8(Madia literation) in the sending in the	tion to subject "Info for education, and So the period of integrat an and evaluation.) on" teacher, and Te g and presentation.) aboration and present sumption others at the	rmation".) oftware as course m ed study.) aching plan.) ntation.)	aterial.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class: pla 5.Lecture#5(Keep an "Information 6.Lecture#6(Information sending 7.Lecture#7(Group work by colla 8.Lecture#8(Media literacy., Info Presentations of Tablics Pla	tion to subject "Info for education. and So the period of integrat an and evaluation.) on" teacher. and Te g and presentation.) aboration athics educ promation ethics educ	rmation".) oftware as course m ed study.) aching plan.) ntation.) ation. and Network.)	aterial.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class: pla 5.Lecture#5(Keep an "Information 6.Lecture#5(Keep an "Information 8.Lecture#7(Group work by colla 8.Lecture#8(Media literacy., Info 9.Presentations of Teaching Pla 10 Presentations of Teaching Pla	tion to subject "Info for education. and So ne period of integrat an and evaluation.) on" teacher. and Te g and presentation.) aboration and presen ormation ethics educ ns #1 lans #2	rmation".) oftware as course m ed study.) aching plan.) ntation.) ation. and Network.)	aterial.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class: pla 5.Lecture#5(Keep an "Information 6.Lecture#6(Information sending 7.Lecture#7(Group work by colla 8.Lecture#8(Media literacy., Info 9.Presentations of Teaching Pla 10.Presentations of Teaching Pla 11.Lecture#0(Expression of info	tion to subject "Info for education. and So ne period of integrat an and evaluation.) on" teacher. and Te g and presentation.) aboration and presen rimation ethics educ ns #1 lans #2 rmation and multime	rmation".) oftware as course m ed study.) aching plan.) ntation.) ation. and Network.)	aterial.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class: pla 5.Lecture#5(Keep an "Informatio 6.Lecture#5(Keep an "Information 8.Lecture#6(Information sending 7.Lecture#7(Group work by colla 8.Lecture#8(Media literacy., Info 9.Presentations of Teaching Pla 10.Presentations of Teaching Pla 11.Lecture#9(Expression of info	tion to subject "Info for education. and So ne period of integrat an and evaluation.) on" teacher. and Te g and presentation.) aboration and presen romation ethics educ ns #1 lans #2 romation and multime ogramming and lafo	rmation".) oftware as course m ed study.) aching plan.) ntation.) ation. and Network.) edia. and Topics in in	aterial.) formation society.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class: pla 5.Lecture#5(Keep an "Informatic 6.Lecture#6(Information sending 7.Lecture#7(Group work by colla 8.Lecture#8(Media literacy., Info 9.Presentations of Teaching Pla 10.Presentations of Teaching Pla 11.Lecture#9(Expression of info 12.Lecture#10(Algorithm and pro 13.Simulated Classes #1	tion to subject "Info for education. and So ne period of integrat an and evaluation.) on" teacher. and Te g and presentation.) aboration and presen ormation ethics educ ns #1 ans #2 rmation and multime ogramming. and Info	rmation".) oftware as course m ed study.) aching plan.) ntation.) ation. and Network.) edia. and Topics in in rmation retrieval and	aterial.) formation society.) I database.)		
1.Guidance, Lecture#1(Introduct 2.Lecture#2(Computer system f 3.Lecture#3(Cooperation with th 4.Lecture#4(Simulated class: pla 5.Lecture#5(Keep an "Informatic 6.Lecture#6(Information sending 7.Lecture#7(Group work by colla 8.Lecture#8(Media literacy., Info 9.Presentations of Teaching Pla 10.Presentations of Teaching Pla 11.Lecture#9(Expression of info 12.Lecture#10(Algorithm and pro 13.Simulated Classes #1 14.Simulated Classes #2	tion to subject "Info for education. and So ne period of integrat an and evaluation.) on" teacher. and Te g and presentation.) aboration and present formation ethics educ ns #1 lans #2 rmation and multime ogramming. and Info	rmation".) oftware as course m ed study.) aching plan.) ntation.) ation. and Network.) edia. and Topics in in rmation retrieval and	aterial.) formation society.) I database.)		

16.Presentations of Final Reports

Self Preparation and Review

Related subjects

Basic skills on information and communication technologies are required. Basic skills on information and communication technologies are required.

Notes for textbook

(Reference) H. Ohiwa, et.al.: "JOUHOUKA KYOUIKUHOU", Ohm Sha, in Japanese.

(Reference) H. Ohiwa, et.al.: "JOUHOUKA KYOUIKUHOU", Ohm Sha, in Japanese.

Notes for reference

Goals to be achieved

Evaluation of achievement Written reports 50%, In class work 50%. Written reports 50%, In class work 50%.

Examination

Details of examination

Other information

Room: F1-206. E-Mail: kawai@tut.jp

Room: F1-206.

E-Mail: kawai@tut.jp

Reference URL

http://www.ita.cs.tut.ac.jp/~kawai/kpe/ (Some pages are written in Japanese.) http://www.ita.cs.tut.ac.jp/~kawai/kpe/ (Some pages are written in Japanese.) **Office hours**

Office hours; Wednesday 2nd period and Friday 2nd period in Room F1-206. Office hours; Wednesday 2nd period and Friday 2nd period in Room F1-206.

Relations to attainment objectives of learning and education

(M43630100)Image Processing, Advanced[Image Processing, Advanced]

				0	
Subject name[English]	Image Processing	, Advanced[Image	Processing, Advance	d	
Schedule number	M43630100	Subject area	Advanced	Required or	Elective
			Computer	elective	
			Science and		
			Engineering		
Time of starting a course	Spring term	Day of the	Tue 2~2	Credit(s)	2
	oping tom	week period			-
Faculta/	Graduata Bragran	for Mostor's Dog		Subject mode	1~2
	Graduate Program	IT for master's Deg	66	Subject grade	1
Department Offered				Beggining	
				grade	
Charge teacher name_Roman	金澤 靖 KANAZA	AWA Yasushi			
alphabet mark]					
Numbering					
Objectives of class					
This course involves fundamental	s and advanced iss	ues on image proc	essing and computer	VISION.	
This course involves fundamental	s and advanced iss	ues on image proc	essing and computer	vision.	
Contents of class					
- Fundamentals on projective geo	ometry				
 Camera model 					
 Epipolar geometry 					
- 3-D reconstruction from two vi	ews				
- 3-D reconstruction from many	views				
 Advanced issues 					
- Fundamentals on projective geo	ometry				
– Camera model					
- Epipeler geometry					
2 Due construction from two of					
- 3-D reconstruction from two vi	ews				
- 3-D reconstruction from many	views				
 Advanced issues 					
Self Preparation and Review					
Related subjects					
Geometry Linear Algebra Statist	inc				
Geometry, Linear Algebra, Statist	lics.				
Geometry, Linear Algebra, Statist	.ics.				
Notes for textbook					
Handouts will be prepared.					
(References)					
······					
- R.I. Hartley and A. Zisserman, N	Aultiple View Geome	etry in Computer			
Vision, Cambridge University Pres	ss, 2000.				
- D.A. Forsyth and J. Ponce, Con	nputer Vision A	Modern Approach ·	,		
Prentice Hall, 2003.					
Handauta will be prepared					
mandouts will be prepared.					
(References)					
- RI Hartley and A 7isserman M	Aultiple View Geom	etry in Computer			
Vision Cambridge University Pro-	se 2000	say in computer			
- DA Earouth and L Danas Or	ss, 2000.	Madara Arrier-			
- D.A. Forsyth and J. Ponce, Con	iputer vision A	would have a series would be a series of the	,		
Prentice Hall, 2003.					
Notes for reference					

Understanding of the fundamentals and advanced issues on image processing and computer vision including:
– camera model,
– epipolar geometry,
- 3-D reconstruction from images.
Understanding of the fundamentals and advanced issues on image processing and computer vision including:
– camera model,
– epipolar geometry,
- 3-D reconstruction from images.
Evaluation of achievement
Grade will be determined by some reports for each area.
Grade will be determined by some reports for each area
Eveninetion
Details of examination
Other information
Room F-404, Ext. 6888, Email: kanazawa@cs.tut.ac.jp (Yasushi Kanazawa)
Room F-404, Ext. 6888, Email: kanazawa@cs.tut.ac.ip (Yasushi Kanazawa)
Peference IIDI
Reference URL
Reference URL http://www.img.cs.tut.ac.jp/
Reference URL http://www.img.cs.tut.ac.jp/ http://www.img.cs.tut.ac.jp/
Reference URL http://www.img.cs.tut.ac.jp/ http://www.img.cs.tut.ac.jp/ Office hours
Reference URL http://www.img.cs.tut.ac.jp/ http://www.img.cs.tut.ac.jp/ Office hours
Reference URL http://www.img.cs.tut.ac.jp/ http://www.img.cs.tut.ac.jp/ Office hours Relations to attainment objectives of learning and education
Reference URL http://www.img.cs.tut.ac.jp/ http://www.img.cs.tut.ac.jp/ Office hours Relations to attainment objectives of learning and education
Reference URL http://www.img.cs.tut.ac.jp/ http://www.img.cs.tut.ac.jp/ Office hours Relations to attainment objectives of learning and education
Reference URL http://www.img.cs.tut.ac.jp/ http://www.img.cs.tut.ac.jp/ Office hours Relations to attainment objectives of learning and education
Reference URL http://www.img.cs.tut.ac.jp/ http://www.img.cs.tut.ac.jp/ Office hours Relations to attainment objectives of learning and education

Key words image processing, computer vision image processing, computer vision

(M43630110)High Performance Computing[High Performance Computing]

Subject name[English]	High Performance	High Performance Computing[High Performance Computing]			
Schedule number	M43630110	Subject area	Advanced	Required or	Elective
			Computer	elective	
			Science and		
			Engineering		
Time of starting a course	Spring term	Day of the	Thu.3~3	Credit(s)	2
		week,period			
Faculty	Graduate Program for Master's Degree		Subject grade	1~2	
Department Offered				Beggining	
				grade	
Charge teacher name[Roman	後藤 仁志 GOTC) Hitoshi			
alphabet mark]					
Numbering					

Objectives of class

This lecture aims to lean the basic concepts and recent developments related to high-performance and cloud computing, simulation science and technology, and especially, to master parallel programming techniques for multi-core processor system and high-performance computing. Recent topics on computational chemistry will be also introduced for well-understanding the current technology of supercomputer and supercomputing. In order to conduct a practical training course on parallel programming techniques of OpenMP and OpenMPI, knowledge and ability to mathematical scientific programming techniques by using Fortran 90/95/2000 and/or C/C++ must be required for students taking this lecture.

This lecture aims to lean the basic concepts and recent developments related to high-performance and cloud computing, simulation science and technology, and especially, to master parallel programming techniques for multi-core processor system and high-performance computing. Recent topics on computational chemistry will be also introduced for well-understanding the current technology of supercomputer and supercomputing. In order to conduct a practical training course on parallel programming techniques of OpenMP and OpenMPI, knowledge and ability to mathematical scientific programming techniques by using Fortran 90/95/2000 and/or C/C++ must be required for students taking this lecture.

Contents of class

1. Guidance and placement examination

2. Introduction to simulation science: What's simulation?

- 3- 5. Partial differential equation of motion, pendulum, mechanical vibration and thier coupled (combined) behaviors
- 6. Introduction to molecular simulations

7-9. Practical training of molecular simulations

- 10. Introduction to parallel programming (OpenMP and OpenMPI) and programming language (Fortran90/95/2000)
- 11-13. Practical training of parallel programming (practical beginner's guide)
- 14-16. Practical training of parallel programming (Intel(R) Compilers)

1. Guidance and placement examination

- 2. Introduction to simulation science: What's simulation?
- 3-5. Partial differential equation of motion, pendulum, mechanical vibration and thier coupled (combined) behaviors
- 6. Introduction to molecular simulations

7-9. Practical training of molecular simulations

- 10. Introduction to parallel programming (OpenMP and OpenMPI) and programming language (Fortran90/95/2000)
- 11-13. Practical training of parallel programming (practical beginner's guide)

14-16. Practical training of parallel programming (Intel(R) Compilers)

Self Preparation and Review

Related subjects

Fundamental knowledge of computation and chemistry, and also basic ability to scientific programming techniques by using Fortran 90/95/2000 and/or C/C++

Fundamental knowledge of computation and chemistry, and also basic ability to scientific programming techniques by using Fortran 90/95/2000 and/or C/C++

Notes for textbook

None

None

Notes for reference

Goals to be achieved

and a first stand black through a billion of a supervision of a standard standard in
nulations and high-level ability of programming technique in
nulations, and high-lovel shility of programming technique in
nulations and high-level ability of programming technique in
ional Physics Computational Chemistry Supercomputer
Innal Physics Lomburgtional Longmistry Subarcomburg
(M43630160)Quantum Biology and Materials Science[Quantum Biology and Materials Science]

Subject name[English]	Quantum Biology and Materials Science[Quantum Biology and Materials Science]					ience]
Schedule number	M43630160	Subject ar	ea	Advanced	Required or	Elective
				Computer	elective	
				Science and		
				Engineering		
Time of starting a course	Spring term	Day of week perio	the	Wed.1~1	Credit(s)	2
Faculty	Graduate Program	n for Master'	s Degr	ee	Subject grade	1~2
Department Offered			o bogi		Beggining	
Bopardinone onorou					grade	
Charge teacher name[Roman	関野 秀男 栗田	典之 SEKIN	O Hide	o. KURITA Norivuki	8	
alphabet mark]				,		
Numbering						
Oblighthere of allows						
Understanding of theories for mo	lecular science and	i simulation te	chnolo	bgy based upon it		
Understanding of theories for mo	lecular science and	simulation te	ecnnoic	bgy based upon it		
Contents of class						
1. Fundamental notion of quantum	n mechanics					
i) Philosophical aspect						
ii) Pragmatical aspect						
2. Differential equations for quant	tum mechanical pro	blems				
i) Free particle						
ii) Confined particle						
iii) Multidimensional problems						
3. Molecular orbital theory						
i) Representation of physical space	ce					
ii) Spectral representation of spa	ce/ Basis functions	6				
4. Approximate theory for many e	electron systems					
i) Many particle problem in confin	ed systems					
ii) Rigor and precision						
iii) Computational aspect						
1. Fundamental notion of quantum	n mechanics					
i) Philosophical aspect						
ii) Pragmatical aspect						
2. Differential equations for quant	tum mechanical pro	blems				
i) Free particle	·					
ii) Confined particle						
iii) Multidimensional problems						
3. Molecular orbital theory						
i) Representation of physical space	ce					
ii) Spectral representation of spa	ce/ Basis functions	6				
4. Approximate theory for many e	electron systems					
i) Many particle problem in confin	ed systems					
ii) Rigor and precision	-					
iii) Computational aspect						
Self Preparation and Review						
Related subjects						
-						
Notes for textbook						
1)Quantum chemistry						
Evring/Walter/Kimball						
Lynng/ Walter/ Kinibali						
2)Modern Quantum Chemistry						
Introduction to Advanced Electro	n Structure Theory	/				
A.Szabo and N.S.Ostlund						

1)Quantum chemistry
Evring/Walter/Kimball
2)Madam Quantum Chamister
Zimodern Quantum Grienischy
A series and N.S. Oshund
A szabo anu N.S. Osubinu Natha Sina antinanan
Goals to be achieved
To understand quantum mechanics, Molecuar quantum mechanics and its numerical representation on computer.
To understand quantum mechanics, Molecuar quantum mechanics and its numerical representation on computer.
Evaluation of achievement
Presentation in the class and reports, small tests(several times) as well as creation of simulation programs.
Presentation in the class and reports, small tests(several times) as well as creation of simulation programs.
Examination
Details of examination
Other information
1 505
1 300 0522-44-6880
Office hours
Wed. 13:00 to 14:30
Wed. 13:00 to 14:30
Relations to attainment objectives of learning and education
Key words
Molecular Orbital Theory Differential Equation
Molecular Orbital Theory Differential Equation

(M43630190)Bio-physical Information Systems[Bio-physical Information Systems]

Subject name[English]	Bio-physical Information Systems[Bio-physical Information Systems]					
Schedule number	M43630190	Subject are	a	Advanced	Required or	Elective
				Computer	elective	
				Science and		
	<u> </u>			Engineering	0	
lime of starting a course	Spring term	Day of	the	Fri.2~2	Gredit(s)	2
Faculty	Graduate Program	n for Master's	Degre	6	Subject grade	1~2
Department Offered			20810	-	Beggining	
					grade	
Charge teacher name[Roman	堀川 順生,福村	直博 HORIK	AWA J	lunsei, FUKUMURA	Naohiro	
alphabet mark]						
Numbering						
Objectives of class						
This course lectures on informa	tion processing in	the nervous	syster	n of animals and h	numans and neura	l network models.
Information processing in the se	ensory and motor	systems and	compi	utational models f	for motor controls	including neuron
models, perceptron and machine I	earning, are studied	d.				
This course lectures on information	tion processing in	the nervous	syster	n ot animals and h	numans and neura	I network models.
models perceptrop and machine	ensory and motor a	systems and	compi	itational models 1	for motor controls	s including neuron
Contents of class	carning, are studied	J.				
(Fukumura)						
1. Introduction to the computation	nal neuroscience in	the motor co	ntrol s	system		
2. Neuron models and simple perc	eptron					
3. Multi-layered perceptron						
4. Reinforcement learning						
5. Information processing in the m	notor system, musc	les and motor	neuro	ns		
6. Motor control models of the hu	man voluntary mov	ements				
7. Models for motor planning in th	e human voluntary	movements				
8. Midterm examination						
(Horikawa)						
9 Introduction to the information	processing in the r	nervous system	n			
10. Structure of the nervous syst	em and neuron					
11. Action potentials and Hodgeki	n-Huxley equation					
12-13. Information processing in t	the visual system					
14. Information processing in the	auditory system					
15. Information processing in the	somatosensory sys	tem				
16. Final examination						
/						
(Fukumura)						
1. Introduction to the computation	nai neuroscience in	the motor co	ntrol s	system		
2. Neuron models and simple percent	epuon					
4. Reinforcement learning						
5. Information processing in the m	notor system, musc	les and motor	neuro	ons		
6. Motor control models of the hu	man voluntary mov	ements				
7. Models for motor planning in th	e human voluntary	movements				
8. Midterm examination						
(Horikawa)						
9. Introduction to the information	processing in the r	nervous syster	n			
10. Structure of the nervous syst	em and neuron					
12-13 Information processing in t	the visual system					
14 Information processing in the	auditory system					
15. Information processing in the	somatosensory svs	tem				
16. Final examination						

Self Preparation and Review

Related subjects

Notes for textbook

References:

Neural Networks for Control (W.Thomas Miller, Richard S.Sutton, and Paul J. Werbos1989) Neuroscience – Exploring the brain (Bear, Connors, Paradiso, Lippincott Williams & Wilkins 2007), Cognitive Neuroscience – The biology of the brain (Gazzaniga, Ivry, Mangun, WW Norton & Co Incm 2008)

References:

Neural Networks for Control (W.Thomas Miller, Richard S.Sutton, and Paul J. Werbos1989) Neuroscience – Exploring the brain (Bear, Connors, Paradiso, Lippincott Williams & Wilkins 2007), Cognitive Neuroscience – The biology of the brain (Gazzaniga, Ivry, Mangun, WW Norton & Co Incm 2008)

Notes for reference

Goals to be achieved

- 1. Understand the computational processing in the motor control
- 2. Understand neuron models, perceptron
- 3. Understand the motor control models of the human voluntary movements
- 4. Understand the models for motor planning of the human voluntary movements
- 5. Understand the structure and function of the nervous system
- 6. Understand neuron, synapse and Hodgekin-Huxley equation
- 7. Understand the information processing in the visual, auditory and somatosensory systems
- 1. Understand the computational processing in the motor control
- 2. Understand neuron models, perceptron
- 3. Understand the motor control models of the human voluntary movements
- 4. Understand the models for motor planning of the human voluntary movements
- 5. Understand the structure and function of the nervous system
- 6. Understand neuron, synapse and Hodgekin-Huxley equation
- 7. Understand the information processing in the visual, auditory and somatosensory systems

Evaluation of achievement

Midterm examination (50%) and final examination (50%), A: 100-80, B: 79-65, C: 64-55, D (fail): 54-0 Midterm examination (50%) and final examination (50%), A: 100-80, B: 79-65, C: 64-55, D (fail): 54-0 **Examination**

Details of examination

Other information

- N. Fukumura (C611, Tel: 0532-44-6772, fukumura@cs.tut.ac.jp) J. Horikawa (F407, Tel: 0532-44-6891, horikawa@cs.tut.ac.jp)
- N. Fukumura (C611, Tel: 0532-44-6772, fukumura@cs.tut.ac.jp)
- J. Horikawa (F407, Tel: 0532-44-6891, horikawa@cs.tut.ac.jp)

Reference URL

Office hours

Thursday 16:20-17:50 Thursday 16:20-17:50

Relations to attainment objectives of learning and education

D1

D1

(M43630210)Advanced Chemoinformatics[Advanced Chemoinformatics]

Subject name[English]	Advanced Chemoinformatics[Advanced Chemoinformatics]						
Schedule number	M43630210	Subject area	a	Advanced	Required	or	Elective
				Computer	elective		
				Science and			
				Engineering			
Time of starting a course	Spring term	Day of week,period	the	Mon.3~3	Credit(s)		2
Faculty	Graduate Program	n for Master's	Degre	e	Subject grade		1~2
Department Offered					Beggining grade		
Charge teacher name[Roman	高橋 由雅 TAKA	HASHI Yoshim	nasa		-		
alphabet mark]							
Numbering							
Objectives of class							
The purpose of this course is t	o introduce and e	xplain practica	al and	l applied approache	s to multivariat	te d	lata analysis (or
mining) and knowledge discovery	with illustrative exa	amples through	n cher	nical data space. Th	e course is help	oful	for the students
who are interested in not only pu	rsuing careers in ch	nemo-informat	ics bu	ıt also taking genera	l data science.		
The purpose of this course is t	o introduce and e	xplain practica	al and	l applied approache	s to multivariat	te d	lata analysis (or
mining) and knowledge discovery	with illustrative exa	amples through	n cher	nical data space. Th	le course is help	oful	for the students
who are interested in not only pu	rsuing careers in cł	nemo-informat	ics bu	it also taking genera	l data science.		
Contents of class							
Topics to be covered:							
1.Introduction: Chemical data spa	ce						
2.Multiple linear regression analys	sis (MLRA)			\			
3.Regression analysis and quantit	ative structure-act	ivity relationsh	nips (C	⊋SAR)			
4.What can you learn from QSAR	? • • • • • • • •						
o.Principal component analysis (P	OA) and data visua	liization					
0.Data scaling 7 Statistical discriminant analysis							
8 Basis of nattern recognition							
9.Linear binary pattern classifier							
10.Basis of classification learning	perceptron model						
11.Artificial neural network (ANN))						
12.Chemical application of ANN							
13.Support vector machine (SVM))						
14.Chemical application of SVM							
15.Concluding remark							
Topics to be covered:							
1.Introduction: Chemical data spa	ce						
2.Multiple linear regression analys	sis (MLRA)			\			
3.Regression analysis and quantit	ative structure-act	ivity relationsh	nips (C	⊋SAR)			
4.What can you learn from QSAR	?						
6 Data scaling	UN) and data visua	mzation					
7 Statistical discriminant analysis							
8.Basis of pattern recognition							
9.Linear binary pattern classifier							
10.Basis of classification learning	perceptron model						
11.Artificial neural network (ANN))						
12.Chemical application of ANN							
13.Support vector machine (SVM))						
14.Chemical application of SVM							
15.Concluding remark							
Self Preparation and Review							
Related subjects						_	

Linear Algebra, Elementary Analytics Linear Algebra, Elementary Analytics Notes for textbook Material will be made available in the form of hard copies or on the class website (to be announced). (Reference) Textbooks for multivariate data analysis and pattern recognition are helpful Material will be made available in the form of hard copies or on the class website (to be announced). (Reference) Textbooks for multivariate data analysis and pattern recognition are helpful Notes for reference Goals to be achieved /They understand regression analysis technique based on linear least squares method and the application to chemical data fitting. /They learn mathematical basis of principal component analysis and visualization of multivariate data space based on the method. /They study how they can avoid chance correlation problems in the case of a large number of explain variables to be used in the analysis. /They understand the principle of statistical linear discriminant analysis which is a statistical pattern recognition method. /They understand mathematical basis of artificial neural network (ANN) and support vector machine (SVM) as the basics of machine learning. They acquire the abilities how they can apply the methods to chemical data analysis, data classification and prediction. /They understand regression analysis technique based on linear least squares method and the application to chemical data fitting /They learn mathematical basis of principal component analysis and visualization of multivariate data space based on the method. /They study how they can avoid chance correlation problems in the case of a large number of explain variables to be used in the analysis. /They understand the principle of statistical linear discriminant analysis which is a statistical pattern recognition method. /They understand mathematical basis of artificial neural network (ANN) and support vector machine (SVM) as the basics of machine learning. They acquire the abilities how they can apply the methods to chemical data analysis, data classification and prediction. **Evaluation of achievement** Reports and classroom performance 50% Written examination 50% Reports and classroom performance 50% Written examination 50% Examination **Details of examination** Other information Office: F-303 (Ext. 6878) Email: taka@cs.tut.ac.jp Office: F-303 (Ext. 6878) Email: taka@cs.tut.ac.jp **Reference URL** http://www.mis.cs.tut.ac.jp http://www.mis.cs.tut.ac.jp Office hours Relations to attainment objectives of learning and education

multivariate data analysis, QSAR, chemical data analysis, pattern recognition, machine learning, data maining multivariate data analysis, QSAR, chemical data analysis, pattern recognition, machine learning, data maining

(M44610010)Seminar on Environmental and Life Science I[Seminar on Environmental and Life Science I]

Subject name[English]	Seminar on Environmental and Life Science I[Seminar on Environmental and Life Science I]					
Schedule number	M44610010	Subject area	Advanced	Required or	Required	
			Environmental	elective		
			and Life			
			Sciences			
Time of starting a course	Year	Day of the	Experiment	Credit(s)	3	
Feauthy	Graduate Program	n for Master's Degr		Subject grade	1~2	
Department Offered	Graduate i rogran	IT TOT WHASTER'S Degr		Beggining	1 2	
				grade		
Charge teacher name[Roman	各教員, S4系教教	務委員 KAKUKYOU	IN Kakukyouin, 4kei I	kyomu Iin−S	L	
alphabet mark]						
Numbering						
Objectives of class						
This course will provide the stu	dents with the op	portunity to study	on his/her researd	h subject in enviro	onmental and life	
sciences by reading textbooks ar	nd papers under the	e guidance of his/h	er supervisor. The st	udents will learn tl	ne knowledge and	
the presentation skills required for	or his/her research	in the seminar.				
This course will provide the stu	dents with the op	portunity to study	on his/her researd	h subject in enviro	onmental and life	
sciences by reading textbooks ar	nd papers under the	e guidance of his/h	er supervisor. The st	udents will learn tl	ne knowledge and	
the presentation skills required for	or his/her research	in the seminar.				
			. f			
The students will be expected to	o read textbooks ar	id papers written b	y foreign language, e	specially English, t	nat are indicated	
by his/her supervisor, and report	and discuss deeply	on his/her researc	n subject in the sen	nnar. Ispacially English t	hat are indicated	
hy his/her supervisor and report	and discuss deenly	on his/her resear	y foreign language, e	ninar		
Self Preparation and Review	and discuss deeping					
Related subjects						
-						
Notes for textbook						
Notes for reference						
Goals to be achieved						
Evaluation of achievement						
The evaluation is based on the scores of reading papers, discussions, reports and presentations of his/her research in the						
seminar. His/her supervisor evalu	ates the scores.					
The evaluation is based on the	scores of reading	papers, discussions	, reports and prese	ntations of his/he	r research in the	
seminar. His/her supervisor evalu	ates the scores.					
Examination						
B - H - H - H						
Details of examination						
Oth our information						
Supervisor						
Reference LIRI						
Office hours						
Relations to attainment objective	s of learning and e	ducation				
2	-					

(M44610020)Seminar on Environmental and Life Science II[Seminar on Environmental and Life Science II]

Subject name[English]	Seminar on Environmental and Life Science II[Seminar on Environmental and Life Science II]				
Schedule number	M44610020	Subject area	Advanced	Required or	Required
			Environmental	elective	
			and Life		
			Sciences		
Time of starting a course	Year	Day of the	Experiment	Credit(s)	3
	<u> </u>	week,period			
Faculty	Graduate Progran	n for Master's Degre	e	Subject grade	2~2
Department Offered				Beggining	
Charge teacher name[Baman	久数吕 €/ ≤ 数 ≧	除禾吕 κ λ κ ι ικ∨∩ι ι	N Kakukwawin Akai k		
elopebet mark]					
Numbering					
based on the Seminar on Environ	intental and Life S	cience II, this cours	by reading taythook	e the students with	n the opportunity
his/her supervisor. The student	s will learn the kr	owledge and the p	by reading textbook	s and papers unde quired for his/her	r the guidance of
seminar	s will learn the ki	lowledge and the p			
Based on the Seminar on Enviro	nmental and Life S	cience II. this cours	e will further provide	e the students wit	h the opportunity
to study on his/her research sub	ject in environmen	tal and life sciences	by reading textbook	s and papers unde	r the guidance of
his/her supervisor. The student	s will learn the kr	owledge and the p	resentation skills re	quired for his/her	research in the
seminar.					
Contents of class					
The students will be expected	to read textbooks	and papers in inte	rnational journals in	dicated by his/he	r supervisor, and
report and discuss deeply on his/	/her research subje	ect in the seminar.			
The students will be expected	to read textbooks	and papers in inte	rnational journals in	dicated by his/he	r supervisor, and
report and discuss deeply on his	/her research subje	ect in the seminar.			
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
The evaluation is based on the	scores of reading	naners discussions	reports and prese	ntations of his/he	r research in the
seminar. His/her supervisor evalu	lates the scores.				
The evaluation is based on the	scores of reading	papers, discussions	, reports and preser	ntations of his/he	r research in the
seminar. His/her supervisor evalu	lates the scores.				
Examination					
Details of examination					
Other information					
Supervisor					
Supervisor					
Reference URL					
Office hours					
Relations to attainment objective	s of learning and a	ducation			
	o or rearring and c				

(M44610030)Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]					
Schedule number	M44610030	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required	
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6	
Faculty	Graduate School	of Engineering		Subject grade	1~1	
Department Offered				Beggining grade		
Charge teacher name[Roman alphabet mark]	S4系教務委員 4	kei kyomu Iin−S				
Numbering						

Objectives of class

In the course, the students will perform the advanced research on the environmental and life science under the direction of his/her supervisor in the laboratory. The students will acquire the knowledge and experimental and analytical skills required for his/her research subject and learn the scientific and social importance of his/her subject by researching for related studies by others and write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.

In the course, the students will perform the advanced research on the environmental and life science under the direction of his/her supervisor in the laboratory. The students will acquire the knowledge and experimental and analytical skills required for his/her research subject and learn the scientific and social importance of his/her subject by researching for related studies by others and write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.

Contents of class

The students will have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be prepared as a Master's Thesis, and the students must present the results from his/her research, discuss and answer the questions with the reviewers in the final review of his/her Master's Thesis.

The students will have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be prepared as a Master's Thesis, and the students must present the results from his/her research, discuss and answer the questions with the reviewers in the final review of his/her Master's Thesis. **Self Preparation and Review**

-

Related subjects

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).

Examination

Details of examination

Other information
Supervisor
Supervisor
Reference URL
Office hours
Relations to attainment objectives of learning and education
Key words

(M44610030)Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]					
Schedule number	M44610030	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required	
Time of starting a course	2Years	Day of the week,period	Experiment	Credit(s)	6	
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~2	
Department Offered				Beggining grade		
Charge teacher name[Roman alphabet mark]	各教員, S4系教利	務委員 KAKUKYOUI	N Kakukyouin, 4kei k	kyomu Iin−S		
Numbering						

Objectives of class

In the course, the students will perform advanced researches on the environmental and life science under the direction of his/her supervisor in the laboratory. The aims of this lessen are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.

In the course, the students will perform advanced researches on the environmental and life science under the direction of his/her supervisor in the laboratory. The aims of this lessen are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.

Contents of class

The students will be required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense. The students will be required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense. **Self Preparation and Review**

Related subjects

Seminar on Environmental and Life Science I

Seminar on Environmental and Life Science II

All other relevant subjects in Advanced Environmental and Life Sciences

Seminar on Environmental and Life Science I

Seminar on Environmental and Life Science II

All other relevant subjects in Advanced Environmental and Life Sciences

Notes for textbook

Supervisor(s) will recommend textbooks, papers, and research materials to students

Supervisor(s) will recommend textbooks, papers, and research materials to students

Notes for reference

Goals to be achieved

To acquire basic knowledge on environmental and life sciences

To master experimental techniques and analytical skills required for research on a given field of environmental and life sciences To be able to present and discuss on the results of his/her research

To be able to make safety control in experimental work

To acquire basic knowledge on environmental and life sciences

To master experimental techniques and analytical skills required for research on a given field of environmental and life sciences To be able to present and discuss on the results of his/her research To be able to make safety control in experimental work

Evaluation of achievement

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation

etc). Examination

Details of examination

Other information

Supervisor

Supervisor

Reference URL

http://ens.tut.ac.jp/en/ http://ens.tut.ac.jp/en/

Office hours

Students are encouraged visiting by appointment.

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

Environmental science and technology, life science, materials science, applied chemistry Environmental science and technology, life science, materials science, applied chemistry

(M4461003T)Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]					
Schedule number	M4461003T	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required	
Time of starting a course	Year	Day of the week period	Experiment	Credit(s)	6	
Faculty	Graduate Program	Graduate Program for Master's Degree			2~2	
Department Offered				Beggining grade		
Charge teacher name[Roman alphabet mark]	各教員, S4系教教	务委員 KAKUKYOUI	N Kakukyouin, 4kei k	kyomu Iin−S		
Numbering						

Objectives of class

In the course, the students will perform the advanced research on the environmental and life science under the direction of his/her supervisor in the laboratory. The students will acquire the knowledge and experimental and analytical skills required for his/her research subject and learn the scientific and social importance of his/her subject by researching for related studies by others and write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.

In the course, the students will perform the advanced research on the environmental and life science under the direction of his/her supervisor in the laboratory. The students will acquire the knowledge and experimental and analytical skills required for his/her research subject and learn the scientific and social importance of his/her subject by researching for related studies by others and write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.

Contents of class

The students will have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be prepared as a Master's Thesis, and the students must present the results from his/her research, discuss and answer the questions with the reviewers in the final review of his/her Master's Thesis.

The students will have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be prepared as a Master's Thesis, and the students must present the results from his/her research, discuss and answer the questions with the reviewers in the final review of his/her Master's Thesis. **Self Preparation and Review**

Related subjects

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).

Examination

Details of examination

Other information
Supervisor
Supervisor
Reference URL
Office hours
Relations to attainment objectives of learning and education
Key words

(M44610040)Seminar on Environmental and Life Science[Seminar on Environmental and Life Science]

Subject name[English]	Seminar on Environmental and Life Science[Seminar on Environmental and Life Science]					Life Science]
Schedule number	M44610040	Subject a	area	Advanced	Required or	Required
				Environmental	elective	
				and Life		
				Sciences		
Time of starting a course	Year	Day of week.peri	f the iod	Experiment	Credit(s)	6
Faculty	Graduate Program	n for Maste	r's Degre	e	Subject grade	2~2
Department Offered					Beggining	
					grade	
Charge teacher name[Roman	各教員, S4系教教	務委員 KAK	UKYOUI	N Kakukyouin, 4kei k	xyomu Iin−S	
alphabet mark]						
Numbering						
Objectives of class						
This course will provide the stu	idents with the op	portunity t	o study	on his/her research	n subject in enviro	onmental and life
sciences by reading textbooks ar	nd papers under the	e guidance	of his/he	er supervisor. The st	udents will learn th	ne knowledge and
the presentation skills required for	or his/her research	in the sem	inar.			
This course will provide the stu	idents with the op	portunity t	o study	on his/her research	n subject in enviro	onmental and life
sciences by reading textbooks ar	nd papers under the	e guidance	of his/he	er supervisor. The st	udents will learn th	ne knowledge and
the presentation skills required for	or his/her research	in the sem	inar.			
The students will be expected	to read textbooks	s and pape	ers writt	en by foreign langu	age that are indic	cated by his/her
supervisor, and report and discus	s deeply on his/he	r research :	subject i	n the seminar.	are that are indi	noted by his/hor
The students will be expected	to read textbooks	r recearch	ers writte	en by foreign langu	age that are more	saled by his/her
Self Preparation and Review	s deeply on his/ he	rresearch	subject i	i the seminar.		
Dalata di sublicata						
Related subjects						
Notes for textbook						
Notes for reference						
Goals to be achieved						
Evaluation of achievement						
The evaluation is based on the	scores of reading	papers, dis	cussions	, reports and prese	ntations of his/he	r research in the
seminar. His/her supervisor evalu	lates the scores.					
The evaluation is based on the	scores of reading	papers, dis	cussions	, reports and prese	ntations of his/he	r research in the
seminar. His/her supervisor evalu	lates the scores.					
Examination						
Details of examination						
Other information						
Supervisor						
Supervisor						
Reference URL						
Office hours						
		_				
Relations to attainment objective	es of learning and e	ducation				

(M44630010)Advanced Separation Chemistry I[Advanced Separation Chemistry I]

Subject name[English]	Advanced Separa	Advanced Separation Chemistry I[Advanced Separation Chemistry I]						
Schedule number	M44630010	Subject area	Advanced	Required or	Elective			
			Environmental	elective				
			and Life					
			Sciences					
Time of starting a course	Spring1 term	Day of the	Fri.2~2	Credit(s)	1			
		week,period						
Faculty	Graduate Program	n for Master's Degre	Subject grade	1~2				
Department Offered				Beggining				
				grade				
Charge teacher name[Roman	齊戸 美弘 SAITO	O Yoshihiro						
alphabet mark]								
Numbering								

Objectives of class

Due to the recent requirements for stationary phases in chromatography such as higher selectivity, various novel stationary phases have been developed by the systematic analysis of the retention behavior of sample solutes. Miniaturization and automation of the whole separation instruments have been regarded as additional important projects in separation science, because of the increasing requirements for recent separation systems, such as selective/specific detection with high sensitivities, high throughput processing, as well as an environmentally-friendly feature of the systems. In this course, novel technologies of sample preparation and chromatographic separations will be provided along with the miniaturization of the hyphenated analytical systems.

Due to the recent requirements for stationary phases in chromatography such as higher selectivity, various novel stationary phases have been developed by the systematic analysis of the retention behavior of sample solutes. Miniaturization and automation of the whole separation instruments have been regarded as additional important projects in separation science, because of the increasing requirements for recent separation systems, such as selective/specific detection with high sensitivities, high throughput processing, as well as an environmentally-friendly feature of the systems. In this course, novel technologies of sample preparation and chromatographic separations will be provided along with the miniaturization of the hyphenated analytical systems.

Contents of class

1. Development of novel stationary phases in liquid chromatography based on the systematic analysis of retention behavior.

2. Development of novel sample preparation media and the applications to real sample analysis in various chromatographic methods.

3. Miniaturization of analytical systems and the hyphenation.

1. Development of novel stationary phases in liquid chromatography based on the systematic analysis of retention behavior.

2. Development of novel sample preparation media and the applications to real sample analysis in various chromatographic methods.

3. Miniaturization of analytical systems and the hyphenation.

Self Preparation and Review

Related subjects

Advanced Separation Chemistry II.

Advanced Separation Chemistry II.

Notes for textbook

No text book is required, however, basic knowledge of chromatography is desirable.

No text book is required, however, basic knowledge of chromatography is desirable.

Notes for reference

Goals to be achieved

Evaluation of achievement

The evaluation will be made based on the score of the report and presentation. The evaluation will be made based on the score of the report and presentation. **Examination**

Details of examination

Other information

Y. Saito; Room# B-404; Phone 6803; E-mail: saito@ens.tut.ac.jp Y. Saito; Room# B-404; Phone 6803; E-mail: saito@ens.tut.ac.jp **Reference URL**

Office hours

Anytime if available, however, an appointment by e-mail is strongly recommended. Anytime if available, however, an appointment by e-mail is strongly recommended. **Relations to attainment objectives of learning and education**

(M44630020)Advanced Separation Chemistry II[Advanced Separation Chemistry II]

Subject name[English]	Advanced Separa	Advanced Separation Chemistry II[Advanced Separation Chemistry II]						
Schedule number	M44630020 Subject area		Advanced	Required or	Elective			
				elective				
			and Life					
			Sciences					
Time of starting a course	Spring2 term	Day of the	Fri.2~2	Credit(s)	1			
		week,period						
Faculty	Graduate Program	n for Master's Degre	Subject grade	1~2				
Department Offered				Beggining				
				grade				
Charge teacher name[Roman	平田 幸夫 HIRA	TA Yukio						
alphabet mark]								
Numbering								

Objectives of class

Chromatography is one of the most widely applied methods for the analysis of mixtures, because of its high resolving power. Purpose of this course is to learn the basic theory of chromatography. To obtain the in-depth understanding, the emphasis is also placed on practice and reports on the related topics.

Chromatography is one of the most widely applied methods for the analysis of mixtures, because of its high resolving power. Purpose of this course is to learn the basic theory of chromatography. To obtain the in-depth understanding, the emphasis is also placed on practice and reports on the related topics.

Contents of class

- 1. Basic theory of chromatography
- distribution equilibrium
- plate theory
- rate theory
- resolution
- mobile and stationary phases
- 2. Practice and Repots for various simulation using Excel
- chromatographic separation process
- effect of various parameters on the separation efficiency
- effect of temperature in GC
- effect of mobile phase composition in LC
- analysis of chromatographic data
- 1. Basic theory of chromatography
- distribution equilibrium
- plate theory
- rate theory
- resolution
- mobile and stationary phases
- 2. Practice and Repots for various simulation using Excel
- chromatographic separation process
- effect of various parameters on the separation efficiency
- effect of temperature in GC
- effect of mobile phase composition in $\ensuremath{\mathsf{LC}}$

- analysis of chromatographic data

Self Preparation and Review

Related subjects

Notes for textbook

Textbook

No textbook is required. Related materials will be provided. Elementary knowledge of Basic Language is required to use Excel-VBA.

Reference

1) "Chromatography: Concepts and Contrasts", J. M. Miller, John Wiley & Sons"

Textbook

No textbook is required. Related materials will be provided.Elementary knowledge of Basic Language is required to use Excel-VBA.

Reference

1) "Chromatography: Concepts and Contrasts", J. M. Miller, John Wiley & Sons" Notes for reference

Goals to be achieved

To undersatnd the principle of chromatography.

To undersatnd the principle of chromatography.

Evaluation of achievement

Based on reports requested on individual chromatographic topic of interest during the course of class.

Based on reports requested on individual chromatographic topic of interest during the course of class.

Examination

Details of examination

Other information

Yukio Hirata: room (B-402), e-mail (hirata@ens.tut.ac.jp), phone: 6804

Yukio Hirata: room (B-402), e-mail (hirata@ens.tut.ac.jp), phone: 6804

Reference URL

Office hours

As needed.

As needed.

Relations to attainment objectives of learning and education

(M44630110)Developmental Neuroscience[Developmental Neuroscience]

Subject name[English]	Developmental Neuroscience[Developmental Neuroscience]						
Schedule number	M44630110	Subject an	a	Advanced Required or Elective		Elective	
				Environmental	elective		
				and Life			
				Sciences			
Time of starting a course	Spring2 term	Day of	the	Mon.3~3	Credit(s)	1	
		week,perio	d				
Faculty	Graduate Program	n for Master'	s Degr	ee	Subject grade	1~2	
Department Offered					Beggining		
		grade					
Charge teacher name[Roman	吉田 祥子 YOS⊦	IDA Sachiko					
alphabet mark							
Numbering							
Objectives of class							
Objective of class is to develop	a new technology	y for detection	on of i	neuronal function in	your brain. We de	eal with neuronal	
property and development of neu	ironal circuit, and di	iscuss applica	ability a	and problem of your	ideas.		
Objective of class is to develop	a new technology	y for detection	on of i	neuronal function in	your brain. We de	eal with neuronal	
property and development of neu	ronal circuit, and di	iscuss applica	ability a	and problem of your	ideas.		
(1)Properties of neuronal cells							
(2)Electrical function and ion tran	isport						
(3)Chemical information transpor	t 						
(4) Development of neuronal circu	11t						
(5) Detection of chemical informa-	tion						
(0)Detection of electrical information	nation						
(1)Properties of neuropal cells	ient						
(1) Fropercies of neuronal cells (2) Electrical function and ion tran	sport						
(2)Chemical information transpor	15port +						
(4)Development of neuronal circu	uit						
(5)Detection of chemical information	tion						
(6)Detection of electrical informa	tion						
(7)Detection of cortical developm	nent						
Self Preparation and Review							
Pelated subjects							
A firm understanding on fundame	ntal hisshamistry a	nd thermody	amiaa	will be necessary			
A firm understanding on fundame	ntal biochemistry a	ind thermody	namics	will be necessary.			
Notes for textbook			annos	will be necessary.			
Web-based text will be distribute	d.						
(Reference)							
From Neuron To Brain 4th Ed. Ni	cholls et al (Sinau	er 2001)					
Web-based text will be distribute	d.	01, 2001)					
(Reference)							
From Neuron To Brain 4th Ed. Ni	cholls et. al. (Sinau	er. 2001)					
Notes for reference		.,,					
Goals to be achieved							
Evaluation of achievement							
Short reports on Web: 40%. Term	report; 60%						
Short reports on Web: 40%. Term	report; 60%						
Examination							
Details of examination							

Other information

Room: B-406, E-mail:syoshida@ens.tut.ac.jp Room: B-406, E-mail:syoshida@ens.tut.ac.jp

Reference URL

https://moodle.imc.tut.ac.jp/ https://moodle.imc.tut.ac.jp/ Office hours

Relations to attainment objectives of learning and education

(M44630140)Advanced Electrical and Electronic Technology for Ecological Engineering[Advanced Electrical and Electronic Technology for Ecological Engineering]

Subject name[English]	Advanced Electrical and Electronic Technology for Ecological Engineering[Advanced							
	Electrical and Ele	ectronic Technology	for Ecological Engine	eering]				
Schedule number	M44630140	Subject area	Advanced	Required or	Elective			
			Environmental	elective				
			and Life					
	0.1.1.		Sciences					
Time of starting a course	Spring1 term	Day of the	Mon.3~3	Credit(s)	1			
E	Cueduete Due mer	week,period		Subject mede	10.2			
Faculty Department Offered	Graduate Program	m for Master's Degre	ee	Subject grade	1~2			
				grade				
Charge teacher name[Roman	田中三郎、廿日	日出 好.水野 彰	高島 和則 TANA	KA Saburo, HATS	SUKADE Yoshimi.			
alphabet mark]	MIZUNO Akira, T	AKASHIMA Kazunor	i		,			
Numbering								
Objectives of class								
Electrical and electronic engineer	ring also contribute	for remediation						
and improvement of our environm	nent and society F	or instance						
electrostatic precipitation (ESP)	has been contribut	ing to clean flue						
gas in industry. ESP uses corona	a discharge that ge	nerates ions.						
Suspended particles are charged	by those ions, and	separated from gas						
stream. At the meantime, corona	a discharge ionize t	he air, and generate	s					
radicals which promote chemical	reactions. Decom	psition of gaseous						
pollutants are possible using radio	cals.							
In this lecture, fundamental proce	esses of ESPs and	possible application	S					
of chemical reactions promoted b	by radicals will be e	explained.						
Understanding of these fundamen	ntals will expand the	e ability to solve						
environmental problems.		6						
Electrical and electronic engineer	ring also contribute	for remediation						
and improvement of our environm	hent and society. F	or instance,						
gas in industry ESP uses coron	a discharge that ge	nerates ions						
Suspended particles are charged	by those ions and	separated from gas						
stream. At the meantime, corona	a discharge ionize t	he air. and generate	s					
radicals which promote chemical	reactions. Decom	psition of gaseous						
pollutants are possible using radi	cals.	_						
In this lecture, fundamental proce	esses of ESPs and	possible application	S					
of chemical reactions promoted b	by radicals will be e	explained.						
Understanding of these fundamer	ntals will expand the	e ability to solve						
environmental problems.								
Contents of class								
1. Fundamental of Electrostatics	Features of elec	ctrostatic forces on						
Tine objects	atuinal diankauraa							
2. Ionization and generation of ele	ectrical discharges							
2.2 Flectrical discharges								
3. Electrostatic precipitation								
3.1 Particle charging								
3.2 Particle transport								
3.3 Collection efficiency								
3.4 Problems in ESPs								
4. Plasma chemical reaction and	its application in er	nvironmental techno	logy					
4.1 Generation of atmospheric pla	asma in combinatio	asma in combination with catalyst						
4.2 Application of plasma chemic	al reactions							
4.3 Effect of radicals on microbes	s and viruses							
i. Fundamental of Electrostatics-	reatures of elec	ctrostatic forces on						
2 Ionization and reportion of old	ectrical discharges							
2. Ionization and generation of ele	oonidal uisofiarges							

 2.2 Electrical discharges 3. Electrostatic precipitation 3.1 Particle charging 3.2 Particle transport 3.3 Collection efficiency 3.4 Problems in ESPs 4. Plasma chemical reaction and its application in environmental technology 4.1 Generation of atmospheric plasma in combination with catalyst 4.2 Application of plasma chemical reactions 4.3 Effect of radicals on microbes and viruses
Related subjects
None
Notes for textbook
No text book is required.
No text book is required.
Notes for reference
Goals to be achieved
Understanding of fundamental electrostatics
Understanding of fundamental electrostatics
Score of the report and presentation will be evaluated.
Examination
Details of examination
Other information
Akira MIZUNO: Room G-607, mizuno@ens.tut.ac.jp
Akira MIZUNO [,] Room G-607, mizuno@enstut.ac.in
Reference URL
http://ens.tut.ac.ip/electrostatics/
http://ens.tut.ac.jp/electrostatics/
Office hours
Anytime, however, appoint by e-mail is required.
Anytime, however, appoint by e-mail is required.
Relations to attainment objectives of learning and education
For future work in environmental engineering, understanding of basic
electrostatics and plasma chemical processes is beneficial, and will
improve ability to apply these basic processes for environmental problems.
For future work in environmental engineering, understanding of basic
electrostatics and plasma chemical processes is beneficial, and will
improve ability to apply these basic processes for environmental problems.
Key words

(M44630160)Advanced Eco-Materials Engineering[Advanced Eco-Materials Engineering]

Subject name[English]	Advanced Eco-Materials Engineering[Advanced Eco-Materials Engineering]						
Schedule number	M44630160	Subject are	a	Advanced	Required or	Elective	
			Environmental	elective			
				and Life			
				Sciences			
Time of starting a course	Spring2 term	Day of week,period	the d	Fri.4~4	Credit(s)	1	
Faculty	Graduate Program	n for Master's	s Degr	e	Subject grade	1~2	
Department Offered			_		Beggining		
-	grade						
Charge teacher name[Roman	辻 秀人 TSUJI H	lideto					
alphabet mark]							
Numbering							
Objectives of class							
The Eco-Motoriale Engineering in	a davialanad and at	udiad for rad	lucing	the environmental in	nnaat Tha aim af	this source is to	
allow the student to achieve und	s developed and st erstanding basis os	noopt of the	lucing biobae	ed and biodegradable	npact. The aim of	this course is to	
The Eco-Materials Engineering in	e developed and st	udied for red	lucing	the environmental in	polymers.	this course is to	
allow the student to achieve und	s developed and st	nagest of the	hinhan			this course is to	
Contents of class	erstanding basic co	ncept of the	DIODAS		e polymers.		
This source deals with all the	anneste of the	hisbased an	ما امت ما	a mua da bla un a buma una	for undusing the	import on the	
This course deals with all the	e aspects of the	biobased an		egradable polymers	for reducing the	impact on the	
(1) Introduction (2) Synthesis (2)	Se scriedule is snov	vri below:	Church	ture (6) Dhusiaal ar	ensution (7) Hudun	lutia de sus detiens	
(1) Introduction, (2) Synthesis, (3)	5) Wolding, (4) Grys	tallization, (5,	Struc	ture, (0) Physical pr	opercies, (7) Hydro	iytic degradation,	
(6) biodegradation, and (9) Applic	ations.						
This course deals with all the	e aspects of the	biobased an	d biod	egradable polymers	for reducing the	impact on the	
environmental. The detailed cours	se schedule is shov	vn below:	_				
(1) Introduction, (2) Synthesis, (3	3) Molding, (4) Crys	tallization, (5)	Struc	ture, (6) Physical pr	operties, (7) Hydro	lytic degradation,	
(8) Biodegradation, and (9) Applic	ations.						
Self Preparation and Review							
Related subjects							
Notes for textbook							
Printed materials from Biopolyme	ers vol 4 (Polvester	rs III.) Y Doi	A Ste	nhuchel Eds Wilev-	VCH 2002		
Printed materials from Biopolyme	ers vol. 4 (Polyester	rs III), Y. Doi, rs III) Y. Doi	A Stei	nbuchel Eds., Wiley-	VCH 2002		
Notes for reference		0 m), 1. Doi,					
Coole to be achieved							
Goals to be achieved							
Evaluation of achievement							
Reports and presentation							
Reports and presentation							
Examination							
Details of examination							
Other information							
Phone: 0532-44-6922 e-mail: ter	uii@ens.tut.ac.in.(Hi	deto Tsuii)					
Phone: 0532-44-6922, e-mail: tsi	uji@ens.tut.ac.jp (Hi uji@ens.tut.ac.in (Hi	deto Tsuji)					
Reference URL	- <u>.</u> energetuogp (III						
Office hours							
Umce nours							
Relations to attainment objective	es of learning and e	ducation					

(M44630190)Advanced Sustainable Coordinator[Advanced Sustainable Coordinator]

Subject name[English]	Advanced Sustainable Coordinator[Advanced Sustainable Coordinator]						
Schedule number	M44630190	Subject are	эа	Advanced	Required or	Elective	
		_		Environmental	elective		
				and Life			
				Sciences			
Time of starting a course	Spring1 term	Day of week,perio	the d	Thu.3~3	Credit(s)	1	
Faculty	Graduate Program	n for Master'	s Degr	ee	Subject grade	1~2	
Department Offered			Beggining				
					grade		
Charge teacher name[Roman	後藤 尚弘 GOTO	OH Naohiro					
alphabet mark]							
Numbering							
Objectives of class							
To establish a "Sustainable Soc	eiety" is one of ma	ajor fields foi	^r susta	inable development.	Countermeasures	for it should be	
comprehensive and they compris	e not only engineer	ring but also s	several	disciplines. The obje	ectives of this class	s are	
1 to comprehend notion of "Sust	ainable Society"						
2 to learn human dimensional dis	ciplines for "Sustai	nable Society	,"				
3 to know planning method to est	tablish "Sustainable	e Society" th	ough e	xamples			
To establish a "Sustainable Soc	iety" is one of ma	ajor fields foi	^r susta	inable development.	Countermeasures	for it should be	
comprehensive and they compris	e not only engineer	ring but also s	several	disciplines. The obje	ectives of this class	s are	
1 to comprehend notion of "Sust	ainable Society"						
2 to learn human dimensional dis	ciplines for "Sustai	nable Society	,"				
3 to know planning method to est	tablish "Sustainable	e Society" th	ough e	xamples			
Contents of class							
1 Concept of Sustainable develop	oment						
2 Material (Substance) flow analy	vsis						
3 Life Cycle Assessment							
4 Japanese environmental law an	d institution						
5 Environmental management, CS	SR						
6 Resource consumption transition	on						
7 Environmental technology com	munication						
1 Concept of Sustainable develop	oment						
2 Material (Substance) flow analy	vsis						
3 Life Cycle Assessment							
4 Japanese environmental law an	id institution						
5 Environmental management, CS	SR						
6 Resource consumption transition	on 						
Self Preparation and Review	munication						
Related subjects							
-							
Notes for textbook							
I will distribute copies of textboo	k in the first day.						
 World resource institute, Weight 	of Nations						
http://pubs.wri.org/pubs_descript	ption.cfm?PubID=3023						
 NIES, Material Flow Data Book 	World Resource Fl	ows around u	lapan				
http://www-cger.nies.go.jp/public	cation/D033/cd/ind	dex.html					
I will distribute copies of textboo	k in the first day.						
 World resource institute, Weight 	of Nations						
http://pubs.wri.org/pubs_descript	tion.cfm?PubID=302	23					
•NIES, Material Flow Data Book	World Resource FI	ows around u	lapan~				
http://www-cger.nies.go.jp/public	cation/D033/cd/ind	dex.html					

Notes for reference

Goals to be achieved

to understant how to establish sustainable society to understant how to establish sustainable society **Evaluation of achievement**

Every week and Term end report (100%) Every week and Term end report (100%) **Examination**

Details of examination

Other information (G603) goto@ens.tut.ac.jp (G603) goto@ens.tut.ac.jp

Reference URL

Office hours

Thursday 10:00-12:00 Thursday 10:00-12:00

Relations to attainment objectives of learning and education

Key words

Sustainablity, Environmental Policy, MFA, LCA, CSR, EMS Sustainablity, Environmental Policy, MFA, LCA, CSR, EMS

(M44630200)Advanced Supercritical Fluid Engineering[Advanced Supercritical Fluid Engineering]

Subject name[English]	Advanced Supercritical Fluid Engineering[Advanced Supercritical Fluid Engineering]						
Schedule number	M44630200	Subject ar	ea	Advanced	Required or	Elective	
				Environmental	elective		
				and Life			
	ļ			Sciences			
Time of starting a course	Spring2 term	Day of	the	Thu.3~3	Credit(s)	1	
Faculty	Graduate Prograr	m for Master	's Degr	ee	Subject grade	1~2	
Department Offered				Beggining	-		
-					grade		
Charge teacher name[Roman	大門 裕之 DAIM	ON Hiroyuki					
alphabet mark]							
Numbering							
Objectives of class							
Based on Supercritical Fluid E	Engineering and E	nvironmental	Chem	nical Engineering, pr	ractical philosophy	y, creativity and	
leadership of engineer are impro	ved during this cou	urse. The to	pics ar	e mainly waste man	agement and utiliz	ation of biomass.	
Environmental issue is widely as	cussed to optain th	ie knowledge	and or	ganizing skill of comp	orehensive process	; or society.	
Based on Supercritical Fluid L	ingineering and Li		Unen Spice al	11Cai Engineering, pr	ractical prillosophy	/, creativity and	
Environmental issue is widely dis	cussed to obtain th	ne knowledge	and or	e maining waste main	orehensive process	action of biomass.	
Contents of class	505560 to obtain an	C KIIOWICAPO		gallizing skin of oom		of society.	
1st Summarv							
2nd History							
3rd Physical property 1							
4th Physical property 2							
5th Instrumentation and process	engineering						
6th Application of Supercritical W	√ater Technologies	1					
7th Application of Supercritical W	√ater Technologies	2					
8th Application of Supercritical W	later Technologies	3					
9th Application of Supercritical W	later Technologies	4					
10th Application of Supercritical	Water Technologies	s 5					
19th Application of Supercritical	Carbon dioxide Tec	chnologies i					
12th Application of Supercritical	Carbon dioxide Tec	chnologies 2					
14th Application of Supercritical	Carbon dioxide Tec	chnologies 4					
15th Examination		1110108.00					
1st Summary							
2nd History							
3rd Physical property 1							
4th Physical property 2							
5th Instrumentation and process	engineering						
6th Application of Supercritical W	later Technologies	1					
7th Application of Supercritical W	later Lechnologies	2					
oth Application of Supercritical M	Voter Technologies	3 1					
10th Application of Supercritical	Water Technologie:	4 e 5					
11th Application of Supercritical	Carbon dioxide Tec	chnologies 1					
12th Application of Supercritical	Carbon dioxide Tec	chnologies 2					
13th Application of Supercritical	Carbon dioxide Tec	chnologies 3					
14th Application of Supercritical	Carbon dioxide Tec	chnologies 4					
15th Examination							
Self Preparation and Review							
Related subjects							
Advanced Analytical Separation (Chemistry, Advance	ed Industrial	Ecolog <u>y</u>	/			
Advanced Analytical Separation (Chemistry, Advance	ed Industrial	Ecology	/			
Notes for textbook							
1. Analytical Supercritical Fluid C	hromatography and	d Extraction					
edited by M. L. Lee and K. E. Mar	rkides, 1990						

Chromatography Conference, Inc.
2. Hyphenated Techniques in Supercritical Fluid Chromatography and Extraction
edited by K. Jinno, 1992
Elsevier
1. Analytical Supercritical Fluid Chromatography and Extraction
edited by M. L. Lee and K. E. Markides, 1990
Chromatography Conference, Inc.
2. Hyphenated Techniques in Supercritical Fluid Chromatography and Extraction
edited by N. Jinno, 1992
Goals to be achieved
1. To understand Supercritical Fluid Technology
2. To improve engineering skill
3. To obtain the knowledge about Environmental problem especially for waste management
1. To understand Supercritical Fluid Technology
2. To improve engineering skill
3. To obtain the knowledge about Environmental problem especially for waste management
Evaluation of achievement
Based on Presentation and Interview during class
More than
80% ; A
65% ; B
55% ; C
Based on Presentation and Interview during class
More than
80% ; A
65% ; B
55%; C
Examination
Details of examination
Other information
Office : Builing G, Floor 6th, Room 602
Tel:0532-44-6905
Email:daimon@ens.tut.ac.jp
Office Builing G. Floor 6th Boom 602
Tel:0532-44-6905
Email:daimon@ens.tut.ac.jp
Reference URL
http://water.eco.tut.ac.jp/class.html (English version under construction)
http://water.eco.tut.ac.jp/class.html (English version under construction)
Office hours
After the class or anytime when you make an appointment through Email
After the class or anytime when you make an appointment through Email
Relations to attainment objectives of learning and education
(D)
(D)
Key worde
Noy works
Supercritical Fluida, Resource Recovery, Material and Energy Dalance, Process Engineering

(M44630220)Advanced Life Science and Biotechnology II[Advanced Life Science and Biotechnology II]

Subject name[English]	Advanced Life Sc	ience and Bio	otechn	ology II[Advanced Li	fe Science and Bio	technology II]	
Schedule number	M44630220	Subject are	a	Advanced	Required or	Elective	
				Environmental	elective		
				and Life			
				Sciences			
Time of starting a course	Spring term	Day of	the	Intensive	Credit(s)	2	
		week,period	1				
Faculty	Graduate Progran	n for Master's	5 Degr	ee	Subject grade	1~2	
Department Offered					Beggining		
					grade		
Charge teacher name[Roman	各教員, S4糸教ネ	务委員 KAKU	KYOU:	IN Kakukyouin, 4kei k	kyomu Iin−S		
alphabet mark							
Numbering							
Objectives of class							
This course will provide the stud	lents with the oppo	ortunity to st	udy or	n the selected subje	ct in the realm of	further advanced	
life science and biotechnology ba	sed on the knowled	lge of the cou	irse of	Advanced Life Scie	nce and Biotechnol	logy I.	
This course will provide the stud	lents with the oppo	ortunity to st	udy or	n the selected subje	ct in the realm of	further advanced	
life science and biotechnology ba	sed on the knowled	lge of the cou	irse of	Advanced Life Scie	nce and Biotechno	logy I.	
Contents of class							
The classes will be given by his/l	ner supervisor. The	type and con	tents	of this course depen	d on his/her super	visor.	
The classes will be given by his/l	ner supervisor. The	type and con	tents	of this course depen	id on his∕her super	visor.	
Self Preparation and Review							
Related subjects							
Notes for textbook							
Notes for a formation							
Notes for reference							
Goals to be achieved							
Evaluation of achievement							
The evaluation is based on the se	cores of reports, pr	esentations, a	and ex	amination.			
The evaluation is based on the se	cores of reports, pr	esentations, a	and ex	amination.			
Examination							
Details of examination							
Other information							
Supervisor							
Beference LIPI							
0.000							
UTTICE hours							
Relations to attainment objective	es of learning and e	ducation					
1							
Key words							

(M44630240)Advanced Environmental Technology II[Advanced Environmental Technology II]

Subject name[English]	Advanced Enviro	nmental Technology	II[Advanced Enviror	mental Technology	, 11]		
	M44630240	Subject area	Advanced	Required or	Flective		
	10144000240		Environmental	elective	LICCLIVE		
			and Life	01000140			
			Solonooo				
Time of starting a source	Service to une	Day of the	Intensive	Orre dit(a)	0		
lime of starting a course	Spring term	Day of the	Intensive	Great(s)	2		
F 11		week,period		<u>.</u>	1 0		
	Graduate Progra	m for Master's Degre	ee	Subject grade	1~2		
Department Offered			Beggining				
		grade					
Charge teacher name_Roman	谷教員, 54糸教	務安員 KAKUKYOU	N Kakukyouin, 4kei ł	kyomu lin-S			
alphabet mark							
Numbering							
Objectives of class							
This course will provide the stud	lents with the opp	ortunity to study on	the selected subje	ct in the realm of t	further advanced		
environmental technology based	on the knowledge	of the course of Adv	anced Environmenta	l Technology I.			
This course will provide the stud	lents with the opp	ortunity to study on	the selected subject	ct in the realm of t	further advanced		
environmental technology based	on the knowledge	of the course of Adv	anced Environmenta	I Technology I			
Contents of class							
The classes will be given by his /	aer supervisor Th	a type and contents	of this course deper	d on his/her super	vicor		
The classes will be given by his/I	an supervisor. The	a type and contents	of this course deper	d on his/her super	visor.		
Solf Properation and Paulow	ter supervisor. The	e type and contents	or this course deper	id off fils/ fier super	VISOF.		
Self Preparation and Review							
Related subjects							
Notes for textbook							
Notes for textbook							
Notes for reference							
Goals to be achieved							
Evoluction of aphievement							
The evoluation is based on the e		waaantationa and av					
The evaluation is based on the so	cores of reports, p	resentations, and exi	amination.				
The evaluation is based on the so	cores of reports, p	resentations, and ex-	amination.				
Examination							
Details of examination							
Other information							
Supervisor							
Supervisor							
Beference LIDI							
Office hours							
Relations to attainment objectives of learning and education							
ולטומטיווס נט מנגמווווסווג טעוסטעסס טו וסמוווווצ מווע סעעטמעטו							
Key worde							
Ney words							
(M44630260)Advanced Environmental and Ecological Systems II[Advanced Environmental and Ecological Systems II]

Subject nemo[English]						
Subject name[English]	Advanced Environmental and Ecological Systems IILAdvanced Environmental and Ecologica					
Oshadala assurban		0	A du como o a d	Demoised an	Election.	
Schedule number	WI44030200	Subject area	Advanced	Required or	Elective	
			Environmental	elective		
			and Life			
			Sciences	• • · · · · ·		
Time of starting a course	Spring term	Day of the	Intensive	Credit(s)	2	
		week,period				
Faculty	Graduate Program	m for Master's Degr	ee	Subject grade	1~2	
Department Offered				Beggining		
				grade		
Charge teacher name[Roman	各教員, S4系教	務委員 KAKUKYOU	N Kakukyouin, 4kei k	xyomu Iin−S		
alphabet mark]						
Numbering						
Objectives of class						
This course will provide the stur	lants with the opp	ortunity to study or	the calected cubie	at in the realm of	further advanced	
an incompanie and ecological and	veteres based on d	the knowledge of t		contraction of the second s	l and Easlagias	
environmental and ecological sy	stems based on i	the knowledge of t	rie course of Advar		ai and Ecological	
Systems I.						
This course will provide the stud	lents with the opp	ortunity to study or	the selected subje	t in the realm of	further advanced	
environmental and ecological sy	stems based on t	the knowledge of t	he course of Advar	nced Environmenta	al and Ecological	
Systems I.						
Contents of class						
The classes will be given by his/	her supervisor. The	type and contents	of this course depen	d on his/her super	visor.	
The classes will be given by his/	her supervisor. The	type and contents	of this course depen	d on his/her super	visor.	
Self Preparation and Review						
Pelated subjects						
Notes for textbook						
Notes for reference						
Goals to be achieved						
Evaluation of achievement						
The evaluation is based on the s	cores of reports, pr	resentations, and ex	amination.			
The evaluation is based on the s	cores of reports, pr	resentations, and ex	amination.			
Examination						
Deteile of exemination						
Details of examination						
Other information						
Supervisor						
Supervisor						
Reference URL						
Office hours						
Relations to attainment objectives of learning and education						
Key words						

(M45610010)Seminar on Architecture and Civil Engineering I[Seminar on Architecture and Civil Engineering I]

Subject name[English]	Seminar on Architecture and Civil Engineering I[Seminar on Architecture and Civil					
Schedule number	M45610010	Subject area	Advanced	Required or	Required	
			Architecture	elective		
			and Civil			
		D C H	Engineering	0	0	
lime of starting a course	Year	Day of the week period	Experiment	Credit(s)	3	
Faculty	Graduate Program	n for Master's Degr	ee	Subject grade	1~2	
Department Offered				Beggining		
				grade		
Charge teacher name_Roman	各教員, S5糸教	務委員 KAKUKYOU	IN Kakukyouin, 5kei	kyomu Iin−S		
alphabet markj Numbering						
All the students are required to	attend all the sem	inars, which is arrai	nged by the laborat	ory supervisor for	the special study	
supervisor at the guidance of the	seminar.		scheduled program		announced by the	
All the students are required to	attend all the sem	inars, which is arraı	nged by the laborat	ory supervisor for	the special study	
subjects related to the current re	esearch activity of	the laboratory. The	scheduled program	of the seminars is a	announced by the	
supervisor at the guidance of the	seminar.					
Contents of class						
Self Preparation and Review						
Related subjects						
Notes for textbook						
Notes for reference						
Goals to be achieved						
Evaluation of achievement						
Examination						
Details of examination						
Other information						
Reference URL						
0.000						
Office nours						
Deletione to attainment alder the		ducation				
relations to attainment objective	s or learning and e	oucation				
Key words						

(M45610020)Seminar on Architecture and Civil Engineering II[Seminar on Architecture and Civil Engineering II]

Subject name[English]	Seminar on Architecture and Civil Engineering II[Seminar on Architecture and Civil Engineering II]					
Schedule number	M45610020	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required	
Time of starting a course	Year	Day of the week,period	Experiment	Credit(s)	3	
Faculty	Graduate Program	n for Master's Degre	ee	Subject grade	2~2	
Department Offered				Beggining		
				grade		
Charge teacher name[Roman	各教員, S5系教教	務委員 KAKUKYOUI	N Kakukyouin, 5kei	kyomu Iin−S		
alphabet mark]						
Numbering						
Objectives of class						
All the students are required to subjects related to the current re supervisor at the guidance of the All the students are required to subjects related to the current re supervisor at the guidance of the Contents of class	attend all the sem esearch activity of t a seminar. attend all the sem esearch activity of t seminar.	inars, which is arran the laboratory. The inars, which is arran the laboratory. The	nged by the laborate scheduled program nged by the laborate scheduled program	ory supervisor for of the seminars is ory supervisor for of the seminars is	the special study announced by the the special study announced by the	
Related subjects Notes for textbook						
Notes for reference						
Goals to be achieved Evaluation of achievement						
Examination						
Details of examination						
Other information						
Reference URL						
Office hours						
Relations to attainment objective	es of learning and e	ducation				

(M45610030)Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]

Schedule number Civil Engineering Civil Engineering Required or Architecture and Civil engineering Required or Architecture and Civil engineering Required or Architecture and Civil engineering Required or Civil Engineering Required or Civil Engineering Required or Civil Engineering Required or Civil Engineering Subject grade Intensive Oraditable Intensive Civil Engineering Subject grade Intensive engineering Subject grade Intensive engineering Subject grade Subject grade Subject grade	Subject name[English]	Thesis Research	n on Architecture	and	Civil Engineering[T	hesis Research	on	Architecture and
Schedule number M45610030 Subject area and Civil Engineering and Civil Engineering Required and Civil Engineering Required on lective and Civil Engineering Required on lective and Civil Engineering Required Avanced Architecture and Civil Bagginin grade Required on lective and Civil Bagginin grade Required on lective and Civil Bagginin grade Required and Civil Engineering Required Architecture and Civil Bagginin grade Required on lective and Civil Bagginin grade Required Architecture and Civil Bagginin grade Required and Civil Bagginin grade Required		Civil Engineering]						
Time of starting a course 2Years Day of the vextperiod Intensive Credit(s) 6 Faculty Graduate School of Engineering Subject grade 1~1 Department Offered Beggining grade 1~1 Department Offered State School of Engineering Beggining grade 1~1 Numbering S5系教務委員 5kei kyomu lin-S Beggining grade 1~1 Numbering Graduate School of Engineering Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering Image and take a final examination or the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the superior. It depends on the laboratory. All students must present their thesis at the end of the course and take a final examination or the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the superior. Self Preparation and Review It depends on the laboratory It depends on the laboratory Notes for trefereco It depends on the laboratory It depends on the laboratory It depends on the laboratory. It depend	Schedule number	M45610030	Subject area		Advanced Architecture and Civil Engineering	Required elective	or	Required
Faculty Graduate School of Engineering Subject grade 1~1 Department Offered Beggining grade 1~1 Department Offered SS系就得委員 5kei kyomu lin-S alphabet mark] Beggining grade 1~1 Numbering Objectives of class SS系就得委員 5kei kyomu lin-S alphabet mark] Image transmitter in the size of class Image transmitter in the size of class of	Time of starting a course	2Years	Day of t week,period	the	Intensive	Credit(s)		6
Department Offered Beggining grade Charge teacher name[Roman alphabet mark] SS系教務委員 5kei kyomu lin-S alphabet mark] SS系教務委員 5kei kyomu lin-S alphabet mark] Numbering SS系教務委員 5kei kyomu lin-S alphabet mark] SS系教務委員 5kei kyomu lin-S alphabet mark] Objectives of class Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering It depends on the laboratory. All students must present their thesis at the end of the course and take a final examination or the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor. Self Preparation and Review Related subjects It depends on the laboratory It depends on the laboratory It Notes for trackbock It depends on the laboratory It It Notes for trackbock It Seging of rall the process for the preparation and presentation of the thesis. This credit is assigned for all the process for the preparation and presentation of the thesis.	Faculty	Graduate Schoo	l of Engineering			Subject grade		1~1
grade Charge teacher name[Roman alphabet mark] S5乘教務委員 5kei kyomu lin-S alphabet mark] Numbering Objectives of class Research on architecture and civil engineering Research on architecture and civil engineering Research on architecture and civil engineering Contants of class Research on architecture and civil engineering Research on architecture and civil engineering Contants of class It depends on the laboratory. All students must present their thesis at the end of the course and take a final examination or the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor. It depends on the laboratory. All students must present their thesis at the end of the course and take a final examination or the thesis as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor. Self Preparation and Review Related aubjects It depends on the laboratory It depends on the laboratory Notes for teatbook It depends on the laboratory Notes for reference Geals to be achieved Evaluation of achievement This credit is assigned for all the process for the preparation and presentation of the thesis. This credit is assigned for all the process for the preparation and presentation of the thesis. <th>Department Offered</th> <th></th> <th></th> <th></th> <th></th> <th>Beggining</th> <th></th> <th></th>	Department Offered					Beggining		
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Reference URL It depends on the laboratory. It depends on the laboratory. Office hours It depends on the laboratory It depends on the laboratory Relations to attainment objectives of learning and education	It depends on the laboratory.							
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Office hours It depends on the laboratory It depends on the laboratory Relations to attainment objectives of learning and education	It depends on the laboratory.							
It depends on the laboratory It depends on the laboratory Relations to attainment objectives of learning and education	Office hours							
It depends on the laboratory Relations to attainment objectives of learning and education	It depends on the laboratory							
Relations to attainment objectives of learning and education	It depends on the laboratory							
	Relations to attainment objective	s of learning and	education					

Key words

(M45610030)Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]

Subject name[English]	Thesis Research	on Architecture and	Civil Engineering[T	besis Research on	Architecture and		
Subject name[Engisit]	Civil Engineering]						
Schedule number	M45610030	Subject area	Advanced	Required or	Required		
	10143010030	Subject area	Architecture	elective	Nequired		
			and Civil	01000140			
			Engineering				
Time of starting a source	220000	Day of the	Engineering	Credit(a)	6		
Time of starting a course	ZTears	week period	Experiment	Oreal(s)	0		
Ecoulty (Graduata Pragran	n for Mostor's Dorr		Subject mede	1~2		
Pacuity Department Offered	Graduate Program	n for Master's Degre	e	Subject grade	1~2		
Department Offered				Degginnig			
Charge teacher name[Boman	久 お吕 05 五 数 3		N Kakukuouin 5kai	graue			
elohebet merk]	百秋頁, 55米秋		IN Makukyouin, Jkei	kyoniu ini 3			
Numbering							
Objectives of class							
Research on architecture and civ	/il engineering						
Research on architecture and civ	/il engineering						
Contents of class							
It depends on the laboratory. All	students must pre	esent their thesis at	the end of the cou	urse and take a fin	al examination on		
the thesis, as a requirement for t	the graduation of th	ne master course. T	he study for the the	esis is planned and	${\tt conducted} \ {\tt under}$		
the guidance of the supervisor.							
It depends on the laboratory. All	students must pre	esent their thesis at	the end of the cou	urse and take a fin	al examination on		
the thesis, as a requirement for t	the graduation of th	ne master course. T	he study for the the	esis is planned and	conducted under		
the guidance of the supervisor.							
Self Preparation and Review							
Related subjects							
It depends on the laboratory							
It depends on the laboratory							
Notes for textbook							
It depends on the laboratory							
It depends on the laboratory							
Notes for reference							
Goals to be achieved							
Evaluation of achievement							
This credit is assigned for all the	process for the pro	eparation and prese	ntation of the thesis	S.			
This credit is assigned for all the	process for the pro-	eparation and prese	ntation of the thesis	8.			
Examination							
Details of examination							
Other information							
It depends on the laboratory							
It depends on the laboratory							
Reference LIRI							
It depends on the laboratory							
It depends on the laboratory							
Office hours							
It depende on the leberatory							
It depends on the laboratory							
Deletions to the laboratory	••••••••••••••••••••••••••••••••••••••						
relations to attainment objective	es of learning and e	oucation					

Key words

(M45630040)Geologic Hazard and Mitigation Planning[Geologic Hazard and Mitigation Planning]

Subject name[English]	Geologic Hazard	and Mitigation	Plann	ing[Geologic Hazard	and Mitigation Pla	nning]
	M45630040	Subject are	8	Advanced	Required or	Elective
				Architecture	elective	
				and Civil		
				Engineering		
Time of starting a course	Spring term	Day of	the	Tue.3~3	Credit(s)	2
_		week,period	1			
Faculty	Graduate Program	n for Master's	Degr	ee	Subject grade	1~2
Department Offered					Beggining	
					grade	
Charge teacher name[Roman	河邑 眞 KAWAM	URA Makoto				
alphabet mark]						
Numbering						
Objectives of class						
The objective are to underdstand	d the characteristic	cs of geologic	ahzar	ds such as earthqua	akes,landslides,and	flloodings and to
learn environment planning to mit	igate the disasters.					
The objective are to underdstand	d the characteristic	cs of geologic	ahzar	ds such as earthqua	akes,landslides,and	flloodings and to
learn environment planning to mit	igate the disasters.	-				
Contents of class						
1 : An introduction to geology and	d planning					
2 : Earthquakes and faulting						
3 : Volcanic activity						
4 : Soil properties and problems						
5 : Landslides						
6 : Subsidence						
7 : Coastal Process						
8 : Flooding						
9 : Groudwater						
10 : Waste treatment						
12 : Environmental planning						
14 : Environmental law						
1 : An introduction to geology and	d planning					
2 : Farthquakes and faulting	a pianining					
3 : Volcanic activity						
4 : Soil properties and problems						
5 : Landslides						
6 : Subsidence						
7 : Coastal Process						
8 : Flooding						
9 : Groudwater						
10 : Waste treatment						
11 : Mineral resouses						
12 : Energy resources						
13 : Environmental planning						
14 : Environmental law						
Self Preparation and Review						
Related subjects						
geology,urban planning,risk manag	gement					
geology,urban planning,risk manag	gement					
Notes for textbook						
Referrence:						
Griggs and Gilchrist:Geologic haz	ards,resources,and	environmenta	l planr	ning,		
Wadsworth Publishing Company,1	983.					

Referrence: Griggs and Gilchrist:Geologic hazards,resources,and environmental planning, Wadsworth Publishing Company, 1983. Notes for reference Goals to be achieved ·Understanding the characteristics of geologic hazards such as earthquake,landslide and flooding. •Understanding the land use planning and law for mitigation of the disaster. $\cdot \text{Understanding the characteristics of geologic hazards such as earthquake, landslide and flooding.}$ •Understanding the land use planning and law for mitigation of the disaster. Evaluation of achievement Report and the presentation of the report. Report and the presentation of the report. Examination **Details of examination** Other information office:D-806 Tel:0532-44-6847 E-mail:kawamura@tutrp.tut.ac.jp office:D-806 Tel:0532-44-6847 E-mail:kawamura@tutrp.tut.ac.jp Reference URL preparing preparing **Office hours** 13:00-15:00 Tuesday 13:00-15:00 Tuesday Relations to attainment objectives of learning and education graduate course subject is not related with JABEE graduate course subject is not related with JABEE Key words geologic hazard, mitigation planning geologic hazard, mitigation planning

(M45630090)Coastal Hydraulics[Coastal Hydraulics]

Subject name[English]	Coastal Hydraulic	cs[Coastal Hy	draulic	s]			
Schedule number	M45630090	Subject are	a	Advanced	Required or	Elective	
				Architecture	elective		
				and Civil			
				Engineering			
Time of starting a course	Spring term	Day of	the	Tue.1~1	Credit(s)	2	
Foouthy	Graduata Program	m for Master's			Subject grade	1~2	
Paculty Department Offered	Graduate Prograi	II for Masters	Degr	56	Subject grade	1	
Department Onered					grade		
Charge teacher name[Roman	加藤 茂 KATO S	Shigeru			6.000		
alphabet mark]		0					
Numbering							
Objectives of class							
To understand the basic concept	of coastal enginee	ering and the a	advanc	ed knowledge of coa	astal process, desi	gn and protection	
including numerical calculation.							
To understand the basic concept	of coastal enginee	ering and the a	advanc	ed knowledge of coa	astal process, desi	gn and protection	
including numerical calculation.							
Contents of class							
 Introduction of Coastal Engineer 	ring						
water waves, wave theories, tide	es and water levels	s, wave breakii	ng, etc				
 Introduction of Coastal Manager 	nent						
pressure, use, impact, managem	ent, etc.						
 Basic Shore Processes 							
near-shore current, coastal mat	erial, beach property, sediment transport, etc.						
•Coastal Design							
design process, model classifica	ition, physical & nui	merical model	s, etc.				
Computation of Coastal Morpho	logy						
sediment transport rate, analytic	cal computation, nu	umerical solut	ions, e	tc.			
- Shore Protection	nourishment sta						
Introduction of Coastal Engineer	, nourisnment, etc.						
water waves wave theories tid	es and water levels	wave breaki	no etc				
•Introduction of Coastal Manager	nent		ig, 000				
pressure, use, impact, managem	ent. etc.						
•Basic Shore Processes	,						
near-shore current, coastal mat	erial, beach proper	ty, sediment f	transp	ort, etc.			
•Coastal Design							
design process, model classifica	tion, physical & nu	merical model	s, etc.				
 Computation of Coastal Morpho 	logy						
sediment transport rate, analyti	cal computation, nu	umerical solut	ions, e	tc.			
 Shore Protection 							
sediment movement, structures	, nourishment, etc.						
Sen Preparation and Review							
Related subjects							
Basic knowledge of coastal engin	eering is desirable.						
Basic knowledge of coastal engin	eering is desirable.						
Notes for textbook							
No textbook is required for this c	lass. Lecture hand	out is distribu	ted.				
(Reference)							
"Water Wave Mechanics for Eng	ineers and Scientis	sts - Advance	ed Ser	ies on Ocean Engin	eering – Vol. 2″F	Robert G. Dean &	
Robert A.							
Dalrymple (World Scientific)							
"Introduction to Coastal Enginee	ering and Managem	nent Advar	nced S	Series on OceanEng	ineering Volum	e 16" J. William	
Kamphuis (World Scientific)							
"Basic Coastal Engineering " Ro	bert M. Sorensen	(Kluwer Acad	emic P	ublishers)			
No textbook is required for this c	lass. Lecture hand	out is distribu	ted.				

(Reference)
Water Wave Mechanics for Engineers and Scientists - Advanced Series on Ocean Engineering - Vol. 2″ Robert G. Dean
Robert A.
Dalrymple (World Scientific)
"Introduction to Coastal Engineering and Management Advanced Series on OceanEngineering Volume 16" J. Willi
Kamphuis (World Scientific)
"Basic Coastal Engineering "Robert M. Sorensen (Kluwer Academic Publishers)
Notes for reference
Goals to be achieved
Understanding the concept and methodology for coastal management.
Understanding the concept and methodology for coastal management.
Evaluation of achievement
Report
Report
Examination
Details of examination
Other information
Room : D-812
E-mail : s-kato@ace.tut.ac.ip.
Room : D-812
E-mail : s-kato@ace.tut.ac.jp.
Reference URL
N/A
Office hours
Monday, 13:00-14:30
Monday, 13:00–14:30
Relations to attainment objectives of learning and education
N/A
N/A
Key words Sediment transport, Current, Waves, Shore protection and management
Sediment transport Current Wayes Shore protection and management

(M45630140)Advanced District Planning[Advanced District Planning]

Subject name[English]	Advanced District Planning[Advanced District Planning]						
Schedule number	M45630140	Subject ar	a	Advanced	Required or	Elective	
				Architecture	elective		
				and Civil			
				Engineering			
Time of starting a course	Spring term	Day of	the	Fri.2~2	Credit(s)	2	
		week,perio	d				
Faculty	Graduate Progra	m for Master'	s Degr	ee	Subject grade	1~2	
Department Offered					Beggining		
					grade		
Charge teacher name[Roman	浅野 純一郎 AS	SANO Junichir	0				
alphabet mark							
Numbering							
Objectives of class							
1) To gain the practical knowledg	e of urban and dist	trict planning.					
2) To learn the advanced method	s of district planni	ng and design					
3) To learn the theory and the sy	stem of Japanese	land use cont	rol sys	tem and land readju	stment projects.		
1) To gain the practical knowledg	e of urban and dis	trict planning.					
2) To learn the advanced method	s of district planni	ng and design					
3) To learn the theory and the sy	stem of Japanese	land use cont	rol sys	tem and land readju	stment projects.		
Contents of class							
The major topics that will be add	ressed in this class	s are the follo	wings.				
1. Overview of the theory and co	ncrete policy and i	methods abou	t mode	rn urban planning sy	stem in Japanese		
2. Overview of Japanese land use	e control system, e	especially area	divisio	on system and devel	opment permission		
3. Overview of Japanese land rea	djustment projects	s.					
4. Practice by application of the o	design methods ab	out land readj	ustmer	nt project and distric	t planning.		
Reporting textbook "Urban Plan	ning System in Ja	pan 2nd Editi	on"an	d doing workshop a	bout land readjustr	ment project and	
district planning.							
The major topics that will be add	ressed in this class	s are the follo	wings.				
1. Overview of the theory and co	ncrete policy and i	methods abou	t mode	rn urban planning sy	stem in Japanese		
2. Overview of Japanese land use	e control system, e	especially area	divisio	on system and devel	opment permission.		
3. Overview of Japanese land rea	djustment projects	S.					
4. Practice by application of the o	design methods ab	out land readj	ustmer	nt project and distric	t planning.		
Reporting textbook "Urban Plan	ning System in Ja	pan 2nd Editi	on"an	d doing workshop a	bout land readjusti	ment project and	
district planning.	g.						
Self Preparation and Review			_				
Related subjects							
The following knowledge is desira	irable,						
1) The basic knowledge on moder	ern urban planning						
2) The knowledge on urban plann	ing system in your	country					
The following knowledge is desira	able,						

- 1) The basic knowledge on modern urban planning
- 2) The knowledge on urban planning system in your country

Notes for textbook

- •Urban Planning System in Japan 2nd Edition
- •Urban Land Use Planning System in Japan 2dn Edition
- Both have been published by Japan International Cooperation Agency

•Urban Planning System in Japan 2nd Edition •Urban Land Use Planning System in Japan 2dn Edition Both have been published by Japan International Cooperation Agency

Notes for reference

Goals to be achieved

Evaluation of achievement

Submitting reports about textbook and another theme. Oral presentation: 30%, Written report: 70% Submitting reports about textbook and another theme. Oral presentation: 30%, Written report: 70% **Examination**

Details of examination

Other information

Reference URL

https://webct.edu.tut.ac.jp:443/webct/public/home.pl or https://moodle.imc.tut.ac.jp/ More information and pdf.files of textbook will be offered from Webct.

https://webct.edu.tut.ac.jp:443/webct/public/home.pl or https://moodle.imc.tut.ac.jp/ More information and pdf.files of textbook will be offered from Webct.

Office hours

Relations to attainment objectives of learning and education

Key words

District planning, Land use control system, Land readjustment project District planning, Land use control system, Land readjustment project

(M45630150)Advanced Transportation and Traffic Engineering[Advanced Transportation and Traffic Engineering]

Subject name[English]	Advanced Trar	sportation and Tra	ffic Engineering[Adv	anced Transporta	tion and Traffic	
	Engineering]					
Schedule number	M45630150	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective	
Time of starting a course	Spring term	Day of the	Mon.4~4	Credit(s)	2	
Faculty	Graduate Progr	week,period		Subject grade	1~2	
Department Offered				Beggining grade		
Charge teacher name[Roman	廣畠 康裕 HIR	OBATA Yasuhiro		-	1	
alphabet mark] Numbering						
Objectives of class						
To gain advanced knowledge of t urban areas.	heories and meth	ods for transportatio	n planning and traffic	c engineering meas	ures especially in	
To gain advanced knowledge of t urban areas.	heories and meth	ods for transportatio	n planning and traffic	c engineering meas	ures especially in	
Contents of class						
1.Characteristics of transportatio 2.Characteristics of transportatio 4.Survey methods of travel dema 5.Methods of travel demand analy 6.Methods of trffic flow analyses/ 7.Methods of evaluating transport 8.Other topics : Traffic flow theor	n systems/ on problems and p nd and traffic flov ysis and modeling ysis and modeling tation plan and tra tation plan and travel	olicy issues/ 3.Tran vs/ / affic measures/ time, and valuing ext	sportation planning p ernal effects of tran	rocess and role of sportation	modeling/	
1.Characteristics of transportatio 2.Characteristics of transportatio 4.Survey methods of travel dema 5.Methods of travel demand analy 6.Methods of trffic flow analyses/ 7.Methods of evaluating transport 8.Other topics : Traffic flow theor	n systems/ n problems and p nd and traffic flov vsis and modeling, / tation plan and tra ry, value of travel	olicy issues/ 3.Tran: vs/ / affic measures/ time, and valuing ext	sportation planning p ernal effects of tran	rocess and role of sportation	modeling/	
Self Preparation and Review						
Related subjects Advanced Regional Planning and	Design I,II					
Advanced Regional Planning and	Design I,II					
Notes for textbook Texts and papers will be decided	by the opening of	f the class.				
Texts and papers will be decided	by the opening of	f the class.				

Notes for reference
Goals to be achieved
To understand the necessity had significance of transportation planning
To understand the concept of transportation planning
2. To gain the theories and methods in transnortation planning
. To gain discussions and model in a simplificance of transmitter planning
2 To understand the concept of transportation planning
2. To gain the theories and methods in transportation planning
5. To gain the debilision and the debilision of a data portation planning
Home work assimpted will be required. Final reports or examination will be imposed
Thome work assignments will be required. Final reports or examination will be imposed.
Home work assignments will be required. Final reports or examination will be imposed.
Examination
Details of examination
Other information
room(D-705),hirobata@ace.tut.ac.jp
room(D-705) hirobata@ace tut ac in
Reference URL
Hirobata: http://www.tr.ace.tut.ac.jp
Hirobata: http://www.tr.ace.tut.ac.jp
Office hours
Hirobata: Mon,16:25–17:30; Tue,12:30–13:30
Hirobata: Mon,16:25-17:30; Tue,12:30-13:30
Relations to attainment objectives of learning and education
Key words
planning process, social & economic evaluation method, forecasting models
planning process, social & economic evaluation method, forecasting models

(M45630180)Advanced Computational Economics[Advanced Computational Economics]

Subject name[English]	Advanced Computational Economics[Advanced Computational Economics]						
Schedule number	M45630180	Subject a	rea	Advanced	Required	or Elective	
		Cubject u		Architecture	elective		
				and Civil	ciccure		
				Engineering			
Time of starting a course	Spring term	Dav of	the	Wed.3~3	Credit(s)	2	
		week,peri	od				
Faculty	Graduate Program	n for Maste	's Degr	ee	Subject grade	1~2	
Department Offered					Beggining		
					grade		
Charge teacher name[Roman	渋澤 博幸 SHIBU	JSAWA Hiro	yuki				
alphabet mark]							
Numbering							
Objectives of class							
In this course, students learn the	economic modelin	g techniques	and th	e simulation method	ology.		
In this course, students learn the	economic modelin	g techniques	and th	e simulation method	ology.		
Contents of class							
1-2: Input-Output Model							
3-4: Simple 2 Sectors General Ed	quilibrium Model						
5-6: Inter-Sectoral General Equil	ibrium Model						
7–8: Simulation and Numerical Ex	ample						
9-11: Open Model with Exports a	nd Imports						
12-13: General Equilibrium Model	with Public Sector						
14–15: Simulation and Numerical	Example						
1-2: Input-Output Model							
3-4: Simple 2 Sectors General Ed	quilibrium Model						
5-6: Inter-Sectoral General Equil	ibrium Model						
7-8: Simulation and Numerical Ex	ample						
9-11: Open Model with Exports a	nd Imports						
12–13: General Equilibrium Model	with Public Sector						
14–15: Simulation and Numerical	Example						
Self Preparation and Review							
Related subjects							
Economics, Policy, Simulation							
Economics, Policy, Simulation							
Notes for textbook							
Papers will be distributed.							
Papers will be distributed.							
Notes for reference							
Goals to be achieved							
Advanced Computational Econom	nics						
Advanced Economic Simulation N	lodel						
Advanced Computational Econom	nics						
Advanced Economic Simulation N	Nodel						
Evaluation of achievement							
Paparte must be submitted							
A: 80 Points or higher B: 65 points	ts or higher C.55 s	ointe or him	or D.I	ess than 55 points			
A. SO FORTS OF Higher, D. 03 point	to or higher, 0.00 p	onits of filgr	iei, D. L	loss than 55 points			
Reports must be submitted.		- 1.1.1		the FF			
A: 80 Points or higher, B: 65 poin	us or nigner, U:55 p	oints or high	ier, D: L	ess than 55 points.			

Examination

Details of examination

Other information

Room:B-409 Tel:6963 E-mail: hiro-shibu@tut.jp

Room:B-409 Tel:6963 E-mail: hiro-shibu@tut.jp

Reference URL

Office hours Tuesday 9:00-10:00 Tuesday 9:00-10:00

Relations to attainment objectives of learning and education

Key words

Computational Economics, Simulation Computational Economics, Simulation

(M45630200)Advanced Structural S	vstem Planning and Des	ign II[Advanced Structural S	vstem Planning and Design II]	

Schedule number Time of starting a course Faculty Department Offered	M45630200	Subject area	Advanced Architecture	Required or	Elective
Time of starting a course Faculty Department Offered	Spring term		and Civil Engineering	elective	
Faculty Department Offered	op8 to	Day of the week,period	Intensive	Credit(s)	2
Department Offered	Graduate Progra	am for Master's Degr	ee	Subject grade	1~2
-				Beggining	
Charge teacher name[Roman alphabet mark]	各教員, S5系教	牧務委員 KAKUKYOU	IN Kakukyouin, 5kei l	grade kyomu Iin−S	
Numbering					
aboratory supervisor for the spe program of the seminars is annou It depends on the laboratory. T laboratory supervisor for the spe program of the seminars is annou	cial study subjec nced by the supe he resistered stu cial study subjec nced by the supe	ervisor at the guidanc udents are required ts related to the cur ervisor at the guidanc	e of the seminar. to attend all the s crent research activi the of the seminar.	eminars, which is ty of the laborator	y. The sc arranged y. The sc
Contents of class	riced by the supe	ervisor at the guidance	e of the seminar.		
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination					
Details of examination					
Other information					
Reference URL					
Office hours					
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(M45630220)Advanced Environm	ental System Planning and Desi	m IIIAdvanced Environmental	System Planning and Design II
		3	

Subject name[English]	Advanced Environmental System Planning and Design II[Advanced Environmental System						
	Planning and Design II						
Schedule number	M45630220	Subject area	Advanced	Required or	Elective		
			Architecture	elective			
			Engineering				
Time of starting a course	Spring term	Dev of the	Intensive	Credit(c)	2		
Time of scarung a course	Spring term	week period	Intensive	Oreall(s)	2		
Faculty	Graduate Program	n for Master's Degre	20	Subject grade	1~2		
Department Offered	Graduate i rograf	in for musice s begin		Beggining	1 2		
				grade			
Charge teacher name[Roman	各教員, S5系教	務委員 KAKUKYOUI	N Kakukyouin, 5kei	kyomu Iin-S			
alphabet mark]			•	-			
Numbering							
Objectives of class							
It depends on the laboratory T	be registered stur	lente are required :	to ottand all the c	eminare which is	arranged by the		
It depends on the laboratory. I	ne resistered stud	serits are required	to attend all the s	ty of the leberator	arranged by the		
naboratory supervisor for the spe	nood by the subjects	viser at the guidened	ent research activi	ty of the laborator	y. The scheduled		
It depends on the laboratory T	he resistered stur	lents are required :	to attend all the s	eminars which is	arranged by the		
laboratory supervisor for the spe	cial study subjects	s related to the cur	rent research activi	ty of the laborator	v. The scheduled		
program of the seminars is appoint	inced by the super	isor at the guidance	of the seminar		. The solieduled		
Contents of class							
Self Preparation and Review							
Related subjects							
Notes for textbook							
Notes for reference							
Goals to be achieved							
Evaluation of achievement	Evaluation of achievement						
Examination							
Details of examination							
Other information							
Reference URL							
Office hours							
Relations to attainment objectives of learning and education							
Key words							
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(M45630240)Advanced Regional System Planning and Design II[Advanced Regional System Planning and Design II]

Subject name[English]	Advanced Region	al System Planning	and Design II[Adva	nced Regional Syst	tem Planning and	
	Design II]					
Schedule number	M45630240	Subject area	Advanced	Required or	Elective	
			Architecture	elective		
			and Civil			
			Engineering			
Time of starting a course	Spring term	Day of the	Intensive	Credit(s)	2	
-		week,period				
Faculty	Graduate Program	n for Master's Degre	е	Subject grade	1~2	
Department Offered				Beggining		
				grade		
Charge teacher name[Roman	各教員, S5系教	務委員 KAKUKYOUI	N Kakukyouin, 5kei I	kyomu Iin−S		
alphabet mark]						
Numbering						
Objectives of class						
It depends on the laboratory 7	he resistered stud	lents are required	to attend all the s	eminars which is	arranged by the	
laboratory supervisor for the spe	cial study subjects	s related to the cur	rent research activi	ty of the laborator	v The scheduled	
program of the seminars is appointed	inced by the superv	isor at the guidance	of the seminar		y. The concurrence	
It depends on the laboratory. T	he resistered stud	dents are required	to attend all the s	eminars, which is	arranged by the	
laboratory supervisor for the spe	cial study subjects	s related to the cur	rent research activi	ty of the laborator	v. The scheduled	
program of the seminars is annou	inced by the superv	isor at the guidance	e of the seminar.		,	
Contents of class		3				
Solf Properation and Paviaw						
Ser Preparation and Review						
Related subjects						
Notes for textbook						
Notes for reference						
Goole to be echieved						
Goals to be achieved						
Evaluation of achievement						
Examination						
Details of examination						
Others information						
Other information						
Reference URL						
Office hours						
Relations to attainment objectives of learning and education						
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Key words						
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